STATE FISCAL YEAR 1997-2000
STATE TRANSPORTATION IMPROVEMENT PROGRAM (STIP)
CLEVELAND/AKRON/LORAIN MODERATE OZONE NONATTAINMENT AREA
AIR QUALITY CONFORMITY DOCUMENTATION

FINAL

JUNE, 1996

BY

NORTHEAST OHIO AREAWIDE COORDINATING AGENCY
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FY 1996 Overall Work Program
Project No. 6101200

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Executive Summary

The Clean Air Act Amendments of 1990 expanded transportation's role in contributing to national clean air goals. The 1990 amendments expand the definition of "transportation conformity" to:

> *Conformity to the (air quality implementation) plan's purpose of eliminating or reducing the severity and number of violations of the national ambient air quality standards and achieving expeditious attainment of such standards; and that such activities will not (i) cause or contribute to any new violations of any standards in any area, (ii) increase the frequency or severity of any existing violation of any standard in any areas, or (iii) delay timely attainment of any standard or any required interim emission reductions or other milestones in any area.*

A fourth requirement is that plans, programs and projects do not delay the timely implementation of transportation control measures (TCMs) in the applicable State Implementation Plan (SIP).

This document, which is a portion of the Ohio 1997-2000 State Transportation Improvement Program (STIP), describes the conformity determination for the former eight county Cleveland/Akron/Lorain (CAL) Moderate Ozone Nonattainment Area, which includes the planning areas of the Northeast Ohio Areawide Coordinating Agency (NOACA), the Akron Metropolitan Area Transportation Study (AMATS), and the County of Ashtabula. The CAL was redesignated to a maintenance area for ozone on May 7, 1996 (Federal Register, Vol. 61, No. 89, p. 20458 -20473). As a result of this redesignation the CAL is no longer required to conduct an action/baseline comparison for conformity purposes. However, since the action/baseline comparison was completed prior to the redesignation, its results are included in this document for informational purposes.

The applicable metropolitan Transportation Improvement Programs (TIP) which are included by reference into this STIP are the NOACA SFY 1997 - 2000 TIP and the AMATS SFY 1997 - 2000 TIP. The Ohio Department of Transportation (ODOT) is responsible for the review of and the conformity determination for transportation changes in the County of Ashtabula.

The conformity determinations for the Ohio FY 1997-2000 metropolitan TIPs were conducted in accordance with the *Criteria and Procedures for Determining Conformity to State or Federal Implementation Plans of Transportation Plans, Programs and Projects Funded or Approved Under Title 23 U.S.C. or the Federal Transit Act*, 40 CFR Parts 51 and 93, issued November 24, 1993. The final rule requires the hydrocarbons and oxides of nitrogen emission burdens from plans and programs to be beneath the emission budgets in the submitted State Implementation Plan (SIP).

As will be explained below, Ohio's 1997-2000 TIPs conform to the State Implementation Plan (SIP) because the TIPs:

- Contribute to the SIP's purpose of eliminating and reducing ozone violations;

- Emission burdens from the Plans and TIPs are below the budgets established for them in the State Implementation Plan (SIP);

- Provide for timely implementation of transportation control measures in the applicable State Implementation Plan;

- The Plans and TIPs have been prepared in accordance with the final conformity guidance.

In all cases, the TIPs are below the emissions budgets established for transportation in the CAL areas.

Introduction

Transportation plans, programs, and projects in maintenance areas must "conform" with Federal or State Implementation Plans for maintaining the national ambient air quality standards (NAAQS). Maintenance areas, as defined by the 1990 Clean Air Act Amendments, are geographic regions of the Country that have achieved the national ambient air quality standards (NAAQS) for a given pollutant and must now maintain that achievement. State or Federal Implementation plans identify the strategies and programs maintenance areas will continue to provide for the continuation of their attainment status. In Ohio, the Ohio Environmental Protection Agency (OEPA) is the lead agency for coordinating development of the State Implementation Plan (SIP) and redesignation requests. The Ohio Department of Transportation, the area Metropolitan Planning Organizations (MPOs), and the Local Air Agencies participated in the development of the SIP, the redesignation requests and transportation plans and Transportation Improvement Programs (TIP)s.

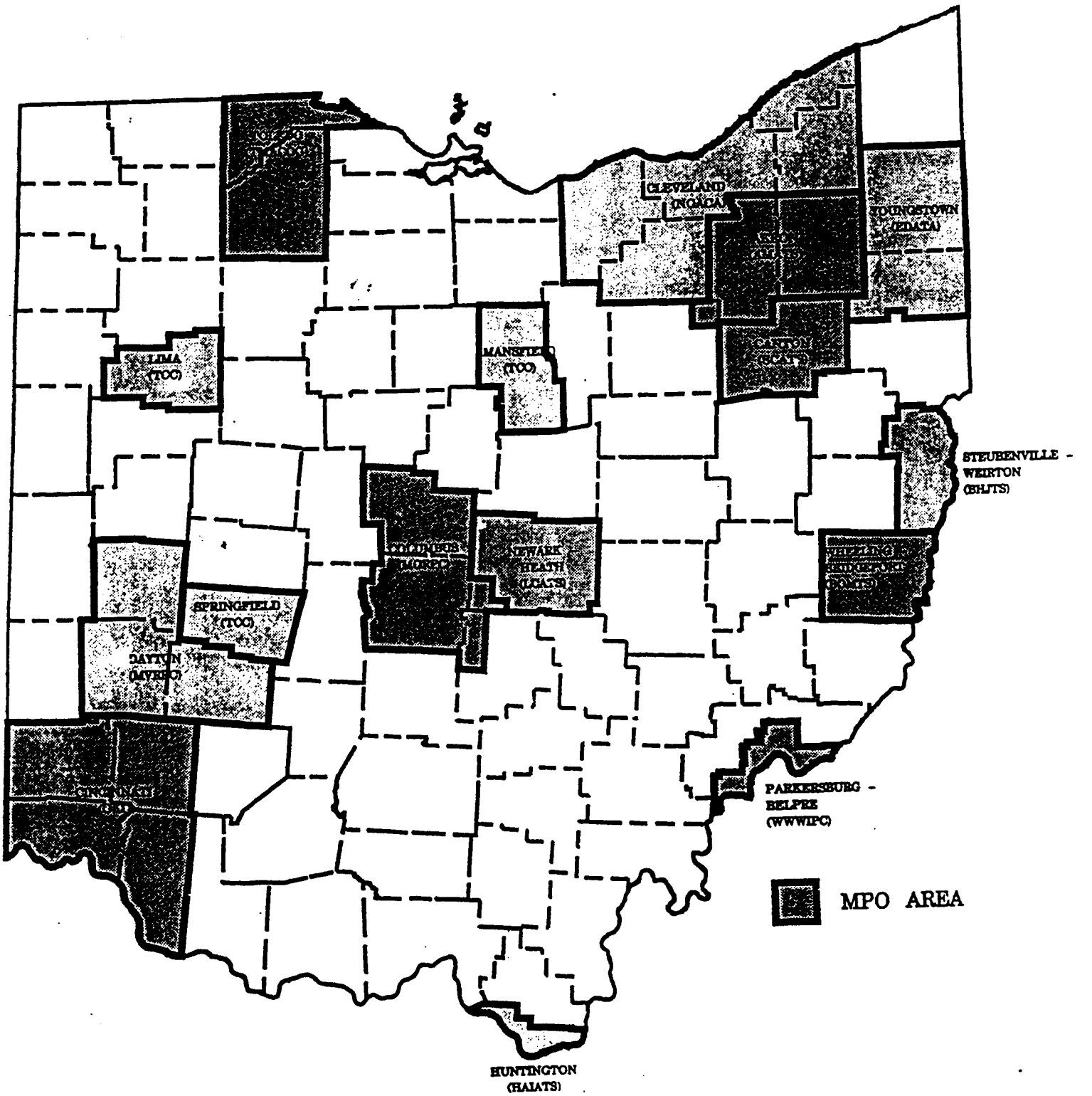
Ohio now contains one moderate ozone nonattainment area and several maintenance areas (See Map 1). Accordingly, the transportation programs for these areas must demonstrate conformity with the SIP. Eleven MPOs are responsible for developing plans and TIPs within these areas (See Map 2). On November 24, 1993, the U. S. Environmental Protection Agency (USEPA) issued the final Air Quality Conformity rule for determining the conformity of transportation plans, programs, and projects. The conformity determinations for Ohio's TIPs are based upon analysis that was conducted consistent with the final Conformity rule procedures. This document summarizes the conformity determination process for the eight county Cleveland/Akron/Lorain ozone maintenance area, which includes the planning areas of the Northeast Ohio Areawide Coordinating Agency (NOACA), the Akron Metropolitan Area Transportation Study (AMATS), and the County of Ashtabula.

1. Maintenance Area Designations

This document describes the process that was employed to conduct the FY 1997 Ohio STIP maintenance area conformity analyses for the CAL area. The conformity analysis procedures varied because of differences in the geographic coverage of the urban transportation travel demand models within the CAL area. The final conformity rule established distinct periods for conformity determinations - interim, transitional and maintenance - periods. Each period has its own requirements. The CAL area is in the maintenance conformity period for the ozone precursor, VOC, based upon the area's May 7, 1996 redesignation to attainment of the NAAQS for ozone. Cuyahoga continues to be a CO maintenance area.

Ohio Non-Attainment Areas

OHIO MPO BOUNDARIES



2. November 15, 1993 Reasonable Further Progress (RFP) and Attainment Demonstration SIP Submittals

The Ohio Environmental Protection Agency has overall responsibility for submittal of an adequate Ohio State Implementation Plan and has the authority to designate an organization of elected officials to prepare the implementation plan for separate portions of the State. During 1991 Ohio EPA signed memorandums of understanding with the Ohio nonattainment area MPOs designating them as "the agency certified by the State to prepare the Implementation Plan required by Section 174 of the Clean Air Act" for their sub-state regions. The MPOs activities related to this designation included coordination of individual plan elements, providing for public involvement, integrating air quality planning into the transportation planning process and preparing mobile source inventories and plan elements relating to control of air pollution emissions related to mobile sources.

The 1990 Clean Air Act Amendments required RFP and attainment demonstration SIP submittals by November 15, 1993. The SIP submittals established 1990 baseline emission inventories for all Ohio nonattainment areas. The mobile source 1990 baseline emissions were developed using county level FHWA Highway Performance Monitoring (HPMS) data for the AMATS planning area and for the County of Ashtabula. For the NOACA planning area, the mobile emission inventory was based upon the outputs from TRANPLAN, the urban transportation planning model used by NOACA. To derive the emission inventories, the HPMS or TRANPLAN data was first stratified by functional classification and average speed. USEPA's Mobile5a_h software was then used to calculate county level emission burdens. Inventories for both Volatile Organic Compounds (VOC) and Nitrous Oxides (NOx) were generated. The 1990 baseline mobile source emission inventories are shown in Table 1.

The November 1993 and March 1994 SIP submittals included 15% plans and attainment demonstrations for the CAL area. The May 7, 1996 redesignation of the CAL replaces the former emission budgets, which were based on EKMA modeling and the inventory process, with the emission budgets defined within the redesignation request. Table 1 shows the 1990 inventories and conformity budgets for the CAL area.

TABLE 1

STATE IMPLEMENTATION PLAN MOBILE SOURCE INVENTORIES AND BUDGETS FOR THE CLEVELAND/AKRON/LORAIN Maintenance AREA

			Transportation Conformity Budgets*			
	UNADJUSTED 1990 BASELINE MOBILE SOURCE INVENTORIES		PROJECTED 1996		MAINTENANCE PLAN 2006	
COUNTY	VOC Tons/Day	NO_x Tons/Day	VOC Tons/Day	NO_x Tons/Day	VOC Tons/Day	NO_x Tons/Day
CUYAHOGA	98.500	69.650	37.200			
GEAUGA	7.200	5.300	2.800			
LAKE	19.100	15.400	7.400			
LORAIN	23.300	17.400	9.100			
MEDINA	13.100	12.900	6.100			
SUBTOTAL	161.200	120.650	62.600	120.650	30.680	50.770
ASHTABULA	11.650	9.600	6.989	9.600	5.180	5.900
PORTAGE	17.590	14.170	7.030			
SUMMIT	57.940	32.180	22.880			
SUBTOTAL	75.530	46.350	29.910	46.350	12.940	18.730
TOTAL	248.380	176.600	99.499	176.600	48.800	75.400

*Source: Ohio EPA.

3. Nonattainment Area Redesignation Plans

A redesignation request was prepared for the CAL area in November 1994. The redesignation request was prepared in a cooperative process led by the Ohio EPA but closely involving the MPOs, the local air agencies and with frequent consultation with the Ohio DOT. Each request includes regional maintenance and contingency plans. USEPA redesignated the CAL area to attainment of the ozone NAAQS in the May 7, 1996 Federal Register (see Attachment C).

4. Transportation Plans Updates and TIP Development

Concurrent with the Statewide agencies' work on SIP issues, the Ohio MPOs continue to respond to the Intermodal Surface Transportation Efficiency Act's (ISTEA) requirement to update urbanized area Transportation Plans and Programs. A key consideration in the transportation planning process used to update these plans and programs was the linkage between air quality and transportation mobile source emissions. The mobile source emission inventories and budgets established through the SIP process served as control totals for plan and program development. Once again, frequent consultation among the MPOs, DOTs (US and Ohio) and the Ohio EPA occurred as the plans and programs were developed.

Nonattainment areas were required to have both a conforming transportation plan and a conforming TIP. During 1994 an MPO and USDOT conformity determination was issued for both the NOACA and AMATS metropolitan area transportation plans and TIPs. The 1994 transportation plans satisfied the ISTEA requirement for metropolitan nonattainment areas to update their transportation plans.

5. TIP Conformity Analysis Procedures

Ohio's State Transportation Improvement Program is a four year annually updated document that lists all Federally funded and regionally significant projects scheduled for implementation through the State. The Program is conducted on the State's July - June Fiscal Year. Consistent with the ISTEA and 1990 Clean Air Act Amendments, air quality issues were an integral component of the STIP/TIP development process in the CAL maintenance area. The TIPs developed by Ohio's MPOs are incorporated directly into the STIP. The narrative below describes the procedures utilized in the conformity analysis for the FY 1997-2000 Ohio STIP.

The following assumptions for conducting the FY 1997-2000 TIP conformity determinations in the CAL area were developed after review of the final conformity regulations, informal discussions with U.S. EPA, Ohio EPA, FHWA Ohio Division and the Ohio MPOs. They are consistent with the procedures used for SFY 1996-1999 TIP development.

- Conduct baseline/action test for HC and NOx in accordance with Section 51.438

- Compare the FY 1997-2000 STIP hydrocarbon and oxides of nitrogen emissions to the applicable emission budgets in the redesignation announcement. As stated in USEPA's July 1, 1994 letter (Attachment A) a regional analysis of CO emissions is not required for the CAL TIP conformity determination.

- Listings of the non-exempt projects included in the baseline and action scenarios are included in the conformity documentation accompanying the Cleveland and Akron TIP submittals. Cleveland's list appears in Appendix 2 of their conformity documentation (See Attacment D) and Akron's is in Appendix 1 of their documentation (See Attachment E).

6. TIP Analysis Years

Based upon the criteria presented in Sections 51.436 and 51.438 of the Final Conformity rule TIP analysis highway networks were developed as follows:

1990 Baseline: This represents the regional highway network that was in place in 1990 and that was used to develop the State Implementation Plan 1990 mobile source inventories.

1997 Baseline: This network is equivalent to the 1990 Baseline Network (transportation system which was open to traffic in 1990) plus completed or programmed, federally funded network changes which will be open to traffic during 1997;

1997 Action: This network is equivalent to the 1997 Baseline plus regionally significant, non-federally funded projects which will be open to traffic in 1997;

2006 Baseline: The 2006 networks are required because analysis years may not be more than ten years apart according to the regulations. This network is equivalent to the 1997 Baseline plus programmed TIP projects which meet one or more of the following criteria:

1) Projects which are currently under construction or are undergoing right-of-way acquisition;
2) Projects which were programmed in the first three years of the SFY 1996 TIP;
3) projects which have completed the NEPA process, and are expected to be open to traffic in 2006;

2006 Action: This network is equivalent to the 2006 Baseline plus 1997 Action projects plus any projects which do not meet the Baseline criteria and are expected to be open to traffic in 2006;

2010 Baseline: This network is equivalent to the 2006 Baseline plus any projects which meet the Baseline criteria but are not expected to be open by the end of 2006; and

2010 Action: This network is equivalent to the 2010 LRTP Minimum Build Highway Network plus other regionally significant, federally or non-federally funded projects with clear funding sources which are expected to be open in 2010. The use of this network accounts for those LRTP projects which are not currently programmed but are expected to be complete by 2010.

7. Latest Planning Assumptions

The FY 1997-2000 STIP conformity analyses readily meet this requirement. The MPO TIPs are developed consistent with the most recent MPO Transportation Plans. The modeling process used to develop each MPO Transportation Plan is calibrated using the latest population and land use data available. Further, USEPA's most recent emissions software, Mobile5a_h, is used for all mobile source emission analyses. The emission inventories and budgets are also from the most recent Ohio SIP submittals, which were also developed using the Mobile5a_h software. All mobile source emission inventories, budgets, and milestone projections were generated using the appropriate Inspection and Maintenance, anti-tampering, and vapor recovery flags in Mobile5a_h.

In response to FHWA comments at a July 15, 1994 meeting on the draft SFY 1995-1998 TIPs, the Vehicle Miles Traveled (VMT) growth projected in Ohio's urban transportation models was compared with the historical HPMS VMT growth. This comparison was suggested in order to provide an additional means of assuring that the models were providing accurate results, thereby meeting the conformity requirements for using the latest planning assumptions.

To initiate this comparison, ODOT reviewed the HPMS data, as submitted to the FHWA, for Ohio's urbanized areas for the years 1980 to 1992. As a first step, data for each functional class of roadway in each urbanized areas was totaled by year. This calculation represents total urbanized area HPMS VMT for each year between 1980 and 1992. A percentage annual change in total HPMS VMT growth was then calculated for each urbanized area. ODOT's intent was to then compare the annual percentage HPMS VMT growth with the annual percentage VMT growth from the urban models. However, there was so much fluctuation in the annual HPMS VMT growth, that ODOT does not have confidence in the HPMS VMT growth trends.

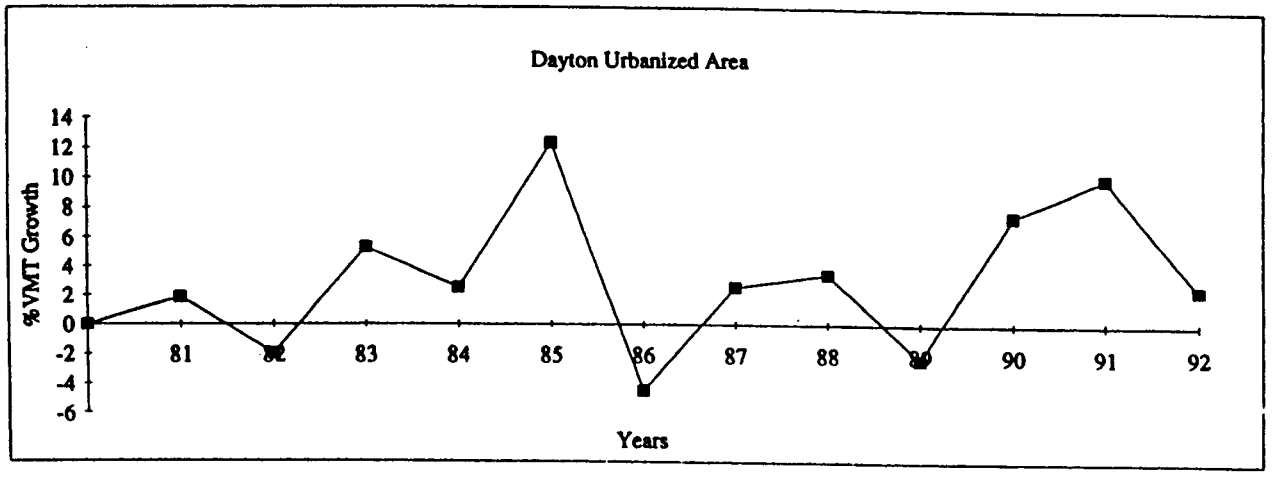
For example, there are numerous years where the HPMS data varies from negative percentage of VMT growth to a growth rate exceeding 10% to 15% in a three year span. Figure 1 charts the HPMS growth rates for the Dayton and Toledo urbanized areas. These areas are representative of the fluctuation in the VMT growth rates that the HPMS data provides. Further, in 1990, significant changes were made to the HPMS data base to correct under reporting from previous years. A one-time adjustment was made to bring the estimates more in line with the FHWA/HPMS theoretical predictions. A new methodology used larger samples that yielded VMT figures which were generally higher than those submitted previously. The ODOT Engineers working with the HPMS data assert that any comparison of the pre-1990 data and the post-1990 data is not valid.

Because of the fluctuation in the HPMS VMT growth, ODOT does not have confidence that a comparison of this data with the urban models' VMT growth is meaningful. The urban transportation models are therefore the best information that ODOT can provide concerning urbanized area VMT growth. As stated above the models are developed and kept current based upon the most recent population and land use data available. They are also validated based upon current traffic counts. ODOT is confident that the urban models accurately project VMT growth in Ohio's urbanized areas.

