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NEXTEA [National Economic Crossroads Transportation Efficiency Act]: NEXTEA - Environment

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THE NATIONAL ECONOMIC CROSSROADS TRANSPORTATION EFFICIENCY ACT

CLEANING OUR AIR: THE CONGESTION MITIGATION AND AIR QUALITY IMPROVEMENT PROGRAM

Scientific research demonstrates the effects of air pollution on our health, especially on that of the most vulnerable Americans: children, the elderly, and the infirm. President Clinton has acted on this research, and taken advantage of ISTEA's landmark environmental provisions to cut pollution. In 1990, the year before ISTEA's enactment, 140 million Americans lived in areas which failed to meet standards for healthful air. That number dropped to 79 million in 1995: a big improvement, but still too many.

Growing traffic threatens even the improvements made through ISTEA programs and through cleaner cars and cleaner fuels. We have to continue, and even expand, efforts to improve technology and to control vehicle miles of travel. NEXTEA, the National Economic Crossroads Transportation Efficiency Act of 1997, would do this. As the President said when he announced NEXTEA, "this is one of the most important pieces of environmental legislation that will be considered by Congress in the next two years."

CMAQ: BUILDING PARTNERSHIPS FOR A HEALTHIER ENVIRONMENT

- ✓ The leading ISTEA environmental initiative is the Congestion Mitigation and Air Quality Improvement Program (CMAQ), which authorized an average of \$1 billion annually to help states and communities clean up their air. CMAQ has given state and local officials unprecedented flexibility to use federal funds for the projects which best meet their needs.

CMAQ'S AIR QUALITY BENEFITS

- ✓ **Significant benefits under ISTEA.** CMAQ projects implemented this year will eliminate 52,000 tons of volatile organic compounds (VOCs) and 62,000 tons of nitrogen oxides, key components of smog, as well as 336,000 tons of carbon monoxide, annually.
- ✓ **Greater benefits projected under NEXTEA.** CMAQ has laid the foundation for continued improvements in air quality under NEXTEA: by 2005, CMAQ projects could remove more than 165,000 tons of VOCs annually, equal to 16 percent of national motor vehicle emission reductions. That number actually exceeds *total* current motor vehicle emissions in New Jersey. CMAQ also could eliminate 856,000 tons of carbon monoxide and 275,000 tons of nitrogen oxides.

CMAQ'S TRANSPORTATION BENEFITS

- ✓ **Supporting transit.** 54 percent of CMAQ funds have been used for transit, enabling nearly \$1.6 billion to be invested in new buses and other transit facilities and services. Transit and rideshare improvements in Los Angeles have eliminated 1.3 million vehicle miles traveled each year.
- ✓ **Supporting intermodal projects.** CMAQ's flexibility has made a reality of the "T" in ISTEA -- *intermodal* -- improving linkages between different forms of transportation. Seattle and Portland, Oregon have used CMAQ funds to improve rail and truck access to seaports, reducing emissions and speeding freight. A CMAQ-supported freight barge daily takes hundreds of trucks off of New York's streets, and a truck-rail facility in Auburn, Maine takes 12,000 trucks a year off of busy I-95.
- ✓ **Deploying new technologies.** CMAQ has fostered the deployment of new technologies, such as cleaner natural gas buses in Cleveland, Ohio -- Kenosha, Wisconsin -- and Boise, Idaho, and advanced auto emissions inspection and maintenance programs in Indiana and Rhode Island.
- ✓ **Promoting transportation alternatives.** CMAQ promotes innovative programs which meet the needs of real people. For example, a San Jose transit station established an on-site child care center to promote ridership by working parents. A parking management program in Glendale, California, eliminates 140,000 car trips each day, and a San Diego vanpool program eliminates a thousand car trips daily. In communities around the country, such as Missoula, Montana, CMAQ has funded bicycle lanes, and it has supported telecommuting projects in Pennsylvania and Virginia.
- ✓ **Improving traffic flow.** CMAQ also funds traffic flow improvements such as synchronized traffic signals in Denver, which have reduced delays by 34,000 hours over the past 18 months, and a freeway incident patrol in San Francisco, which has cut delays by 90,000 hours since 1992. By cutting congestion, these programs also reduce pollution.

KEY NEXTEA PROVISIONS FOR CMAQ

- **INCREASE FUNDING.** NEXTEA would increase authorized CMAQ funding by 30 percent, to \$1.3 billion annually.
- **EXPAND ELIGIBILITY.** NEXTEA would act on new research on the dangers of particulate matter by allowing areas that do not meet health standards for this pollutant to receive CMAQ funds. NEXTEA also would expand funding eligibility to include scrappage of higher-polluting pre-1980 vehicles and programs to reduce the additional carbon monoxide pollution produced by engines in extremely cold conditions.
- **SUSTAIN FUNDING.** NEXTEA would ensure that no state loses CMAQ funds as a result of proposed enhancements of air quality standards. As proposed under NEXTEA, CMAQ would help to keep emission trends moving downward nationally.
- **HELP STATES MEET FEDERAL REQUIREMENTS.** Under NEXTEA, CMAQ would help states and communities fund projects necessary to satisfy federal air quality requirements. CMAQ helps to make the Clean Air Act a *funded* mandate.

Final CMAQ Assessment, I hope!
Ken Adler

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Janno Lieber 366-7127

THE EMISSION REDUCTION POTENTIAL OF THE CONGESTION MITIGATION AND AIR QUALITY PROGRAM

PRELIMINARY ASSESSMENT

OFFICE OF POLICY, PLANNING AND EVALUATION

U.S. ENVIRONMENTAL PROTECTION AGENCY

MAY 19, 1997

THE EMISSIONS REDUCTION POTENTIAL OF THE CMAQ PROGRAM¹

OVERVIEW

The Congestion Mitigation and Air Quality Improvement Program (CMAQ) provides funds to states for projects designed to help attain and maintain the national ambient air quality standards (NAAQS) set under the Clean Air Act (CAA). CMAQ was created in 1991 by the Intermodal Surface Transportation Efficiency Act (ISTEA), and Congress is now considering reauthorization of ISTEA. This report analyzes the potential of the CMAQ program to reduce air pollutant emissions of volatile organic compounds (VOC), carbon monoxide (CO), and oxides of nitrogen (NO_x) in the U.S. under ISTEA and in the Administration's NEXTEA reauthorization proposal. Data for this exercise came from estimates of emission benefits and funding obligations reported by the states to the Federal Highway Administration (FHWA) and published in FHWA's CMAQ Program Annual Report for FY 1994.²

KEY CONCLUSIONS

- The CMAQ program, under ISTEA, is projected to reduce VOC emissions by 52,135 tons per year, CO emissions by 336,349 tons per year, and NO_x by 62,406 tons per year (Table 1 and Figures 1a-c)³. Under NEXTEA, annual CMAQ emission reductions could grow substantially to 165,151 tons per year of VOC, 856,166 tons of CO, and 275,837 tons of NO_x. These estimates represent the cumulative reductions from CMAQ projects funded through 1997 and 2003. Projects funded after 1997 are assumed to achieve improved effectiveness compared to projects funded prior to 1997. *why?*
- Under NEXTEA, the projected emission reductions from CMAQ could have a significant affect on improving urban air quality. For example, by 2005, CAA requirements for on-road vehicles will have reduced VOC emissions by approximately 888,000⁴ tons per year, while CMAQ is projected to reduce VOC emissions by 104,200 to 165,151 tons per year. While NEXTEA ends in 2003, emission reductions are estimated to 2005 since this is when projects funded in 2003 are expected to produce results.
- While increasing VMT threatens to reverse air quality gains made through ISTEA programs and through cleaner cars and cleaner fuels, Figure 2 suggests that CMAQ may help keep emission trends moving downward. In Figure 2, the top line represents EPA's estimate of emission trends from on-road vehicles without CMAQ, and the bottom line is emission trends with CMAQ.
- By 2005, CMAQ VOC emission reductions could equal 10 to 16 percent of total on-road vehicle emission reductions for the period 1995 to 2005 (Figure 3). For NO_x and CO

¹ For additional information concerning this report, please contact Ken Adler, U.S. EPA, 260-6925, or Camille Mittelholtz, U.S. DOT, 366-4861.

² Federal Highway Administration. "The Congestion Mitigation and Air Quality Improvement Program: A Summary of Third Year Activities (FY 1994)." December 1995. (As of the date of this analysis, the FY 1995 report had not been released.)

³ These estimates are slightly higher than the estimates released by EPA and DOT on May 7, 1997 because of a correction in the amount of funds available for CMAQ.

⁴ U.S. EPA. National Air Pollution Emission Trends. EPA-454/R-95-0111. October 1995. These emission estimates reflect existing and projected regulatory requirements as of 1994.

CMAQ emission reductions, these numbers are 11 to 23 percent, and 8 to 10 percent, respectively.

- Estimates of emission benefits from the CMAQ program are sensitive to assumptions about the effectiveness of individual projects. There is a large range in the estimated effectiveness of CMAQ projects funded in FY 1994. The balance of this report address these issues, and provide information to place the data in the proper contexts.

Estimated Potential Emissions Effect of CMAQ

max/min The report presents potential tons of pollutants reduced due to the CMAQ program when it reaches its potential effectiveness. FHWA analysis shows that obligation rates have continued to rise since the inception of the program. As states become more familiar with the CMAQ program and institutionalize procedures to select projects, the effectiveness of projects is expected to increase compared to current levels. This analysis assumes steady state conditions under which the program has ramped-up to max potential effectiveness. To coincide with the ISTEA legislative cycle, the years 1997 and 2003 was selected for analysis, and CMAQ spending was assumed to be equal to the annual obligation levels for CMAQ. Emission estimates for ISTEA and NEXTEA, however, are reported for 1999 and 2005, respectively, because projects are assumed to take 2 years to reach their full effect. Emission estimates were derived by dividing deflated CMAQ expenditures by a range of effectiveness estimates for each project type. A more detailed description of our approach is provided in the Methodology section.

Lower and upper bound estimates are presented in the analysis for the 2000 to 2005 year estimates. The lower bound estimate assumes that the typical project funded will be as effective as the median or 50th percentile project in 1994. For the upper bound estimate we assume that project effectiveness increases moderately, beginning in 1998, as states and metropolitan areas learn more about the administration and impact of CMAQ projects. For the upper bound we assume that the typical project will be as effective as the 60th percentile project in 1994. (The 60-percentile project is more effective than 60 percent of projects, on a dollar per ton basis, and less effective than 40 percent.) Corresponding to the large range in effectiveness estimates, there is a large range in the estimated national emissions effect.

METHODOLOGY

This analysis involved estimating the potential effectiveness, by project type, of all CMAQ projects in FY 1994 where CMAQ emission reductions and expenditures were reported by states. These effectiveness estimates were then used to develop a range of estimates for potential national emissions reductions associated with the CMAQ program to be expected in 1999 (ISTEA), and 2005 (NEXTEA).

The methodology for this analysis is detailed below:

1. Project effectiveness was calculated for each project and pollutant by dividing FY 1994 CMAQ project expenditures by estimated tons of each pollutant reduced per year. Since the CMAQ database presented emissions reductions in kilograms per day, daily reductions were multiplied by 240 days per year to calculate annual reductions, assuming most projects affect workweek travel. This assumption is conservative, i.e., tends to underestimate emissions reductions, since many projects—such as enhanced inspection and maintenance (I&M) programs and traffic flow improvements—affect travel every day of the year.

2. The projects were then grouped into the six project categories according to classifications under the CMAQ Program guidance: traffic flow improvements, transit, shared ride, demand management, bicycle and pedestrian, and I&M and other.
3. For each project category, projects were then ranked by effectiveness in order from highest to lowest for each pollutant. Projects were ranked in separate analyses for each pollutant. Projects with no reported emissions reductions (including those with emissions increases) were excluded from these rankings.⁵ The projects at the 50th and 60th-percentile were selected. The project at the 50-percentile is the median project—half of all projects were less cost-effective and half were more cost-effective. The 60-percentile project is more cost effective than 60 percent of projects, and less cost-effective than 40 percent.
4. The average life of the projects was based on a methodology developed by California's Department of Transportation and the California Air Resources Board for estimating emissions effects of CMAQ projects. The average for the range was used in this analysis:
 - Traffic flow improvements – 12.5 years (average of 5-20 years)
 - Transit – 12 years (average of 5-12 years)⁶
 - Shared ride – 14 years (average of 8 – 20 years)
 - Demand management – 12.5 years (average of 5-20 years)
 - Bicycle and Pedestrian – 20 years
 - I/M and Other – 5 years (not estimated in the California methodology)
5. Total year 1997 and 2003 federal CMAQ expenditures were calculated for each category of spending. According to the President's reauthorization proposal for ISTEA, \$1.3 billion would be authorized and \$1.047 billion would be obligated annually for CMAQ for FY 1998-2003. The table below provides annual obligation rates. For the analysis, these dollar values were converted into 1994 dollars⁷ since the cost effectiveness estimates represent emissions reductions per 1994 dollar spent.

CMAQ Obligations (millions of dollars)

FY 1992-- Actual	FY 1993-- Actual	FY 1994-- Actual	FY 1995-- Actual	FY 1996-- Actual	FY 1997-- Actual
340	601	815	950	939	878
FY 1998- Estimate	FY 1999- Estimate	FY 2000- Estimate	FY 2001- Estimate	FY 2002- Estimate	FY 2003- Estimate
1047	1047	1047	1047	1047	1047

6. The proportion of spending for each project type was assumed to be the same as in 1994:
 - Traffic flow improvements – 34.1%
 - Transit – 40.4%

⁵ It would be incorrect to assume that no emissions reductions occur for projects that report no emissions benefits. These projects may have been located in areas that were in attainment for the non-reported pollutant. Projects that resulted in increased emissions were dropped from the analysis since negative cost-effectiveness values are not meaningful in this context.

⁶ The mid-range estimate for transit projects appears low, given that many rail projects can last 25 to 35 years, so the upper bound estimate was chosen for transit.

⁷ A GDP price deflator was used to convert the current-dollar CMAQ obligations for each year into constant 1994 dollars. The 1992-1995 GDP deflators were calculated from *Economic Report to the President, 1996*. The 1996-2003 GDP deflators were calculated from GDP price index growth rate projections reported in CBO's *The Economic and Budget Outlook: Fiscal Years 1998-2007* (January 1997, Table 1-1).

projects in FY 1994. Our upper bound assumption, supported by our analysis of the California and Pennsylvania data (see table below), is that as the program continues, States will become more effective at targeting CMAQ funding, and so projects are likely to have higher than the median 1994 cost effectiveness in future years.

Change in Cost-Effectiveness

	5 year signal + hwy project life		10 year signal + hwy project life	
	1993	1996	1993	1996
VOC				
California	\$ 15,630	\$ 9,121	\$ 11,301	\$7,437
Pennsylvania	\$ 72,734	28,181	\$ 44,076	\$19,848
NO_x				
California	\$ 20,192	\$11,756	\$ 16,813	\$10,008
Pennsylvania	\$ 99,084	27,588	\$ 93,706	\$24,667

This analysis is also conservative in that it assumes spending will continue to be apportioned among the six categories of CMAQ projects in the same manner as in 1994. That is, this analysis does not assume that funding shifts to the more effective *categories* of projects, only to more effective projects within each category. The assumptions used on this issue tend to underestimate potential effectiveness.

Costs measured in this analysis only account for Federal expenditures on CMAQ.

For most CMAQ-funded projects, federal CMAQ-funds are only a portion of total project costs. For our analysis, the CMAQ portion of the project costs was used as an intermediate step to analyzing the potential effectiveness of CMAQ funding in the future. We were not attempting to assess the relative cost-effectiveness of different types of project. As a result, the effectiveness estimates should not be confused with cost-effectiveness estimates that include total costs. The analysis presented here assumes that the CMAQ program leverages other funds that would not have otherwise been spent on these projects. That is, if CMAQ-spending were reduced, the states would not spend money on these projects. CMAQ projects often have substantial state and other funding sources. For example, \$1.9 million in CMAQ funds contributed to total project costs of \$6.4 million for a Freeway Service Patrol (to clear highway incidents) in San Francisco. CMAQ contributed \$7.3 million out of \$13.7 million in total project costs to build an elevated pedestrian walkway connecting Tower City Center transit station to the Gateway Sports and Entertainment Complex in Cleveland. In some cases, CMAQ funds have been used to pay for most or all of project costs. For example, CMAQ provided \$1.7 million out of \$2.2 million for a transit operating assistance project in Ventura County, CA.⁸ Some TCMs have financial costs for the private sector as well.

Projects have different levels of effectiveness at reducing various pollutants.

This analysis estimated potential effectiveness based on individual analyses of the 50- and 60-percentile projects for each pollutant. In reality, a project that is near the top in effectiveness for one pollutant may be average or near the bottom in effectiveness for another pollutant, measured in terms of CMAQ expenditures per ton of emission reduction. Metropolitan areas would be expected to target funding priority to projects that help them meet attainment status. As a result, regions may select projects that most effectively reduce pollutants of their concern. However, at the national level, it

⁸ U.S. Department of Transportation. *CMAQ, Innovations in Transportation & Air Quality: Twelve Exemplary Projections* (FHWA-PD-016).

may not be possible to achieve the full potential of CMAQ reported for all pollutants. Targeting projects that are highly effective in reducing one pollutant often results in less effectiveness at targeting the others. For example, 33 CMAQ-funded projects that reduce VOC and CO were expected to result in *increased* emissions of NO_x. This is true for a number of traffic flow improvement projects, since increasing travel speeds often reduces VOC and CO, but increases NO_x emissions. These findings stress the importance of examining CMAQ from a regional perspective—since regions can target funding to help implement their transportation/air quality plans—rather than solely from a national emissions inventory perspective.

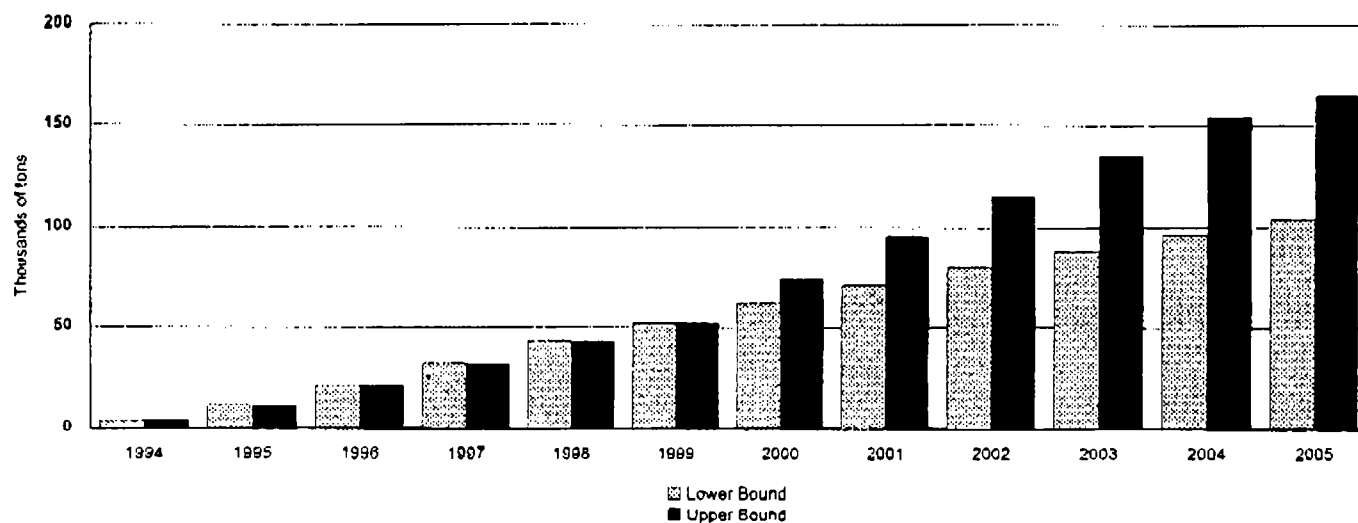
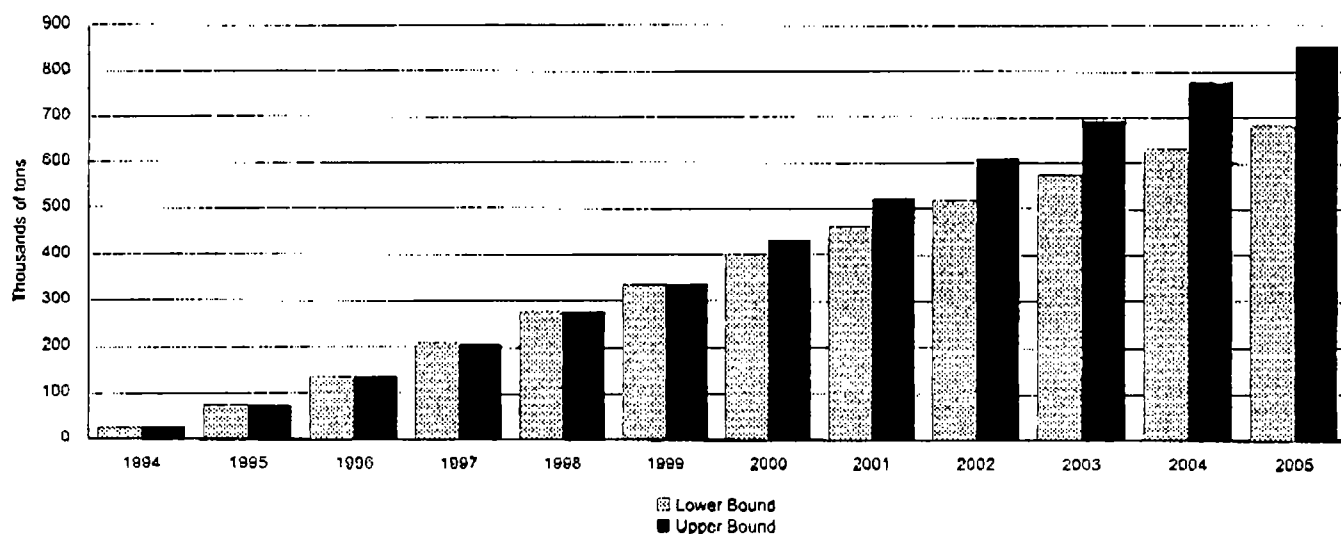
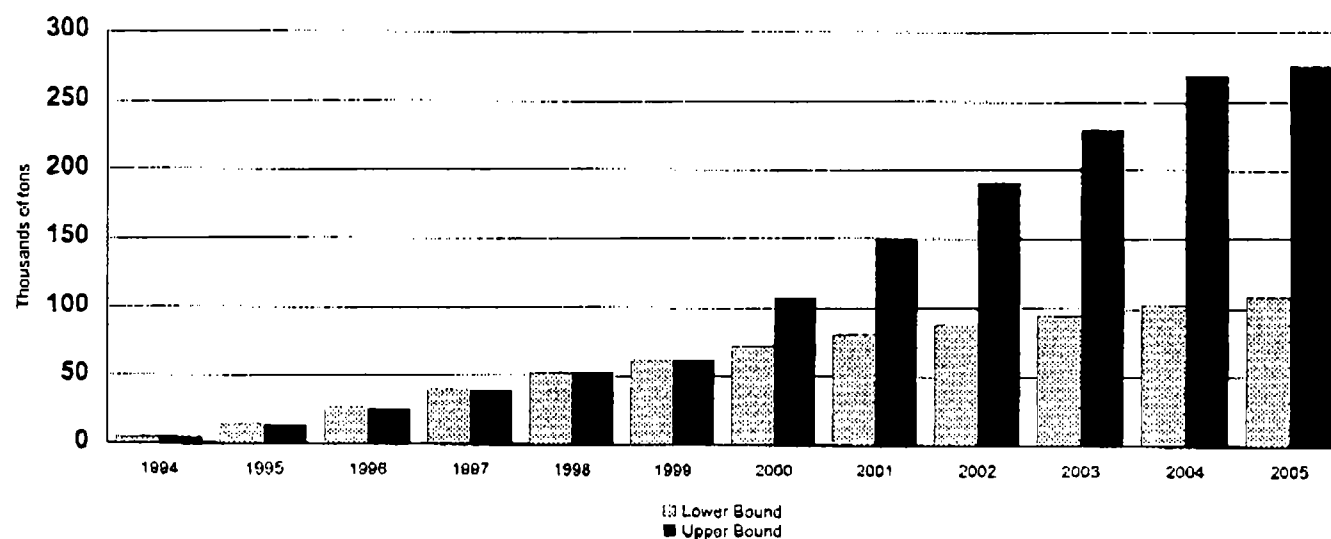
Figure 1a. Estimated On-road Vehicle VOC Emission Reductions from CMAQ**Figure 1b. Estimated On-road Vehicle CO Emission Reductions from CMAQ****Figure 1c. Estimated On-road Vehicle NOx Emission Reductions from CMAQ**

Table 1. Estimated On-road Vehicle Emissions Reductions from the CMAQ Program (tons reduced per year)

	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Volatile Organic Compounds (VOC)														
Lower Bound	0	0	4,263	11,607	21,338	32,438	43,284	52,135	62,061	71,209	79,796	88,180	96,485	104,200
Upper Bound	0	0	4,263	11,607	21,338	32,438	43,284	52,135	74,262	95,303	115,480	135,161	154,477	165,151
Carbon Monoxide (CO)														
Lower Bound	0	0	27,437	74,707	137,343	208,789	277,955	336,349	401,584	462,252	519,554	575,487	630,740	682,494
Upper Bound	0	0	27,437	74,707	137,343	208,789	277,955	336,349	432,439	523,180	609,793	694,294	777,391	856,166
Oxides of Nitrogen (NOX)														
Lower Bound	0	0	5,201	14,160	26,033	39,576	52,686	62,406	72,447	80,868	88,217	95,419	102,784	108,979
Upper Bound	0	0	5,201	14,160	26,033	39,576	52,686	62,406	107,558	150,200	190,903	230,614	269,664	275,837

These estimates represent the cumulative reductions from existing CMAQ projects funded through each year.

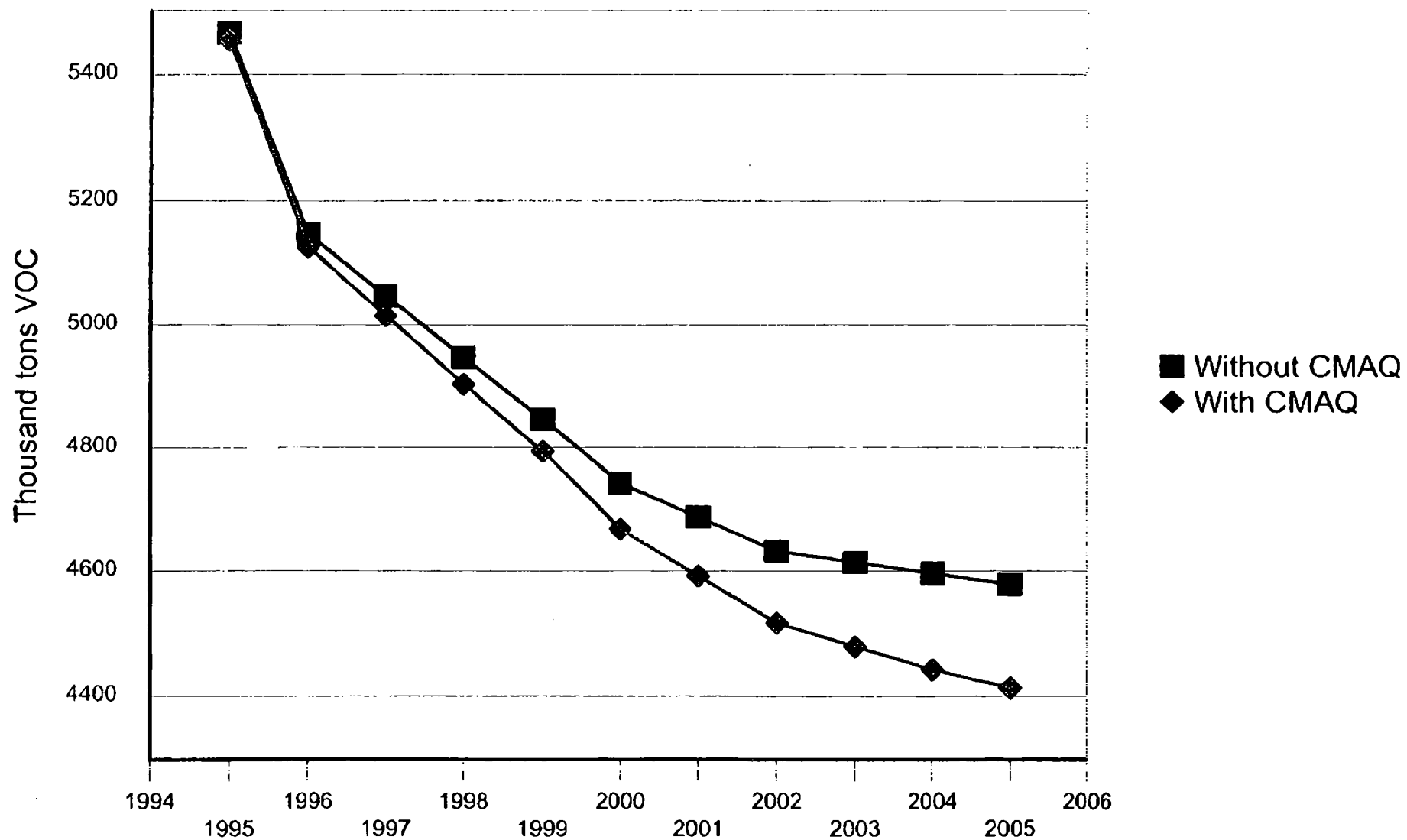
Emissions reductions were calculated based on the cost-effectiveness of the 50th percentile projects in FY 1994 for obligations in FY 1992 to FY 1997.

In the Lower Bound, projects obligated in FY 1998 to FY 2003 are assumed to remain as cost-effective as the 50th percentile FY 1994 projects.

In the Upper Bound, projects obligated in FY 1998 to FY 2003 are assumed to be as cost-effective as the 60th percentile FY 1994 projects.

Please refer to memo for assumptions.

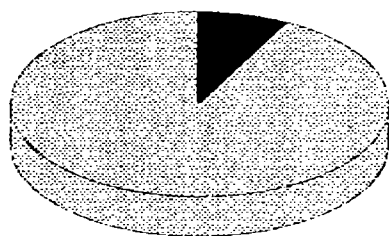
Figure 2. Estimated VOC Emission Trends from On-Road Vehicles



U.S. EPA. National Air Pollutant Emission Trends. EPA-454/R-95-011. October 1995. These estimates reflect existing and projected regula
U.S. EPA. Emission Reduction Potential of the CMAQ Program—Preliminary Assessment. May 1997.

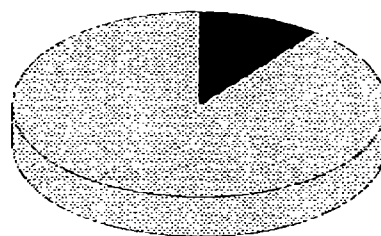
Figure 3. Estimated Emission Reductions from On-road Vehicles--1995 to 2005

CO-Lower Bound
8%



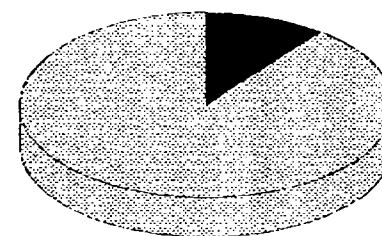
92%

NOx-Lower Bound
11%



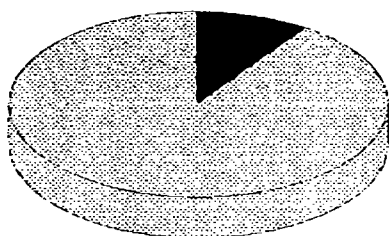
89%

VOC-Lower Bound
10%



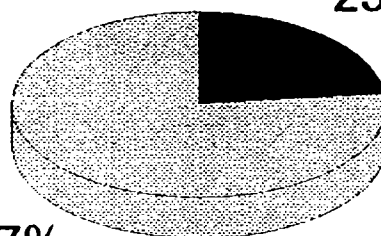
90%

CO-Upper Bound
10%



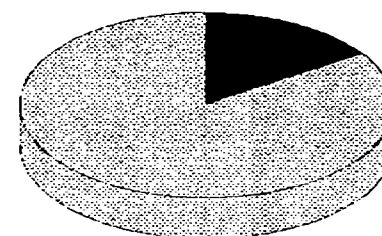
90%

NOx-Upper Bound
23%



77%

VOC--Upper Bound
16%



84%

■ **CMAQ Emission Reductions**

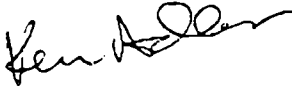
▨ **Emission Reductions from Existing On-road Vehicle Regulations**

Sent By FAX

May 16, 1997

NOTE

SUBJECT: Essential Factoids for New CMAQ One/Two Pager

FROM: Ken Adler 

TO: Camille Mittelholtz
Jim Schrouds
Mike Savonas
Peter Lidiak
Mark Simons
John Reeder
Linda Lance
Dorothy Robyn
Diane Montgomery

In addition to material DOT is providing, I believe the attached bullets and graphs provide the essential ingredients for the new CMAQ one/two pager. I understand that DOT will take a first crack at preparing this document.

We have an excellent opportunity to present the results of this analysis at a briefing for Senate and House staff on ISTEA reauthorization and the environment on Monday, May 19th, 3-4:30pm (2253 Rayburn House Office Building). The briefing is being organized by the Environmental and Energy Study Institute (EESI), and typically draws a large crowd of staffers. A copy of the briefing notice is attached. I would suggest that some combination of Janno Lieber, Linda Lance and/or David Gardiner present the results. EESI would like the Administration to release the report at the briefing.

If you have any questions about this material or the EESI briefing, please let me know (260-6925).

DRAFT

KEY CONCLUSIONS FROM CMAQ ASSESSMENT

- The CMAQ program, under ISTEA, is projected to reduce VOC emissions by 52,135 tons per year, CO emissions by 336,349 tons per year, and NO_x by 62,406 tons per year (Table 1 and Figures 1a-c). Under NEXTEA, annual CMAQ emission reductions could grow substantially to 165,151 tons per year of VOC, 856,166 tons of CO, and 275,837 tons of NO_x.
- Under NEXTEA, the projected emission reductions from CMAQ could have a significant affect on improving urban air quality. For example, by 2005¹, CAA requirements for on-road vehicles will have reduced VOC emissions by approximately 888,000² tons per year, while CMAQ is projected to reduce VOC emissions by 104,200 to 165,151 tons per year.
- While increasing VMT threatens to reverse air quality gains, Figure 2 suggests that CMAQ may be able to keep emission trends moving downward. In Figure 2, the top line represents EPA's estimate of emission trends from on-road vehicles without CMAQ, and the bottom line is emission trends with CMAQ.
- By 2005, CMAQ VOC emission reductions could equal 10 to 16 percent of total on-road vehicle emission reductions for the period 1995 to 2005. For NO_x and CO CMAQ emission reductions, these numbers are 11 to 23 percent, and 8 to 10 percent, respectively.