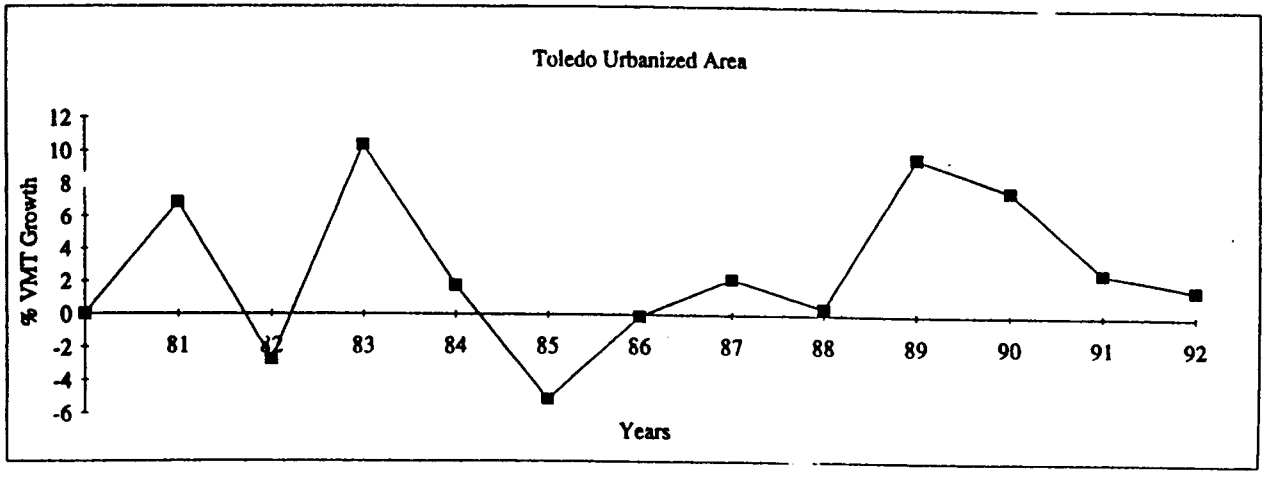
Figure 1

HPMS Annual % of VMT Growth (1980-1992)

	81	82	83	84	85	86	87	88	89	90	91	92
Dayton	1.84	-1.99	5.27	2.51	12.31	-4.48	2.58	3.47	-2.31	7.47	10	2.49



	81	82	83	84	85	86	87	88	89	90	91	92
Toledo	6.86	-2.75	10.36	1.75	-5.16	-0.11	2.17	0.39	9.66	7.68	2.64	1.66



8. Timely Implementation of TCMs

The November 15, 1993 SIP submittal for the CAL area includes Transportation Control Measures (TCMs). The TCMs were identified for the Cleveland metropolitan area portion of the CAL area. Cleveland recommended 10 traffic signalization projects for implementation from 1991 through 1993, 12 traffic signalization projects for implementation between 1994 and 1996, and 10 park and ride lots for construction between 1991 and 1996. The first set of 10 signal projects and 8 of the 10 park and ride lots have been implemented. Table 2 tracks the status of the remaining Cleveland TCMs.

Table 2
Cleveland SIP TCM Status

Location	Project	Implementation Schedule	Status
North Royalton (PID 11841)	signalization	FY 95	
Parma Heights (PID 12789)	signalization	FY 94	
North Olmsted (PID 7561)	signalization	FY 94	Sold. Estimated Completion Date: 11/15/96
Rocky River (PID 8373)	signalization	FY 94	Sold. Estimated Completion Date: 5/29/96
Eastlake (8778)	signalization	FY 94	Complete
Bay Village (11842)	signalization	FY 94	
Willoughby (US20) (PID 10844)	signalization	FY 94	Sold. Estimasted Completion Date: 6/30/96
Lyndhurst/ S. Euclid (Mayfield Rd.) (PID 7778)	signalization	FY 95	Sold. Estimated Completion Date: 5/9/96
Beachwood (Green Rd.) (PID 5525)	signalization	FY 96	Sold. Estimated Completion Date: 10/31/96
Wickliffe (Lakeland Blvd.)	signalization	FY 94	Complete
Mayfield Heights (SOM Center)	signalization	FY 94	Complete
Chagrin Falls (PID 12639)	signalization	FY 95	
Euclid	park-n-ride lot	1996	Open
Westlake	park-n-ride lot	1996	Open

9. Urban Travel Demand Modeling

Ohio's urbanized areas maintain regional travel demand forecasting models for use in their urban transportation planning processes. These models employ a traditional four step modeling process to project existing and future traffic volumes and travel patterns on the regional transportation networks. The four step process consists of trip generation, trip distribution, modal split, and route

assignment. Output from the urban models is link-by-link directional 24 hour traffic volumes for the existing or future regional transportation networks.

Fifteen Ohio urbanized areas have an urban transportation model. The Ohio Department of Transportation (ODOT) holds the models and provides extensive technical support for the AMATS area. ODOT's modeling is run on the main frame PlanPac software. NOACA's models are run on the PC based TranPlan software.

The TIP conformity demonstrations for Ohio's urbanized areas utilize the capabilities of the urban transportation models. These models are uniquely suited to perform the attainment and milestone year Plan and TIP baseline/action scenarios analyses required under the Final Conformity rule. The modeling process identifies growth in vehicle miles of travel and changes in regional travel patterns resulting from the projects that are proposed in the area transportation plans and programs.

To generate pollutant burdens for the AMATS area TIP analysis scenarios, ODOT completes a three phase process. Phase 1 uses program G5AIMPAR, written by ODOT, to create the control records required by U. S. EPA Mobile5a_h to estimate emission factors. The temperature, percent Hot and Cold starts, and the vehicle mix vary for each hour of the day for both hydrocarbons (HC) and carbon monoxide (CO). Emission factors are calculated for each speed measured in miles per hour (MPH). The speeds vary from 5 MPH to 65 MPH for freeways and from 5 MPH to 55 MPH for surface arterials. Parameter records are used to override default values. The values for the Inspection Maintenance program, Anti-Tampering program, Pressure test, the Stage II Vapor Recovery System, and on board VRS were specified by the Ohio EPA.

The G5AIMPAR.MSG listing shows:

a) The control records for program G5AIMPAR
b) The flag summary for the hourly ambient HC, the hourly ambient CO and the 24 hour HC required for evaporative and refueling emission factors
c) The hours requested
d) Inspection and Maintenance program summary
e) Anti-Tampering program summary
f) Pressure Test program summary
g) Stage II Vapor Recovery System program summary
h) On board Vapor Recovery System summary
i) The hourly temperatures (s for HC and w for CO), percent Cold and Hot starts and the vehicle mixes for freeways and surface arterials

   The percent Cold and Hot starts were developed using "Determination of Percentages of Vehicles Operating In the Cold Start Mode, EPA-450/3-77-023, Office of Air and Waste Management, Office of Air Quality Planning Standards, Research Triangle Park, North Carolina 27711". The vehicle mixes were developed using Ohio observed data obtained by the Bureau of Technical Services.
j) Summary of the first scenario record for HC for freeway
k) Summary of the first local area parameter record for HC for freeway

Phase 2 uses USEPA Mobile5a_h to generate 13, 444 emission factors based on input created by program G5AIMPAR. Output routines were added to Mobile5a_h to write the emission factors in an array format.

Phase 3 uses program CMAQ5ANO, written by ODOT, to relate the Mobile5a_h emission factors with the urban models' 24 hour link data files to generate hourly pollutant burdens for hydrocarbons (HC), oxides of nitrogen (NOx), and carbon monoxide (CO).

Program CMAQ5ANO reads 1) the transportation links containing the weighted 24 hour volumes 2) the node grid coordinates and 3) the emission factors from program Mobile5a_h and then lists 1) the credits 2) the program control records 3) the table summaries used by the program 4) the number of centroids 5) the option values used 6) the hours requested 7) the seasonal factors for both HC, NO_X and CO. The hourly volumes are multiplied by the corresponding seasonal factor.

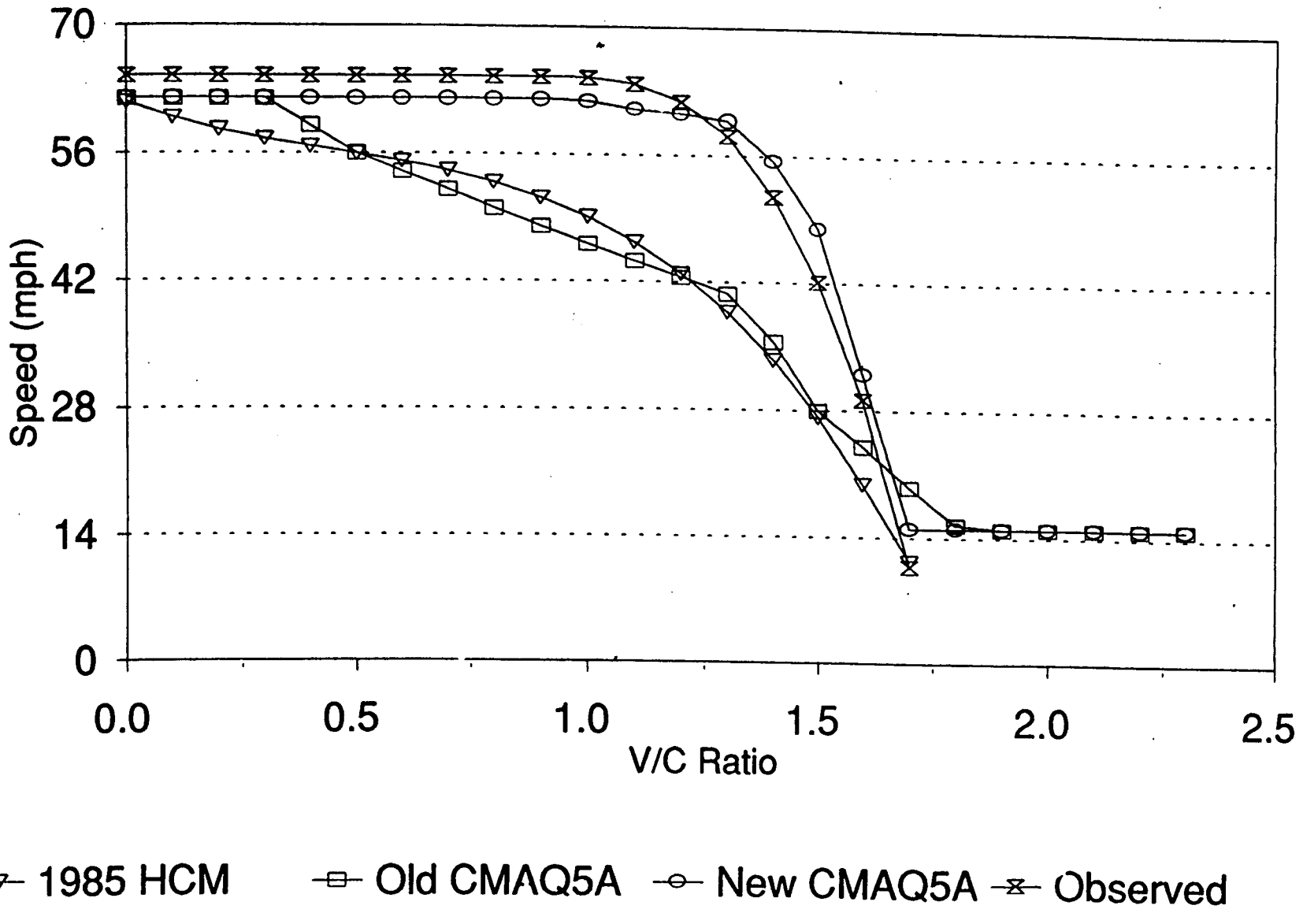
After the seasonal factors, listed is the interzonal vehicle miles of travel (VMT). The VMT is calculated by assuming that the zonal area in square miles is represented as a circle. The radius is computed and the intrazonal trips are multiplied by the radius to compute the intrazonal VMT. The directional hourly speeds are estimated by applying the percent Average Daily Traffic (ADT), percent Direction, percent heavy duty trucks adjusted by 1.7 to represent auto equivalents. The auto equivalent is divided by the directional capacity and the resulting volume to capacity ratio (V/C) is used in a lookup table to determine the directional speed. The hour, functional classification and directional speed are used to derive the directional emission factor using USEPA Mobile5a_h array file. If required, emission factors are interpolated. The above process is done hourly by direction on each link in the network. After processing all hours, CMAQ5ANO lists the 1) hourly vehicle miles of travel and pollutant burdens for freeways and surface arterials 2) the total vehicle miles and pollutant burden for evaporative and refueling HC and 3) the total HC pollutant burden. All items listed above are summarized for the Baseline and the Action runs.

The speed-flow model used in the CMAQ5ANO (hereinafter referred to as CMAQ5A) program was evaluated against the 1985 Highway Capacity Manual (HCM) equations. A basic freeway segment analysis was performed along with each of the three arterial types as defined by the HCM. For each illustration the HCM and other data were converted using Level of Service 'C' being equal to a volume-to-capacity ratio of 1.0, as this is the capacity used by the CMAQ5A model.

A linear regression model was used to plot the HCM freeway data for volume-to-capacity ratio versus speed. Four plots are illustrated in Figure 2. The previous version of CMAQ5A, represented by the □ marker, correlated closely with the 1985 HCM (∇). The newer version of CMAQ5A (○) uses the proposed 1994 HCM basic freeway segment curve. Data collected as a part of a travel time study in the Columbus area was used to evaluate the new CMAQ5A data. This data, referred to as "observed" (⧗) data, was extracted from the urban freeway segments of the study. The raw data showed no statistical correlation in terms of regression. Therefore selected speed-flow data points were used for linear regression resulting in the curve as shown in Figure 2. This data lends some significance to the new CMAQ5A freeway speed-flow relationships.

The arterial speed-flow relationships use the 1985 HCM arterial Class definitions by design category (3) and functional category (2). The CMAQ5A surface arterials are defined by area type (CBD,

Figure 2


Freeway Segment Speed-Flow
(v/c of 1.0 = LOS 'C')
Speed (mph)
70
56
42
28
14
0
0.0
0.5
1.0
1.5
2.0
2.5
V/C Ratio
1985 HCM
Old CMAQ5A
New CMAQ5A
Observed

central city, and suburb). The speed-flow data from CMAQ5A for suburbs was compared to HCM Class I; central city compared to Class II, and CBD compared to Class III. Figure 3 shows the relationship between arterial type (Class) I for CMAQ5A and the 1985 HCM. The curves are very similar. Figure 4 depicts arterial type II data with characteristics similar to the type I CMAQ5A/HCM relationship. The type III graph of Figure 5 is a departure from the close association of data points of the previous types. A relatively simple test was done to demonstrate the effects of each speed-flow curve on emission factors. Using a v/c ratio of 1.3 to represent a "base network" and 1.0 as a "build network", HC exhaust emission factors were determined based on the relative speed at each v/c.. The HCM curve resulted in a 20% decrease in HC exhaust emissions while the CMAQ5A curve showed a 9% decrease. Therefore the CMAQ5A curve could be considered to be the more conservative equation when used in conformity analysis. A determination as to why the curves are significantly different, as compared to the other arterial type comparisons, was not made.

The preceding discussion covers the procedures that ODOT uses for the AMATS area. Additional documentation for the AMATS area conformity determination appears in Attachment E. NOACA uses its own modeling processes. Details related to NOACA's methodology are documented in Attachment D. NOACA performed the TIP conformity analyses using its TRANPLAN urban transportation model. NOACA and ODOT staffs' closely coordinated the respective conformity processes to ensure that the assumptions and applicable Mobile5a_h flags were consistent in all TIP conformity analyses.

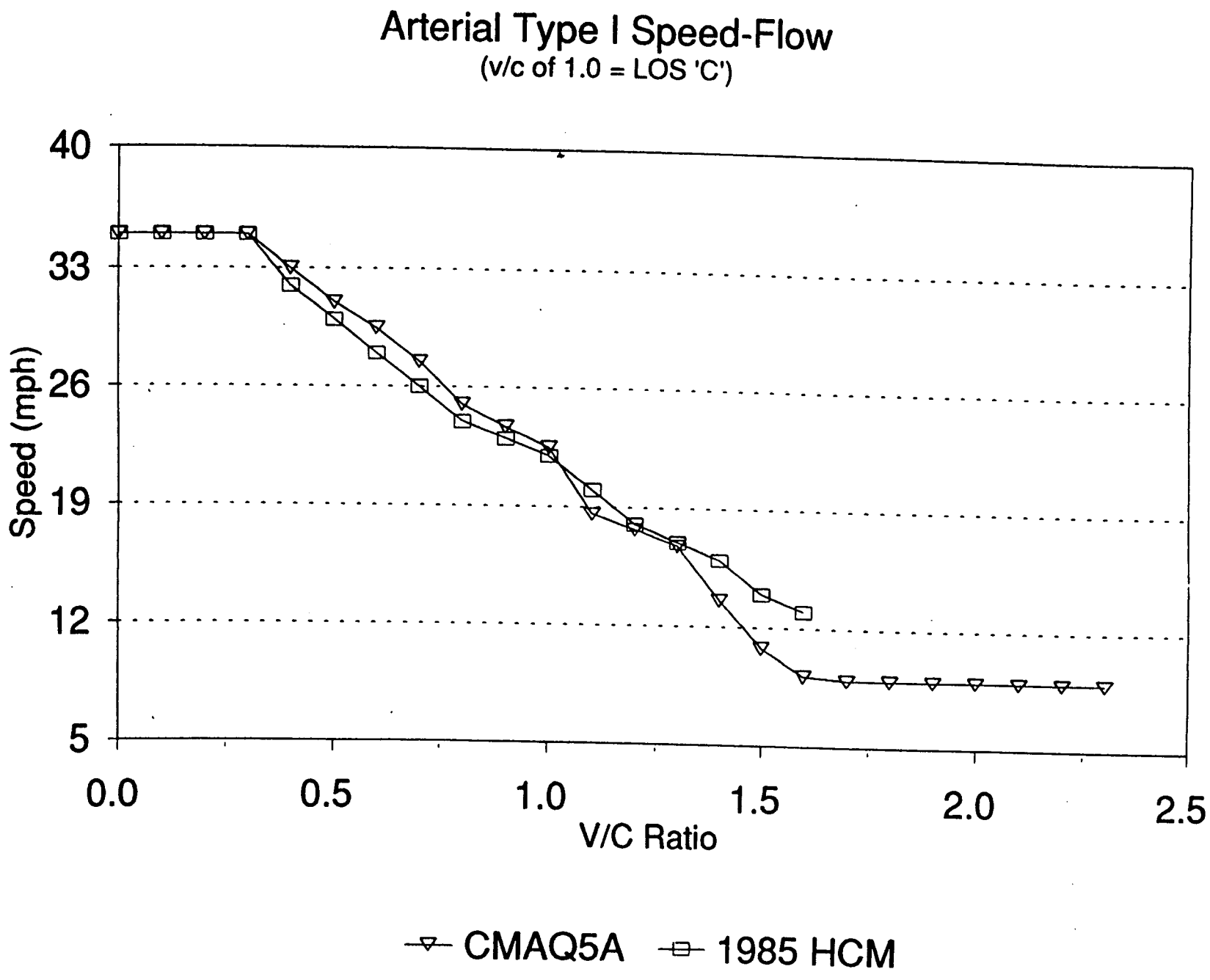
10. Area Geography not Covered by an Urban Model

A limitation of the urban models is that they do not always cover the entire metropolitan area boundary. For the non-modeled portions of the areas, conformity analyses are performed based on a process using the HPMS vehicle miles of travel (VMT) estimates. The base year 1990 VMT estimates are taken directly from the HPMS information that was used to develop the Ohio SIP. Attainment and milestone year VMT rates, for the conformity analysis, are derived by applying a growth factor by functional classification to the base year VMT estimates.

The HPMS VMT estimates are generated on a countywide basis by functional classification. The Mobile5a_h emission factors for future years for each functional classification use the same input parameters that were used for the State Implementation Program (SIP) such as vehicle speed, vehicle mix, percentage of hot and cold starts, etc. The pollutant burden by functional classification are summed and the total pollutant burden is used as a base condition for the future year. The HPMS based data is factored to proportionally reflect the area geography not included in an urban model.

Baseline and action pollutant burdens are generated for proposed projects. The difference in the pollutant burdens from the baseline and action is added to the future base condition to evaluate the impacts associated with new projects.