Additional Facts

- National NEXTEA CMAQ NO_x emission reductions (1253 tons per day) are three times larger than the predicted reductions from EPA's National Low Emission Vehicle program (400 tons per day, by 2005).
- National NEXTEA CMAQ VOC emission reductions (165,151 tons per year) are larger than New Jersey's total 1995 VOC emissions from on-road vehicles (161,000 tons per year).
- National NEXTEA CMAQ VOC emission reductions (165,151 tons per year) are larger than the total emissions from the ten largest industrial plants in operation in 1994 (145,105 tons per year).
- National NEXTEA CMAQ NO_x emission reductions (275,837 tons per year) are more than twice as large as all 1994 NO_x emissions from the Tennessee Valley Authority's electric utility plants (110,766 tons per year).
- National NEXTEA CMAQ NO_x emission reductions (1,253 tons per day) are more than twice the NO_x emissions from the Miami-Fort Lauderdale-West Palm Beach area (546 tons per day).

¹ While NEXTEA ends in 2003, we estimate emission reductions out to 2005 since this is when projects funded in 2003 are expected to produce results.

² U.S. EPA. National Air Pollution Emission Trends. EPA-454/R-95-0111. October 1995.

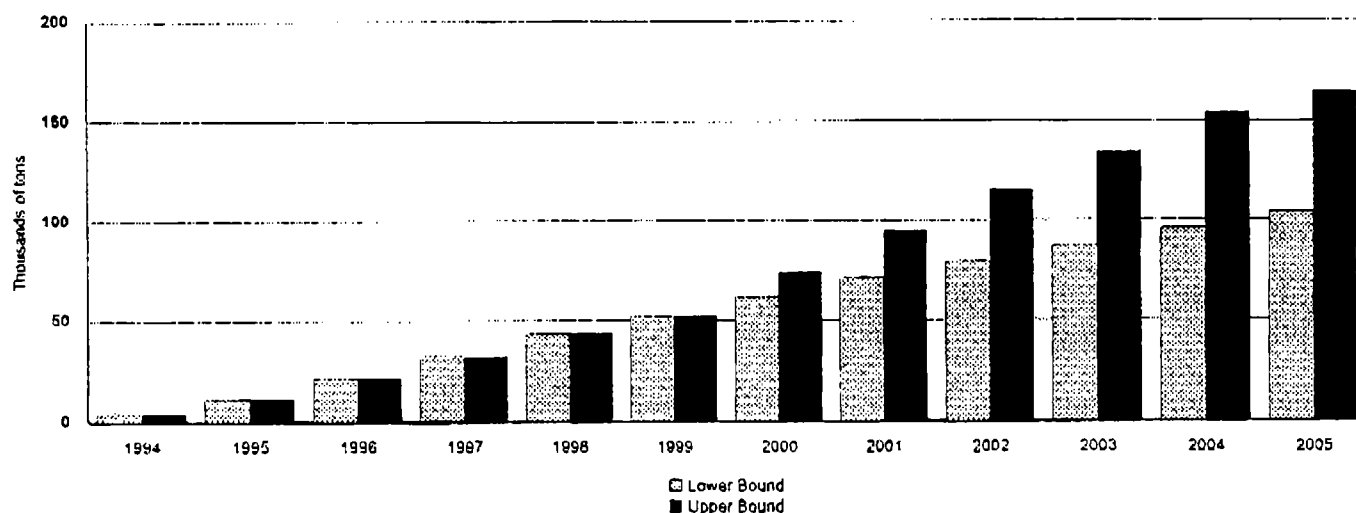
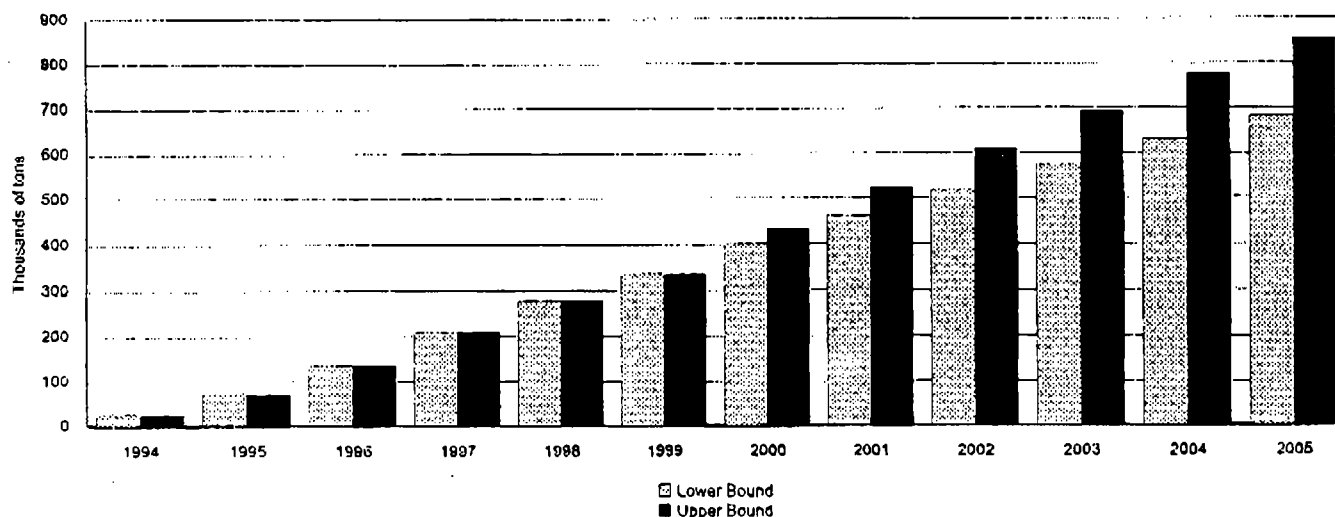
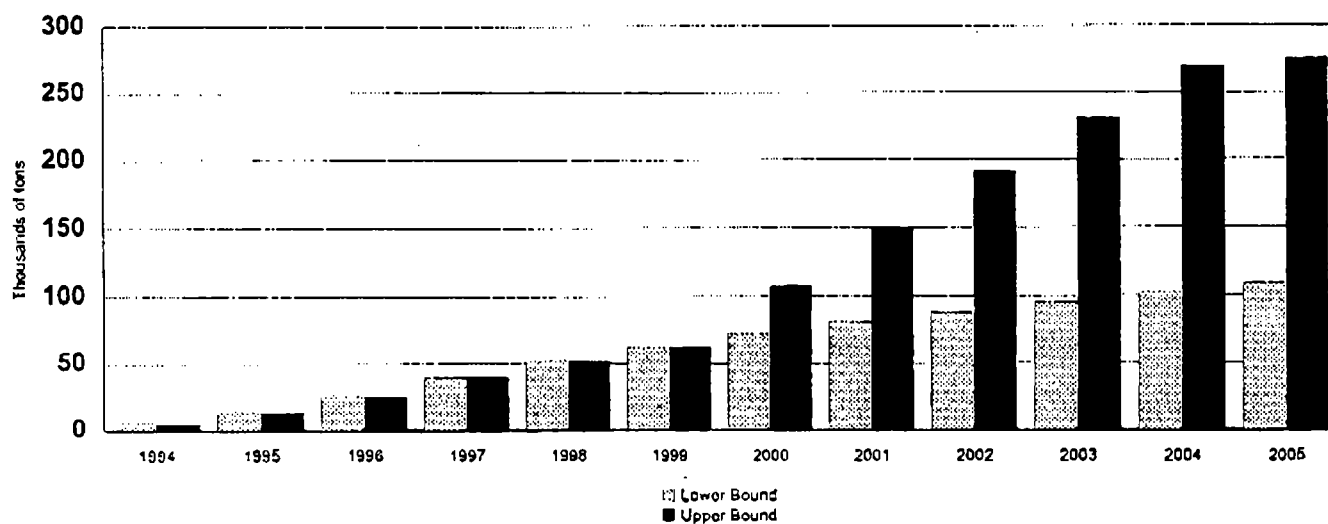
Figure 1a. Estimated On-road Vehicle VOC Emission Reductions from CMAQ**Figure 1b. Estimated On-road Vehicle CO Emission Reductions from CMAQ****Figure 1c. Estimated On-road Vehicle NOx Emission Reductions From NOx**

Table 1. Estimated On-road Vehicle Emissions Reductions from the CMAQ Program (tons reduced per year)

	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Volatile Organic Compounds (VOC)														
Lower Bound	0	0	4,263	11,607	21,338	32,438	43,284	52,135	62,061	71,209	79,796	88,180	96,485	104,200
Upper Bound	0	0	4,263	11,607	21,338	32,438	43,284	52,135	74,262	95,303	115,480	135,161	154,477	165,151
Carbon Monoxide (CO)														
Lower Bound	0	0	27,437	74,707	137,343	208,789	277,955	336,349	401,584	462,252	519,554	575,487	630,740	682,494
Upper Bound	0	0	27,437	74,707	137,343	208,789	277,955	336,349	432,439	523,180	609,793	694,294	777,391	856,166
Oxides of Nitrogen (NOX)														
Lower Bound	0	0	5,201	14,160	26,033	39,576	52,686	62,406	72,447	80,868	88,217	95,419	102,784	108,979
Upper Bound	0	0	5,201	14,160	26,033	39,576	52,686	62,406	107,558	150,200	190,903	230,614	269,664	275,837

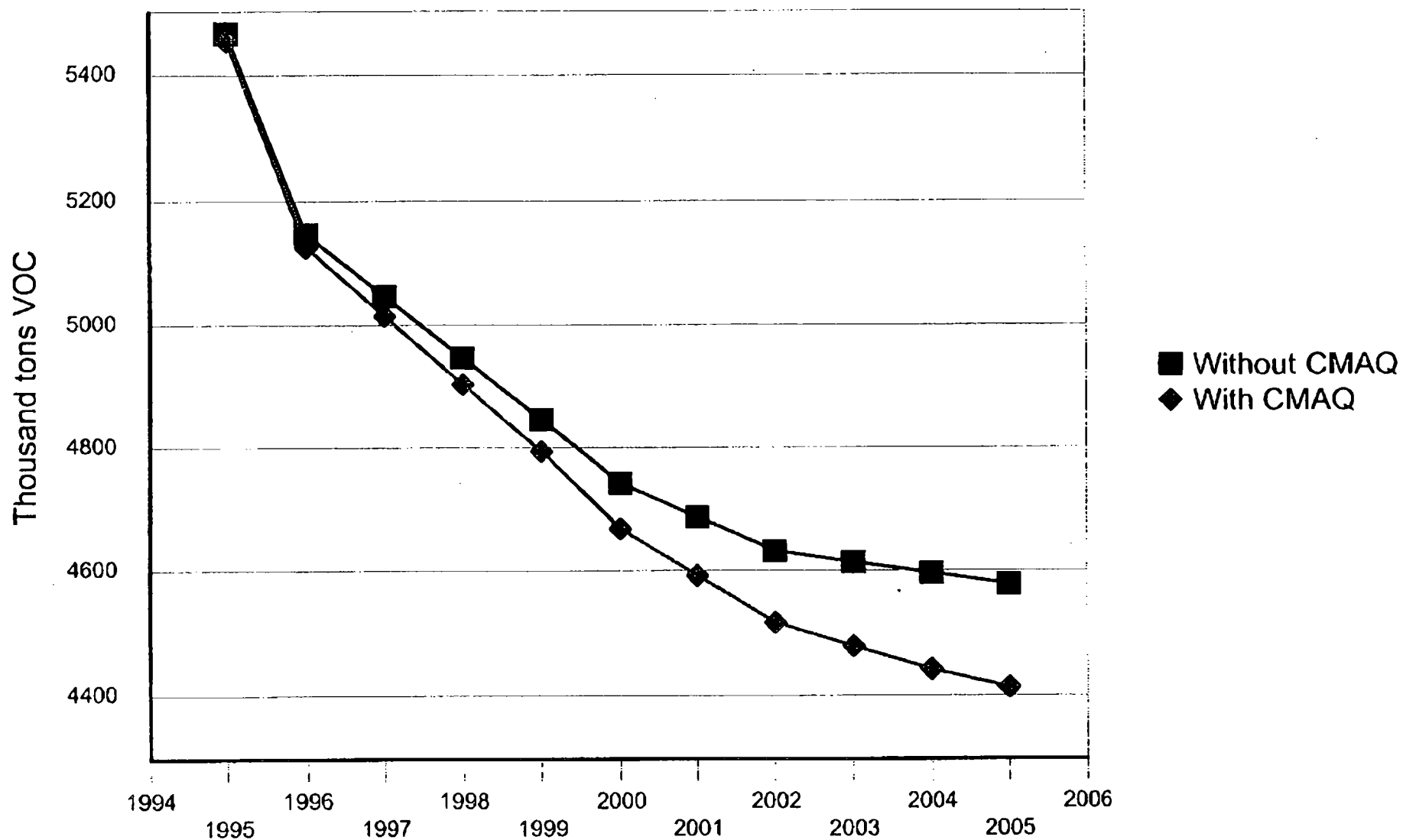
Emissions reductions were calculated based on the cost-effectiveness of the 50th percentile projects in FY 1994 for obligations in FY 1992 to FY 1997.

In the Lower Bound, projects obligated in FY 1998 to FY 2003 are assumed to remain as cost-effective as the 50th percentile FY 1994 projects.

In the Upper Bound, projects obligated in FY 1998 to FY 2003 are assumed to be as cost-effective as the 60th percentile FY 1994 projects.

Please refer to memo for assumptions.

Figure 2. Estimated VOC Emission Trends from On-Road Vehicles



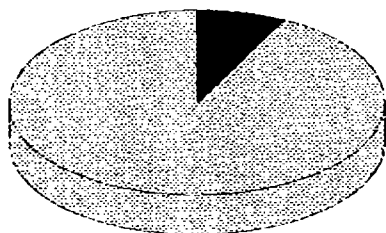
U.S. EPA. National Air Pollutant Emission Trends. EPA-454/R-95-011. October 1995.

U.S. EPA. Emission Reduction Potential of the CMAQ Program--Preliminary Assessment. May 1997.

Figure 3. Estimated Emission Reductions from On-road Vehicles--1995 to 2005

CO-Lower Bound

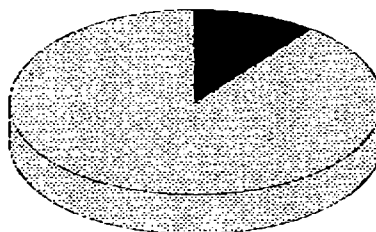
8%



92%

NOx-Lower Bound

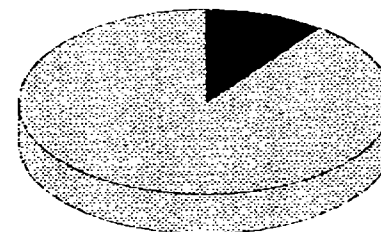
11%



89%

VOC-Lower Bound

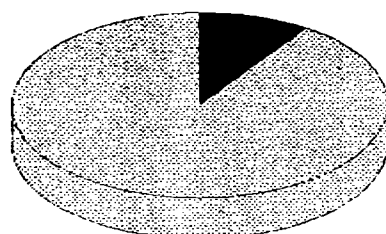
10%



90%

CO-Upper Bound

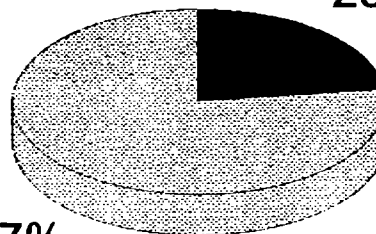
10%



90%

NOx-Upper Bound

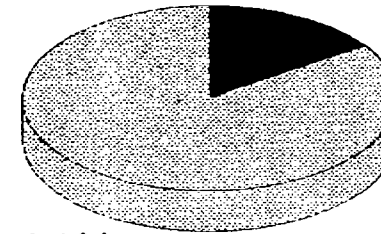
23%



77%

VOC--Upper Bound

16%



84%

■ **CMAQ Emission Reductions**

▨ **Emission Reductions from Existing On-road Vehicle Regulations**



ENVIRONMENTAL AND ENERGY STUDY INSTITUTE

NOTICE

KEN MURPHY, EXECUTIVE DIRECTOR ■ 122 C STREET N.W., STE 700 ■ WASH D.C., 20001 ■ (202) 628-1400

The Reauthorization of ISTEA: Implications for the Environment

Monday, May 19, 1997

3 p.m. - 4:30 p.m., 2253 Rayburn House Office Building

You are invited to a briefing on the environmental implications of different proposals to reauthorize the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA). Legislation reauthorizing ISTEA may be voted on in both the House and Senate transportation committees before the Memorial Day recess. Sponsors hope to have a final bill passed and signed into law before ISTEA expires on September 30, 1997.

When President Bush signed ISTEA into law in 1991, he called it "landmark" legislation with a new focus on the environment. Congress now is reviewing ISTEA's role in protecting the environment. Key questions are: What are the impacts on the environment from transportation? What does ISTEA do or not do? What will be the effects of the different reauthorization proposals?

Transportation impacts on the environment include:

Air: transportation fuels are a major source of fine particulate matter, greenhouse gases (primarily carbon dioxide) urban ozone or smog.

Land: highway expansion is one the leading causes of wetland losses; roads and parking lots are primary consumers of "green" spaces in metropolitan areas; Americans discard approximately 250 million scrap tires every year causing major solid waste problems for hundreds of county governments.

Water: nitrogen emissions damage surface waters; highway runoff damages streams, rivers, lakes and estuaries.

(over)

ISTEA includes the following provisions to enhance environmental protection:

- Congestion Mitigation and Air Quality Improvement (CMAQ) Program: provides money for air quality projects.
- Planning factors: require consideration of environmental impacts by state and metropolitan governments in developing their Transportation Improvement Programs (TIPs) and require the TIPs to conform with the State Implementation Plans (SIPs) prepared under the Clean Air Act.
- Transportation Enhancement Program: provides funding for bicycle and pedestrian facilities, mitigation from highway runoff, historic and scenic beautification.
- Major Investment Study: requires an assessment of alternatives to major highway projects.

The various ISTEA reauthorization proposals under consideration by the House and Senate transportation committees would have widely varying impacts on the provisions listed above. The briefing will help provide an understanding of the complicated relationships among transportation, the environment and the different ISTEA reauthorization bills. There will be four short presentations followed by an opportunity for "questions and answers". The panelists are:

Will Schroeer, project manager, Apogee Research Incorporated (produces environmental analysis for the Federal Highway Administration and the Environmental Protection Agency);

Paul Kerkhoven, director of environmental affairs, American Highway Users Association;

Roy Kienitz, director of federal affairs, Surface Transportation Policy Project; and

Roger Nober, chief counsel, House Surface Transportation Subcommittee

The briefing is free and open to the public with no reservations required. For more information, contact Michael Chelius or Jill Crouch at (202) 628-1400.

Record Type: Record

To: Linda Lance/CEQ/EOP, Dorothy Robyn/OPD/EOP

cc:

Subject: Draft NEXTEA Outline

Attached you will find a rough draft of the outline for the environmental piece, sample attachments, and sample questions and answers. I welcome your input.

There are a few specific areas where I would appreciate your guidance:

- 1) How do we approach national versus local benefits of programs?
- 2) I've included a "model" example section after each program discussion. David Worzala suggested that for the program other than CMAQ, we could use a quote from a third party promoting the program. Could be a good space saving idea.
- 3) Since the authorized level for Recreational Trails is reduced in NEXTEA (NEXTEA authorization equals average actual ISTEA appropriations), should it be included in the piece? DOT's argument is that the increase in Enhancements can cover the decrease in Recreational Trails.
- 4) I've include CMAQ changes (STP provision and CMAQ flexibility restrictions, see bullets 4 and 5 under NEXTEA section). Should these be included?

I realize the document is kind of long. Because of the length, David Worzala suggested that we could create two documents, i.e., a brochure with highlights and a paper to support the brochure. I'm sure some sections/ideas will be dropped and others will be added.

Please note that the performance measures are only my suggestions. I'm not sure how DOT/EPA will react to them. Please note that I've specifically ventured away from the usual flexibility, MPO empowerment, and planning arguments. I think those benefits have already been well-articulated.

Please give me a buzz once you've had a chance to review and comment and let me know if you have any questions. I hope this moves us in the right direction.

Thanks,
Diane
5-3834



enviro.wpd

Proposed NEXTEA Environmental Message

TITLE: Building a Sustainable Transportation System for the 21st Century: Key Environmental Provisions in the National Economic Crossroads Transportation Efficiency Act (NEXTEA)

THEME: The Intermodal Surface Transportation Efficiency Act's (ISTEA) environmental programs should be preserved and improved upon in NEXTEA because these important programs provide tangible environmental and transportation benefits to our Nation's local communities.

I. Quotes

- A. Clinton
- B. Slater
- C. Browner

II. Overview of ISTEA Environmental Programs/Provisions

THEME: ISTEA was a landmark piece of legislation because it recognized for the first time the impacts of transportation on the environment and implemented programs to mitigate those impacts.

- A. Introduced New Programs: CMAQ, Enhancements, Recreational Trails, and Scenic Byways
- B. Provided Critical Funding
- C. Introduced Other Critical Components: Flexibility, Planning Requirements, Fiscal Constraint

III. Benefits of ISTEA Environmental Programs

A. CMAQ

1. Goal: To Reduce Congestion and Improve Air Quality
2. Funding: Table by Year
3. Performance Indicators

a) Congestion-Related Benefits

- 1) Benefits highway and transit users: number/funding of projects: % highway, % transit, % other.

CMAQ

- 2) Traffic flow improved by X%
- 3) X % of CMAQ flexed to transit
- 4) Number/funding for rail
- 5) X numbers of transit riders
- 6) Reduced congestion and travel time, \$

(b) Air Quality Benefits

- (1) Reduced VOCs by X Tons

- starts (2) Reduced VMT by X miles, X vehicle trips/cars, X cold
- areas (3) Reduced number of people living in non-attainment
- Mitigation (4) Number of new alternative fuel buses purchased
- to non- 2. Two "Model" Examples of Innovative Air Quality and Congestion
Projects, e.g., rail, IM (targets problem), HOVs, benefits
attainment areas, i.e., even marginal are important

B. Enhancements

- Mitigate 1. Goal: To Improve and Preserve the Transportation Network and
Environment the Impacts of Transportation Projects on the
2. Funding: Table by Year
- a) Number/Funding by Types of Projects
3. Performance Indicators
- a) Improving and Preserving Transportation Network
- (1) Miles of Bike/Pedestrian Paths
- (2) Miles of Railways Preserved
- (3) Number of Transportation Facilities Preserved
- b) Mitigating the Impacts of Transportation Projects on the
- Environment
- (1) Number of Water Pollution Mitigation Projects
- (2) Number of Billboards Removed
- (3) Acres of Landscaping/Beautification
4. 1 "Model" Example

C. Recreational Trails

- and 1. Goal: To Provide a Diverse Trail System within our Nation's Parks
Forests
2. Funding: Table by Year
3. Performance Indicators
- a) Number/Funding by Types of Trail
- b) Miles of Trail by Type
4. 1 "Model" Example

D. Scenic Byways

1. Goal: To Preserve and Protect our Nation's Most Scenic Roads
2. Funding: Table by Year
3. Performance Indicators
- a) Number/Funding by Project Type
- b) Miles of Byways
- c) Miles of All-American Roads
4. 1 "Model" Example

IV. Overview of NEXTEA Environmental Programs/Provisions

THEME: ISTEA's link between transportation and the environment should be preserved and improved in NEXTEA because this nexus benefits transportation and environmental interests alike.

A. CMAQ

1. Increases funding
2. Eligibility expanded to include new nonattainment areas, vehicle scrappage
3. Funding expanded to particulate matter, carbon monoxide, maintenance areas
4. Protects States from negative impact as result of new nonattainment areas
5. Allows flexibility in use of CMAQ funds if States are meeting or maintaining air quality standards

B. Enhancements

1. Increases funding
2. Requires transportation link

C. Recreational Trails

1. Provides \$42 million
2. Provides direct authorization for funding from Highway Trust Fund
3. Allows up to 80% federal share
4. Permits States programmatic match rather than project-level match

D. Scenic Byways

1. Allows Federal agencies to make non-Federal match
2. Expands eligibility to marketing programs

V. Benefits of NEXTEA Environmental Programs

A. CMAQ

1. Projections of Continued Benefits

a) Congestion Mitigation

- 1) Traffic flow improved by X%
- 2) X % of CMAQ flexed to transit
- 3) Number/funding of rail projects
- 4) X numbers of transit riders
- 5) Reduced congestion and travel time, \$

b) Air Quality Benefits

- 1) Reduced VOCs by X Tons
- 2) Reduced VMT by X miles, X vehicle trips/cars, X cold

starts

3) Reduction in number of people living in non-attainment

areas

4) Number of new alternative fuel buses purchased

B. Enhancements

1. Projections of Continued Benefits

a) Improving and Preserving Transportation Network

(1) Miles of Bike/Ped Paths

(2) Miles of Railways Preserved

(3) Number of Transportation Facilities Preserved

b) Mitigating the Impacts of Transportation Projects on the

Environment

(1) Number of Water Pollution Mitigation Projects

(2) Number of Billboards Removed

(3) Acres of Landscaping/Beautification

C. Recreational Trails

1. Projections of Continued Benefits

a) Number/Funding by Types of Trail

b) Miles of Trail by Type

D. Scenic Byways

1. Projections of Continued Benefits

a) Number/Funding by Project Type

b) Miles of Byways

c) Miles of All-American Roads

V. Conclusion

Sample Attachments:

Attachment A: Total Funding Comparison by Program by State over ISTEA and NEXTEA

Attachment B: States Who Will Gain Funding from CMAQ STP Provision

Attachment C: List of Current Nonattainment Areas Versus New Nonattainment Areas (Map)

Attachment D: List/Miles of Recreational Trails Per State

Attachment E: List/Miles of National Scenic By-ways per State

Questions and Answers:

1) If funds are not used for congestion mitigation and air quality protection, how much would air and congestion increase?

2) Environmental projects also have economic development benefits. Please provide a quantitative analysis of these benefits for five model projects.

3) How does Federal CMAQ spending compare with total Federal costs of emissions reduction measures undertaken during the ISTEA period. How does this spending reflect on effectiveness of program?

4) STP funds will be used to supplement CMAQ funds once the new nonattainment areas are determined and factored into the CMAQ apportionment. Some States will benefit from this provision and some States will lose. Please provide a State-by-State funding break-out of those States that will gain and those States that will lose.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OFFICE OF
POLICY, PLANNING AND EVALUATION

NOTE

MAY 14 1997

SUBJECT: Request for Final Comments on "The Emission Reduction Potential of the Congestion Mitigation and Air Quality Program: Preliminary Assessment"

FROM: Maryann Froehlich, Director
Office of Policy Development

A handwritten signature in cursive script, appearing to read "Maryann Froehlich", is written over the typed name and title.

TO: Peter Lidiak
Mark Simons
John Reeder
Linda Lance
Dorothy Robyn
Diane Montgomery
Camille Mittelholtz
Mike Savonas
Jim Shrouds

Attached for your review is a final draft of our CMAQ assessment titled, "The Emission Reduction Potential of the Congestion Mitigation and Air Quality Program: Preliminary Assessment." As described below, I believe we have also resolved the three issues that were raised during the May 8th meeting at OMB:

Obligation Versus Authorization Emission results are now based, per OMB's request, on annual obligation rates, instead of authorization levels. In addition, the use of annual obligation amounts allowed us to report CMAQ emission reductions on an annual basis.

Multi-Year Projects Regarding the multi-year projects issue, DOT's conversations with transportation officials in the Dallas-Fort Worth area and in Pennsylvania suggests that the number of multi-year projects range from 10 to 20 percent of the total projects. In our line-by-line analysis of the Pennsylvania CMAQ projects for 1994-1996 we came up with similar results: about 9 percent of the projects were multi-year projects. However, when we eliminated the multi-year projects from our Pennsylvania and California databases, it only reduced VOC emissions by 2 percent and 2.5 percent, respectively. It appears that



these multi-year projects were producing much lower than average emission reductions. To account for multi-year projects we have reduced emission estimates by 2.5 percent.

Mean Versus Median After reviewing the distribution of the cost-effectiveness data, we have determined that we should use the median cost-effectiveness estimates, and not the mean cost-effectiveness. We plotted the distribution of projects by cost-effectiveness and determined that they were not normally distributed, which suggests that the median is the appropriate number to use.

If you have comments on this final draft, please send them to Ken Adler, (260-6925, fax: 260-2300) by noon tomorrow. I understand that Linda Lance, CEQ, will be setting up a conference call for us to discuss any final issues.

cc: David Gardiner
Janno Lieber

DRAFT

THE EMISSION REDUCTION POTENTIAL OF THE CONGESTION MITIGATION AND AIR QUALITY PROGRAM

PRELIMINARY ASSESSMENT

OFFICE OF POLICY, PLANNING AND EVALUATION

U.S. ENVIRONMENTAL PROTECTION AGENCY

MAY 14, 1997

DRAFT

THE EMISSIONS REDUCTION POTENTIAL OF THE CMAQ PROGRAM

OVERVIEW

The Congestion Mitigation and Air Quality Improvement Program (CMAQ) provides funds to states for projects designed to help attain and maintain the national ambient air quality standards (NAAQS). CMAQ was created in 1991 by the Intermodal Surface Transportation Efficiency Act (ISTEA), and Congress is now considering reauthorization of ISTEA. This report analyzes the potential of the CMAQ program to reduce air pollutant emissions of volatile organic compounds (VOC), carbon monoxide (CO), and oxides of nitrogen (NO_x) in the U.S. under ISTEA and as proposed in NEXTEA. Data for this exercise came from estimates of emissions benefits and funding obligations reported by the states to the Federal Highway Administration (FHWA) and published in FHWA's CMAQ Program Annual Report for FY 1994.¹

KEY CONCLUSIONS

A number of key conclusions stem from this analysis:

- The CMAQ program, under ISTEA, is projected to reduce VOC emissions by 52,135 tons per year, CO emissions by 336,349 tons per year, and NO_x by 62,406 tons per year (Table 1 and Figures 1a-c). Under NEXTEA, annual CMAQ emission reductions would grow substantially to 165,151 tons per year of VOC, 856,166 tons of CO, and 275,837 tons of NO_x. These estimates assume that projects have multiple year effects and that they achieve improved effectiveness compared to 1994 projects.
- Under NEXTEA, the projected emission reductions from CMAQ could have a significant affect on improving urban air quality. For example, by 2005², CAA requirements for on-road vehicles will have reduced VOC emissions by approximately 515,000³ tons per year, while CMAQ is projected to reduce VOC emissions by 104,200 to 165,151 tons per year.
- While increasing VMT threatens to reverse air quality gains, Figure 2 suggests that CMAQ may be able to keep emission trends moving downward. In Figure 2, the top line represents EPA's estimate of emission trends from on-road vehicles without CMAQ, and the bottom line is emission trends with CMAQ. The top line curves up beginning in 2005 because growth in VMT outpaces the emission reductions from cleaner cars and cleaner fuels.
- By the end of NEXTEA, Figure 3 shows the growing importance of CMAQ for reducing vehicle emissions. By 2002, CMAQ projects will provide eight times the annual emission reductions of existing technological controls.
- The estimated emissions reduction resulting from the overall CMAQ program is sensitive to assumptions about the effectiveness of individual projects. There is a large range

¹ Federal Highway Administration. "The Congestion Mitigation and Air Quality Improvement Program: A Summary of Third Year Activities (FY 1994)." December 1995. (As of the date of this analysis, the FY 1995 report has not been released.)

² While NEXTEA ends in 2003, we estimate emission reductions out to 2005 since this is when projects funded in 2003 are expected to produce results.

³ U.S. EPA. National Air Pollution Emission Trends. EPA-454/R-95-0111. October 1995.

in the estimated effectiveness of CMAQ projects funded in FY 1994. The rest of this report provides important caveats to the data.

This report provides a preliminary assessment of the potential effectiveness of CMAQ at reducing air pollutant emissions. The report presents the following data and findings:

Estimated Potential Emissions Effect of CMAQ

The report presents potential tons of pollutants reduced due to the CMAQ program when it reaches its potential effectiveness. According to FHWA, obligation rates have continued to rise since the inception of the program. As states become more familiar with the CMAQ program and institutionalize procedures to select projects, one would expect the average effectiveness of projects to increase compared to current levels. This analysis assumes steady state conditions under which the program has ramped-up to potential effectiveness. To coincide with the ISTEA legislative cycle, the years 1997 and 2003 was selected for analysis, and CMAQ spending was assumed to be equal to the annual obligation levels for CMAQ. Emission estimates for ISTEA and NEXTEA, however, are reported for 1999 and 2005, respectively, because this is when the projects are estimated to reach full effect (we assume it takes 2 years for projects to reach their full effect). Emission estimates were derived by dividing deflated CMAQ expenditures by a range of effectiveness estimates for each project type. A more detailed description of our approach is provided in the Methodology section.

Lower and upper bound estimates are presented in the analysis for the 2000 to 2005 year estimates. The lower bound estimate assumes that the typical project funded will be as effective as the median or 50th percentile project in 1994. For the upper bound estimate we assume that project effectiveness increase moderately, beginning in 1998, as states and metropolitan areas learn more about CMAQ. For the upper bound we assume that the typical project will be as effective as the 60th percentile project. The 60-percentile project is more effective than 60 percent of projects, on a dollar per ton basis, and less effective than 40 percent. Corresponding to the large range in effectiveness estimates, there is a large range in the estimated national emissions effect.

METHODOLOGY

This analysis involved estimating the potential effectiveness, by project type, of all CMAQ projects in FY 1994 where CMAQ emission reductions and expenditures were reported by states. These effectiveness estimates were then used to develop a range of estimates for potential national emissions reductions associated with the CMAQ program in 1999 (ISTEA), and 2005 (NEXTEA).

The methodology for this analysis is presented below:

1. Project effectiveness was calculated for each project and pollutant by dividing FY 1994 CMAQ project expenditures by estimated tons of each pollutant reduced per year. Since the CMAQ database presented emissions reductions in kg/day, daily reductions were multiplied by 240 days per year to calculate annual reductions, assuming most projects affect workweek travel. This assumption is conservative (i.e., tends to underestimate emissions reductions) since many projects—such as enhanced inspection and maintenance (I&M) programs and traffic flow improvements—affect travel every day of the year.
2. The projects were then grouped into the six project categories according to classifications under the CMAQ Program guidance: traffic flow improvements, transit, shared ride, demand management, bicycle and pedestrian, and I&M and other.