Figure 3


Arterial Type I Speed-Flow
(v/c of 1.0 = LOS 'C')
Speed (mph)
40
33
26
19
12
5
0.0
0.5
1.0
1.5
2.0
2.5
V/C Ratio
CMAQ5A
1985 HCM

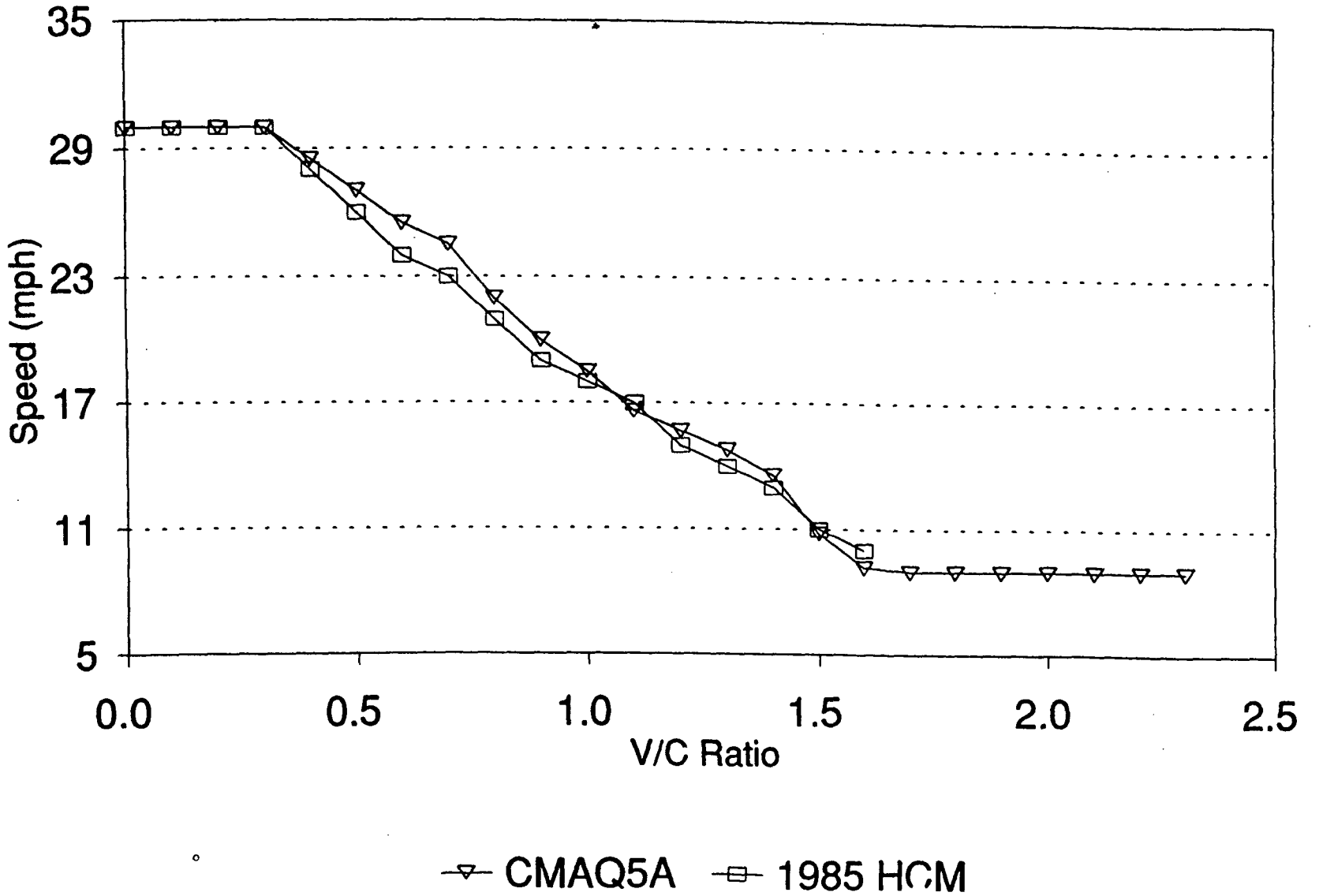
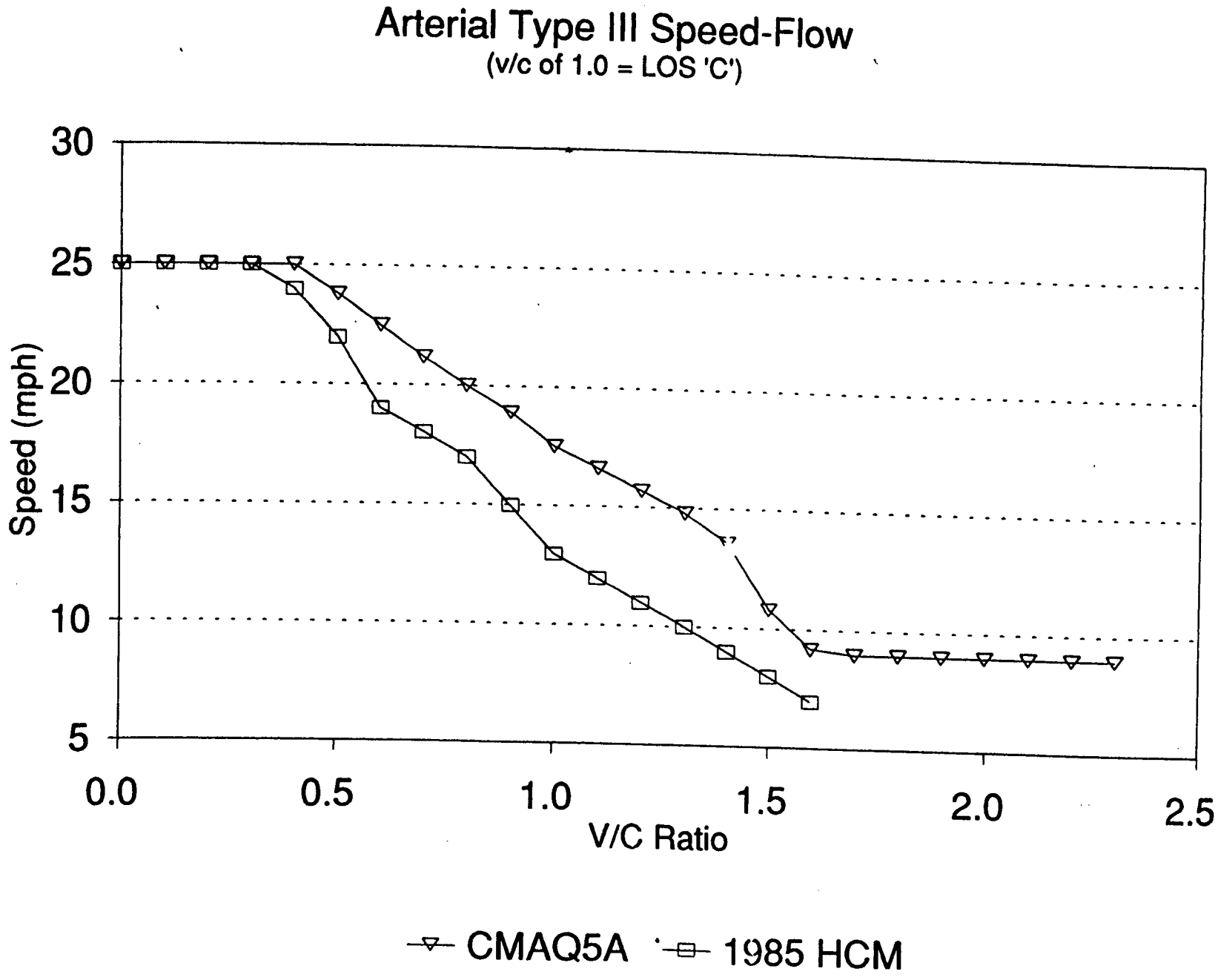

Arterial Type II Speed-Flow
(v/c of 1.0 = LOS 'C')
Speed (mph)
35
29
23
17
11
5
0.0
0.5
1.0
1.5
2.0
2.5
V/C Ratio
CMAQ5A
1985 HCM

Figure 5


Arterial Type III Speed-Flow
(v/c of 1.0 = LOS 'C')
Speed (mph)
30
25
20
15
10
5
0.0
0.5
1.0
1.5
2.0
2.5
V/C Ratio
CMAQ5A
1985 HCM

11. Off Model Emission Reduction Credits

Specific transportation improvements that are included in the area Transportation Plans and funded through the TIPs generate significant emission reductions, however these reductions are not reflected in either the urban modeling process or the non-model HPMS procedures. Ohio identifies this type of emission reduction as "off model" credits.

Off model credits are an important component of the Ohio area conformity determinations. Emission reductions resulting from Congestion Mitigation and Air Quality (CMAQ) projects are not accounted for in the urban modeling process. However, certain CMAQ projects will result in significant emission reductions that need to be accounted for in the conformity process. Several Ohio metropolitan transit agencies are beginning to convert their vehicle fleets to run on Compressed Natural Gas (CNG). The switch from diesel fueled vehicles to CNG results in reductions of regional NOx emissions. A methodology to determine CNG emission credits has been developed by the Northeast Ohio Areawide Coordinating Agency (NOACA). In a May 19, 1994 letter, USEPA Region 5 has approved NOACA's methodology. A copy of this methodology is included in NOACA's conformity analysis documentation (See Attachment D). This methodology was used in the conformity determination for the CAL area.

Other projects such as park and ride lots, and traffic flow operational improvements are also generating emission reductions that have been incorporated into TIP conformity analyses.

12. TIP Conformity Analysis Geographic Coverage Issues

As previously mentioned, the CAL area is comprised of the planning areas of two MPOs and one independent county. NOACA and AMATS perform independent conformity analyses for their respective portions of the area. ODOT conducts the conformity analysis for the County of Ashtabula. The results of these analyses are then combined, through this document to make conformity attainment and milestone year emission budget tests. This results in a single conformity determination for the area.

Conformity determinations for the CAL area use a combination of the urban model, the non-model, and the off model analysis procedures to determine the emission burdens for the entire area. The AMATS model coverage for the Akron area corresponds with the area boundaries. AMATS, therefore, does not use the non-model analysis procedures. The NOACA model coverage for the Cleveland area does not cover the entire area, so the non-model procedures must be employed. In the NOACA area, the county level HPMS emissions burden is factored to represent the proportion of the county that is not covered by the model. The emissions burden generated from the modeled portion of the area is then factored to reconcile the model results with the HPMS data from which the inventories were developed. This process is described in the next section. Finally, the model, non-model, and off model credits results are combined to incorporate all relevant factors into the area's conformity analysis.

13. Factoring Process to Normalize HPMS and Model Results

Section 51.440 of the final Conformity rule requires development of a factor "to reconcile and calibrate the network-based model estimates of vehicle miles traveled in the base year of its validation to the HPMS estimates for the same period."

Although Sec. 51.452 refers to calibrating VMT, it specifies that this is a requirement for serious and above areas after Jan. 1, 1995. Although no Ohio areas meet this requirement, Ohio decided that reconciling the HPMS generated data and the model generated data was merited. ODOT, OEPA, and the MPOs discussed whether the calibration should be based upon differences in emissions or on differences in VMT. The group decided that the emissions were the pertinent factor and therefore used the emissions difference for the calibration.

Ohio's factoring process compares the SIP 1990 baseline emission inventories from the SIP with the 1990 baseline emissions from the urban model. A simple ratio calculating the percentage difference between the 1990 HPMS-generated emissions and the model emissions establishes the calibration factor. This factor is then applied to the Plan and TIP analysis scenarios to compare those emissions to the emissions in the redesignation plans, 15% plans or Attainment demonstrations. These are shown for the AMATS area in Table 5.

This process is used for the area geography covered by an urban model. For geography not covered by an urban model, the HPMS data is used to directly calculate emissions.

Table 5

1990 HPMS

1990 Model = Calibration Factor

MPO	HC 1990 HPMS (tons/day)	HC 1990 Model (tons/day)	HC Calibration Factor
Akron	75.53	68.442	1.104

MPO	NOx 1990 HPMS (tons/day)	NOx 1990 Model (tons/day)	NOx Calibration Factor
Akron	46.35	59.832	.775

Calibration was not necessary for the NOACA area. The mobile source SIP inventories for this MPO area were developed based upon the MPO's model outputs rather than with HPMS data. The MPO conformity analyses are also performed using the MPO's models.

14. Non-Federal Projects

The Ohio area TIPs contain several nonexempt, regionally significant projects that are not Federally funded. Two of these projects are reflected in the Akron TIP. The air quality impacts of these projects (VMT, traffic redistribution, emissions) are also included in the Akron conformity analysis. The projects are a new interchange on the Ohio Turnpike (I80) at SR44 and a privately funded interchange on SR21 in Norton, Ohio. The NOACA TIP conformity analysis reflects the construction of two new interchanges and lane construction on the Ohio Turnpike and several other local or state funded road projects which are listed in the NOACA SFY 1997-2000 TIP document.

Cleveland/Akron/Lorain Area
Conformity Demonstration

As shown in Map 1, this area includes eight counties in northeast Ohio, Ashtabula, Cuyahoga, Geauga, Lake, Lorain, Medina, Portage, and Summit Counties. Two MPOs serve seven of these counties. The Northeast Ohio Areawide Coordinating Agency (NOACA) is the MPO for Lorain, Cuyahoga, Lake, Geauga and Medina counties. The Akron Metropolitan Area Transportation Study (AMATS) is the MPO for Summit and Portage Counties and Chippewa Township in Wayne County. Wayne County is an attainment area and is therefore, not included in AMATS' conformity process. Ashtabula is a rural county on the extreme northeast border of the non-attainment area. At the request of Ashtabula County, in August and September 1993, the County, the two MPOs, OEPA, and ODOT executed a memorandum of agreement exempting Ashtabula County from the Federal 3-C urban transportation planning process and specified a process for conducting the conformity analyses. The MPOs conducts the conformity analyses for their respective areas, while ODOT conducts the analysis for Ashtabula County (see Attachment F).

In their respective FY 1997-2000 TIP conformity analyses, NOACA and AMATS demonstrate that their emissions conform to the budgets for their areas. In this document, NOACA and AMATS conformity demonstrations are combined with the Ashtabula County emissions to demonstrate conformity for the entire area. The Ashtabula County emissions are included in the budget comparison. Ashtabula's emissions are added to the overall area mobile emissions burden.

Areas are required to have both a conforming Plan and TIP. This document describes the SFY 1997-2000 TIP conformity process for the CAL area. The Transportation Plan conformity analyses for the Cleveland and Akron Metropolitan Planning Organizations were submitted to the Federal Agencies in June, 1994 and were subsequently approved. Ashtabula County does not have a metropolitan area Transportation Plan due to its exemption from the urban transportation planning process requirements.

To ensure coordination within the area, the two MPOs, ODOT, Ohio EPA and FHWA met at NOACA on April 15, 1994 during the preparation of the SFY 1995-1998 TIPs to discuss the planning methodologies utilized for these three sub-regions of the area. The meeting concluded with the determination that the methodologies for the sub-areas are compatible and will allow for a conformity determination to be made for the entire area. The methodologies used for SFY 1997-2000 TIP conformity analyses are consistent with these previously agreed upon methodologies.

NOACA conducted its analysis using its TRANPLAN urban planning model. AMATS conducted its demonstration using the PLANPAC urban model held by ODOT. The results of the AMATS PLANPAC forecast were then normalized using the HPMS calibration factors discussed in Section 13. In addition, ODOT conducted the analysis for Ashtabula County, based upon the HPMS non-model procedures.

As required in the conformity regulations, emissions from the implementation of transportations plans in the CAL are compared to the emission budgets designated in the redesignation

announcement. A Baseline/Action analysis was completed prior to the redesignation and its results are included here for informational purposes. The milestone years for the MPOs in the CAL area were 1997, 2006, and 2010, the final year of the TIP and Plan.

Emission reductions resulting from "off model" sources are an important component in the Cleveland/Akron conformity demonstration. Once again, NO_X reductions from CNG bus replacements play an important role in the NO_X conformity demonstration. Both NOACA and AMATS have CNG conversion programs scheduled for implementation in their TIPs. For the first time, NOACA is reporting the HC and NO_X emission reductions generated by signalization projects.

For every milestone year, the area transportation emissions generated by the action scenarios are less than their respective emission budgets. Table 15 illustrates the comparison of the TIP action scenarios to the emission budgets. Additionally, for every milestone year, the area emissions resulting from the TIP action scenarios are less than than the emissions resulting from the baseline scenarios. Table 16 illustrates the TIP baseline scenario vs. action scenario results.

Final Conformity Determination

Based on the above descriptions, conformity for the combined Cleveland/Akron/Lorain area's SFY 1997-2000 transportation programs and the Ohio State Implementation Plan has been determined. As described in this document, the conformity determination analyses were conducted consistent with the *Criteria and Procedures for Determining Conformity to State or Federal Implementation Plans of Transportation Plans, Programs and Projects Funded or Approved Under Title 23 U.S.C. or the Federal Transit Act*, 40 CFR Parts 51 and 93, issued November 24, 1993.

Table 10: Cleveland/Akron/Lorain TIP Budget Comparison

	NOACA (tons/day)		AMATS (tons/day)		Ashtabula[1] (tons/day)		Total (tons/day)		VMT (thousands)
	HC	NOx	HC	NOx	HC	NOx	HC	NOx	
1990 Baseline	161.20	120.65	75.53	46.35	11.65	9.60	248.38	176.60	62692.50
1996 Budget	62.60	120.65	29.91	46.35	6.99	9.61	99.50	176.61	65,466.45
1997 TIP Action	52.94	76.12	27.96	31.76	6.85	7.84	87.75	115.72	65406.69
2006 Budget[2]	30.68	50.77	12.94	18.73	5.18	5.90	48.80	75.40	
2006 TIP Action	24.30	48.89	14.75	19.45	5.99	6.59	45.04	74.92	69585.14
2010 TIP Action	20.77	45.07	12.75	17.97	5.91	6.57	39.43	69.61	71439.73

1. Ashtabula has been exempted from the metropolitan planning process and therefore does not have a Plan or a separate TIP. However, the mobile inventory, including VMT growth, is shown for Ashtabula.

2. These are the current budgets for the area as defined in the May 7, 1996 redesignation announcement.

Table 11: Cleveland/Akron TIP Action/Baseline Comparison

	NOACA (tons/day)		AMATS (tons/day)		Ashtabula (tons/day)		Total (tons/day)	
	HC	NOx	HC	NOx	HC	NOx	HC	NOx
1997 TIP Action	52.94	76.12	27.96	31.76	6.85	7.84	87.75	115.72
1997 TIP Baseline	54.32	76.25	28.02	31.93	6.85	7.84	89.19	116.02
2006 TIP Action	24.30	48.89	14.75	19.45	5.99	6.59	45.04	74.92
2006 TIP Baseline	29.83	49.06	14.86	19.67	5.99	6.59	50.68	75.32
2010 TIP Action	20.77	45.07	12.75	17.97	5.91	6.57	39.43	69.61
2010 TIP Baseline	26.40	45.19	12.94	18.52	5.91	6.57	45.25	70.28

LIST OF ATTACHMENTS

ATTACHMENT A

United States Environmental Protection Agency and Ohio Department of Transportation
SFY 1997 Transportation Conformity Determination Correspondence

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

RECEIVED
MAR 01 1996
BUREAU OF PLANNING

REPLY TO THE ATTENTION OF
(AR-18J)

FEB 26 1996

Gordon Proctor, Deputy Director
Division of Multi-modal Planning
Ohio Department of Transportation
25 South Front Street
Columbus, Ohio 43215

Dear Mr. Proctor:

This letter addresses two topics: (1) the effect on conformity requirements of the 1995 particulate matter (PM) exceedances in Cuyahoga County, and (2) the interpretation of 40 CFR 51.438(b) for this year's conformity analyses.

In response to a concern regarding 1995 PM exceedances in Cuyahoga County and the possibility of requiring PM conformity analyses, the following course of action has been decided: Cleveland's 1997-2000 TIP Air Quality Conformity will not need to include PM modeling analyses.

The Ohio Environmental Protection Agency (OEPA) is currently preparing a submittal to the United States Environmental Protection Agency Region 5 that supports the fact that the PM exceedances in 1995 were due to fugitive dust sources, not to mobile source exhaust emissions. We understand that microscopic analysis performed on the respective monitor filters shows fugitive soil and roadway dust as the cause of the exceedances. A final decision on future PM conformity requirements will be made by our office after review of OEPA's submittal.

For the purposes of 40 CFR 51.438(b), the first analysis year may be assumed to be 1997 for ozone areas, since the analysis year of 1996 has passed.

If you have any questions regarding these matters please contact Patricia Morris, of my staff, at (312) 353-8656.

Sincerely yours,

Jay Bortzer, Chief
Regulation Development Section

Post-it™ brand fax transmittal memo 7671	# of pages ▸ 2
To Bill Davis	From Matt S.
Co. NOACA	Co. ODOT
Dept.	Phone #
Fax # (216) 621-3024	Fax #

cc: Herman Rodrigo
Federal Highway Administration Ohio Division

Chuck Gebhardt, Technical Services
Ohio Department of Transportation

Che Brewer-Coon and Harry Judson
Ohio Environmental Protection Agency

Inter-Office Communication

To: *See Below

From: Gordon D. Proctor, Deputy Director, Division of Multi-modal Planning

Date: January 24, 1996 Gordon D Proctor

Subject: FY 1997-2000 STIP/TIP Air Quality Conformity Process

Post-it™ brand fax transmittal memo 7671	# of pages > 9
To Bill Davis	From CHUK TAYLOR
Co. NOACA	Co. ODOT 12
Dept. ENVIRO.	Phone # 581-2100
Fax # 621-3024	Fax #

In nonattainment and maintenance areas development of the FY 1997-2000 STIP/TIPs must include an air quality conformity demonstration. The narrative below addresses a number of issues concerning this year's conformity process.

The requirements for demonstrating conformity differ depending on the air quality status of the respective nonattainment or maintenance area. The attached pages identify the tests and networks needed for conducting the tests, for each Ohio nonattainment or maintenance area. Also attached is a table, prepared by the OEPA, identifying the State Implementation Plan (SIP) emission budgets that will be used for the budget tests.

The conformity analysis networks must include all regionally significant projects, regardless of funding source. For this year's STIP/TIP, this will include the Turnpike lane addition projects in the Toledo, Cleveland, Akron, and Youngstown areas. The TIP out year analysis network must also include all regionally significant projects from the Long Range Plan. In other words, the TIP out year network and the LRP out year network must be exactly the same.

Because of delays in selecting the State's major new projects and in identifying the MPO attributable funding marks, development of the MPO conformity analysis networks has been delayed. The major new selections are scheduled for February 16, 1996. The MPO attributable funding marks will be issued shortly. MPOs are encouraged to submit their conformity analysis networks, to the Office of Technical Services, as soon as possible following this information becoming available.

As a final item, Ashtabula, Clinton, Columbiana, and Preble counties are subject to the

air quality conformity requirements. If the FY 1997-2000 STIP includes any capacity addition projects in these counties, an air quality conformity analysis will need to be conducted. Districts can contact Office of Planning staff to coordinate the conformity analysis procedures.

Please forward this information to the nonattainment or maintenance area MPOs in your District. Questions concerning this material may be directed to the Office of Planning Metro staff.

GDP
LFS:DAM:dm

all with attachment

c: Rodrigo - Judson - P. Moore - McQuirt - Ligibel - Hunt - Schafer - Charles - Longberry - Gephart - Morris - Monaco - Taylor - Rushley - Selhorst - Moore - File (All Studies - 602) - Reading File

FY 1997-2000 TIP networks and analyses

Canton(marginal)

requirements
- §51.438

networks
- FY 1997 Build/No Build
- FY 2005 Build/No Build
- FY 2010 Build/No Build

conformity tests
- FY 1997 Build/No Build for HC(§51.438)
- FY 2005 Build/No Build for HC(§51.438)
- FY 2010 Build/No Build for HC(§51.438)
- Less than 1990 inventory budget test for HC(§51.438)

explanations
- NOx waiver (only applies to the less than 1990 test and the build/no build tests)
- No other budget tests are required until the area is redesignated (July 1, 1994 USEPA letter)
- §51.464 (a) as referenced from §51.430(a) states that marginal areas are not required to demonstrate attainment

Redesignation of the area may occur before the July 1, 1996 TIP approval. If this occurs, the area will no longer have the §51.438 requirements of a build/no build test. The area will have to meet the §51.430 requirements of a redesignation budget test. Therefore, ODOT suggests that the area shows its 2005 redesignation budgets for HC and NOx for illustrative purposes.