3. For each project category, projects were then ranked by effectiveness in order from highest to lowest for each pollutant. Projects were ranked in separate analyses for each pollutant. Projects with no reported emissions reductions (including those with emissions increases) were not placed in these rankings.⁴ The projects at the 50th and 60th-percentile were selected. The project at the 50-percentile is the median project—half of all projects were less cost-effective and half were more cost-effective. The 60-percentile project is more cost effective than 60 percent of projects, and less cost-effective than 40 percent.
4. The average life of the projects was based on a methodology developed by California's Department of Transportation and the California Air Resources Board for estimating emissions effects of CMAQ projects. The average for the range was used in this analysis:
 - Traffic flow improvements – 12.5 years (average of 5-20 years)
 - Transit – 12 years (average of 5-12 years)⁵
 - Shared ride – 14 years (average of 8 – 20 years)
 - Demand management – 12.5 years (average of 5-20 years)
 - Bicycle and Pedestrian – 20 years
 - I/M and Other – 5 years (not estimated in the California methodology)
5. Total year 1997 and 2003 federal CMAQ expenditures were calculated for each category of spending. According to the President's reauthorization proposal for ISTEA, \$1.3 billion would be authorized and \$1.047 billion would be obligated annually for CMAQ for FY 1998-2003. The table below provides annual obligation rates. For the analysis, these dollar values were converted into 1994 dollars⁶ since the cost effectiveness estimates represent emissions reductions per 1994 dollar spent.

CMAQ Obligations (millions of dollars)

FY 1992	FY 1993	FY 1994	FY 1995	FY 1996	FY 1997
340	601	815	950	939	878
FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003
1047	1047	1047	1047	1047	1047

6. The proportion of spending for each project type was assumed to be the same as in 1994:
 - Traffic flow improvements – 34.1%
 - Transit – 40.4%
 - Shared ride – 4.3%
 - Demand management – 4.6%
 - Bicycle and Pedestrian – 2.1%
 - I&M and Other – 5.5%

⁴ It would not be appropriate to assume that no emissions reductions occur for projects that do not report any emissions benefits. These projects may have been located in areas that were in attainment for the non-reported pollutant. Projects that resulted in increased emissions were dropped from the analysis since negative cost-effectiveness values are not meaningful in this context.

⁵ The mid-range estimate for transit projects appears low, given that many rail projects can last 25 to 35 years, so we chose to use the upper bound for transit.

⁶ A GDP price deflator was used to convert the current-dollar CMAQ obligations for each year into constant 1994 dollars. The 1992-1995 GDP deflators were calculated from *Economic Report to the President, 1996*. The 1996-2003 GDP deflators were calculated from GDP price index growth rate projections reported in CBO's *The Economic and Budget Outlook: Fiscal Years 1998-2007* (January 1997, Table 1-1).

7. Annual CMAQ expenditures for each category of projects were divided by various effectiveness estimates (computed in steps 3 and 4), in dollars per ton, to estimate a range for the tons of pollutants reduced nationally.

CAVEATS

While this analysis provides an order-of-magnitude approximation of *potential* emissions benefits from CMAQ funding, it is important to note a few significant caveats for this analysis:

Accuracy of reported emissions estimates is uncertain.

Emissions estimates associated with CMAQ-spending are reported by individual states. Since Federal guidance imposes no uniform approach, each state performs air quality analyses using its own methods, and quality control/quality assurance mechanisms. Analyses may use different underlying assumptions, emissions estimation methodologies, and types of data. FHWA has noted that occasionally numbers were reported that appeared unreasonable and required extensive follow-up. In some cases, it was not possible to obtain better information, and these figures were deleted by FHWA from their database. It is not clear to what extent, if at all, the states have taken into account the secondary effects of projects. For example, it is possible that traffic flow improvements that reduce travel times, and mass transit projects that reduce congestion levels could lead to induced travel that would reduce emissions effectiveness. It is also possible that an interconnected bicycle path system could be much more effective than the sum of the individual bicycle paths.

This analysis deals with uncertainties in estimating CMAQ effects by performing statistical analysis using the entire database of projects, rather than pre-selecting an individual project or case study for analysis, which may or may not be representative of most projects. This analysis also uses a range of estimates in order to deal with the uncertainty in individual estimates.

No emissions estimates are reported for a number of projects.

About 77 percent of all CMAQ projects reported quantified emissions reductions. Many of these projects reported emissions reductions for fewer than all four pollutants (VOC was the pollutant reported most often). Projects with no reported data for individual pollutants were dropped from the ranking of projects when selecting the 50- and 60-percentile projects within each category. Dropping these projects may have eliminated some projects with small impacts and lowered the effectiveness of the 50- and 60-percentile projects. However, it would not be appropriate to assume that no emissions reductions occur for projects that do not report emissions benefits. These projects may have been located in areas that were in attainment for the non-reported pollutant. Non-attainment areas would be expected to target funding to projects that help them reach attainment status.

Nine (9) percent of CMAQ funds were spent by states that did not have any non-attainment areas. This analysis uses the conservative assumption that CMAQ spending in states without any non-attainment areas does not result in emissions reductions. This assumption tends to underestimate CMAQ's effectiveness. Since states are expected to target CMAQ funds toward projects that help them meet attainment, emissions reductions would be proportionally larger in non-attainment and maintenance areas.

Timing of emission reductions

There is significant variation in the nature of benefits of CMAQ-projects. In particular, some projects may have multiple-year impacts (e.g., replacement of old transit buses with cleaner ones, development

of bicycle facilities, and improvement of signalization) while others have one-time effects (e.g., operating costs for park-and-ride lots or vanpooling service). For some projects, it may take many years to reach full benefits while for others the effect may occur immediately. For analytic purposes we assumed that projects would need 2 years to reach effectiveness. The database of projects maintained by FHWA does not provide information on the duration of benefits or peak year for benefits. This analysis projects emissions estimates under steady-state conditions in which the CMAQ-program has ten years to reach potential effectiveness.

Assuming only one-year effects for each project underestimates the total emissions reductions in 2005 since many projects from prior years will continue to have an emissions effect in 2005 (for example a park and ride lot funded in 1998 will produce benefits in 2005). To estimate cumulative/steady state emission reductions in 2005, this analysis sums emission reductions from all potential projects initiated during the twelve year period between 1992 and 2003.

FHWA suggests that air quality analysis be done for the year when the implemented project is expected to realize its maximum benefits. Some projects may require multiple years in order to reach full impact, in which case there will be some interim years in which the emissions impact of spending is less than in subsequent years. For example, CMAQ funding has been used to help establish Transportation Management Organizations, which may not yield reported impacts for a number of years. In addition, 1994 projects that continue to produce benefits in 2005 may be on-average less effective than the 50- or 60-percentile projects. As a result, the total emissions benefits estimated using the assumption of multiple year impacts may overstate the total benefits that would occur in one year.

It is also important to note that some projects reported in the FY 1994 DOT Annual CMAQ Report do not report the total CMAQ funds needed for the projects. This can occur when a project is funded over a two or three year period. If a large number of projects were funded over a multi-year period it would lead to an over-estimate of the emission reductions from CMAQ projects. To assess the magnitude of this problem we reviewed 3 years of CMAQ project data from Pennsylvania and California. While 9 percent of the Pennsylvania projects were multi-year projects, they only accounted for 2 percent of the the emission reductions. California's multi-year projects only accounted for 2.5 percent of the state's emission reductions. To adjust for multi-year projects we reduced total emission estimates by 2.5 percent.

Effectiveness of CMAQ projects in 2005

Predicting future effectiveness associated with transportation control measures (TCMs) in general is very uncertain. On the one hand, the effectiveness of a particular type of project may fall in the future since each vehicle mile of travel (VMT) reduced will result in fewer grams of pollution reduced (since the average vehicle on the road will be cleaner, and emit less pollution per mile traveled). On the other hand, each dollar spent may affect more vehicle miles since projected increases in travel and congestion nationwide may mean that a particular project, such as rideshare services, reduces more VMT. This analysis estimated the potential of the CMAQ program in 2005 using the effectiveness of the 50- and 60-percentile of projects in FY 1994. Our upper bound assumption, supported by our analysis of the California and Pennsylvania data (see table below), is that as the program continues, states will become more effective at targeting CMAQ funding, and so projects are likely to have higher than the median 1994 cost effectiveness in out years.

Change in Cost-Effectiveness

	5 year signal + hwy project life		10 year signal + hwy project life	
	1993	1996	1993	1996
VOC				
California	\$ 15,630	\$ 9,121	\$ 11,301	\$7,437
Pennsylvania	\$ 72,734	28,181	\$ 44,076	\$19,848
NO_x				
California	\$ 20,192	\$11,756	\$ 16,813	\$10,008
Pennsylvania	\$ 99,084	27,588	\$ 93,706	\$24,667

This analysis is also conservative in that it assumes spending will continue to be apportioned among the six categories of CMAQ projects in the same manner as in 1994. That is, this analysis does not assume that funding shifts to the more effective *categories* of projects, only to more effective projects within each category. The assumptions used on this issue tend to underestimate potential effectiveness.

Costs measured in this analysis only account for Federal expenditures on CMAQ.

For most CMAQ-funded projects, federal CMAQ-funds are only a portion of total project costs. For our analysis, the CMAQ portion of the project costs was used as an intermediate step to analyzing the potential effectiveness of CMAQ funding in the future. We were not attempting to assess the relative cost-effectiveness of different types of project. As a result, the effectiveness estimates should not be confused with cost-effectiveness estimates that include total costs. The analysis presented here assumes that the CMAQ program leverages other funds that would not have otherwise been spent on these projects. That is, if CMAQ-spending were reduced, the states would not spend money on these projects. CMAQ projects often have substantial state and other funding sources. For example, \$1.9 million in CMAQ funds contributed to total project costs of \$6.4 million for a Freeway Service Patrol (to clear highway incidents) in San Francisco. CMAQ contributed \$7.3 million out of \$13.7 million in total project costs to build an elevated pedestrian walkway connecting Tower City Center transit station to the Gateway Sports and Entertainment Complex in Cleveland. In some cases, CMAQ funds have been used to pay for most or all of project costs. For example, CMAQ provided \$1.7 million out of \$2.2 million for a transit operating assistance project in Ventura County, CA.⁷ Some TCMs have financial costs for the private sector as well.

Projects have different levels of effectiveness at reducing various pollutants.

This analysis estimated potential effectiveness based on individual analyses of the 50- and 60-percentile projects for each pollutant. In reality, a project that is near the top in effectiveness for one pollutant may be average or near the bottom in effectiveness for another pollutant, measured in terms of CMAQ expenditures per ton of emission reduction. Metropolitan areas would be expected to target funding priority to projects that help them meet attainment status. As a result, regions may select projects that most effectively reduce pollutants of their concern. However, at the national level, it may not be possible to achieve the full potential of CMAQ reported for all pollutants. Targeting projects that are highly effective in reducing one pollutant often results in less effectiveness at targeting the others. For example, 33 CMAQ-funded projects that reduce VOC and CO were expected to result in *increased*

⁷ U.S. Department of Transportation. *CMAQ, Innovations in Transportation & Air Quality: Twelve Exemplary Projections* (FHWA-PD-016).

emissions of NO_x. This is true for a number of traffic flow improvement projects, since increasing travel speeds often reduces VOC and CO, but increases NO_x emissions. These findings stress the importance of examining CMAQ from a regional perspective—since regions can target funding to help implement their transportation/air quality plans—rather than solely from a national emissions inventory perspective.

Table 1. Estimated Emissions Reductions from the CMAQ Program (tons reduced per year)

	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Volatile Organic Compounds (VOC)														
Lower Bound	0	0	4,263	11,607	21,338	32,438	43,284	52,135	62,061	71,209	79,796	88,180	96,485	104,200
Upper Bound	0	0	4,263	11,607	21,338	32,438	43,284	52,135	74,262	95,303	115,480	135,161	154,477	165,151
Carbon Monoxide (CO)														
Lower Bound	0	0	27,437	74,707	137,343	208,789	277,955	336,349	401,584	462,252	519,554	575,487	630,740	682,494
Upper Bound	0	0	27,437	74,707	137,343	208,789	277,955	336,349	432,439	523,180	609,793	694,294	777,391	856,166
Oxides of Nitrogen (NOX)														
Lower Bound	0	0	5,201	14,160	26,033	39,576	52,686	62,406	72,447	80,868	88,217	95,419	102,784	108,979
Upper Bound	0	0	5,201	14,160	26,033	39,576	52,686	62,406	107,558	150,200	190,903	230,614	269,664	275,837

Emissions reductions were calculated based on the cost-effectiveness of the 50th percentile projects in FY 1994 for obligations in FY 1992 to FY 1997.
 In the Lower Bound, projects obligated in FY 1998 to FY 2003 are assumed to remain as cost-effective as the 50th percentile FY 1994 projects.
 In the Upper Bound, projects obligated in FY 1998 to FY 2003 are assumed to be as cost-effective as the 60th percentile FY 1994 projects.
 Please refer to memo for assumptions.