Cincinnati(moderate)

requirements
- §51.438
- §51.430

networks
- FY 1997 Build/No Build
- FY 2005 Build/No Build
- FY 2010 Build/No Build

conformity tests
- FY 1997 Build/No Build for HC and NOx(§51.438)
- FY 2005 Build/No Build for HC and NOx(§51.438)
- FY 2010 Build/No Build for HC and NOx(§51.438)
- Less than 1990 inventory budget test for HC and NOx(§51.438)
- Budget Test with the 1996 budgets in the 15% plan for analysis years beyond 1996 for HC and NOx(§51.430) (1990 inventory number is the budget for NOx)

explanations

There is no requirement to conform to any budget year beyond 1996 because the 15% plans only contained 1996 numbers. The 2005 budget does not have to be used until the maintenance plan is approved. (May 12, 1995 USEPA letter) (Redesignation has been suspended due to air quality violation)
No NOx waiver

Cleveland/Akron(moderate)

requirements

§51.438
§51.430

networks

FY 1997 Build/No Build
FY 2006 Build/No Build
FY 2010 Build/No Build

conformity tests

FY 1997 Build/No Build for HC and NOx(§51.438)
FY 2006 Build/No Build for HC and NOx(§51.438)
FY 2010 Build/No Build for HC and NOx(§51.438)
Less than 1990 inventory budget test for HC and NOx(§51.438)
Budget Test with the 1996 budgets in the 15% plan for analysis years beyond 1996 for HC and NOx(§51.430) (1990 inventory number is the budget for NOx, June 6, 1995 USEPA letter)

explanations

There is no requirement to conform to any budget year beyond 1996 because the 15% plans only contained 1996 numbers. The 2006 budget does not have to be used until the maintenance plan is approved. (May 12, 1995 USEPA letter)
No NOx waiver

Redesignation of the area may occur before the July 1, 1996 TIP approval. If this occurs, the area will no longer have the §51.438 requirements of a build/no build test. The area will have to meet the §51.430 requirements of a redesignation budget test. Therefore, ODOT suggests that the area shows its 2006 redesignation budgets for HC and NOx for illustrative purposes.

Columbus/Newark(marginal)

requirements

§51.438

networks

FY 1997 Build/No Build
FY 2005 Build/No Build
FY 2010 Build/No Build

conformity tests
FY 1997 Build/No Build for HC(§51.438)
FY 2005 Build/No Build for HC(§51.438)
FY 2010 Build/No Build for HC(§51.438)
Less than 1990 inventory budget test for HC(§51.438)

explanations
NOx waiver (only applies to the less than 1990 test and the build/no build tests)
No other budget tests are required until the area is redesignated (July 1, 1994 USEPA letter)
§51.464 (a) as referenced from §51.430(a) states that marginal areas are not required to demonstrate attainment

Redesignation of the area may occur before the July 1, 1996 TIP approval. If this occurs, the area will no longer have the §51.438 requirements of a build/no build test. The area will have to meet the §51.430 requirements of a redesignation budget test. Therefore, ODOT suggests that the area shows its 2005 redesignation budgets for HC and NOx for illustrative purposes.

Dayton(maintenance)

requirements
§51.430

networks
FY 2005 Build
FY 2015 Build

conformity tests
Budget Test with the 2005 budget in the maintenance plan for analysis years 2005 and beyond for HC and NOx(§51.430) (NOx waiver no longer applies to the redesignation budget test)

Springfield(maintenance)

requirements
§51.430

networks
FY 2005 Build
FY 2015 Build

conformity tests
Budget Test with the 2005 budget in the maintenance plan for analysis years 2005 and beyond for HC and NOx(§51.430) (NOx waiver no longer applies to the redesignation budget test)

Steubenville(maintenance)

requirements
§51.430

networks
FY 2005 Build
FY 2015 Build

conformity tests
Budget Test with the 2005 budget in the maintenance plan for analysis years 2005 and beyond for HC and NOx(§51.430) (NOx waiver no longer applies to the redesignation budget test)

Toledo(maintenance)

requirements
§51.430

networks
FY 2005 Build
FY 2010 Build

conformity tests
Budget Test with the 2005 budget in the maintenance plan for analysis years 2005 and beyond for HC and NOx(§51.430) (NOx waiver no longer applies to the redesignation budget test)

Youngstown(marginal)

requirements
§51.438

networks
FY 1997 Build/No Build
FY 2005 Build/No Build

conformity tests
FY 1997 Build/No Build for HC(§51.438)
FY 2005 Build/No Build for HC(§51.438)
Less than 1990 inventory budget test for HC(§51.438)

explanations
NOx waiver (only applies to the less than 1990 test and the build/no build tests)
No other budget tests are required until the area is redesignated (July 1, 1994 USEPA letter)
§51.464 (a) as referenced from §51.430(a) states that marginal areas are not required to

demonstrate attainment

Redesignation of the area may occur before the July 1, 1996 TIP approval. If this occurs, the area will no longer have the §51.438 requirements of a build/no build test. The area will have to meet the §51.430 requirements of a redesignation budget test. Therefore, ODOT suggests that the area shows its 2005 redesignation budgets for HC and NOx for illustrative purposes.

Ohio Emission Budgets in Tons Per Day

Nonattainment Area		1990 Baseline VOC	1990 Baseline NOx	Conformity Budget 2005/6 VOC	Conformity Budget 2005/6 NOx	Remaining Margins
Cincinnati	Point	70.43	280.67	80.86	339.92	
REDES #s	Area	101.85	36.74	101.71	39.63	
(AA)	Mobile	125.84	130.68	36.78	65.48	
SEE (JJ)	Total	298.12	448.09	248.05	379.55	
(No safety margin used yet.)						VOC Margin 50.07
						NOx Margin 68.54
Clinton	Point	0.00	0.00	0.00	0.00	
(BB)	Area	11.30	1.62	11.45	1.66	
	Mobile	5.04	4.80	2.04	2.73	
	Total	16.34	6.42	13.49	4.39	
(No safety margin used yet.)						VOC Margin 2.85
						NOx Margin 2.03
Clev/Ak/Ash	Point	82.22	245.59	88.63	298.00	
Clev/Ak/Ash	Area	201.05	80.46	200.86	80.18	
Cleveland	Mobile	161.20	120.62	30.68	50.77	
Akron	Mobile	75.52	46.35	12.94	18.73	
Ashtabula	Mobile	11.65	9.61	5.18	5.90	
REDES #s	Total	531.64	502.63	338.29	453.58	
(See CC, KK).						VOC Margin 193.35
(No safety margin used yet.)						NOx Margin 49.05
Day/Spring	Point	37.40	32.20	97.40	38.20	
Day/Spring	Area	54.90	36.50	64.40	41.70	
Dayton	Mobile	88.75	47.55	27.39	31.60	
Springfield	Mobile	14.85	13.35	4.31	7.80	
	Total	195.90	129.60	193.50	110.30	(DD)
(No safety margin used yet.)						VOC Margin 2.40
						NOx Margin 10.30
Preble	Point	0.24	0.00	0.34	0.00	(EE)
	Area	41.13	5.91	41.64	6.29	
	Mobile	4.16	4.80	1.93	2.81	
	Total	45.52	10.71	43.91	9.10	
(No safety margin used yet.)						VOC Margin 1.61
						NOx Margin 1.61
Toledo	Point	60.08	73.97	38.67	40.69	
	Area	37.25	10.26	37.60	10.29	
	Mobile	66.33	37.82	29.85	24.69	
	Total	163.66	122.05	106.32	75.67	(FF)
(Of original VOC safety margin of 68.48, 1.142 is used.)						VOC Margin 57.34
(Original 2005 VOC mobile number was 28.71.)						NOx Margin 46.38
Canton	Point	12.36	6.74	14.07	7.96	
	Area	42.65	16.87	44.20	17.68	
	Mobile	31.66	16.24	15.34	12.00	
	Total	86.67	39.85	73.61	37.64	
(No safety margin has been used yet.)						VOC Margin 13.06
						NOx Margin 2.21

continued on next page...

Ohio Emission Budgets, In Tons Per Day--continued

Nonattainment Area		1990 Baseline VOC	1990 Baseline NOx	Conformity Budget 2005/6 VOC	Conformity Budget 2005/6 NOx	Remaining Margins
Columbus	Point	16.44	13.79	19.33	15.27	(GG)
	Area	101.18	96.68	117.30	111.82	
	Mobile	94.73	78.65	61.38	61.24	
	Total	212.35	189.12	198.01	188.33	
(No safety margin has been used yet).						VOC Margin 14.34
						NOx Margin 0.79
Youngs-town	Point	16.71	23.25	15.42	23.46	(HH)
	Area	41.28	17.99	41.11	17.70	
	Mobile	48.98	29.87	32.16	27.30	
	Total	106.97	71.10	88.69	68.46	
(Use of 7.833 of VOC safety margin of 26.11 requested.)						VOC Margin 18.28
(Original 2005 VOC mobile number was 24.33.)						
(Use of 6.18 of NOx safety margin of 8.83 requested.)						NOx Margin 2.64
(Original 2005 NOx mobile number was 21.12.)						
Jefferson	Point	1.13	378.00	1.33	340.00	(II)
	Area	6.50	2.70	6.30	2.60	
	Mobile	8.51	4.70	4.11	3.40	
	Total	16.14	385.40	11.74	346.00	
(No safety margin has been used yet.)						VOC Margin 4.40
						NOx Margin 39.40
Columbiana	Point	1.89	0.06	2.25	0.07	
	Area	10.40	4.60	10.80	4.90	
	Mobile	11.69	7.00	5.65	5.05	
	Total	23.98	11.66	18.70	10.02	
(No safety margin has been used yet.)						VOC Margin 5.28
						NOx Margin 1.64

(AA) Ohio counties only. Shows maintenance plan numbers (submitted but not proposed), not 15% plan numbers

(BB)Clinton County numbers were proposed in the Federal Register, vol. 60, page 22337ff., 05/05/95.

(CC) For Cleveland/Akron, 2006 maintenance plan numbers are used instead of 2005.

Safety margins for Clev/Ak/Ash derived by subtracting 2006 total of point, area, and mobile from 1990 total of point, area, and mobile

(DD) Dayton numbers, excluding Preble, are from USEPA's redesignation direct-final in Federal Register, vol 60, p.22289ff, 05-05-95

Safety margins for Dayton/Springfield derived by subtracting 2005 total of point, area, and mobile from 1990 total of point, area, and mobile.

(EE) Preble County numbers are from the "final rule" of 09/21/94 in the Federal Register, vol. 59, p. 48395ff

(FF) Toledo numbers are from USEPA's redesignation direct-final rule for Federal Register, vol. 60, p. 21456ff, 05-02-95

(GG) Columbus not proposed in Federal Register yet.

(HH) For Youngstown, 2006 numbers are used instead of 2005.

(II) Jefferson and Columbiana Counties' numbers are from the "final rule" of 09/21/94 in the Federal Register, vol. 59, p. 48395ff

(JJ) If Cincinnati is not redesignated, then the 15% plan budget is used for conformity. See below.

Nonattainment Area		1990 Baseline VOC	1990 Baseline NOx	96 15% plan VOC
Cincinnati	Mobile	125.84	130.68	57.23
(No safety margin exists.)				

(KK) If Cleveland/Akron/Ashtabula is not redesignated, then the 15% plan budget is used for conformity. See below.

Nonattainment Area		1990 Baseline VOC	1990 Baseline NOx	96 15% plan VOC
Cleveland	Mobile	161.2	120.62	62.6
Akron	Mobile	75.52	46.35	29.91
Ashtabula	Mobile	11.65	9.61	6.989
	Total Mobile	248.37	176.58	99.499
(No safety margin exists.)				

ATTACHMENT B

United States Environmental Protection Agency
May 7, 1996 Redesignation Announcement

40 CFR Parts 52 and 81

[OH92–1 & OH79–3; FRL–5458–8]

Approval and Promulgation of Implementation Plans and Designation of Areas for Air Quality Planning Purposes; Ohio

AGENCY: Environmental Protection Agency (USEPA).

ACTION: Final rule.

SUMMARY: The USEPA is determining that the Cleveland-Akron-Lorain (CAL) ozone nonattainment area (which includes the Counties of Ashtabula, Cuyahoga, Geauga, Lake, Lorain, Medina, Portage and Summit) has attained the public health-based National Ambient Air Quality Standard (NAAQS) for ozone. This determination is based upon three years of complete, quality-assured, ambient air monitoring data for the 1993 to 1995 ozone seasons that demonstrate that the ozone NAAQS has been attained in each of these areas. On the basis of this determination, USEPA is also determining that certain reasonable-further-progress (RFP) and attainment demonstration requirements, along with certain other related requirements, of Part D of Title 1 of the Clean Air Act (CAA) are not applicable to the Cleveland-Akron-Lorain area.

In another part of this rulemaking, the USEPA is approving the Ohio Environmental Protection Agency (OEPA) request to revise the official designation of the Cleveland-Akron-Lorain (CAL) area as an area that is meeting the ozone air quality standard. The USEPA is also approving the CAL area maintenance plan as a revision to Ohio's State Implementation Plan (SIP) for ozone. The purpose of the maintenance plan is to provide for continued good ozone air quality levels in the area over the next 10 years.

EFFECTIVE DATE: This final rule is effective on May 7, 1996.

ADDRESSES: Copies of the determination of attainment, redesignation requests, public comments on the rulemaking, and other materials relating to this rulemaking are available for inspection at the following address: (It is recommended that you telephone William Jones at (312) 886–6058, before visiting the Region 5 Office.) United States Environmental Protection Agency, Region 5, Air and Radiation Division, 77 West Jackson Boulevard (AR–18J), Chicago, Illinois 60604.

FOR FURTHER INFORMATION ON THIS ACTION CONTACT: William Jones, Air Programs Branch, Regulation Development Section (AR–18J), United States Environmental Protection Agency, Region 5, Chicago, Illinois 60604, (312) 886–6058.

SUPPLEMENTARY INFORMATION:

Determination of Attainment

I. Background

Subpart 2 of Part D of Title I of the CAA contains various air quality planning and state implementation plan (SIP) submission requirements for ozone nonattainment areas. The USEPA believes it is reasonable to interpret provisions regarding RFP and attainment demonstrations, along with certain other related provisions, so as not to require SIP submissions if an ozone nonattainment area subject to those requirements is monitoring attainment of the ozone standard (i.e., attainment of the NAAQS demonstrated with three consecutive years of complete, quality-assured, air quality monitoring data). As described below, USEPA has previously interpreted the general provisions of subpart 1 of part D of Title I (sections 171 and 172) so as not to require the submission of SIP revisions concerning RFP, attainment demonstrations, or contingency measures. As explained in a memorandum from John S. Seitz, Director, Office of Air Quality Planning and Standards, entitled "Reasonable Further Progress, Attainment Demonstration, and Related Requirements for Ozone Nonattainment Areas Meeting the Ozone National Ambient Air Quality Standard," dated May 10, 1995, USEPA believes it is appropriate to interpret the more specific RFP, attainment demonstration and related provisions of subpart 2 in the same manner.

First, with respect to RFP, section 171(1) of the CAA states that, for purposes of part D of Title I, RFP "means such annual incremental reductions in emissions of the relevant air pollutant as are required by this part or may reasonably be required by the Administrator for the purpose of ensuring attainment of the applicable NAAQS by the applicable date." Thus, whether dealing with the general RFP requirement of section 172(c)(2), or the more specific RFP requirements of subpart 2 for classified ozone nonattainment areas (such as the 15 percent plan requirement of section 182(b)(1)), the stated purpose of RFP is to ensure attainment by the applicable attainment date.[1] If an area has in fact attained the standard, the stated purpose of the RFP requirement will have already been fulfilled and USEPA does not believe that the area need submit revisions providing for the further emission reductions described in the RFP provisions of section 182(b)(1).

The USEPA notes that it took this view with respect to the general RFP requirement of section 172(c)(2) in the General Preamble for the Interpretation of Title I of the Clean Air Act Amendments of 1990 (57 FR 13498 (April 16, 1992)), and it is now extending that interpretation to the specific provisions of subpart 2. In the General Preamble, USEPA stated, in the context of a discussion of the requirements applicable to the evaluation of requests to redesignate nonattainment areas to attainment, that the "requirements for RFP will not apply in evaluating a request for redesignation to attainment since, at a minimum, the air quality data for the area must show that the area has already attained. Showing that the State will make RFP towards attainment will, therefore, have no meaning at that point." (See 57 FR at 13564)[2]

Second, with respect to the attainment demonstration requirements of Section 182(b)(1), an analogous rationale leads to the same result. Section 182(b)(1) requires that the plan provide for "such specific annual reductions in emissions * * * as necessary to attain the national primary ambient air quality standard by the attainment date applicable under this Act." As with the RFP requirements, if an area has in fact monitored attainment of the standard, USEPA believes there is no need for an area to make a further submission containing additional measures to achieve attainment. This is also consistent with the interpretation of certain section 172(c) requirements provided by USEPA in the General Preamble to Title I. As USEPA stated in the Preamble, no other measures to provide for attainment would be needed by areas seeking redesignation to attainment since "attainment will have been reached." (57 FR at 13564; *see also* September 1992 Calcagni memorandum

[1] USEPA notes that paragraph (1) of subsection 182(b) is entitled "PLAN PROVISIONS FOR REASONABLE FURTHER PROGRESS" and that subparagraph (B) of paragraph 182(c)(2) is entitled "REASONABLE FURTHER PROGRESS DEMONSTRATION," thereby making it clear that both the 15 percent plan requirement of section 182(b)(1) and the 3 percent per year requirement of section 182(c)(2) are specific varieties of RFP requirements.

[2] *See also* "Procedures for Processing Requests to Redesignate Areas to Attainment," from John Calcagni, Director, Air Quality Management Division, to Regional Air Division Directors, September 4, 1992, at page 6 (stating that the "requirements for reasonable further progress * * * will not apply for redesignations because they only have meaning for areas not attaining the standard") (hereinafter referred to as "September 1992 Calcagni memorandum").

at page 6). Upon attainment of the NAAQS, the focus of state planning efforts shifts to the maintenance of the NAAQS and the development of a maintenance plan under Section 175A.

Similar reasoning applies to other related provisions of subpart 2. The first of these are the contingency measure requirements of section 172(c)(9) of the Act. The USEPA has previously interpreted the contingency measure requirement of section 172(c)(9) as no longer being applicable once an area has attained the standard since those "contingency measures are directed at ensuring RFP and attainment by the applicable date." (57 FR at 13564; *see also* September 1992 Calcagni memorandum at page 6).

The State must continue to operate an appropriate air quality monitoring network, in accordance with 40 CFR part 58, to verify the attainment status of the area. The air quality data relied upon to determine that the area is attaining the ozone standard must be consistent with 40 CFR part 58 requirements and other relevant USEPA guidance and recorded in USEPA's—Aerometric Information Retrieval System (AIRS).

The determinations made in this notice do not shield an area from future USEPA action to require emissions reductions from sources in the area where there is evidence, such as photochemical grid modeling, showing that emissions from sources in the area contribute significantly to nonattainment in, or interfere with maintenance by, any other States with respect to the NAAQS (see section 110(a)(2)(D)). The USEPA has authority under sections 110(a)(2)(A) and 110(a)(2)(D) of the Act to require such emission reductions if necessary and appropriate to deal with transport situations.

Analysis of Air Quality Data

The USEPA has reviewed the ambient air monitoring data for ozone (consistent with the requirements contained in 40 CFR part 58 and recorded in AIRS) for the Cleveland-Akron-Lorain ozone nonattainment area in Ohio from the 1992 through 1995 ozone seasons. The following ozone exceedances were recorded for the period from 1993 to 1995 (and the average number of expected exceedances for this three-year period is also presented):

Cleveland-Akron-Lorain: Medina County, 6364 Deerview Lane (1994)—0.127 parts per million (ppm); average expected exceedances: 0.3. Cuyahoga County, 891 E. 152 St. (1993)—0.126 ppm, (1994) 0.127 ppm and 0.125 ppm; average expected exceedances: 1.0. Data for 1995 shows no new exceedances of the ozone NAAQS were monitored in the Cleveland-Akron-Lorain area.

On the basis of this review, USEPA determines that the area has attained the ozone standard during the 1993–95 period, which is the most recent three-year time period of air quality monitoring data, and therefore are not required to submit a 15% emissions reduction plan, attainment demonstration, and a section 172(c)(9) contingency measure plan. See the June 29, 1995, proposed rulemaking published in the **Federal Register** at 60 FR 31433.

Public Comment/USEPA Response

These are the comments and responses that relate to the determination of attainment for the Cleveland-Akron-Lorain area. Comments that were received in support of the determination are not summarized below; only the adverse comments are summarized and responses are provided to these comments. No further action will be taken on the determination of attainment for the Dayton and Toledo areas since those areas have already been redesignated to attainment. In a later part of this rulemaking comments and responses are provided on the ozone redesignation request for the CAL area. Because of the potential for overlap of comments received on the issue of the determination of attainment and the redesignation, USEPA hereby incorporates by reference the responses contained in the section below on redesignation to the extent that they bear on the issues involved in the determination of attainment, and vice versa. To the extent that comments can be construed to bear on both rulemaking actions, responses should be construed to pertain to both.

(1) Comment: The determination action has been inappropriately segregated from the section 110(a)(2)(D) petition submitted by the State of New York which requested the Federal government to assess the implementation plans of upwind states to determine their contribution to nonattainment in the State of New York. Regional Oxidant Modeling indicates that areas to the west of the State of New York, including the State of Ohio, contribute to violations of the ozone NAAQS in the northeast United States, including the State of New York. Therefore these areas should continue to meet the statutory reasonable further progress requirements set forth in the Clean Air Act, at least until the State of New York's section 110(a)(2)(D) request has been acted on.

(1) Response: The issue of transported emissions is not relevant to this rulemaking action. The purpose of the requirements of section 182(b)(1) concerning reasonable further progress and attainment demonstration and the contingency measure requirements of section 172(c)(9) as they apply to CAL is not to address emissions from that area that may cause or contribute to air quality problems in downwind areas. The purpose of those requirements as they apply to CAL is to achieve attainment of the standard in that area. The issue of transported emissions is dealt with by other provisions of the Act, provisions that are not the subject of this rulemaking action. USEPA has authority, and the state has an obligation, under section 110(a)(2)(A) (in the case of intrastate areas) and section 110(a)(2)(D) (in the case of interstate areas), to address transported emissions from upwind areas that significantly contribute to air quality problems in downwind areas. The determination being made in this rulemaking is that, as CAL has attained the ozone standard, certain additional Act requirements whose purpose is to achieve attainment in the area do not apply to them. That determination does not mean that the area might not have to achieve additional reductions pursuant to other provisions of the Act if it is determined in the future that such reductions are necessary to deal with transport from the CAL area to downwind areas.