DRAFT

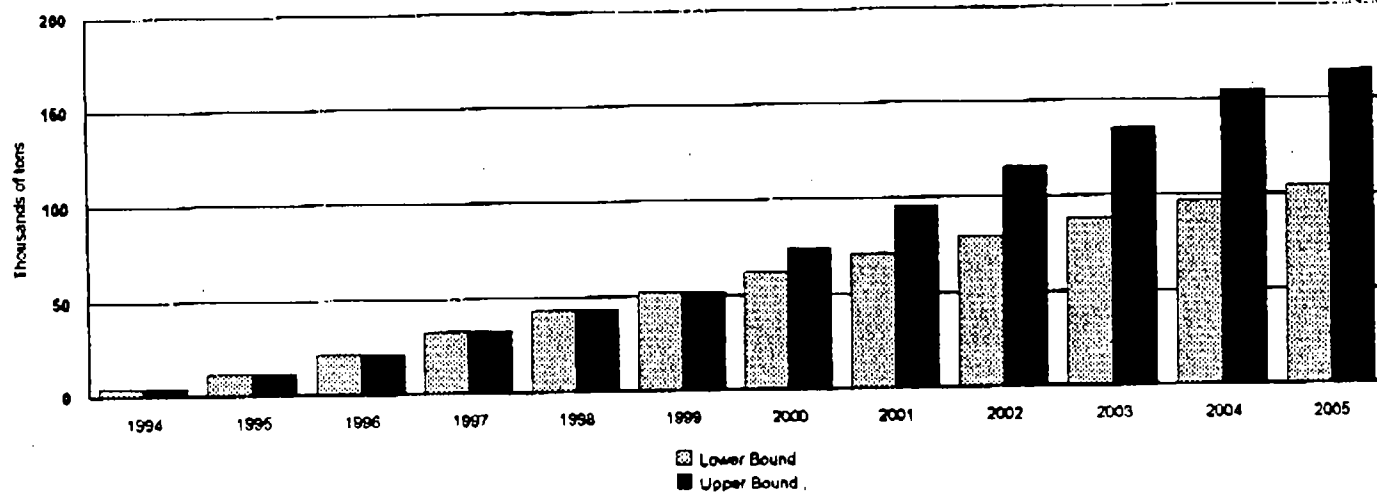
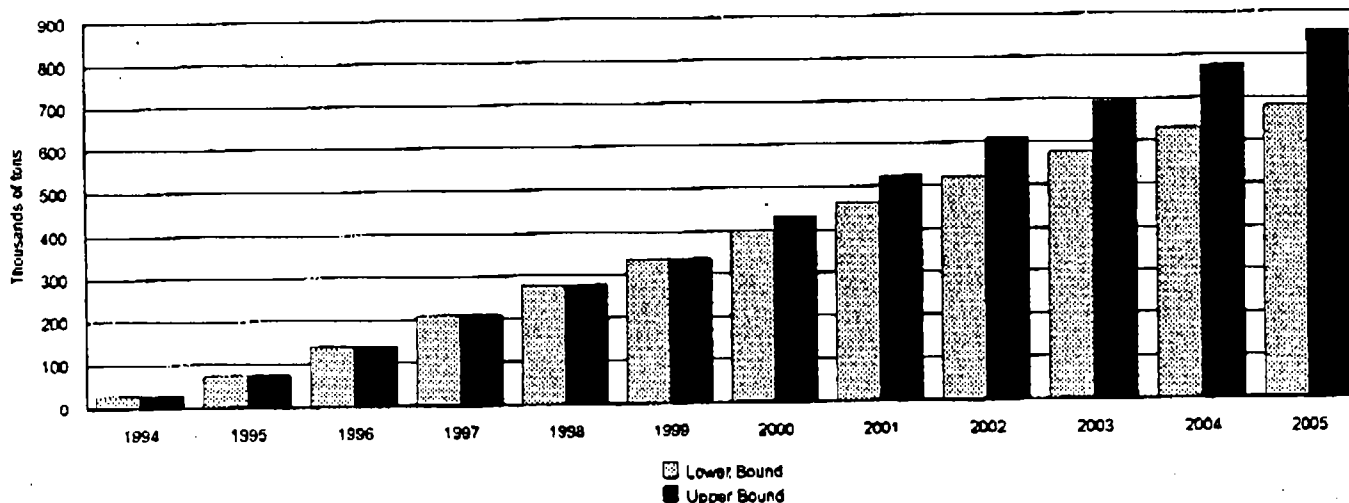
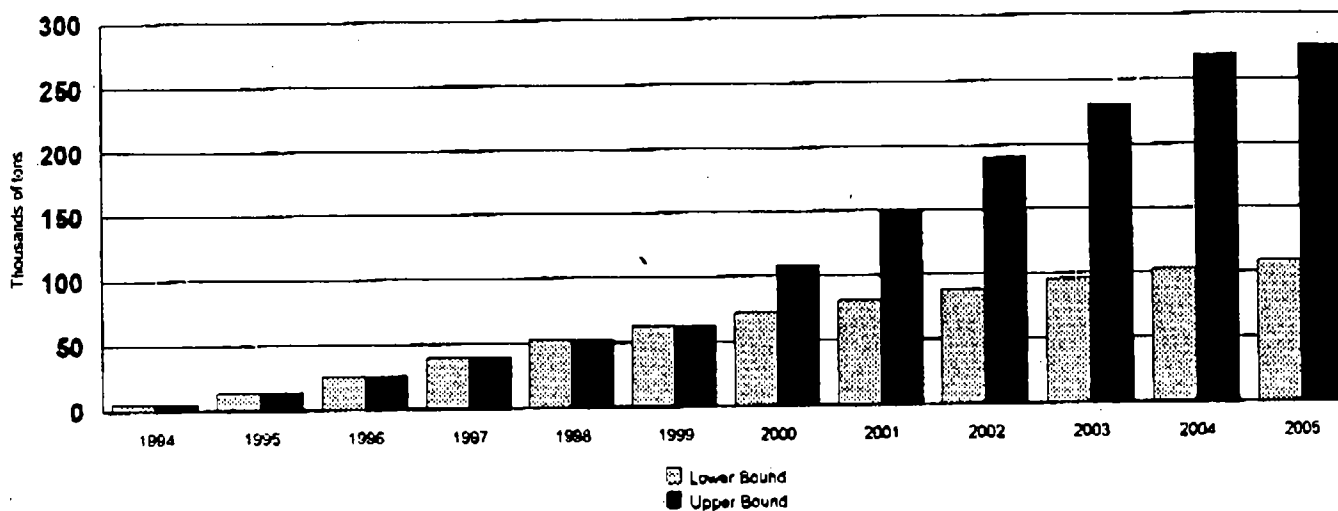
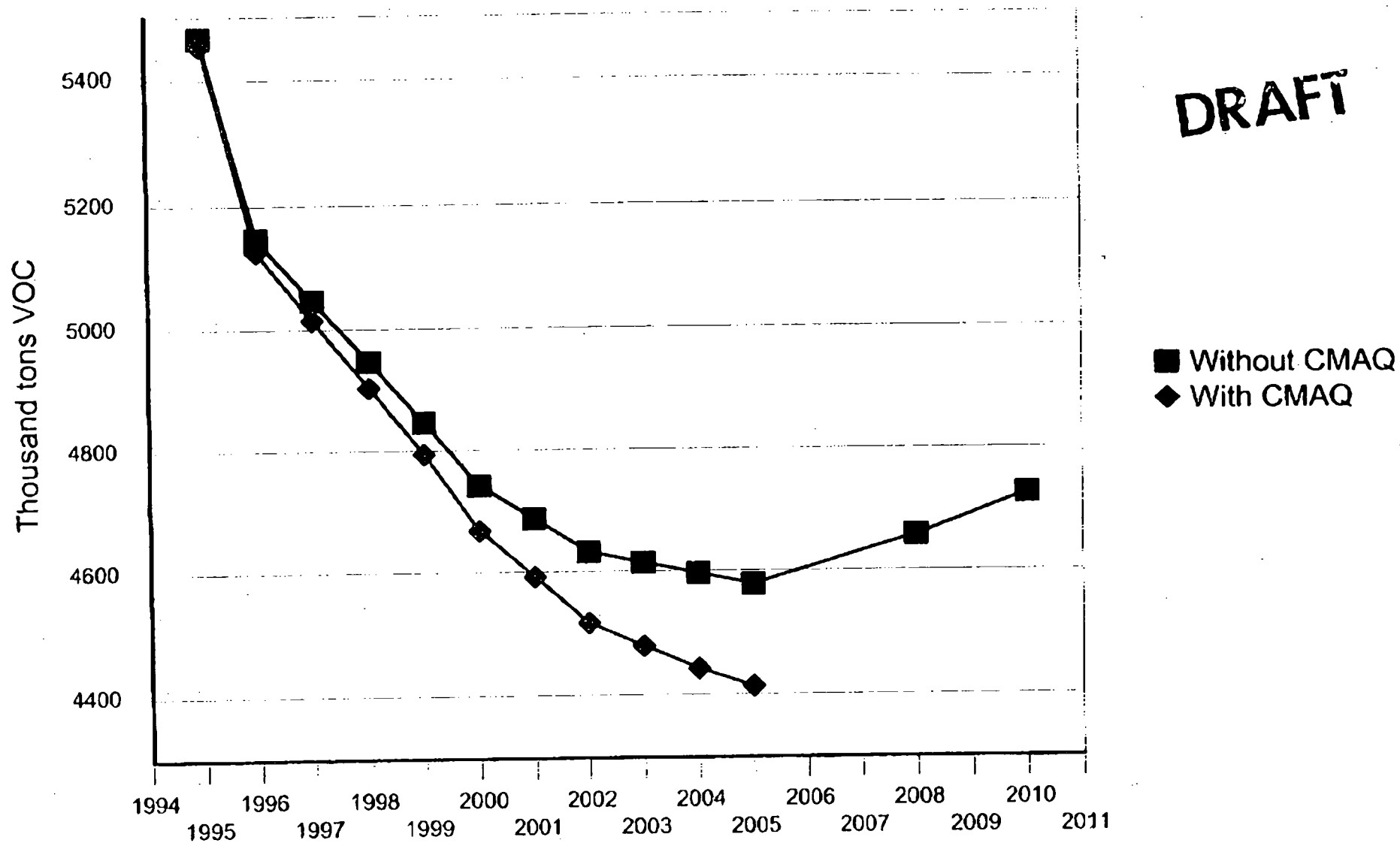
Figure 1a. Estimated VOC Emission Reductions from CMAQ**Figure 1c. Estimated CO Emission Reductions from CMAQ****Figure 1b. Estimated NOx Emission Reductions From NOx**

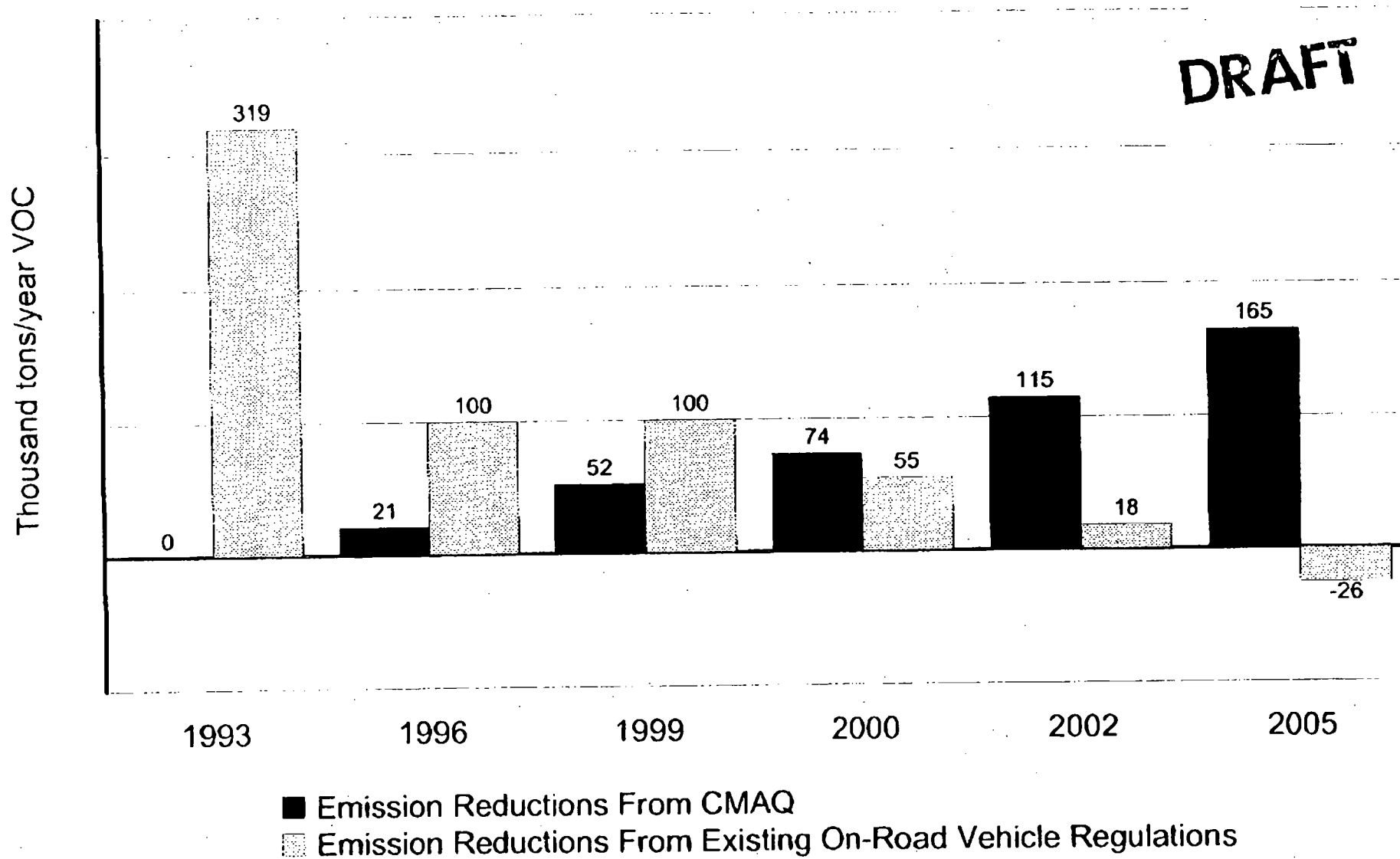
Figure 2. Estimated VOC Emission Trends from On-Road Vehicles



U.S. EPA. National Air Pollutant Emission Trends. EPA-454/R-95-011. October 1995.

U.S. EPA. Emission Reduction Potential of the CMAQ Program--Preliminary Assessment. May 1997.

Figure 3. Estimated Annual VOC Emission Reductions from On-road Vehicles



U.S. EPA. National Air Pollutant Emission Trends. EPA-454/R-95-0111. October 1995.

U.S. EPA. Emission Reduction Potential of the CMAQ Program—Preliminary Assessment. May 1997.



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Federal Highway Administration

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REMARKS:

This is the draft brochure on CMAQ that I mentioned to you. We hope to get it printed in 2-3 weeks.

CMAQ
Congestion Mitigation and
Air Quality Improvement Program

**INDIRECT
BENEFITS**

U.S. Department of Transportation
Federal Highway Administration
Federal Transit Administration



U.S. Department of Transportation
Federal Highway Administration
Federal Transit Administration

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Message from the

FHWA and FTA Administrators

The Congestion Mitigation and Air Quality Improvement (CMAQ) program was introduced in the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) as one of its critical links to the Clean Air Act Amendments. CMAQ's ability to provide funding to help fulfill Clean Air Act mandates in nonattainment and maintenance areas has made it clear that the Federal government is a full partner in helping these areas meet their clean air goals. It also turns out that CMAQ has had a significant impact on several aspects of the overall implementation of ISTEA programs and objectives.

As the Administration prepares for the reauthorization of ISTEA we felt it would be important for us to carefully examine and document the complete benefits of the CMAQ program, including those synergistic impacts that have occurred as both ISTEA and CMAQ have had the chance to mature. We gained substantial insight into the CMAQ program from the program review conducted in the Summer and Fall of 1994 as a joint effort by FHWA, FTA and the EPA. Based on the consistent support we encountered regarding continuation of the CMAQ program, we sought to dig deeper into the specific indirect benefits of the program.

While work was ongoing regarding the direct air emission benefits, little information was available regarding the indirect benefits of the CMAQ program. We heard consistently that the CMAQ program had improved the overall planning process fostering better coordination and much more frequent contact

between the transportation and air quality communities. We wanted to learn more about the specifics. We wanted to learn what components of the planning process had been enhanced and why. We wanted to know how we might build on this success. We identified MPOs who had expressed a strong track record with the CMAQ program and sought additional detail on what they regarded as the complete benefits of their CMAQ program. We asked about:

- ◆ What indirect benefits MPOs or their stakeholders have experienced as a result of the CMAQ program;
- ◆ How CMAQ affected their strategic planning efforts and processes; and,
- ◆ Which specific projects best demonstrated these indirect benefits.

The findings of this research are highlighted in this publication.



Jane Garvey
*Acting Administrator,
FHWA*



Gordon Linton
Administrator, FTA

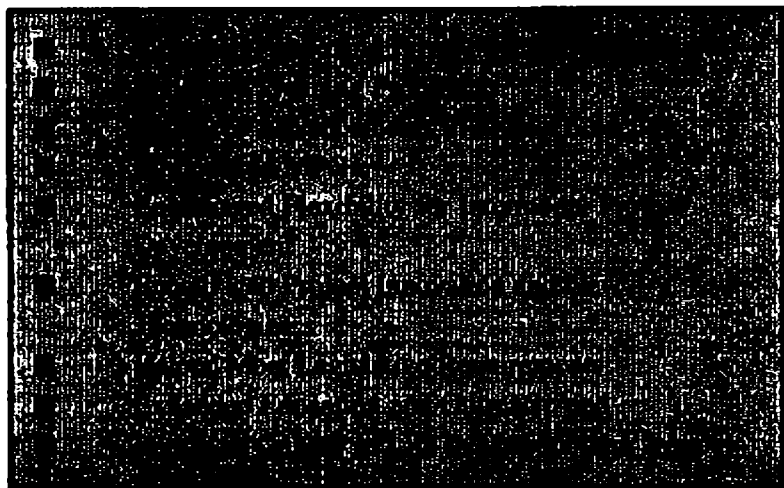
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Introduction

Since its introduction under the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA), the Congestion Mitigation and Air Quality Improvement (CMAQ) program has provided benefits beyond air quality improvements. The purpose of this research was to better understand and document the indirect benefits that could be attributed to the CMAQ program.

Through contact with numerous stakeholders, including MPOs, state departments of transportation, transit agencies, professional associations and environmental coalitions the indirect benefits of CMAQ include:



This research effort sought information and evidence of CMAQ's benefits to specify:

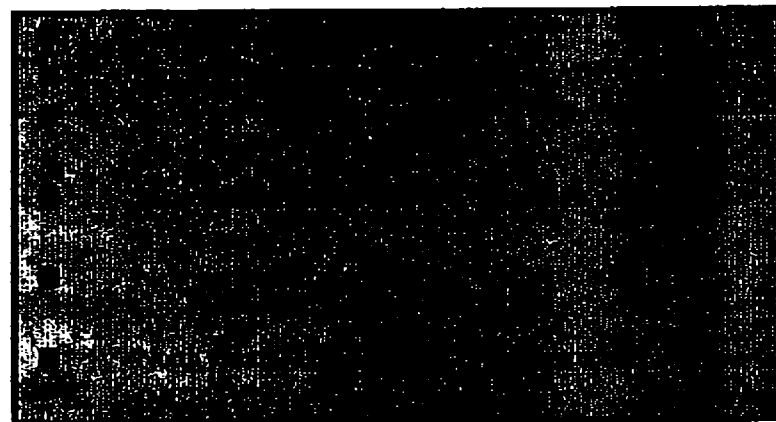
- ◆ **Insight as to the indirect benefits Metropolitan Planning Organizations (MPOs) and other stakeholders have experienced from the CMAQ program;**
- ◆ **Examples of specific projects and the demonstration of indirect benefits; and**

- ◆ **Information on how CMAQ has affected strategic planning processes.**

Information was gathered through direct contact with current CMAQ practitioners including MPOs, state departments of transportation, national transportation and planning coalitions and advocacy and environmental groups.

Following initial contacts, and after discussion with Federal Highway Administration (FHWA) staff, a list of potential MPOs to be contacted was devised. An interview guide was designed to provide a level of consistency in conducting the interviews with the selected MPOs. An outreach effort was launched to identify further participants, and follow-up contacts were pursued to gather additional insight from CMAQ stakeholders and beneficiaries of the program. Research also included the accumulation and evaluation of current literature and testimony relating to the CMAQ program.