Currently, the issue of transported ozone and ozone precursors is being addressed by the Ozone Transport Assessment Group (OTAG) which is composed of Industry, Environmental Groups, Federal Government, State Governments (including the State of Ohio), and Local Governments from the Midwest and Eastern Regions. OTAG is performing ozone modeling to determine how ozone transport can be addressed on a regional basis. After this assessment is completed, The United States Environmental Protection Agency (USEPA) anticipates using its authority under sections 110(a)(2)(A) and 110(a)(2)(D) of the Act to require emissions reductions where appropriate based on this assessment and any other relevant information.

(2) Comment: The determination of attainment fails to meet the purpose, intent and spirit of the Clean Air Act by not protecting and enhancing the quality of the Nation's air resources so as to promote the public health and welfare and the productive capacity of its population. The ozone standard has been shown to be inadequate to protect public health. The American Lung

Association has provided ample evidence and new studies continue to confirm this. It is very clear to many people living here that the air is polluted and adversely affecting people's health. Furthermore, no one has demonstrated that the bad air and high pollution levels in Ohio's nonattainment areas are not adversely affecting the health of those downwind.

(2) Response: The determination of attainment is based on ozone monitoring data collected in the Cleveland-Akron-Lorain area. These data continue to show that the area has attained the standard. In a separate part of this rulemaking the ozone redesignation request is discussed. This request contains a maintenance plan which will provide for continued maintenance of the standard into the future. The maintenance plan is unaffected by the determination of attainment that finds that the 15% plan, attainment demonstration, and section 172(c)(9) contingency measures are no longer required.

USEPA is also reviewing the current ozone standard to see whether it should be revised in order to better protect the public health. Until the current NAAQS is revised, the current NAAQS of .12 parts per million is the appropriate standard against which to assess plans and measure attainment.

(3) Comment: The piecemeal approach which USEPA is taking to ozone attainment and redesignation is promoting backsliding and encouraging doing the least possible to protect public health and actually clean up the air. A holistic approach to solving environmental problems is always needed. This is no exception. Reviewing emissions inventories in one rulemaking, NO_x in another, the SIP in another, Reasonable Further Progress in another, transportation modeling in another, etc. is a methodology which effectively puts blinders on and prevents complete analysis of interdependence aspects. Furthermore this piecemeal approach is an out-of-sequence, illogical process.

USEPA must first determine if attainment has been reached in accordance with the Clean Air Act's redesignation criteria given in section 107. Without ascertaining that attainment has actually been reached it is premature to alleviate the requirements for further controls or Reasonable Further Progress. It appears that USEPA is only applying the first redesignation requirement that the area has attained the NAAQS and ignoring the other requirements for redesignation and proceeding to relax the standards.

(3) Response: Nothing requires that all of the SIP revisions submitted by the State be reviewed together. The CAA has differing submittal dates for the SIPs and requires USEPA to act on each within a specific time period of its submittal. This would probably not allow adequate time for USEPA to process all of the submittals at once, given that some of the submittals were submitted years apart from each other. Where possible USEPA has sought to consolidate responses to submittals but the CAA is not always conducive to this approach. The determination of attainment is not the same as a redesignation to attainment, and therefore the requirements of section 107, which apply to redesignations to attainment are not applicable. See also the response to comments below. The determination of attainment is only based on the area's ozone monitoring data. USEPA has decided to address the determination of attainment and the State's ozone redesignation request for Cleveland-Akron-Lorain together in this **Federal Register** action. This rulemaking does not circumvent the redesignation requirements. See the discussion in the redesignation rulemaking, below, and in USEPA's Responses to Comments in its Determination of Attainment of Ozone Standard for Salt Lake and Davis Counties, Utah 60 FR 36723 (July 18, 1995). USEPA in this portion of the rulemaking, its determination of attainment, is simply making a factual determination that since CAL is attaining the standard, certain provisions of the CAA, whose express purpose is to achieve attainment of the standard, do not require SIP revisions. In the redesignation portion of this rulemaking, USEPA explains its basis for concluding that CAL has met the requirements of section 107 for redesignation to attainment.

With respect to the determination of attainment, USEPA set forth in the June 29, 1995 notices on CAL its basis for interpreting certain CAA requirements as inapplicable to an area that is attaining the ozone standard.

This interpretation is consistent with USEPA's General Preamble for the Implementation of Title I of the Clean Air Act Amendments of 1990 ("General Preamble"), 57 FR 13,498 (April 16, 1992), which directly addressed requirements for redesignations. *Id.* at 13,561–64. USEPA interpreted the general reasonable further progress requirement and contingency measures as not applying to redesignation requests because an area must have attained the standard before it could be redesignated to attainment, making reasonable further progress and contingency measures, unnecessary.

USEPA's May 10 memorandum set forth USEPA's interpretation of the requirements of CAA sections 172(c)(9) and 182(b)(1)(A), with respect to ozone nonattainment areas that have achieved the ozone NAAQS. USEPA explained that because the purpose of those requirements has already been fulfilled for areas that have attained the standard, the requirements do not apply to those areas for as long as they stay in attainment. It further explained that this interpretation is consistent with USEPA's interpretation of the general reasonable further progress requirements and section 172(c)(9) contingency measure requirements with respect to redesignation requests as set forth in its General Preamble, and with related USEPA guidance on the procedures to be used when USEPA is processing redesignation requests.

USEPA has concluded that Congress included the 15 percent plan as a specification of "reasonable further progress". Section 182(b)(1) is entitled "Plan provisions for reasonable further progress." The heading's reference to "reasonable further progress" indicates Congress' overall intent in enacting the provision. The term "reasonable further progress" is defined as "such annual incremental reductions in emissions of the relevant air pollutant as are required by this part or may reasonably be required by (USEPA) for the purpose of ensuring attainment of the applicable (NAAQS) by the applicable date." 42 U.S.C. section 7501(l). This definition applies for "the purposes of * * * part" D of Title I of the CAA, which includes section 182(b). *Id.* Thus, the term "reasonable further progress" requires only such reductions in emissions as are necessary to attain the NAAQS by the attainment date and no more. 42 U.S.C. section 7501(l). Accordingly, USEPA has interpreted section 182(b)(1)(A)(I) consistent with the statutory definition of "reasonable further progress" and with section 182(b)(1)(A)(I)'s express purpose of assuring progress to bring violating areas into attainment. If an area has in fact attained the standard, the stated purpose of the RFP requirement will have already been fulfilled and USEPA does not believe that the area need submit revisions providing for the further emissions reductions described in section 182(b)(1).

The legislative history expressly supports USEPA's interpretation of section 182(b)(1)(A)(I). In describing the 15 percent plan, the House Report stated:

The emissions reductions called for in this subsection * * * provide a concrete translation of how much an area must do to achieve "reasonable further progress" toward attainment of the standards, as required in section 172 and defined in section 171. Areas that fail, as determined by USEPA, to achieve reasonable further progress are in violation of the Act.

H.R. Rep. no. 490, 101st Cong., 2d Sess., pt. 1 (1990) at 236. Thus, Congress contemplated that the requirements of section 182(b)(1)(A)(I) were simply a specification of the more general reasonable further progress requirements of the Act, with the same goals and definition.

Moreover, USEPA's interpretation of the requirements of section 182(b)(1)(A)(I) is consistent with its interpretation of the general reasonable further progress requirements of CAA section 172.

USEPA has also determined that section 172 (c)(9), 42 U.S.C. section 7502(c)(9) does not require a contingency measures plan for an area such as CAL, which has attained the standard. The contingency measures plan is required for an area which "fails to make reasonable further progress, or to attain the (NAAQS) by the attainment date * * *" 42 U.S.C. section 7502(c)(9). If, as USEPA has determined with respect to CAL, an area has already attained the standard, then by definition such an area is not one to which contingency measures apply. There simply is no failure to attain or make progress for which additional measures need be contingent. However, as with section 182(b)(1)(A)(I), USEPA interprets section 172(c)(9)'s requirements to be applicable to areas that lapse back into violation prior to redesignation, and which therefore need additional progress toward attainment. Moreover, USEPA's interpretation of 172(c)(9) is consistent with its interpretation of these requirements in the context of redesignation requests. 57 FR 13564. USEPA's interpretation also vindicates the policy objective of reducing the burden on states and sources of adopting and implementing additional control measures that are not necessary to attain the standard.

(4) Comment: The number of "close calls" and the use of voluntary measures to reduce ozone raises real questions about the overall air quality. Modeling would answer some of these questions and give a truer picture of what the air is really like. Some initial analysis of the weather patterns in 1995 indicates that they may be similar to 1988, a supposedly "unusually hot, dry summer" when numerous exceedances were recorded. In fact, the weather in Ohio in 1988 or thus far in 1995 is not all that unusual. Even higher temperature have been recorded. It can be expected that there will be more exceedances, unless there are reductions in ozone precursor emissions.

USEPA policy (September 4, 1992, procedures for processing requests to redesignate areas to attainment, from John Calcagni) states that data from the monitors be from areas of highest concentration and that modeling may be necessary to determine the representativeness of the monitor data.

(4) Response: While voluntary measures were used in Cleveland during the summer of 1995 to involve the community in keeping their air clean, the Ohio Environmental Protection Agency (OEPA) did not claim that this measure was responsible for the Cleveland area attaining the NAAQS. Ohio's request claimed that the improvement in air quality was due to permanent and enforceable measures, namely the Federal Motor Vehicle Emissions Control Program and the Federal fuel volatility requirements that reduced the emissions from gasoline. In addition, the basic automobile inspection and maintenance program, required as a part of the carbon monoxide SIP, would also have provided volatile organic compound (VOC), and oxide of nitrogen (NOx) emissions reductions in the area, as a side benefit. These measures resulted in the area's VOC emissions decreasing by about 14 percent from 1990 to 1994, enabling the area to reach attainment of the ozone NAAQS.

USEPA policy on the determination of attainment is provided in a May 10, 1995, memorandum from John S. Seitz, Director of the Office of Air Quality Planning and Standards. This memorandum sets forth USEPA's interpretation of certain requirements of subpart 2 of part D of title I of the Clean Air Act as they relate to ozone nonattainment areas that are meeting the ozone NAAQS. The USEPA believes it is reasonable to interpret provisions regarding RFP and attainment demonstrations, along with the related requirements, so as not to require SIP submissions if an ozone nonattainment area subject to those requirements is in fact attaining the ozone standard (i.e., attainment of the NAAQS is demonstrated with 3 consecutive years of complete, quality-assured air quality monitoring data). The USEPA has previously interpreted the general provisions of subpart 1 of part D of title I (section 171 and 172) so as not to require the submissions of SIP revisions concerning RFP, attainment demonstrations, or contingency measures, and USEPA believes it is appropriate to interpret the ozone-specific provisions of subpart 2 in the same manner. This is further discussed under section I covering the background on the determination of attainment.

The determination of attainment is based only on ozone monitoring data for the area. The data for at least the last four years show that the area has achieved attainment. We believe that the monitoring data is adequate and representative of the area and that modeling is not necessary to show attainment. These data show that the area is in attainment and the monitoring data for 1995 show that no exceedances were monitored in the entire Cleveland-Akron-Lorain area. This shows that the provisions related to submitting a SIP revision to bring an area into attainment of the ozone NAAQS, such as the attainment demonstration, RFP, and contingency measures requirements are not necessary since the area is already in attainment of the ozone NAAQS.

The weather in 1995 was more conducive toward forming ozone in many parts of the Country. Even though this was the case no exceedances were monitored at any of the monitors in the CAL area showing that the area has reduced its emissions to a level that has brought the CAL area into attainment of the ozone NAAQS.

(5) Comment: The Southwestern Pennsylvania Growth Alliance (Growth Alliance) is concerned that the redesignation of the Cleveland-Akron-Lorain area could adversely affect both the economy and air quality in southwestern Pennsylvania, and it feels that action on the applications from these regions should be suspended until a more comprehensive national solution to interstate transport of ozone and ozone precursors is developed and implemented. The Growth Alliance believes that Southwestern Pennsylvania is being unfairly disadvantaged compared to neighboring states by the requirements created by the Clean Air Act, by USEPA, and by the Northeast Ozone Transport Commission.

(5) Response: USEPA's proposed action to determine that the Cleveland-Akron-Lorain area has reached attainment and that it is not necessary for it to have an attainment demonstration, 15% rate of reduction plan, and a contingency plan is different from redesignating the Cleveland-Akron-Lorain area as an attainment area for ozone. In order for USEPA to make a determination concerning the 15% plan and other requirements, it is only necessary to show that the area has attained the ozone standard through

monitoring data. In order to be redesignated from nonattainment to attainment the area must meet the five redesignation requirements of section 107 of the CAA. One of the five redesignation requirements is that the area have met all of the SIP requirements applicable to the area. A determination of attainment renders some of those requirements as inapplicable, based on the area attaining the standard, but the area would still have to meet the remaining applicable SIP requirements before it could satisfy part of the requirements for redesignation. The ozone redesignation request for Cleveland-Akron-Lorain is being addressed in a separate part of this same **Federal Register** action. A discussion of the comments and responses received on the redesignation is given in that part of this action. In order for the CAL area to be redesignated from nonattainment to attainment it would have to meet all of the applicable redesignation requirements. If an area meets the criteria for redesignation nothing in the CAA suggests that redesignations should be delayed. Any issue regarding transport of ozone and its precursors can and is expected to be dealt with through the Ozone Transport and Assessment Group (OTAG) and USEPA's authority under section 110 (a)(2)(A) and (a)(2)(D) of the Act. See also Response to comment 2.

Determination Conclusion

The USEPA has determined that the Cleveland-Akron-Lorain (which includes the Counties of Ashtabula, Cuyahoga, Geauga, Lake, Lorain, Medina, Portage and Summit) has attained the ozone standard and continues to attain the standard at this time.

As a consequence of this determination that the Cleveland-Akron-Lorain ozone nonattainment area has attained the ozone standard, the requirements of section 182(b)(1) concerning the submission of the 15 percent plan and ozone attainment demonstration and the requirements of section 172(c)(9) concerning contingency measures are not applicable to the Cleveland-Akron-Lorain area. Additionally since this determination is occurring simultaneously with the ozone redesignation to attainment, the determination will not be revoked in the event of a violation. Rather, in the event of a violation, the contingency measures in the approved maintenance plan would be triggered by a violation.

Ozone Redesignation Request

I. Background

On November 14, 1994, the OEPA submitted to the USEPA a request for redesignation to attainment for ozone for the CAL area of Lorain, Cuyahoga, Lake, Ashtabula, Geauga, Medina, Summit and Portage. Additional information on the State public hearing and response to comments was submitted to USEPA on February 22, 1995. The redesignation requests were supported by technical information demonstrating that the requirements of section 107(d)(3)(E) of the Clean Air Act Amendments (CAAA) were met. On June 15, 1995, a notice was published in the **Federal Register** (60 FR 31433) which proposed approval of the redesignation requests to attainment for ozone and the maintenance plans for the Ohio CAL moderate ozone nonattainment area counties.

II. Summary of Proposed Rulemaking

The proposed rulemaking detailed how the State submittal fulfilled the redesignation requirements of the CAAA. Specifically, section 107(d)(3)(E) provides for redesignation if: (i) The Administrator determines that the area has attained the National Ambient Air Quality Standards (NAAQS); (ii) The Administrator has fully approved the applicable implementation plan for the area under section 110(k); (iii) The Administrator determines that the improvement in air quality is due to permanent and enforceable reductions in emissions resulting from implementation of the applicable implementation plan and applicable Federal air pollutant control regulations and other permanent and enforceable reductions; (iv) The Administrator has fully approved a maintenance plan for the area as meeting the requirements of section 175(A); and (v) the State containing such area has met all requirements applicable to the area under section 110 and Part D.

Included in the State submittal was a maintenance plan. A component of the maintenance plan is the maintenance demonstration which shows that the level of emissions projected out 10 years will not exceed the attainment year inventory. The proposed rulemaking presented summary tables of Volatile Organic Compounds (VOC) emissions, and NO_X emissions projections for the CAL area counties. The OEPA has revised the base year and projected year inventories numbers in response to comments made by Region 5. The VOC and NO_X point source emissions projections for the year 2000 were estimated by USEPA based on an average growth rate for the 1996 to 2006 period. These estimates show that the total emissions in the area are expected to remain below the attainment level of emissions. In addition, the NO_X point source emission projections do not account for emission reductions due to the Title IV Acid Rain requirements of the CAA, which would further reduce NO_X emissions in the area. The changes did not affect the State's ability to demonstrate maintenance. The revised tables are presented below.

SUMMARY OF VOC EMISSIONS

[Tons/day]

	1990 base	1993 attain	1996 projected	2000 projected	2006 projected
Point	82.22	75.75	78.55	82.44	88.63
Area	201.05	201.37	201.45	201.63	200.86
Mobile	248.4	181.4	131.2	78.4	48.8
Totals	531.7	458.5	411.2	362.5	338.3

SUMMARY OF NO_X EMISSIONS

[Tons/day]

	1990 base	1993 attain	1996 projected	2000 projected	2006 projected
Point	245.59	254.61	263.91	277.05	298.00

SUMMARY OF NO_X EMISSIONS—Continued

[Tons/day]

	1990 base	1993 attain	1996 projected	2000 projected	2006 projected
Area	80.46	80.56	80.51	80.61	80.18
Mobile	176.6	159.9	142.2	95.5	75.4
Totals	502.6	495.1	486.6	453.2	453.6

Additionally, the VOC and NO_X emissions projected for the year 2006 in the above tables are considered emission budgets for purposes of transportation conformity.

The proposal stated that final approval of the CAL moderate nonattainment area counties was contingent upon final approval of VOC reasonably available control technology (RACT) rules, the 1990 Base-year inventory, the section 182(f) NO_X waiver request, the 182(b)(1) reasonable further progress plan (15% plan), the 182(b)(4) inspection and maintenance plan, the attainment demonstration, and the 172(c)(9) contingency measures. All of these requirements have either been met through full approval of state submittals or have been determined in this rulemaking to be no longer applicable. The final approval of most of the VOC RACT rules were published on March 23, 1995 (60 FR 15235), and became effective on May 22, 1995. Final approval of RACT rules for major stationary sources not specifically covered by a USEPA Control Technique Guideline for RACT became effective on October 31, 1995, in a letter notice action from Regional Administrator Adamkus to the individual companies. A formal announcement of this was made in the Federal Register. The Base-year inventories were approved on December 7, 1995 (60 FR 62737) and effective on January 8, 1996. The NO_X waiver request was approved on July 13, 1995 (60 FR 36051) and became effective on August 14, 1995. The I/M plan was approved on April 4, 1995 (60 FR 16989) and became effective on June 3, 1995.

A May 10, 1995, memorandum from John S. Seitz, Director, Office of Air Quality Planning and Standards, entitled "Reasonable Further Progress, Attainment Demonstration, and Related Requirements for Ozone Nonattainment Areas Meeting the Ozone National Ambient Air Quality Standard", states that upon a determination made by USEPA that an area has attained the NAAQS for ozone, that area need not submit SIP revisions concerning reasonable further progress (15%) plan, 182(b)(1) attainment demonstrations, and 172(c)(9) contingency measures for as long as the area continues to meet the standard. Such a determination is made for the CAL area in a separate part of this rulemaking. Consequently, final approval of the redesignation request for the CAL counties of Lorain, Cuyahoga, Lake, Ashtabula, Geauga, Medina, Summit, and Portage is no longer dependent upon approval of the 15% plan, attainment demonstration, or section 172(c)(9) contingency measures.

Public Comment/USEPA Response

In response to the request for written comments on the proposed rulemaking, USEPA received about 50 comment letters. Letters were received from concerned citizens, environmental groups, and industry. Over 30 of these letters were adverse comments on the propose rulemaking. The remaining comments were in support of the proposed rule. The following summarizes the adverse comments received and responds to them. The comments in support of the rule are not summarized below, but are available for public review in USEPA's docket. In an earlier part of this rulemaking comments and responses are provided on the determination of attainment for the CAL area. To the extent that any comments under the determination section also apply to the ozone redesignation action for the CAL area they are also incorporated into the comments/responses under this section covering the ozone redesignation action for the CAL area.

(1) Comment: Many of the commenters are opposed to the redesignation of the Cleveland-Akron-Lorain area to attainment on the grounds that they believe that more stringent emission control requirements and sanctions are needed to avoid unsafe pollution levels. These commenters believe that the benefits of health and environmental improvements to be achieved through stricter standards outweigh the increased costs of emission controls on industry and on the public. Several commenters state that the ozone standard itself should be tightened, expressing concerns over long term health impacts, impacts on children and the elderly, and impacts on smog levels still visible in the area.

(1) Response: The NAAQS were established to protect the public's health and welfare with an adequate margin of safety. Although additional reductions in VOCs may provide further health improvements, it is noted that the issue here is attainment of the ozone standard. The State of Ohio has met the requirements for the redesignation of the Cleveland-Akron-Lorain area to attainment of the ozone standard, including attainment of the ozone NAAQS. It is not clear that further reduction in ozone levels will provide significant health improvements.

With regard to a revised ozone standard, it should be noted that the USEPA along with States and science advisors, is the process of reconsidering the ozone standard. If the ozone standard is revised a number of ozone attainment and nonattainment areas may be affected. A redesignation of Cleveland-Akron-Lorain to attainment at this time will not prevent this area from being redesignated to nonattainment if it is subsequently found to be in violation of a revised ozone standard. Until the NAAQS is revised, however, the 0.12 ppm NAAQS for ozone is the only appropriate standard against which to judge attainment.

(2) Comment: People in the Cleveland-Akron-Lorain area suffer from sinus problems, and increased occurrence of asthma and other life-threatening respiratory illnesses that are directly attributable to air pollution. The air is often oppressive and really unbreathable, especially in the kind of hot, humid weather that the area has experienced this summer. Infants and the elderly are affected by the higher tolerance of ozone levels now in force. We see people who become ill from polluted air whenever the ozone level rises. The current ozone standard is not health based. We want to breathe cleaner air. We are opposed to the redesignation of Cleveland-Akron-Lorain because of the asthma epidemic and increasing number of asthma deaths. The pervasiveness of the health threat posed far outweighs the inhibition of industrial expansion and limits on smokestack pollution.