As the information gathering phase of the research concluded, a total of 12 MPOs were contacted. Of the 12 MPOs six served as primary information sources. The Primary Contacts were interviewed at length and provided back-up materials for this effort. The Primary Contacts include:



The remaining MPOs providing information, as well as the state departments of transportation (DOTs), transit agencies, professional associations and coalitions contacted, served as a secondary contact list. They provided information through interviews, literature and/or on-line. The Secondary Contact list included:

MPOs	DOTs/ Transit Agencies	Professional Assoc. & Coalitions
Maricopa Association of Governments	California - DOT	Bicycle Forum (Missoula, Montana)
Miami Regional Planning (Dayton, Ohio)	CT Transit - Connecticut	Commuter Check Services Corporation
New York City Transportation Coordinating Council of NYMTC	MARTA - Atlanta Georgia	Chicagoland Bicycle Federation
North Jersey Transportation Planning Authority	Metro - Southwest Ohio Regional Transit Authority	Environmental & Energy Institute
Southeastern Wisconsin Regional Planning Commission	New Jersey Transit	Government Relations, Inc.
The Planning Commission (Tampa, Florida)	New York City Department of Transportation	National Association of Regional Councils (NARC)
California - DOT	New York State DOT	Surface Transportation Policy Project (STPP)
	NY Metropolitan Transportation Authority - Metro North Commuter Railroad	U.S. Conference of Mayors
	Wisconsin DOT District 2	Association for Commuter Transportation (ACT)

The details of the indirect benefits are discussed in the following pages. The findings provide insight into the broad range of effects the CMAQ program has had since its inception in 1991. It is important to recognize that there may also be additional benefits that have not been fully realized. Other potential indirect benefits that were mentioned by stakeholders, but not

emphasized by the MPOs, should also be noted. The indirect benefits may include:

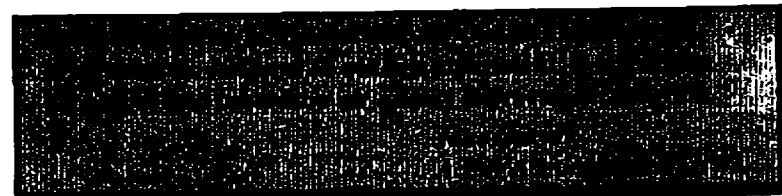
- ◆ **Economic Benefits**—There was considerable discussion among stakeholders of new technologies and overall quality of life benefits attributable to CMAQ. However, there was little recognition of the economic benefits that CMAQ funded projects will ultimately have in many metropolitan areas.
- ◆ **Quantifiable Congestion Relief**—The primary focus has been to evaluate the CMAQ program based on the dollars invested to remove tons of pollutant. However, the value of the congestion relief provided by the implementation of CMAQ projects has not been fully explored.
- ◆ **Capital Cost Avoidance**—While the implementation of Transportation Demand Management (TDM) strategies were a cornerstone of the CMAQ program, they were seldom analyzed for their ability to offset or at least delay larger capital investments, and there appeared to be some recognition of this potential when it was discussed with the research participants.
- ◆ **Accumulation of Environmental Benefits**—The synergistic benefits may go beyond clean air to include cleaner water, enhanced energy efficiency (reduced oil dependency) and greater support for ordered growth and development in expanding metropolitan areas.

The opinion of the stakeholders contacted in this study was overwhelmingly in favor of retaining and evolving the CMAQ program. As expected, participants also raised issues that need-

ed to be addressed, including standardized and more sensitive air quality modeling tools, as well as improved contracting procedures. But the consensus which emerged from this research was clearly to continue the CMAQ Program—building and expanding on its success.

Research Findings—Indirect CMAQ Benefits

To many of the participants interviewed, the CMAQ program embodied the true spirit of ISTEA. Given the short time the CMAQ program has been available, the number of indirect benefits attributable to the program is significant. It should be recognized that new programs requiring behavioral changes, infrastructure development and/or new contract requirements (often dealing with smaller dollar values and system management practices) need to be carefully evaluated for the full package of benefits, both direct and indirect, that can potentially emerge over time.



Through extensive discussions with MPOs around the country, including telephone, internet and in-person conversations, it became clear that CMAQ was a critical program in their implementation of ISTEA. While several MPOs have worked toward quantifying the air emissions benefits of their CMAQ program, and have noted considerable successes in doing so, it was clear that the indirect benefits of the CMAQ program were often just as important.

Increased Public and Private Sector Participation

As stated in STPP's ISTEA Planner's Notebook, "ISTEA requires that state departments of transportation and MPOs seek the involvement of all interested partners, including

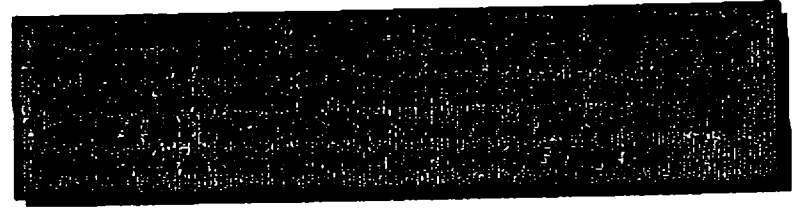
those traditionally underserved by the current transportation system." In fact, ISTEA regulations require that every MPO and state publish and periodically review an overall plan for public participation that assures "the process provides full and open access to all." Throughout this research, there was a broad recognition that the CMAQ program opened the planning process to numerous new participants in both the public and private sector and resulted in bringing new players to the transportation planning table. Bringing the private sector into the public transportation planning process was of particular significance in fulfilling the intent of ISTEA.

There were two factors that brought these new players to the table. The CMAQ program presented both an opportunity and a mechanism to increase public involvement in transportation planning activities. First and foremost was the availability of a specific funding source which was available to projects of interest to these new participants. An even greater level of involvement was noted when these stakeholders were invited to be part of the process of developing criteria for selection or actually participating in the selection of CMAQ-funded projects. In Oakland California, the Metropolitan Transportation Commission convened the Bay Area Partnership, comprised of the 31 agencies responsible for moving people and goods in the San Francisco Bay area. This group took responsibility for screening and ranking projects based on ISTEA goals for efficiency, equity and modal balance.

The other factor that influenced the increased participation levels was the open solicitation for candidate CMAQ projects which occurred in many of the MPO interview areas. For instance, the North Central Texas Council of Governments in the Dallas area solicited and evaluated projects without initial regard to project sponsorship ensuring that a wide range of candidate projects were put on the table. In New York, the New

York City Transportation Coordinating Council reported that CMAQ participants included the port, airport, freight, and highway interests, as well as environmental and community advocates.

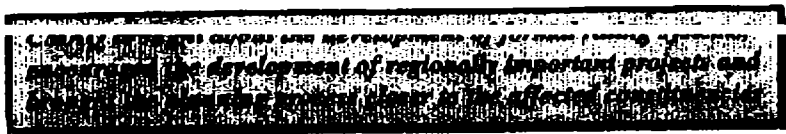
There were many examples of public/private partnerships that were the direct result of the availability of the CMAQ program. In several cases, these relationships involved public and private transportation providers responsible for moving people or freight.



Private sector participation was also enhanced by the creation of MPO working groups and advisory councils convened to allocate the CMAQ funding. CMAQ funds were used to create the Bay Area Partnership, as well as a Freight Advisory Council, which was able to initiate a critical dialog with new participants from the public and private sector. In addition, the Transportation Management Associations (TMAs) in several areas were intimately involved in bringing in the private sector. In the Chicago area, for the Lake Cook shuttle bus program, the TMA worked with area companies, governments, transit agencies, and the MPO to determine the type and level of service needed. Area businesses provided the local match.

Enhanced Planning Processes

ISTEA and the CAAA required that serious attention be given to urban transportation planning. According to several MPOs interviewed, the CMAQ program enhanced the planning process in several ways.



Several of the MPOs interviewed had established a formal evaluation and rating system for CMAQ project selection. Project criteria were often developed with input from multiple stakeholders. At the Delaware Valley Regional Planning Commission, the CMAQ committee structure was credited with successful consensus building in presenting their recommendations for CMAQ project funding to the Regional Transportation Committee (RTC). In this example, the CMAQ committee recommended about one-third of the projects originally put on the table for funding. The projects recommended were accepted and programmed by the RTC and their Board. The rating systems employed by several of the MPOs interviewed produced another, indirect benefit to the planning process. Stakeholders noted that this was often the first time they understood and were included in developing the rationale behind project selection. It was also important that the project selection criteria were performance based, i.e., ranked by ability to relieve congestion/improve air quality without regard to the traditional funding mode (such as transit or highway). According to the Chicagoland Bicycle Federation, this enabled a wider array of projects to compete equally and, as a result, several bicycle and pedestrian projects were funded.

The CMAQ program also improved the strategic planning process for implementing regionally important projects. As clean air concerns transcended local boundaries, the CMAQ program became an available source of funding to address regional concerns. This was exemplified by several programs including: the regional traffic signalization projects funded in the San Francisco Bay Area; the bike and pedestrian program

developed by the Atlanta Regional Commission, which included separate evaluation criteria for regional and interjurisdictional linkages; and the freight barge project in the New York area, which transcended both state and MPO jurisdictions.

CMAQ was also credited with bringing the planning process closer to the constituencies affected by project decision-making. In New York City, CMAQ was clearly responsible for expanding the three local Transportation Coordinating Councils (TCCs) responsibilities in the planning and programming process, as they were individually responsible for CMAQ project evaluation and recommendations. In Atlanta, the local cities became interested in MPO planning through their county representatives. Before CMAQ, there was little interest at this sub-county level. One MPO even noted that CMAQ allowed important local projects, which may not have been a priority for state level DOTs, to be brought to the table.

Encouraged Advancements in Project Selection

Another important contribution of the CMAQ program was the formalization of methodologies, in many MPOs, for the selection of transportation air quality projects. Of particular note were the procedures developed by the New York City Transportation Coordinating Council. The evaluation process involved a two-tiered approach which categorized projects based on their ability to achieve quantifiable emissions reductions. These procedures were organized and implemented through the MPO members. Projects were also accepted from outside the MPO as long as there was a member sponsor.

Several of the other MPOs interviewed also introduced similar, formal, project evaluation procedures. These procedures served to formalize the project selection process for CMAQ funding

and make it much more understandable to the involved players as well as concerned members of the general public. This type of advancement in planning assisted the development of a well thought out, and objective process.

Empowered MPOs

An important objective of ISTEA is to provide greater control of the transportation planning and programming at the local level. ISTEA recognized the need to make metropolitan areas more equal partners with state agencies with more control over transportation decision making in their own region. The empowerment of the MPOs was considered critical to achieving local control. CMAQ was cited by the Delaware Valley RPC as putting the MPOs in a much stronger position to negotiate project selection. CMAQ helped to bring transportation decision making to the local level.

MPO empowerment was most apparent in cases where the MPO was given responsibility for both project selection and the direct allocation of CMAQ funding. This was particularly true where CMAQ funds are automatically suballocated based on an established formula within the state to the various metropolitan regions either as a matter of law or practice, thus ensuring that the MPOs control CMAQ programming. In the case of the Puget Sound MPO, CMAQ provided an opportunity for the MPO to allocate funds based on transportation policies identified by the Regional Transportation Council's Metropolitan Transportation Plan. CMAQ gave the Puget Sound MPO plans more "clout." In Chicago, the CMAQ program provided the opportunity for a programming process somewhat unique for the region. The program has an open call for projects reaching all state and local governments, park and forest preserve districts, transit operators and public interest groups. Projects to be funded under the CMAQ program are selected from all of

the projects submitted by a committee of the MPO consisting of representation from the MPO, the state DOT, county governments, the City of Chicago, suburban municipalities, transit operators, and the state air quality agency.

CMAQ enabled the MPOs to provide local leadership in the development of project selection criteria that best fit local transportation needs, while addressing local clean air needs. While MPOs had long had responsibility for developing Transportation Improvement Programs (TIPs), the CMAQ program's outreach to local participants gave the MPOs a much greater say over the use of funds than before ISTEA.



Encouraged Flexibility and Intermodal Project Development

The Transportation Research Board's Special Report 240, ISTEA and Intermodal Planning, states that the intermodal aspects of transportation referred to in ISTEA includes highways, transit, air, water, and rail systems. The array of CMAQ projects discussed during the various interviews conducted as part of this effort clearly illustrate that these projects touched on every one of these categories. CMAQ funds were important in funding numerous modes of transportation, as well as the intermodal connections and planning process. CMAQ funds for intermodal projects benefited from the funding flexibility permitted in ISTEA. In one MPO's estimation, CMAQ was the key source of flexibility. Nationally, CMAQ has accounted for approximately 50 percent (\$1.6 billion) of all funds

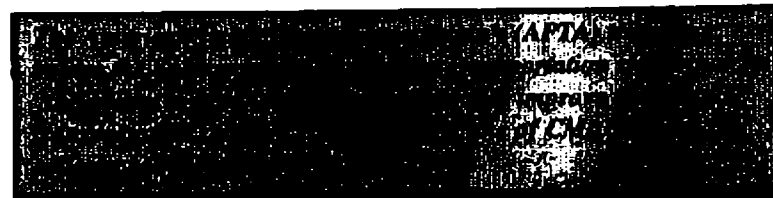
flexed to transit. Given its potential performance based context, alternate modes of transportation were given the opportunity to compete on an equal basis with traffic flow and transit projects under the CMAQ program. In the Chicago, Dallas, and Atlanta MPOs, the intermodal/multimodal impacts of a project were included in the framework for project evaluation and prioritization.

It was also considered important that CMAQ funding is seen as a safe haven and reliable funding source for intermodal projects. There was a sentiment expressed by several of the MPOs interviewed that overall project needs still significantly outweighed available resources and that more highway (as well as transit and maintenance) projects still need additional funding, creating pressure to divert CMAQ funds to these needs. Given these very real transportation needs, it was critical to have a program that considered alternative modes of transportation, including capital investment and management strategies. CMAQ funding was responsible for intermodal investments in transit; freight, truck and rail; ferry operations; bikeways; pedestrian improvements, as well as an intermodal passenger terminal; and alternate fueled vehicles for airport service.

Encouraged Project Innovation and New Technologies

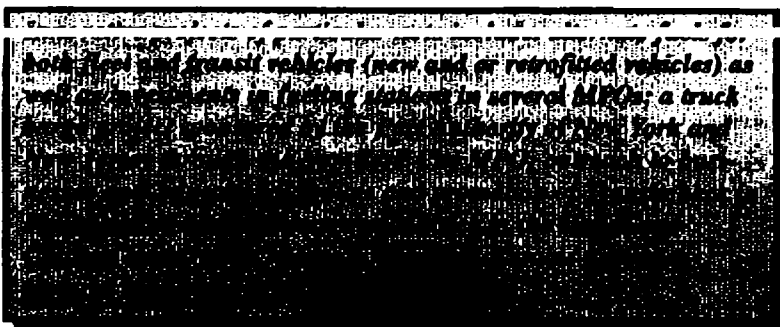
In the GUIDE to Metropolitan Planning Under ISTEA, published by the U.S. Department of Transportation, it is noted that "ISTEA promotes transportation systems that maximize mobility and accessibility and minimize transportation related fuel consumption and air pollution." In order to meet these goals, transportation projects that go beyond traditional highway and or transit expansion and improvements had to be included in the mix of transportation investments. The CMAQ program provided an essential source of funding for innovative management

systems and capital projects that took risks in trying new techniques and technology applications.



Innovative capital projects undertaken by the MPOs, as well as their willingness to venture further into new areas including Transportation Demand Management activities, were the result of available CMAQ funding. While discussions with various MPOs revealed a belief in the effectiveness and the necessity of the types of innovative and "cutting edge" projects sponsored through CMAQ, it also became clear that without a specific CMAQ program the overall pressure exerted by traditional transportation needs would seriously jeopardize their ability to include these types of innovative projects in the project mix.

The mix of innovative projects included a wide array of projects that were aimed at improving the efficiency of the existing system, providing alternatives to single occupancy travel and using technology advances in both alternative fuel programs and the implementation of Intelligent Transportation Systems technologies (ITS). Projects also included those that involved an element of risk, in that suburban transit operations may not have met traditional density criteria but were implemented to test and learn from empirical information how to best serve this expanding, sprawling market. New ITS technologies were often funded as important elements of congestion relief programs.



Innovative projects also included the implementation of smart technologies for both highway and transit management. New technologies were employed in the implementation of information systems geared at providing better and, in some cases, real time information to transportation users. This information technology covered a wide array of applications. CMAQ projects funded in the Bay Area included a regional Intelligent Transportation System—TravInfo and a regional transit coordination project—Translink. Delaware's CMAQ funding for the Southeast Pennsylvania Transit Authority's (SEPTA) transit information center, and kiosk projects have proven to be valuable resources.

Appropriately, CMAQ was not cited as a source of funding for the actual research that went into the development of the ITS technology, but it was a critical program to demonstrate the effectiveness of these technologies to meeting clean air and congestion goals. Signal priority and advanced signal coordination programs were implemented in the Puget Sound region, a freeway management system was implemented in Dallas, and a bus locator system implemented in Atlanta, all because of the availability of the CMAQ program. In Atlanta, the CMAQ ITS projects considerably helped in transportation management during the Olympics. In fact, ITS was a component of every interviewed MPO's transportation agenda.

Helped Meet Legislative Requirements

The availability of CMAQ funds and the implementation of CMAQ funded projects helped meet both the conformity requirements of the CAAA and the Unfunded Mandates Reform Act of 1995. Under CAAA's conformity provisions, MPOs are required to produce long range plans and TIPs that will work toward the attainment of clean air standards. **The CMAQ program was an important instrument in funding programs critical to helping regions meet conformity.** In his testimony before the Surface Transportation Subcommittee, Frank Carlile, Assistant Secretary for Transportation Policy for the Florida Department of Transportation, credited the CMAQ program as a valuable asset in meeting the transportation conformity requirements in Florida. In the Atlanta Regional MPO, it was noted that Transportation Control Measures (TCMs) funded by CMAQ were clearly responsible for helping the region meet previous conformity goals.

The CMAQ program also helped to protect the Clean Air Act from becoming an unfunded mandate. CMAQ was continually cited as an important program that provided funding for the implementation of the CAAA. The STPP cited, in their testimony at the same hearing, the CMAQ program as a commitment of Federal funds to solve at least part of the air quality problem. They further noted that, in the 104th Congress's consideration of unfunded mandates, the CMAQ program helps to fulfill the spirit of the law. In the Association of Commuter Transportation's (ACT) public comment on CMAQ, they clearly supported the continuation of the CMAQ program, in part for its funding of CAAA mandates.