(2) Response: The current ozone standard is a health based standard. It was recently reviewed and reaffirmed, see 58 FR 13008 (March 9, 1995). However, the ozone NAAQS is currently being reviewed to see if the standard should be changed and what the new standard would be, see 59 FR 5164 (February 3, 1994). A staff report was recently released that discusses this review of the ozone NAAQS. But unless and until the ozone NAAQS is changed - it remains the standard to use for comparison against ozone monitoring data in the area. Those data indicates attainment of the ozone standard.

(3) Comment: In Cleveland-Akron-Lorain the air smells. There are also foul odors coming from factories during the early morning hours that are waking us up and making us nauseated.

(3) Response: At the Federal level the Clean Air Act (CAA) does not provide specific requirements for companies to control odors. Odor is not an issue pertinent to the ozone standard or the attainment of that standard. We have, however, made our enforcement group aware of these complaints to see what can be done. Further, existing facilities must continue to operate existing air pollution control equipment in accordance with applicable rules, regulations and permits, and sources that are problematic in terms of posing a nuisance to area residents may be referred to the State and local environmental enforcement staff for investigation.

(4) Comment: Several commenters expressed concern that trucks and buses pollute the air by blowing out black smoke and that cleaning up emissions from cars is not sufficient.

(4) Response: The USEPA agrees that cleaning up emissions from cars is not enough. Trucks and buses also produce significant pollution. The USEPA has set stringent standards for new heavy duty diesel engines beginning with the 1988 model year, with additional improvements to be made with the 1991 and 1994 model year engines. The black smoke from diesel trucks and buses is particulate matter which is a visible air pollutant. Trucks and buses also contribute to ozone air pollution because they produce hydrocarbons and NO_X. The NO_X emission standard has been tightened from 10.7 grams per brake horsepower per hour (g/bhp-hr) in 1985 to 6.0 in 1988 and 5.0 in 1991. The hydrocarbon emission rate for diesel engines is set at 1.3 g/bhp-hr. Particulate emission standards have been tightened from 0.60 g/bhp-hr in 1988 to 0.10 g/bhp-hr in 1994 for all new heavy duty engines. As the older trucks and buses are replaced by the newer, cleaner engines the pollution from these vehicles will be significantly reduced.

In October 1993, the USEPA required the use of a cleaner diesel fuel throughout the country. Diesel fuel used in on-highway compression ignition engines contains less sulphur than earlier fuels. Lower sulphur reduces the amount of indirect particulate and improves the operation of new diesel engines using particulate trap oxidizers to control direct particulate emissions. It is estimated that the use of low-sulphur diesel fuel reduces direct and indirect particulate by approximately 28 percent from the baseline fuel. Air quality impacts of fuel controls are projected to reduce particulate by 2.3 to 8.3 micrograms per cubic meter and sulphur dioxide by 7 to 16 micrograms per cubic meter in a metropolitan area the size of Cleveland-Akron-Lorain.

The State of Ohio will implement its inspection and maintenance (I/M) program beginning in 1996. The authorizing State legislation for the I/M program requires the testing of diesel powered vehicles up to 10,000 pounds for opacity (smoke). Buses are also required to meet emission standards for smoke, hydrocarbons and carbon monoxide.

The reductions in hydrocarbon, and NO_X emissions from trucks and buses will contribute to maintaining the ozone standard and protecting the public's health. Particulate issues are separate from ozone issues and are not relevant for consideration here. While the standards for particulate emissions will greatly reduce the amount of smoke emitted from trucks and busses, it is not expected to have a significant effect on ozone levels and as a result is not pertinent to an ozone redesignation request.

(5) Comment: Several commenters have expressed confusion over the relationship between the proposed redesignation and the protection of the "ozone layer." One commenter in particular requests that the USEPA explain the "whole ozone picture."

(5) Response: At the very outset of this response, it must be noted that "ozone" referred to in the proposed redesignation is chemically identical to the "ozone" referred to in the term "ozone layer." In both situations ozone refers to a gas composed of molecules with three oxygen atoms each.

In the case of the "ozone layer", one is referring to the layer of the Earth's stratosphere where ozone is found in relatively high concentrations. Ozone in this layer is formed through the reaction of oxygen molecules (two oxygen atoms each) and high energy electromagnetic radiation from the Sun. Oxygen atoms are freed when oxygen molecules are impacted by the high energy radiation. Some of these freed oxygen atoms combine with oxygen molecules to form ozone molecules. Within this layer of the atmosphere, ozone is a significant absorber of high energy ultraviolet radiation from the Sun. If this ultraviolet radiation reached the surface of the earth in sufficient intensity, significant, undesirable biological damage could result to surface organisms. Concerns over potential damage to the protective ozone layer has led to efforts to reduce the emissions of gasses which are believed to directly or indirectly eliminate ozone molecules.

In the case of the proposed of Cleveland-Akron-Lorain, one is dealing with ozone found in the lowest levels of the atmosphere. At this level of the atmosphere, high ozone levels are not typically found (natural processes can lead to peak ozone levels of 0.04 to 0.06 parts per million, well below the ozone standard of 0.12 parts per million). Man-made (anthropogenic) emissions of volatile organic compounds, oxides of nitrogen, and other gases, in the presence of sunlight and relatively warm temperatures, can lead to ozone formation of considerably higher concentrations. This chemical formation process involves hundreds of chemical reactions and differs significantly from the process that forms ozone in the stratosphere. There is no significant exchange of ozone between the lower atmosphere, where high ozone levels are undesirable, and the stratosphere, where high ozone levels are desirable for the protection of life on earth.

Ozone concentrations in excess of the ozone standard are shown, based on numerous health studies and correlation of health data and monitored ozone concentrations, to be damaging to human health, particularly causing problems with the human respiratory system. For this reason, ozone has been listed as a primary pollutant with a defined health-based standard.

(6) Comment: The air quality in Cleveland-Akron-Lorain is lousy and there has been no improvement in the quality of our air. If anything, I would say things are worse.

(6) Response: With respect to ozone levels in the CAL, the air quality has improved significantly since the late 1980's. During 1988 there were a number of monitored readings above .150 parts per million in the area. During the last four years the highest concentration monitored was .127 ppm. CAL achieved attainment of the ozone standard at the end of 1994, by monitoring attainment of the ozone NAAQS during the three previous years

(which are 1992, 1993, and 1994). The area continued to attain the standard since that time.

Section 107(d)(3)(E)(iii) requires that, for the USEPA to approve a redesignation, it must determine that the improvement in air quality is due to permanent and enforceable reductions in emissions. The September Calcagni memorandum, at page 4, clarifies this requirement by stating that "[a]ttainment resulting from temporary reductions in emission rates (e.g., reduced production or shutdown due to temporary adverse economic conditions) or unusually favorable meteorology would not qualify as an air quality improvement due to permanent and enforceable emission reductions." As discussed in the June 15, 1995 **Federal Register** proposed rulemaking, the State of Ohio demonstrated that permanent and enforceable emission reductions are responsible for the recent improvement in air quality. This demonstration was accomplished through an estimate of the reductions (from 1990 to 1993) of VOC achieved through Federal measures such as the Federal Motor Vehicle Emissions Control Program (FMVECP) and fuel volatility rules implemented from 1990–1993, as suggested by the September Calcagni memorandum.

Volatile Organic Compound (VOC) emissions are one of the precursors that help to form ozone. The total emission reductions achieved from 1990 to 1993 were 65 tons of VOC per day. This is a 14 percent reduction in VOCs, which corresponds to the drop in ozone concentrations in the area. These emission reductions were primarily the result of the FMVECP, Automobile Inspection and Maintenance program, and Gasoline Reid Vapor Pressure (RVP) reductions from 10.5 pounds per square inch (psi) in 1989, to 9.0 psi in 1992. The VOC emissions are expected to continue to decrease in the future due to the Federal Motor Vehicle Emissions Control Program, Stage II vapor recovery program, and the Enhanced Automobile Inspection and Maintenance Program. The NO_x emissions are also expected to decrease in the future due to the Federal Motor Vehicle Emissions Control Program and the Enhanced Automobile Inspection and Maintenance Program.

(7) Comment: I am sure you are being bombarded with requests to change the designation to attainment, on the grounds that the region will be hurt economically if this is not done. To me, such arguments ignore two fundamental points. First, there is not evidence that stricter environmental regulations hurt the economy. A clean environment does not mean less jobs, it can mean more jobs. In fact, there is evidence that indicates the opposite. Second, even if this is true, we would be selling our health, and the health of our world and our children, for economic benefit. This does not seem a good trade. There is entirely too much emphasis on business economic considerations over health considerations. The cost to industry may be high, but what about the cost to pay for increased health problems? Air pollution results in hundreds of thousands of dollars worth of asthma illnesses and deaths each week. This should be spent on pollution controls instead.

It would be reprehensible if the agency charged with the protection of health and the environment capitulated to vested, self-serving interests that place the almighty dollar ahead of human health and welfare. The redesignation request should not be approved.

(7) Response: The approval of the ozone redesignation request for Cleveland-Akron-Lorain is based on the area meeting the five requirements of section 107 of the CAA. It is not based on economic grounds. The first of the five requirements of section 107 is that the area has attained the National Ambient Air Quality Standard for ozone, which it has. The NAAQS for ozone is set at a level designed to protect the public's health and monitoring data show that the area is meeting the standard.

(8) Comment: One commenter, although not expressing opposition to the proposed redesignation, does express opposition to the approach used in the Cleveland-Akron-Lorain area of trying to get the public to reduce emissions only during critical high ozone potential periods. The commenter favors a permanent curtailment of emissions so that people with related health risks, such as asthma, will not have to seek the shelter of air-conditioned places during such periods.

(8) Response: It is agreed that, where possible, permanent emission controls should be implemented to minimize ozone levels and to attain the ozone standard. It should be recognized that many permanent emission controls, such as reasonably available control technology, transportation control measures, and vehicle inspection/maintenance, have been implemented in the Cleveland-Akron-Lorain area. The maintenance plan takes into account that these emission controls will be maintained despite the redesignation of the area as an area in attainment of the ozone standard. The permanent and enforceable emissions reductions are discussed under comment number six, and in comment 4 in the determination of attainment section.

(9) Comment: A number of commenters believed the air monitoring in the area was inadequate. Several concerns were noted: Commenters stated that there is presently insufficient monitoring both in terms of what is monitored and the number of monitoring stations (specifically, a lack of ozone monitoring in Geauga County was cited by several commenters).

(9) Response: The requirements for ambient air quality monitoring are detailed in 40 CFR part 58. The federal requirements include: The use of approved air monitoring equipment; quality assurance of monitoring data; appropriate network design; operating schedule; and siting of individual monitors. In determining attainment or nonattainment status of an area for the NAAQS for ozone, only air monitors sampling for ozone are relevant. Monitoring for precursors of ozone (such as VOC_s and NO_x) can be beneficial in understanding ozone formation. For determining the air quality concentrations of ozone in an area and determining attainment of the ozone standard, ambient ozone monitors are considered.

The Cleveland-Akron-Lorain ozone monitoring network consists of ten ambient ozone monitors: three in Cuyahoga County, two in Lake County, and one each in Ashtabula, Lorain, Medina, Portage and Summit Counties. The monitoring network is reviewed by the USEPA. The individual monitoring sites meet the federal monitoring requirements. The commenters are correct in noting that Geauga County is downwind of the urban area and in a location that would be expected to receive high ozone concentrations. However, the USEPA believes that decisions on the air quality can be made with the current network because the monitors cover an adequate geographic area to be representative of the nonattainment area. Ozone monitors are located in every county that is contiguous to Geauga County. All of these monitors are in attainment of the ozone NAAQS, including Lake County which is also downwind of the main urban area and would be expected to have similar air quality to Geauga County. Based on this USEPA believes that Geauga County is also in attainment of the ozone NAAQS.

(10) Comment: One commenter believed that the original readings that brought about the "bad rating" were taken in an industrial area surrounded by freeways inundated with Cleveland Browns fans. The commenter believed

the monitoring readings to be unrepresentative.

(10) Response: The highest ozone readings are not typically found in industrial areas or near freeways. Industries and traffic produce hydrocarbons (also called volatile organic compounds) and NO_x pollution that react in the presence of sunlight to form ozone. This reaction takes place over a period of several hours and thus the highest ozone concentrations are typically found 20 to 40 miles in the downwind direction. The USEPA considers all valid, quality assured monitoring data in the area in assessing the air quality. The moderate ozone nonattainment designation was based on 3 years of ozone monitoring data (1987–1989) and was based on the fourth highest reading (.157 the design value) at the monitoring site in Akron, Ohio. Other ozone monitoring sites in the area also had ozone concentrations in the range of a moderate classification. For example, the site at Jefferson Elementary School in Eastlake, Ohio had a design value of .152 for the 1987–1989 time period. The ozone monitoring data now shows an improvement in air quality that demonstrates attainment of the health based ozone standard. All air monitoring data is available to the public from the national USEPA Aerometric Information and Retrieval System (AIRS) data bank.

(11) Comment: The fact that this region did not adopt reformulated, less ozone-producing gasoline with fewer VOC's for summertime use clearly demonstrates the lack of commitment to clean air.

(11) Response: While the Cleveland-Akron-Lorain area was not required to adopted reformulated gasoline in order to be redesignated, they did choose an Enhanced Automobile Inspection and Maintenance program (I/M) as a maintenance measure to be implemented in the area. This program was chosen as the most cost effective program that the area could use for maintaining the standard while still providing room for growth in the area.

(12) Comment: Several commenters expressed dissatisfaction with the inspection and maintenance program for automobiles. Some were concerned about gaps in the I/M program that reduced the effectiveness. One commenter suggested other pollution reduction measures. A commenter believed that the vehicle inspection and maintenance program was not effective. The commenter believed that the I/M funds would be better spent on enforcing the speed limit, getting rid of high polluting vehicles, doing more on "Ozone Action Days" or making these mandatory, and giving incentives for sharing rides. One commenter was against the more stringent I/M program.

(12) Response: The I/M program for automobiles is a very cost-effective program for reducing pollution. Studies show that a small percentage of vehicles are producing a large portion of the pollution in a metropolitan area. Automobiles that are not well-maintained or that have pollution control equipment that has been disabled emit air pollution that can increase ozone concentrations. The I/M program will identify these automobiles and require repairs. Compared to other forms of pollution control, the I/M program is a low-cost alternative. The enhanced I/M program is estimated to cost between $500 to $900 dollars per ton of VOC pollution reduced. This compares to a cost of approximately $5,000 per ton for a basic program, $5,000 to $10,000 dollars per ton of VOC reduced for additional stationary source controls beyond the current RACT required in the Cleveland-Akron-Lorain area. The USEPA agrees that an effective I/M program is important. The enhanced I/M program adopted by Ohio and which began in January 1996, is the best and most cost effective testing program recommended by the USEPA.

An additional feature of the State's enhanced I/M program, designed to improve repair-effectiveness, is the requirement that automobile technicians become certified to repair vehicles which fail the test. The auto technician training program requires technicians to undergo a training program to ensure they are able to perform repairs on current new-technology vehicles and vehicles of the future. Technicians and repair facilities will be graded on the effectiveness of repairs and this information will be available to the public in order to make informed decisions on where to take their vehicle for repairs. This technician training and certification program began implementation in October 1995, and is being supervised by the OEPA.

(13) Comment: A commenter expresses the concern that control of emissions from aircraft as they travel over the area (and over the United States in general) have not been given enough consideration. The commenter believes aircraft emissions must be considered along with emissions from industries and automobiles in the control of air pollution.

(13) Response: It should be noted that States, under the requirements of section 182(a)(1) of the Clean Air Act, have included aircraft emissions in a base year emissions inventory for each ozone nonattainment area. These aircraft emissions were projected to the 10-year maintenance period in Ohio's maintenance plan for the Cleveland-Akron-Lorain area, and were shown, along with emissions from other sources, to not cause a projected violation of the ozone standard.

(14) Comment: A number of commenters were concerned that the redesignation would affect transportation choices and transportation planning and would contribute to more pollution. Concerns were expressed about: The need for more bike paths, the need for improved public transit, the need to discourage driving. Specific concern was expressed about express lanes on I–271 which would impact the environment. Another commenter had concerns about a subway being dropped from the transportation planning, a lack of bicycle facilities, more interchanges and freeways and new lane additions. There was concern about a tollway from Toledo to Portsmouth instead of light rail that would be upwind of the populated current nonattainment areas and would add pollution to the areas. The commenter wanted pollution prevention through better transportation choices.

(14) Response: The redesignation to attainment does not negate the need for the area to make smart transportation choices. The transportation conformity requirements still apply to the area as a maintenance area. The area will need to demonstrate that emissions are not exceeding the mobile source emission budget in the maintenance plan. The Northeast Ohio Area wide Coordinating Agency (NOACA) is the local metropolitan planning organization for the Cleveland-Akron-Lorain area and performs the conformity analysis on the transportation plan. Conformity to the emission budget is designed to prevent the area from increasing mobile source emissions to the point where the air quality standards are exceeded. Conformity will also provide assurance that a project will not be done if it would cause or contribute to a violation of the ozone NAAQS in the CAL area.

The commenters are correct in noting that transportation measures such as improvements in bicycle paths and facilities and improved public transit will contribute to better air quality by reducing the number of automobiles and the number of vehicle miles of travel. The commenters are also correct in their concerns about increasing freeway capacity and tollways, as these types of projects will encourage additional vehicular traffic. The USEPA believes that the conformity requirements will allow the area to make local decisions

on transportation planning while assuring that mobile source emissions will not increase. Increases to the mobile source budget are only allowed if there is an excess in the total projected emissions for the area.

Projects such as tollways that are built in the maintenance area would also be subject to conformity. Tollways that are in attainment areas are not currently required to meet any conformity tests. It is possible that projects of this type could affect air quality downwind; however, the USEPA believes that the cleaner vehicle standards will contribute to preventing degradation of the air. See also the response to comment 18.

(15) Comment: Over Lake Erie there is a gray and yellow mass of pollution. There is also a trail of smoke that rises from the smoke stacks of the East Lake Electric Power plant, and the trucks and buses are also emitting smoke. When I am at a high point on a hill looking down at downtown Cleveland, I can barely see the buildings. It's as if they are behind a cloud of dirt, smoke, and other pollution. We need to change this.

(15) Response: USEPA has a variety of programs addressing the commenter's concerns. The "trail of smoke" from the East Lake power plant is particulate matter, which is regulated both by limits on the mass of particulate matter and by limits on the opacity of the plume. Smoke from trucks and buses is being limited by new emissions standards that have been made achievable by new limitations on the sulfur content of diesel fuel. USEPA is updating its visibility regulations to reduce the impairment of visibility due to air pollution. Nevertheless, USEPA evaluates attainment of the air quality standards based on quantitative measurements of air pollutant concentration. Since these measurements indicate that the ozone standard is being attained, USEPA must conclude that this criterion for redesignation is satisfied.

(16) Comment: Several commenters are opposed to the redesignation because they believe it will lead to less USEPA oversight of existing emission control regulations and, therefore, to increased air pollution.

(16) Response: All volatile organic compound emission control regulations in place at the time of the redesignation of the Cleveland-Akron-Lorain area will remain in place unless it is ultimately shown through photochemical dispersion modeling that such control measures are not necessary for continued attainment of the ozone standard. These regulations will continue to be enforced by the State and will remain federally enforceable.

(17) Comment: One commenter asserted that section 107(d)(e)(E)(v) requires that a state meet all applicable requirements under section 110 and Part D. While claiming that Cleveland satisfies all 172(c) requirements, USEPA acknowledges that some components have not yet completed regulatory review. 60 FR 31437.

(17) Response: All applicable components, including those were referred to in the proposal as pending regulatory review, have now completed regulatory review. The Clean Air Act requires that the Cleveland-Akron-Lorain area meet all applicable requirements before the area is redesignated. USEPA approved the 1990 base year emissions inventory in a final rulemaking published on December 7, 1995 (60 FR 62737). The remaining VOC RACT rules for the area were approved in letter notice rulemakings dated October 31, 1995 and announced in the **Federal Register**. In a separate part of this final rulemaking USEPA determined that the 15% plan and contingency measures requirements are no longer applicable to the Cleveland-Akron-Lorain area. USEPA's rational for this action is contained in the rulemakings dated August 25, 1995 (60 FR 44277), June 29, 1995 (60 FR 33742, and 60 FR 33781), and this final rulemaking. As a result of these actions the Cleveland-Akron-Lorain area has met all of the fully approved SIP requirements. These requirements were met before USEPA published this final rulemaking taking action on the redesignation requests.

In response to the comment on the protection of the public health. The public's health is protected as evidenced by the monitoring data collected in the area. The data show that the air quality levels are meeting the NAAQS for ozone. These standards were set to protect the public health and welfare.

(18) Comment: By this proposed approval, USEPA claims the redesignation request relieves Ohio from submitting SIP revisions providing transportation and general conformity criteria guidance.

(18) Response: USEPA in this notice does not relieve Ohio from conformity requirements. Rather, USEPA has determined that those requirements will continue to apply after the area is redesignated, and therefore need not be fulfilled as a condition of redesignation. Section 176(c) of the Act requires States to revise their SIPs to establish criteria and procedures to ensure that Federal actions, before they are taken, conform to the air quality planning goals in the applicable SIP. The requirement to determine conformity applies to transportation plans, programs and projects developed, funded or approved under Title 23 U.S.C. or the Federal Transit Act ("transportation conformity"), as well as to all other Federal actions ("general conformity"). Section 176 further provides that the conformity revisions to be submitted by the States must be consistent with Federal conformity regulations that the Act required the USEPA to promulgate. Congress provided for the State revisions to be submitted one year after the date of promulgation of final USEPA conformity regulations.

The USEPA promulgated final transportation conformity regulations on November 24, 1993 (58 FR 62188), and general conformity regulations on November 30, 1993 (58 FR 63214). These conformity rules require that States adopt both transportation and general conformity provisions in the SIP for areas designated nonattainment or subject to a maintenance plan approved under section 175A of the Act. Pursuant to 40 CFR 51.396 of the transportation conformity rule and 40 CFR 51.851 of the general conformity rule, the State of Ohio is required to submit a SIP revision containing transportation conformity criteria and procedures consistent with those established in the Federal rule by November 25, 1994, and November 30, 1994, respectively. Ohio submitted transportation and general conformity SIP revisions on August 17, 1995. The USEPA has not yet approved the transportation conformity rules as part of the SIP. Final rulemaking on the general conformity rules is expected soon.

The USEPA believes it is reasonable to interpret the conformity requirements as not being applicable requirements for purposes of evaluating the redesignation request under section 107(d). The rationale for this is based on a combination of two factors. First, the requirement to submit SIP revisions to comply with the conformity provisions of the Act continue to apply to areas after redesignation to attainment, since such areas would be subject to a section 175A maintenance plan. Therefore, the State remains obligated to adopt the transportation and general conformity rules even after redesignation and would risk sanctions for failure to do so. While redesignation of an area to attainment enables the area to avoid further compliance with most requirements of section 110 and part D, since those requirements are linked to the nonattainment status of an area, the conformity requirements apply to both

nonattainment and maintenance areas. Second, USEPA's federal conformity rules require the performance of conformity analyses in the absence of state-adopted rules. Therefore, a delay in adopting State rules does not relieve an area from the obligation to implement conformity requirements.

Because areas are subject to the conformity requirements regardless of whether they are redesignated to attainment and must implement conformity under Federal rules if State rules are not yet adopted, the USEPA believes it is reasonable to view these requirements as not being applicable requirements for purposes of evaluating a redesignation request.

For the reasons just discussed, the USEPA believes that the ozone redesignation request for the CAL area may be approved notwithstanding the lack of fully approved State transportation and general conformity rules. This policy was also exercised in the Tampa, Florida ozone redesignation finalized on December 7, 1995 (60 FR 62748).

(19) Comments: A commenter argued that the submission is defective under section 107(d)(3) because of the absence of a complete and fully approved implementation plan. The commenter asserted that USEPA cannot excuse Ohio's failure to submit required SIP revisions coming due after the November 15, 1994 filing of the redesignation request. The commenter complained that USEPA in its proposal was illegally attempting to rectify gaps by waiving applicability of necessary SIP requirements, including the requirements of 15 percent RFP, attainment demonstration, and contingency measures. Under section 107(d)(3)(E)(ii), a nonattainment area may be redesignated only after USEPA has fully approved the applicable implementation plan for the area under section 110(k).

Under the APA, the Administrator may not suspend applicability of SIP requirements except by redesignation pursuant to 107(d)(e)(E). This can be done only if USEPA has fully approved the SIP under 110(k). See 107(d)(3)(E)(iii). Congress allotted USEPA no discretion in determining what constitutes the applicable plan, but directed it to look at section 110(k), which does not give the Administrator authority to decide what constitutes the "applicable requirements of this Act." Under section 107(d), the Administrator can only grant a request to redesignate to attainment if the state has met all applicable requirements under section 110 and Part D, and after the state has adopted a complete implementation plan.

(19) Response: USEPA has not suspended or granted the CAL an exemption from any applicable requirements. Rather, USEPA has interpreted the requirements of section 182(b)(1)(A)(i) and 172 (c)(9) as not being applicable once an area has attained the standard, as long as it continues to do so. This is not a waiver of requirements that by their terms clearly apply; it is a determination that certain requirements are written so as to be operative only if the area is not attaining the standard.

The May 10 Policy was clear about the consequences of the policy for redesignations. First, it made plain that a determination of attainment is not tantamount to a redesignation of an area to attainment. Attainment is only one of the criteria set forth in 107(d)(3)(E). To be redesignated, the State must satisfy all of the criteria of 107(d)(3)(E), including the requirement of a demonstration that the improvement in the area's air quality is due to permanent and enforceable reductions, and the requirements that the area have a fully-approved SIP which meets all of the applicable section 110 and part D requirements, and a fully approved maintenance plan.

Upon a determination of attainment, however, the 182(b)(1)(A)(i) requirements of RFP and attainment plans, and the 172(c)(9) requirement of contingency plans are no longer considered applicable requirements under section 107(d)(3)(E). They would no longer be included among those measures whose approval is part of the requirement of having a fully approved SIP.

A commenter contended that, by relying upon its determination of attainment, USEPA is avoiding the redesignation requirements of 107(d). This is not the case. What USEPA has done is make a determination that since the area is attaining the standard, which is a factual determination, certain provisions of the CAA, whose express purpose is to achieve attainment of the standard, do not require SIP revisions to be made by the State for so long as the area continues to attain the standard. This has long been USEPA's policy with respect to the section 172(c)(9) contingency measures and section 172(c)(2) RFP requirement. *See* general preamble at 57 FR 13498. USEPA has also made determinations regarding section 182(f) NOx waivers at or before the redesignation of an area and therefore not required NOx RACT submissions to approve such redesignations. *See* the Bay Area redesignation at 59 FR 49361.

USEPA disagrees with the commentor's analysis of the language and structure of the CAA. USEPA's statutory analysis was explained in detail in the June 8, 1995 direct final rule and in the May 10, 1995 memorandum from John Seitz. USEPA further elaborated upon this analysis, and responded to many of the concerns raised by the plaintiffs, in its final determination of attainment of Ozone Standard for Salt Lake and Davis Counties, Utah, and Determination Regarding Applicability of Certain Reasonable Further Progress and Attainment Demonstration Requirements. See 60 FR 36,723 (July 18, 1995). To the extent here pertinent, such portions of that notice, including the responses to comments, are incorporated herein by reference.

Thus, USEPA disagrees with the commentors' view that USEPA is not complying with all the redesignation requirements of 107(d)(3)(E). The area has a fully approved plan for and has met all applicable requirements. USEPA has interpreted SIP submission requirements of section 182(b)(1) regarding reasonable further progress and attainment demonstration plans, and of section 172(c)(9) regarding contingency measures to be implemented in the event an area fails to make reasonable further progress or attain the standard by the attainment date, not to apply for so long as the area continues to attain the standard. Since they are not applicable, fulfillment of these requirements is not necessary to meet the redesignation criteria of 107(d)(3)(E).

The commenter challenges USEPA's authority to determine certain SIP requirements inapplicable, and then bootstraps that argument to complain that since CAL has not met these requirements, the redesignation request only partially fulfills 107(d)(E)(v). The commenter argues that this is because the state has not met all "applicable" requirements under section 110 and Part D; but the requirements it points to are the very ones that USEPA has determined are inapplicable.

USEPA rejects this kind of circular argument. Since USEPA has determined that the statute does not require certain submissions so long as the area is in attainment, those inapplicable requirements cannot serve as the basis for concluding that the redesignation request is defective. Under the criteria of section 107(d)(E)(3) itself, a state need only meet all *applicable* requirements, and have a fully approved plan that contains all *required* elements. Thus USEPA's interpretation is fully consistent with the criteria of section

107(d)(3). Since USEPA has determined that the 15%, attainment demonstration, and contingency plan requirements are not applicable to CAL, and has found the SIP to be fully approvable without them, the CAL area has fairly met the criteria of section 107(d)(3). Certainly USEPA, after determining that these requirements are inapplicable, could not in good faith conclude that the redesignation request is defective because it fails to meet them.

Thus USEPA concludes that, where it has made a determination of attainment that results in the suspension of requirements, it may rely on that determination and its consequences in considering the approvability of a redesignation request.

For the reasons stated above and elsewhere in this Notice, in the June 29, 1995 **Federal Register** notices (60 FR 3372, 33781), in the May 10, 1995 memorandum, and in the 60 FR 36,723 (July 18, 1995) Utah notice, USEPA does not believe that the rulemaking violates any section of the CAA, nor does it circumvent the redesignation requirements under section 107(d)(3)(E).

(20) Comment: Citizens Commissions for Clean Air in the Lake Michigan Area stated that USEPA's action is not a reasonable interpretation of USEPA's nondiscretionary mandate "to protect and enhance the quality of the Nation's air resources so as to promote the public health and welfare and the productive capacity of its population[.]}. section 101(b)(1).

(20) Response: The USEPA disagrees with the commentor's statement that its action violates section 101(b)(1). Section 101(b)(1) does not establish a nondiscretionary duty; it is a statement of purpose—a purpose that USEPA is not disregarding in this action. the area has attained the primary ozone standard, a standard designed to protect public health with an adequate margin of safety. (*see* section 109(b)(1)). USEPA's action does not relax any of the requirements that have led to the attainment of the standard. Rather, its action has the effect of suspending requirements, for additional pollution reductions, above and beyond those that have resulted in the attainment of the health-based standard.

(21) Comment: A commentor asserts that USEPA's action violates the Administrative Procedure Act and the CAA through its reliance on unpublished memoranda of John Calcagni and John Seitz and the General Preamble for the Implementation of Title I of the Clean Air Act Amendments of 1990, 57 FR l3498 (April 16, 1992). According to the commentor, reliance on those documents is inappropriate and illegal since those documents were issued without opportunity for notice and comment and are not enforceable regulations.

(21) Response: USEPA's reference to and reliance on those documents, all of which are either published or publicly available and a part of the record of this rulemaking, is in no way illegal under provisions of either the CAA or the Administrative Procedures Act. (The commentor cited no specific provisions of either act). USEPA agrees that such documents do not establish enforceable regulations; they do not purport to be anything but guidance. That is precisely why USEPA has performed this rulemaking—a notice-and-comment rulemaking to take comment on its statutory interpretations and factual determinations in order to make a binding and enforceable determination regarding the CAL area. The June 29, 1995 **Federal Register** notice referred to USEPA's prior policy memoranda not as binding the Agency to adopt the interpretations being proposed therein, but rather as a useful description of the rationale underlying those proposed interpretations. USEPA has explained the legal and factual basis for its rulemaking in the June 29, 1995 **Federal Register** notice and afforded the public a full opportunity to comment on USEPA's proposed interpretation and determination fully consistent with the applicable procedural requirements of the Administrative Procedures Act. (The procedural requirements of section 307(d) of the CAA do not apply to this rulemaking since it is not among the rulemakings listed in section 307(d)(1).)

(22) Comment: USEPA claims that, in accordance with the October 1994 Nichols memorandum, "that areas being redesignated need not comply with the requirement that a NSR program be approved prior to redesignation so [long] as they have an approved Prevention of Significant Deterioration (PSD) SIP or delegated PSD authority." 60 FR at 31439. USEPA apparently believes it can replace NSR with PSD, but the CAA does not grant the Administrator such discretion.

(22) Response: The USEPA believes that the CAL area may be redesignated to attainment notwithstanding the lack of a fully-approved NSR program meeting the requirements of the 1990 Act amendments and the absence of such an NSR program from the contingency plan. This view, while a departure from past policy, has been set forth by the USEPA as its new policy in a memorandum from Mary Nichols, Assistant Administrator for Air and Radiation, dated October 14, 1994, entitled *Part D New Source Review (part D NSR) Requirements for Areas Requesting Redesignation to Attainment.*

The USEPA believes that its decision not to insist on a fully-approved NSR program as a prerequisite to redesignation is justifiable as an exercise of the Agency's general authority to establish de minimis exceptions to statutory requirements. *See Alabama Power Co.* v. *Costle*, 636 F.2d 323, 360–61 (D.C. Cir. 1979). Under *Alabama Power Co.* v. *Costle*, the USEPA has the authority to establish de minimis exceptions to statutory requirements where the application of the statutory requirements would be of trivial or no value environmentally.

In this context, the issue presented is whether the USEPA has the authority to establish an exception to the requirements of section 107(d)(3)(E) that the USEPA have fully-approved a SIP meeting all of the requirements applicable to the area under section 110 and part D of title I of the Act. Plainly, the NSR provisions of section 110 and part D are requirements that were applicable to the Ohio area seeking redesignation at the time of the submission of the request for redesignation. Thus, on its face, section 107(d)(3)(E) would seem to require that the State have submitted and the USEPA have fully-approved a part D NSR program meeting the requirements of the Act before the areas could be redesignated to attainment.

Under the USEPA's de minimis authority, however, it may establish an exception to an otherwise plain statutory requirement if its fulfillment would be of little or no environmental value. In this context, it is necessary to determine what would be achieved by insisting that there be a fully-approved part D NSR program in place prior to the redesignation of the CAL area. For the following reasons, the USEPA believes that requiring the adoption and full-approval of a part D NSR program prior to redesignation would not be of significant environmental value in this case.

Ohio has demonstrated that maintenance of the ozone National Ambient Air Quality Standards (NAAQS) will occur even if the emission reductions expected to result from the part D NSR program do not occur. The emission projections made by Ohio to demonstrate maintenance of the NAAQS considered growth in point source emissions (along with growth for other source categories) and were premised on the assumption that the Prevention of Significant Deterioration (PSD) program, rather than the part D NSR, would be in effect, during the

maintenance period. Under NSR, significant point source emissions growth would not occur. Michigan assumed that NSR would not apply after redesignation to attainment, and therefore, assumed source growth factors based on projected growth in the economy and in the area's population. (It should be noted that the growth factors assumed may be overestimates under PSD, which would restrain source growth through the application of best available control techniques.) Thus, contrary to the assertion of the commentor, Ohio has demonstrated that there is no need to retain the part D NSR as an operative program in the SIP during the maintenance period in order to provide for continued maintenance of the NAAQS. (If this demonstration had not been made, NSR would have had to have been retained in the SIP as an operative program since it would have been needed to maintain the ozone standard.)

The other purpose that requiring the full-approval of a part D NSR program might serve would be to ensure that NSR would become a contingency provision in the maintenance plan required for these areas by section 107(d)(3)(E)(iv) and 175A(d). These provisions require that, for an area to be redesignated to attainment, it must receive full approval of a maintenance plan containing "such contingency provisions as the Administrator deems necessary to assure that the State will promptly correct any violation of the standard which occurs after the redesignation of the area as an attainment area. Such provisions shall include a requirement that the State will implement all measures with respect to the control of the air pollutant concerned which were contained in the SIP for the area before redesignation of the area as an attainment area." Based on this language, it is apparent that whether an approved NSR program must be included as a contingency provision depends on whether it is a "measure" for the control of the pertinent air pollutants.

As the USEPA noted in the proposal regarding this redesignation request, the term "measure" is not defined in section 175A(d) and Congress utilized that term differently in different provisions of the Act with respect to the PSD and NSR permitting programs. For example, in section 110(a)(2)(A), Congress required that SIPs include "enforceable emission limitations and other control measures, means, or techniques . . . as may be necessary or appropriate to meet the applicable requirements of the Act." In section 110(a)(2)(C), Congress required that SIPs include "a program to provide for the enforcement of the *measures* described in subparagraph (A), *and* regulation of the modification and construction of any stationary source within the areas covered by the plan as necessary to assure that NAAQS are achieved, including a permit program as required in parts C and D." (Emphasis added.) If the term measures as used in section 110 (a)(2)(A) and (c) had been intended to include PSD and NSR there would have been no point to requiring that SIPs include both measures *and* preconstruction review under parts C and D (PSD or NSR). Unless "measures" referred to something other than preconstruction review under parts C and D, the reference to preconstruction review programs in section 110(a)(2)(C) would be rendered mere surplusage. Thus, in section 110(a)(2) (A) and (C), it is apparent that Congress distinguished "measures" from preconstruction review. On the other hand, in other provisions of the Act, such as section 161, Congress appeared to include PSD within the scope of the term "measures."

The USEPA believes that the fact that Congress used the undefined term "measure" differently in different sections of the Act is germane. This indicates that the term is susceptible to more than one interpretation and that the USEPA has the discretion to interpret it in a reasonable manner in the context of section 175A. Inasmuch as Congress itself has used the term in a manner that excluded PSD and NSR from its scope, the USEPA believes it is reasonable to interpret "measure," as used in section 175A(d), not to include NSR. That this is a reasonable interpretation is further supported by the fact that PSD, a program that is the corollary of part D NSR for attainment areas, goes into effect in lieu of part D NSR.[3] This distinguishes NSR from other required programs under the Act, such as inspection and maintenance and Reasonably Available Control Technology (RACT) programs, which have no corollary for attainment areas. Moreover, the USEPA believes that those other required programs are clearly within the scope of the term "measure."[4]

The USEPA's logic in treating part D NSR in this manner does not mean that other applicable part D requirements, including those that have been previously met and previously relied upon in demonstrating attainment, could be eliminated without an analysis demonstrating that maintenance would be protected. As noted above, Ohio has demonstrated that maintenance would be protected with PSD in effect, rather than part D NSR. Thus, the USEPA is not permitting part D NSR to be removed without a demonstration that maintenance of the standard will be achieved. Moreover, the USEPA has not amended its policy with respect to the conversion of other SIP elements to contingency provisions, which is that they may be converted to contingency provisions only upon a showing that maintenance will be achieved without them being in effect. Finally, as noted above, the USEPA believes that the NSR requirement differs from other requirements, and does not believe that the rationale for the NSR exception extends to other required programs.

As the USEPA has recently changed its policy, the position taken in this action is consistent with the USEPA's current national policy. That policy permits redesignation to proceed without otherwise required NSR programs having been fully approved and converted to contingency provisions provided that the area demonstrates, as has been done in this case, that maintenance will be achieved with the application of PSD rather than part D NSR.

(23) Comment: A violation does not occur until the third "exceedance", this is deceptive and doesn't help people get information that the air is polluted. Even though .124 ppm is above the "standard" of 0.12 ppm; because of rounding that terrible air wouldn't even be counted as an exceedances or violation.

[3] The USEPA is not suggesting that NSR and PSD are equivalent, but merely that they are the same type of program. The PSD program is a requirement in attainment areas and designed to allow new source permitting, yet contains adequate provisions to protect the NAAQS. If any information including preconstruction monitoring, indicates that an area is not continuing to meet the NAAQS after redesignation to attainment, 40 CFR part 51 appendix S (Interpretive Offset Rule) or a 40 CFR 51.165(b) program would apply. The USEPA believes that in any area that is designated or redesignated as attainment under section 107, but experiences violations of the NAAQS, these provisions should be interpreted as requiring major new or modified sources to obtain VOC emission offsets of at least a 1:1 ratio, and as presuming that 1:1 NO_x offsets are necessary. See October 14, 1994 memorandum from Mary Nichols entitled *Part D New Source Review (part D NSR) Requirements for Areas Requesting Redesignation to Attainment.*

[4] The USEPA also notes that in the case of the Cleveland, Ohio area, all permits to install for major volatile organic compound (VOC) emission sources and major VOC emission source modifications issued by the State in the moderate ozone nonattainment areas since November 15, 1992 have complied with the 1.15 to 1.0 VOC emissions offset ratio. In addition, permits to install cannot be issued under the Prevention of Significant Deterioration (PSD) program unless the applicant can demonstrate that the increased emissions from the new or modified source will not result in a violation of the NAAQS.

Cleveland-Akron-Lorain's ozone monitors are not on all year. We should be monitoring year-round. We get unusual weather in northeast Ohio. We've had temperatures in the 80's during every month when we are not required by law to monitor. If we had a violation during these months (we have had extreme haze then and lots of emergency room visits from respiratory patients), we have no way of knowing, so these days don't count, either. I am against the redesignation of Cleveland-Akron-Lorain for these reasons.

(23) Response: Published guidance (*Guideline for the Interpretation of Ozone Air Quality Standards*, January 1979, EPA–450/4–79–003), which is part of the ozone standard by reference in 40 CFR part 50, appendix H, notes that the stated level of the standard is determined by defining the number of significant figures to be used in comparison with the standard. For example, a standard level of 0.12 ppm means that measurements are to be rounded to two decimal places (0.005 rounds up), and therefore, 0.125 ppm is the smallest three-decimal concentration value in excess of the level of the standard that is considered an exceedance.

Since ozone levels decrease significantly in the colder parts of the year in many areas, ozone is required to be monitored at monitors only during the "ozone season" which is listed in Appendix D to 40 CFR part 58 for Ohio as April through October. This seasonal definition was initially set in 1986 based on temperature data. Months where the monthly mean daily maximum temperature is less than 55 degrees Fahrenheit were generally excluded from the season. In Cleveland-Akron-Lorain, this occurs from November through March. In different areas of the country where months are cooler than 55 degrees Fahrenheit, ozone concentrations greater than .08 ppm are unlikely to occur. In addition actual ozone monitoring data for the Cleveland-Akron-Lorain area collected from 1987 though 1994 for the months of April and October show only three recorded concentrations above .100 parts per million. The highest monitored concentration was .109 parts per million during October 1992. The ozone NAAQS of .12 ppm was not exceeded in the Cleveland-Akron-Lorain area for the months of April and October from 1987 though 1994. Given the generally lower temperatures of the other winter months compared to April and October, it is expected that these months would not have monitored an exceedance of the ozone NAAQS.

(24) Comment: A commenter was concerned that because of the redesignation to attainment the area would become exempt from congestion mitigation and air quality (CMAQ) funds which local transit agencies relied on for new buses and expanded service thus increasing air pollution.

(24) Response: The federal CMAQ program is designed to give additional money for air quality nonattainment areas to use on transportation projects that will improve the air quality and bring the area into attainment of the air quality standards. The United States Department of Transportation (USDOT) revised their CMAQ guidance on July 13, 1995, to allow redesignated areas to have a 2 year transition period to insure continuity in CMAQ funding for projects which are programmed in the first 2 years of the transportation improvement program at the time the area is redesignated to attainment. Although Cleveland-Akron-Lorain will lose the additional CMAQ funds after the 2-year transitional period, the projects already programmed for funding will now be able to continue implementation. Air pollution is not expected to increase because the stricter standards for new cleaner cars, trucks and buses will help to decrease pollutant emissions. The USEPA believes the air pollution emissions will thus continue to decrease or at least maintain the levels that have brought the area into attainment.

(25) Comment: The 15% plan approved for Greater Cleveland-Akron-Lorain fell short of the required reduction because the area did not choose to do reformulated gasoline. The area has not met this requirement and should not be redesignated.

(25) Response: USEPA determined that, based on USEPA's determination of attainment, the requirement for a 15% reduction in volatile organic emissions in the area is no longer applicable. See the final action also contained in this final rulemaking. Since this is no longer an applicable requirement, the area is not required to meet it before the CAL area can be redesignated. The 15% reduction plan that was submitted for the CAL area did not rely on reformulated gasoline to achieve the emissions reduction.

(26) Comment: Several commenters believed there was a potential conflict of interest when the same entity (i.e. the City of Cleveland) does the monitoring and also applies for redesignation.