Expanded Education and Outreach

Education and outreach are critical components to ensure that the general public understands the need to modify behaviors or activities in order to contribute to clean air attainment. An example is to look back on how education and outreach affected people's willingness to participate in recycling programs. Education and outreach regarding the impacts of poor air quality and congestion and potential solutions may, one day, boast the same success.

The CMAQ program sponsored numerous projects which increased the public's awareness of issues and concerns regarding congestion and air quality impacts. This was achieved by several marketing efforts which brought to the public's attention the serious implications of air quality impacts through such efforts as ozone alert programs. The ozone alert programs served to educate the general public as to what they can and should do to reduce the impacts of ozone. The ozone alert program funded by the Maricopa Association of Governments in Phoenix is in effect for the summer and fall, with a shift in emphasis to carbon monoxide in the winter. They have found, as have other MPOs interviewed, that year-round public service announcements on TV and radio are effective ways to reach and educate the public.

Another important aspect of the CMAQ education and outreach projects included outreach to school children. Clean air health and bicycle programs were funded through CMAQ. This type of education has the dual advantage of building an aware constituency among the youngest members of society as well as the "trickle up" advantage, where many of these valuable lessons are in turn passed on to the parents of these informed youngsters. The North Central Texas MPO used CMAQ funding to develop school curriculum and an education campaign through

TV that included a clean air education component of the nightly weather report. The nightly news carried a feature that emphasized anticipated ozone levels and suggestions to reduce their impacts such as restrictions on lawn mowing with gas mowers or that people with respiratory problems should limit outdoor activities.

Education programs like the one developed by the Delaware Regional MPO to inform realtors, developers and the banking community about the advantages of transit-oriented design is an educational tool that can lead to better transportation and land use linkages. Also, a Walk to Work Guide produced through "Select Milwaukee" for employees in the existing neighborhood businesses and industries promoted the advantages of choosing a home that is close enough to walk to work. Information sharing and outreach on telecommuting programs help to reach the private sector and provide them with options for meeting their individual clean air compliance goals. Other examples include the Puget Sound's Transportation/Air Quality Public Information Kit, their Carless Commuter program and their award winning "One Less Car...Use it Wisely" program.

Improved Quality of Life in Metropolitan Areas

CMAQ investments in metropolitan areas begin to address both congestion and air quality concerns. In addition, CMAQ programs have been cited by MPOs, particularly in the Atlanta area, as important to improving the quality of life. The ARC emphasized that the implementation of bike path and pedestrian improvements go a considerable distance in areas which may lack open space and, given congested street systems, welcome the addition of safe bike and pedestrian improvements. Transit is also an important contribution to the quality of life in many

metropolitan areas. Overall, nearly half of CMAQ spending went to transit.

Addressing the full range of transportation costs has been discussed and explored for decades. Current research such as TRB Special Report 242 "Curbing Gridlock" and World Resources Institute's, "The Going Rate: What It Really Costs to Drive," continue to mount compelling examples of the overall cost of both congestion and incidents/highway injuries. The programs funded by the CMAQ program are often targeted at projects that address these concerns.



Incident detection programs, like the Highway Emergency Road Operators (HERO) program in the Atlanta area, train operators to handle a multitude of emergency situations from flat tires to first aid training. These programs are targeted to help reduce both the delay an incident may cost as well as the rate of injury experienced by motorists.

CMAQ programs that promote a reverse commute trip for transit and/or a suburban-to-suburban transit trip have played a role in addressing issues regarding transportation and social equity. The New Jersey Transit "Wheels" program and the bus service between downtown Milwaukee and suburban Ozaukee County are prime examples. In the Milwaukee project, the local TMA was working to resolve problems with worker shortages related to inadequate public transportation between Milwaukee and suburban employment centers. This project had to overcome numerous social concerns. This new service has been operating well in excess of projections, and, in fact, the success of this project has inspired employers in neighboring Washington County to consider a similar arrangement. The NJT

Wheels Program, that carries passengers from downtown and rail stations to suburban residential and job centers, was recently labeled a "suburban transit success" by the Tri-State Campaign, a regional environmental advocacy group.

Conclusions

The CMAQ program provided numerous indirect benefits to the transportation planning community. These benefits have touched many areas intrinsic to the intent and requirements of ISTEA. ISTEA's policy statement reads in part:



The CMAQ program has gone a long way in fulfilling the broadest goals of ISTEA. The fact that projects were funded that link good transportation planning to sound environmental policies is a major accomplishment of the CMAQ program. CMAQ also fulfilled a focused set of ISTEA sub-goals, namely: opening up the planning process and bringing new partners and participants into the transportation planning and decision making process; giving local officials and planners greater input into transportation project selection; and encouraging flexibility in funding and innovation in project design and implementation. The types of projects highlighted by the MPOs and stakeholders interviewed illustrate the significant role CMAQ had in fulfilling these goals.

There is a common thread that runs through many of the projects highlighted in this research. A number of CMAQ projects, in several categories, are responsible for significantly improving the planning process. While projects that encouraged the devel-

system of planning tools and procedures directly influenced planning procedures, many of the other projects which resulted in increasing public participation, developing more intermodal projects, providing education and outreach, and empowering the MPOs significantly contributing to improving the overall planning process.

Stakeholders in the CMAQ program contacted for this study are united in their support for the continuation of a dedicated CMAQ program. There is an acceptance of the fact that, like all new programs, CMAQ will require some adjustment during reauthorization. In the words of the MTC, "we are only now beginning to learn the types of projects which are most effective for reducing congestion and improving air quality, the dual objective of the CMAQ program. In the next reauthorization, the program should continue to evolve."

NEXTEA

THE NATIONAL ECONOMIC CROSSROADS TRANSPORTATION EFFICIENCY ACT

KEY ENVIRONMENTAL PROVISIONS



MAY 7, 1997

PROTECTING THE ENVIRONMENT

We have made tremendous progress over the past generation in preserving and improving America's environment, but we still have much to do. ISTEA helped us to start the job by giving us the tools to protect our environment even as we create a transportation system that enables our economy to compete abroad and to create jobs at home. NEXTEA would build on ISTEA's success: as the President said when he announced NEXTEA, "make no mistake about it, this is one of the most important pieces of environmental legislation that will be considered by Congress in the next two years."

- ☐ NEXTEA would increase by 30 percent, to \$1.3 billion annually, funding to help states and communities clean their air, and expands the eligibility for such funding to include regions that fail to meet any new clean air standards.
- ☐ NEXTEA would increase by 35 percent funding to make communities more livable through "transportation enhancement" projects that protect the cultural, aesthetic, and recreational aspects of our transportation system.
- ☐ NEXTEA would provide greater flexibility for communities to invest in such sustainable forms of transportation as transit, bicycle and pedestrian facilities, Amtrak, and publicly-owned intercity rail terminal projects. NEXTEA also would simplify federal transportation planning requirements and emphasize public involvement in decision-making.
- ☐ NEXTEA would sustain the record levels of transit funding achieved under President Clinton.
- ☐ NEXTEA would provide flexibility and incentives for states and communities to meet their highway capacity needs by investing in technology as an environmentally-friendly and cost-effective alternative to new construction.

CLEANING OUR AIR

Scientific research demonstrates the effects of air pollution on our health, and President Clinton has taken advantage of ISTEA's landmark environmental provisions to cut pollution. In 1990, the year before ISTEA's enactment, 140 million Americans lived in areas which failed to meet standards for healthful air. That number dropped to 79 million in 1995: still too many, but a big improvement.

However, growing traffic threatens to reverse the improvements made through ISTEA programs and through cleaner cars and cleaner fuels. We have to continue, and even expand, efforts to improve technology and to reduce vehicle miles of travel, and NEXTEA does this.

ISTEA SUCCESSES

- ✓ The Congestion Mitigation and Air Quality Improvement Program (CMAQ) authorized an average of \$1 billion annually under ISTEA to help states and communities clean up their air. CMAQ has funded such innovative projects as cleaner natural gas buses in Cleveland and Boise, a child care center to promote ridership at a San Jose transit station, a freight barge which daily takes hundreds of trucks off of New York's streets, and an inspection and maintenance program in Indiana, which ensures that auto emissions systems continue to cut pollution.
- ✓ Each year CMAQ currently eliminates 48,000 tons of volatile organic compounds (VOCs) and 60,000 tons of nitrogen oxides, key components of smog, as well as 316,000 tons of carbon monoxide.

KEY NEXTEA PROVISIONS

- NEXTEA would increase authorized CMAQ funding by 30 percent, to \$1.3 billion annually, and expand funding eligibility to include scrappage of higher-polluting pre-1980 vehicles. It also would act on new research on the dangers of particulate matter by allowing areas that do not meet health standards for this pollutant to receive CMAQ funds. Finally, NEXTEA would ensure that no state loses CMAQ funds as a result of proposed enhancements of air quality standards.
- CMAQ will help states and communities fund projects necessary to satisfy federal air quality requirements.

ENHANCING THE ENVIRONMENT

Although mitigating the impacts of transportation projects and making them more compatible with our environment has been a federal priority for years, ISTEA went beyond this to actively use transportation as a way to help communities improve their quality of life. The Transportation Enhancements program has enabled states to invest nearly \$1.3 billion in such initiatives during ISTEA's first five years.

ISTEA SUCCESSES

- ✓ Transportation enhancement activities include bicycle and pedestrian facilities, enhancements to scenic or historic sites and highways, historic preservation, landscaping, preservation of former rail rights-of-way, control of outdoor advertising, and mitigation of highway runoff pollution.
- ✓ Among the projects states have supported are the redevelopment of Lafayette, Indiana's historic railway terminal as an intermodal transportation center; construction of bicycle-pedestrian paths in Kalama, Washington; highway landscaping projects in Columbus, Ohio; the acquisition of scenic easements in Kaneohe, Hawaii; and the conversion of Springfield, Massachusetts' abandoned waterfront into bicycle and pedestrian walkways.

KEY NEXTEA PROVISIONS

- NEXTEA would fund projects with a 10 percent set-aside from each state's Surface Transportation Program funds, and increase total Transportation Enhancements funding authorizations by more than 30 percent. The activities currently eligible would remain so, and NEXTEA would clarify that enhancement activities must be related to surface transportation.

SUSTAINING OUR COMMUNITIES

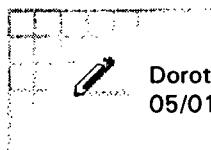
Communities must be able to choose the projects which best meet their needs if they are to have a balanced, sustainable transportation system. Ensuring that requires a strong and inclusive transportation planning and decision-making process which considers environmental factors and which provides ample opportunity for public input.

ISTEA SUCCESESSES

- ✓ ISTEAs strengthened the role of cities in transportation planning, and enhanced public participation has helped to build community consensus for transportation projects.
- ✓ ISTEs increased flexibility among funding programs has enabled states to transfer more than \$3 billion from highway programs to transit, and supported programs ranging from bicycle and pedestrian projects to wetlands mitigation.
- ✓ New programs for recreational trails and scenic byways have greatly improved Americans' quality of life and supported tourism.

KEY NEXTEA PROVISIONS

- NEXTEA would provide \$5 billion annually in direct transit funding and increase flexible funding which could be transferred to transit. Projects such as improvements to Amtrak and to publicly-owned intercity public rail and bus terminals would be eligible for funding, and bicycle and pedestrian projects would continue to be broadly eligible.
- NEXTEA would simplify federal transportation planning requirements, encourage linkages with land use and other related forms of planning, and further strengthen the role of central cities in regional planning.
- NEXTEA would enhance key environmental programs, broadening the eligibility for wetlands habitat preservation activities and increasing states' flexibility under the Recreational Trails program.
- NEXTEA would continue the All-American Roads and National Scenic Byways programs, and continue funding for planning, designing and developing state scenic byway programs.
- NEXTEA would support innovative initiatives to promote community-friendly transportation, such as provisions encouraging businesses to offer their employees transit subsidies as well as free parking and a program to demonstrate how pricing policies can encourage more efficient travel.



Dorothy Robyn
05/01/97 04:03:11 PM

Record Type: Record

To: See the distribution list at the bottom of this message

cc:

Subject: Conference Call at 5:30 today on NEXTEA

As you know, we've scheduled a NEXTEA briefing for Wed., May 7, between 10 am and noon, in the Roosevelt Room. The goal is to emphasize the Admin's commitment to NEXTEA -- especially CMAQ.

If possible, could you join a conference call today at 5:30 pm to go over what we need to decide/do for the briefing. The call number is 6-6755; code is 5109.

Message Sent To:

Linda Lance/CEQ/EOP
Lynn G. Cutler/WHO/EOP
Richard L. Hayes/WHO/EOP
Daniel C. Tate/WHO/EOP
Ananias Blocker III/WHO/EOP
Katherine Hubbard/WHO/EOP
Diane R. Montgomery/OMB/EOP

Roosevelt Rm. 10-12

60 people

Lynn

- NXC@

- Conf. of Mayors } 20

John

Env'to; Community - Nancy Willis, STPP - 20

Transit - 7

Calif. ISTEX Coal. Team

- univ.
- Research
- CALSTART

- Names in by COB Fri

- Faxes tomorrow

Diane R. Montgomery

03/31/97 01:58:17

PM

Record Type: Non-Record

To: See the distribution list at the bottom of this message

cc:

Subject: NEXTEA Environmental Meeting

Per the EPA/DOT/WH office discussions on what the NEXTEA strategy should be, I would like to schedule a meeting between EPA, DOT, CEQ, NEC, and OMB staff to discuss what sort of information might be useful versus what information is available to defend the NEXTEA environmental programs, particularly CMAQ. The overarching purpose of this meeting is to fine-tune our NEXTEA environmental story.

The goal would be to produce a single "educational" document that could be used by EPA, DOT, WH, and OMB in "outreach" sessions with environmental groups and Congress. For example, DOT could provide information on state-by-state break-outs of CMAQ funding under NEXTEA while EPA could provide data on air quality benefits of ISTEA CMAQ projects. This document would serve as a baseline from which Exec. Branch parties can build upon. I think this might be helpful to ensure that everyone is singing from the same song sheet. I realize that EPA and DOT have already begun to prepare materials along these lines. This meeting should serve to coordinate what both EPA/DOT have accomplished to date and what needs to be completed. EPA has also asked that we discuss implementation/process issues.

Could we meet at OMB Wednesday (4/2) at 3:30 pm? If this time is not convenient, please make suggestions for alternative times on Tuesday or Wednesday.

Message Sent To:

Linda Lance/CEQ/EOP
Dorothy Robyn/OPD/EOP
adler.ken @ epamail.epa.gov @inet
camille.mittleholtz @ ost.dot.gov @ inet
David J. Worzala/OMB/EOP
Jonathan C. Ball/OMB/EOP
David E. Tornquist/OMB/EOP
Mark J. Schwartz/OMB/EOP

AGENDA -- NEXTEA ENVIRONMENTAL PROVISIONS
Meeting Thursday, March 26, 1997

1. Message/Information -- There is general agreement that NEXTEA as an major environmental bill is the appropriate message, and that good material on all environmental provisions is available from DOT on their Website and in materials prepared for POTUS event. Additional information on actual impacts of CMAQ and other environmental provisions in the current ISTEA law is being requested by the Hill and needs to be gathered. Ideally, this information should demonstrate objective results (e.g., air quality improvements for CMAQ) as opposed to anecdotes. This info-gathering should be assigned (EPA has begun work on some of this in response to post-hearing questions from the Hill).

2. Outreach -- Administration outreach meetings with environmental/sustainable development groups; conference of mayors; national league of cities, NACO and NGA as appropriate (need input from intergov on this) should be scheduled to update these groups on bill's status, Administration activities, and other legislative proposals on Hill. Initial meetings should be set up through White House with interested agencies attending. These initial meetings should be at the staff level to exchange information. Later meetings with CEOs, Mayors, etc., may be appropriate.

Agency officials should also include the environmental piece in their relevant speeches and look for opportunities to address the environmental issues. DOT and EPA have agreed to exchange speech text for the speeches already made to ensure they're in sync. The basic message is contained in DOT's briefing materials and that should be generally followed.

3. Hill Update/Visits -- We need an update from agencies/leg affairs on hearings held, hearings upcoming, and legislative proposals by opponents (Baucus bill in particular). Assignments need to be made for preparation of a list of members/staff who should get near-term briefings on the environmental issues in the bill and Administration officials to provide the briefings.

4. Coordination/Info Exchange -- A process should be established to ensure that all Administration offices/agencies working on NEXTEA can receive notice of hearings, legislative proposals, markups, requests for information, etc. OMB circulates most of this for clearance now. Can they be asked to also track hearings scheduled, markups and legislative proposals introduced and circulate to the contact list?

TO DO -- SUMMARY

1. Assign production of objective information about impacts of current ISTEA

environmental provisions. (EPA; consult w/ DOT?)

2. Assign scheduling of informational meetings with Administration, environmental community, state and local officials. (WH public liaison w/ WH intergovernmental affairs, CEQ. EPA, DOT to provide advice about agenda, invitees).
3. Assign preparation of list of near-term Hill briefings and officials to conduct the briefings. (WH, DOT, EPA leg affairs; CEQ -- DOT leg affairs to draft?)
4. Establish process for information exchange within Administration. (OMB)

- quantify β s of CRAP