(26) Response: The ambient air data collected by State and local agencies are required to meet very specific quality assurance measures that are detailed in 40 CFR 58.10 and appendix A. The USEPA Quality Assurance manual gives more detailed guidance on operation of ambient air monitors. The USEPA audits the State and local agencies on a regular basis to ascertain that the appropriate quality assurance measures are being implemented. In the case of the Cleveland local agency, the State air agency (Ohio Environmental Protection Agency) is responsible for conducting accuracy audits on the air monitoring equipment being operated by the Cleveland local agency. In addition, the USEPA conducts audits of the air monitoring network. Precision and Accuracy audits are reported on a regular basis to the USEPA and recorded in the national AIRS data bank. This information is available to the public. This oversight ensures the quality of the data relied upon for redesignation.

III. Rulemaking Action

On June 29, 1995, USEPA proposed to determine that the 15% plan, attainment demonstration, and contingency measures plan for the Cleveland-Akron-Lorain area are no longer applicable requirements, since the area has attained the ozone NAAQS. The USEPA received several comments pertaining to the proposed rulemaking. These comments were considered and responses are detailed in the above section of the rulemaking on the determination of attainment. USEPA believes that the determination of attainment is still warranted and is taking final action to determine that the requirements for a 15% emissions reduction plan, attainment demonstration, and contingency measures plan are not applicable at this time.

On June 15, 1995, USEPA proposed to approve the OEPA request for redesignation to attainment and the maintenance plan for ozone for the CAL moderate nonattainment area counties of Lorain, Cuyahoga, Lake, Ashtabula, Geauga, Medina, Summit, and Portage. The USEPA received about 50 comment letters pertaining to the proposed rulemaking. The comments were considered and responses are detailed in the above section of the rulemaking on the ozone redesignation request. The USEPA believes that the redesignation requirements of Section 107(d) are satisfied and is taking final action to approve the requests for redesignation to attainment and the maintenance plan for the CAL counties of Lorain, Cuyahoga, Lake, Ashtabula, Geauga, Medina, Summit, and Portage.

IV. Boilerplate Regulatory Language

USEPA finds that there is good cause for this redesignation, SIP revision, and

determination of attainment to become effective immediately upon publication because a delayed effective date is unnecessary due to the nature of a redesignation to attainment, determination of attainment, which exempts the areas from certain Clean Air Act requirements that would other wise apply to it. The immediate effective date for this redesignation is authorized under both 5 U.S.C. 553(d)(1), which provides that rulemaking actions may become effective less than 30 days after publication if the rule "grants or recognizes an exemption or relieves a restriction" and section 553(d)(3), which allows an effective date less than 30 days after publication "as otherwise provided by the agency for good cause found and published with the rule."

Nothing in this action should be construed as permitting, allowing or establishing a precedent for any future request for revision to any SIP. USEPA shall consider each request for revision to the SIP in light of specific technical, economic, and environmental factors and in relation to relevant statutory and regulatory requirements.

This action has been classified as a Table 3 action for signature by the Regional Administrator under the procedures published in the **Federal Register** on January 19, 1989 (54 FR 2214–2225), as revised by a July 10, 1995, memorandum from Mary Nichols, Assistant Administrator for Air and Radiation. The Office of Management and Budget (OMB) has exempted this regulatory action from Executive Order 12866 review.

Under the Regulatory Flexibility Act, 5 U.S.C. 600 *et seq.*, USEPA must prepare a regulatory flexibility analysis assessing the impact of any proposed or final rule on small entities (5 U.S.C. 603 and 604). Alternatively, USEPA may certify that the rule will not have a significant impact on a substantial number of small entities. Small entities include small businesses, small not-for-profit enterprises, and government entities with jurisdiction over populations of less than 50,000.

Redesignation of an area to attainment under section 107(d)(3)(E) of the CAA does not impose any new requirements on small entities. Redesignation is an action that affects the status of a geographical area and does not impose any regulatory requirements on sources. The Administrator certifies that the approval of the redesignation request will not affect a substantial number of small entities.

SIP approvals under section 110 and subchapter I, Part D of the CAA do not create any new requirements, but simply approve requirements that the State is already imposing. Therefore, because the federal SIP-approval does not impose any new requirements, I certify that it does not have a significant impact on any small entities affected. Moreover, due to the nature of the federal-state relationship under the CAA, preparation of a regulatory flexibility analysis would constitute federal inquiry into the economic reasonableness of state action. The CAA forbids USEPA to base its actions concerning SIPs on such grounds. *Union Electric Co.* v. *U.S. E.P.A.*, 427 U.S. 246, 256–66 (S.Ct. 1976); 42 U.S.C. 7410(a)(2).

Under sections 202, 203, and 205 of the Unfunded Mandates Reform Act of 1995 (Unfunded Mandates Act), signed into law on March 22, 1995, USEPA must undertake various actions in association with proposed or final rules that include a Federal mandate that may result in estimated costs of $100 million or more to the private sector, or to State, local, or tribal governments in the aggregate.

Through submission of the state implementation plan or plan revisions approved in this action, the State and any affected local or tribal governments have elected to adopt the program provided for under section 175A of the Clean Air Act. The rules and commitments being proposed for approval in this action may bind State, local and tribal governments to perform certain actions and also may ultimately lead to the private sector being required to perform certain duties. To the extent that the rules and commitments being proposed for approval by this action will impose or lead to the imposition of any mandate upon the State, local or tribal governments either as the owner or operator of a source or as a regulator, or would impose or lead to the imposition of any mandate upon the private sector, USEPA's action will impose no new requirements; such sources are already subject to these requirements under State law. Accordingly, no additional costs to State, local, or tribal governments, or to the private sector, result from this action. The USEPA has also determined that this action does not include a mandate that may result in estimated costs of $100 million or more to State, local, or tribal governments in the aggregate or to the private sector.

Under section 307(b)(1) of the Clean Air Act, petitions for judicial review of this action must be filed in the United States Court of Appeals for the appropriate circuit by July 8, 1996. Filing a petition for reconsideration by the Administrator of this final rule does not affect the finality of this rule for the purposes of judicial review nor does it extend the time within which a petition for judicial review may be filed, and shall not postpone the effectiveness of such rule or action. This action may not be challenged later in proceedings to enforce its requirements. (See section 307(b)(2).)

List of Subjects in 40 CFR Part 52

Air pollution control, Nitrogen Oxides, Ozone, Volatile organic compounds.

40 CFR Part 81

Air pollution control.

Dated: April 4, 1996.

Valdas V. Adamkus,

Regional Administrator.

Chapter I, Title 40 of the Code of Federal Regulations is amended as follows:

PART 52—[AMENDED]

1. The authority citation for Part 52 continues to read as follows:

Authority: 42 U.S.C. 7401–7671q.

2. Section 52.1885 is amended by adding paragraphs (b)(10) and (w) to read as follows:

§ 52.1885 Control Strategy: Ozone.

* * * * *

(b) * * *

(9) Lorain, Cuyahoga, Lake, Ashtabula, Geauga, Medina, Summit, and Portage Counties.

* * * * *

(w) Determination—USEPA is determining that, as of May 7, 1996, the Cleveland-Akron-Lorain ozone nonattainment area (which includes the Counties of Ashtabula, Cuyahoga, Geauga, Lake, Lorain, Medina, Portage and Summit) have attained the ozone standard and that the reasonable further progress and attainment demonstration requirements of section 182(b)(1) and related requirements of section 172(c)(9) of the Clean Air Act do not apply to the area.

* * * * *

PART 81—DESIGNATION OF AREAS FOR AIR QUALITY PLANNING PURPOSES—OHIO

1. The authority citation for part 81 continues to read as follows:

Authority: 42 U.S.C. 7401–7671q.

2. In § 81.336 the ozone table is amended by revising the entry for the Cleveland-Akron-Lorain Area to read as follows:

§ 81.336 Ohio.

* * * * *

OHIO—OZONE

Designated area	Designation		Classification	
	Date[1]	Type	Date[1]	Type
Cleveland-Akron-Lorain Area	May 7, 1996	Attainment.		
Ashtabula County				
Cuyahoga County				
Geauga County				
Lake County				
Lorain County				
Medina County				
Portage County				
Summit County				

[1] This date is November 15, 1990 unless otherwise noted.

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[FR Doc. 96–11133 Filed 5–6–96; 8:45 am]

BILLING CODE 6560–50–P

40 CFR Part 300

[FRL–5468–7]

National Oil and Hazardous Substances Contingency Plan; National Priorities List Update

AGENCY: Environmental Protection Agency.

ACTION: Notice of Deletion of the East Bethel Demolition Landfill Superfund Site from the National Priorities List (NPL).

SUMMARY: The Environmental Protection Agency (EPA) announces the deletion of the East Bethel Demolition Landfill site in Anoka, Minnesota from the National Priorities List (NPL). The NPL is Appendix B of 40 CFR Part 300 which is the National Oil and Hazardous Substances Contingency Plan (NCP), which EPA promulgated pursuant to Section 105 of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended. EPA and the State of Minnesota have determined that all appropriate Fund-financed responses under CERCLA have been implemented and that no further response by responsible parties under CERCLA is appropriate.

EFFECTIVE DATE: May 7, 1996.

FOR FURTHER INFORMATION CONTACT: Rita Garner-Davis at (312) 886–2440, Associate Remedial Project Manager, Superfund Division, U.S. EPA—Region V, 77 West Jackson Blvd., Chicago, IL 60604. Information on the site is available at: EPA Region V docket room at the above address and at the East Bethel City Hall and the Minnesota Pollution Control Agency Public Library, 520 Lafayette RD. St. Paul, MN 55155–4194.

SUPPLEMENTARY INFORMATION: The site to be deleted from the NPL is the East Bethel Demolition Landfill Site in Anoka County, Minnesota. A Notice of Intent to Delete was published March 13, 1996, (61 FR 10298) for this site. The closing date for comments on the Notice of Intent to Delete was April 12, 1996. EPA received no comments.

The EPA identifies sites which appear to present a significant risk to public health, welfare, or the environment and it maintains the NPL as the list of those sites. Sites on the NPL may be the subject of Hazardous Substance Response Trust Fund-financed remedial actions. Any site deleted from the NPL remains eligible for Fund-financed remedial actions in the unlikely event that conditions at the site warrant such action. Section 300.425(e)(3) of the NCP states that Fund-financed actions may be taken at sites deleted from the NPL in the unlikely event that conditions at the site warrant such action. Deletion of a site from the NPL does not affect responsible party liability or impede Agency efforts to recover costs associated with response efforts.

List of Subjects in 40 CFR Part 300

Environmental protection, Hazardous Waste, Chemicals, Hazardous substances, Reporting and recordkeeping requirements, Superfund, Water pollution control, Water supply.

Dated: April 22, 1996.

David A. Ullrich,

Acting Regional Administrator, U.S. EPA, Region V.

40 CFR part 300 is amended as follows:

PART 300—[AMENDED]

1. The authority citation for part 300 continues to read as follows:

Authority: 33 U.S.C. 1321(c)(2); 42 U.S.C. 9601–9657; E.O. 12777, 56 FR 54757, 3 CFR, 1991 Comp.; p.351; E.O. 12580, 52 FR 2923, 3 CFR, 1987 Comp.; p. 193.

Appendix B—[Amended]

2. Table 1 of appendix B to part 300 is amended by removing the East Bethel Demolition Landfill Site, East Bethel Township, Minnesota.P

[FR Doc. 96–11218 Filed 5–6–96; 8:45 am]

BILLING CODE 6560–50–P

40 CFR Part 355

[Docket 300 PQ–R2; FRL–5468–5]

RIN 2050–AD50

Extremely Hazardous Substances

AGENCY: Environmental Protection Agency (EPA).

ACTION: Final rule.

SUMMARY: Today, EPA is implementing one of its regulatory reform commitments set forth in its June 1, 1995, Report to the President. EPA is taking final action on two proposed rules that modify the extremely hazardous substances (EHS) list and reportable quantities under section 302 of the Emergency Planning and Community Right-to-Know Act of 1986

ATTACHMENT C

Northeast Ohio Areawide Coordinating Agency
SFY 1997-2000 Conformity Determination Documentation

METHODOLOGY FOR THE AIR QUALITY CONFORMITY ANALYSIS OF THE THE NOACA SFY 1997-2000 TRANSPORTATION IMPROVEMENT PROGRAM (TIP)

FINAL

JUNE, 1996

By

NORTHEAST OHIO AREAWIDE COORDINATING AGENCY
THE ATRIUM OFFICE PLAZA, 4TH FLOOR
668 EUCLID AVENUE
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FY 1996 Overall Work Program
Project No. 61012

METHODOLOGY FOR THE AIR QUALITY CONFORMITY ANALYSIS OF THE THE NOACA SFY 1997-2000 TRANSPORTATION IMPROVEMENT PROGRAM (TIP)

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I. Introduction

These analyses are required by Section 176(c) of the Clean Air Act Amendments of 1990 which requires that Metropolitan Planning Organizations (MPOs) make a determination that their transportation plans, programs and projects conform to clean air requirements. NOACA's five-county area is wholly within an eight-county ozone maintenance area as a result of the May 7, 1996 redesignation of the area to maintenance status. These analyses follow USDOT/USEPA Conformity Guidelines published on November 24, 1993 in the Federal Register (40 CFR, Parts 51 and 93).

As a result of the area's redesignation, an action/baseline comparison for conformity purposes is no longer required. However, since the action/baseline comparisons were completed prior to the area's redesignation, they are included herein for informational purposes. The requirement that the area emissions generated by plan or program implementation, as well as the construction of non federally funded regionally significant projects be less than the emissions budget identified or implied by the State Implementation Plan (SIP) remains. The redesignation announcement clearly specifies these budgets for the maintenance area. The mobile source emissions budget for hydrocarbons (HC, also referred to as VOC) is defined as 99.499 tons/day. The Oxides of Nitrogen (NO_x) emissions budget is defined as 176.58 tons/day.

The purpose of these conformity analyses is to demonstrate that the emissions from the implementation of the NOACA SFY 1996 Transportation Improvement Program (TIP), the NOACA Long Range Transportation Plan (LRTP), and the construction of other non-federally funded, regionally significant projects, when combined with the emissions from other area TIPs are less than their respective pollutant emission budgets in the SIP.

The analysis years required by the guidelines and recent interpretations thereof by USEPA (see Appendix 1) for this year's analyses are 1997 (the base year), 2006 (an analysis year at least five years after the attainment year), and 2010 (the last year forecast by the NOACA LRTP). Information for 1990 is presented for the purposes of comparison.

In all, the Guidelines identify four tests for conformity in maintenance areas. These tests are:

(1) it must be based on the latest planning assumptions, (e.g., latest population projections);

(2) it must be based on the latest available emission estimation model;

(3) it must provide for the timely implementation of Transportation Control Measures (TCM) in the applicable State Implementation Plan;

(4) it must be consistent with the motor vehicle emissions budget in the State Implementation Plan; and

The first two tests are readily met by the NOACA SFY 1997-2000 TIP which is based on the latest planning assumptions. Furthermore, the mobile source emissions reductions analysis described in this chapter utilizes the USEPA Mobile5a_h Emission Factor Model which is the latest model available.

In regards to the third test, the Ozone SIP for Northeast Ohio commits to the implementation of a variety of Transportation Control Measures (TCMs), whose collective impact is estimated to reduce hydrocarbon emission by 2.82 Tons/day by 1996. These TCMs include signalization projects for

several transportation corridors in our region. A further discussion of the status of these signalization projects appears in Section VII below.

See Section VIII below for a discussion of the emissions budget conformity test.

II. Methodology for Hydrocarbon (HC), and Nitrous Oxides (NO_X) Emissions Analysis

The general methodology for emissions analysis is accomplished in four steps:

1) Development of vehicle miles of travel (VMT) estimates for the required analysis years and transportation system scenarios;

2) Development of emission factors for HC and NO_X corresponding to the required analysis years;

3) Multiplication of emission factors by VMT to calculate estimated pollutant emissions from mobile sources;

4) Addition or subtraction of "off-network" analysis results from modeled totals.

II.1 Vehicles Miles of Travel

VMT estimates are developed using a conventional four-step modeling process. NOACA uses a transportation model, TRANPLAN, to accomplish this process. Model inputs include trip assumptions (vehicle driver trip table), speed assumptions, mode split assumptions (vehicle driver vs. transit passenger partitions), and the transportation network over which trips are simulated by the model. VMT output is generated for six highway functional classes and thirteen possible speed ranges in five-mile per hour increments from 0 to 65 mph.

Vehicle driver trip tables have been developed for 1990 and 2010. Trip tables for intermediate year analyses are calculated by interpolating trips between these two years.

II.1.1 Networks

Using the criteria presented in Sections 51.436 and 51.438 of 40 CFR (November 24, 1993) and discussions with ODOT, TIP Highway networks were developed as follows:

1990 Baseline: This is equivalent to the 1990 Cordon area portion of the network used in the 1990 SIP Baseline Inventory;

1997 Baseline*: This network is equivalent to the 1990 Baseline Network (transportation system which was open to traffic in 1990) plus completed or programmed, federally funded network changes which will be open to traffic during 1997;

1997 Action*: This network is equivalent to the 1997 Baseline plus regionally significant, non-federally funded projects which will be open to traffic in 1997;

2006 Baseline*: The 2006 networks are required because analysis years may not be more than ten years apart according to the regulations. This network is equivalent to the 1997 Baseline plus programmed TIP projects which meet one or more of the following criteria:

1) Projects which are currently under construction or are undergoing right-of-way acquisition;

1) Projects which were programmed in the first three years of the SFY 1996 TIP;

2) projects which have completed the NEPA process, and are expected to be open to traffic in 2006;

2006 Action*: This network is equivalent to the 2006 Baseline plus 1997 Action projects plus any projects which do not meet the Baseline criteria and are expected to be open to traffic in 2006;

2010 Baseline*: This network is equivalent to the 2006 Baseline plus any projects which meet the Baseline criteria but are not expected to be open by the end of 2006; and

2010 Action*: This network is equivalent to the 2010 LRTP Minimum Build Highway Network plus other regionally significant, federally or non-federally funded projects with clear funding sources which are expected to be open in 2010. The use of this network accounts for those LRTP projects which are not currently programmed but are expected to be complete by 2010.

Appendix 2 lists the transportation projects included in each network.

II.1.2 Speed Assumptions

The base speeds table for assigning average daily trips to the highway assignment network appear in Table 1.

II.1.3 Mode Split

All vehicle driver trip tables assume a Transportation System Management (TSM) mode split. This mode split accounts for existing regional transit services with minor modifications over time including the addition of park-n-ride lots and/or transit centers.

II.1.4 Traffic Assignment Results

The results of the modeling process for each highway network described in Section II.1.1 appear in Table 2-7. The VMT estimates resulting from the application of the previously described inputs to a highway network are referred to as simulations. VMT for each simulation is listed by speed range and functional classification.

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* These networks are forecasts.

Table 1: Base Speed Table (MPH) and Area Types for the Highway Assignment Model (TRANPLAN)

FUNCTIONAL CLASS	CBD A	FRINGE B	O. BUSINESS URBAN C0	O. BUSINESS RURAL C1	RESIDENTIAL URBAN D0	RESIDENTIAL RURAL D1
FREEWAY 00, 80	36	37	40	59	49	59
RAMPS 01, 02, 11, 12, 21, 22, 81, 82	24	24	25	25	25	25
EXPRESSWAY 03, 10	29	33	33	43	38	43
MAJOR ARTERIAL 20	24	31	31	41	35	41
MINOR ARTERIAL 30, 85, 90	22	22	31	41	34	41
LOAD LINKS	15	15	15	15	15	15

II.2 Emission Factors

Emission Factors for each analysis year were generated for HC and NO_X using the Mobile5a_h emission factor model developed by USEPA. Emission factors were generated in five mph increments to correspond to resultant speeds on highway links from the traffic simulations.

Mobile5a_h emission factors represent conditions of the summer ozone season. The following describes inputs to the Mobile5a_h runs. These were selected in consultation with Ohio EPA. Following are the parameters, known as flags, with which the model user tailors model output to represent vehicular conditions in the modeled area.

TAMFLG - TAMFLG is set to 1 for all scenarios. This directs the model to use default tampering rates for all vehicle types.

SPDFLG - SPDFLG is set to 1 for all scenarios. This tells the model that one speed is being provided for all vehicle types for each scenario.

VMFLG - VMFLG is set to 3 for all scenarios. This directs the model to use user-supplied vehicle mixes and operating mode fractions. The determination of the vehicular mix is based upon the Ohio Department of Transportation's (ODOT) vehicle mix, as supplied by Ohio EPA, for various highway functional classes. Since the functional classification systems used by NOACA and ODOT differ in some respects, NOACA classes are matched to ODOT classes based upon similarity of facility description; then vehicle mix fractions are applied. Table 8 lists the vehicle mix and operating mode fractions used for the six NOACA functional classes. The eight vehicle mixes considered by the model are light duty gasoline vehicles (LDGV), light duty gasoline trucks (LDGT) in two size ranges, heavy duty gasoline vehicles (HDGV), light duty diesel vehicles (LDDV), light duty diesel trucks (LDDT), heavy duty diesel vehicles (HDDV), and motorcycles (MC). Operating mode inputs allow the model to estimate the percentage of the time an average vehicle spends in cold start, stabilized, or hot start conditions.

MYMRFG - MYMRFG is set to 3 for all scenarios. This directs the model to use user supplied vehicle registration data. Table 9 displays local vehicle registration distributions for passenger cars which were developed from Ohio Bureau of Motor Vehicle (BMV) data. Table 10 displays the national default distribution for passenger vehicles. National defaults were used for the other vehicle types.

ALHFLG - ALHFLG is set to 1 for all scenarios. This tells the model that special exhaust emission factor adjustments for air conditioning usage, extra loading, trailer towing, and humidity are not being requested.

LOCFLG - LOCFLG is set to 2 for all scenarios. This tells the model that one local area parameter (LAP) record is being supplied for all scenarios of each MOBILE5a run.

TEMFLG - TEMFLG is set to 1 for all scenarios. This instructs the model to determine the temperatures to be used in correcting emission factors on the basis of the input values of minimum (64°F) and maximum (94°F) daily temperature.

OUTFMT - OUTFMT is set to 4 for all scenarios. This directs the model to print out results in a 80 column descriptive format.

PRTFLG - PRTFLG is set to 4 for all scenarios. This directs the model to generate emission factors for HC, CO, and NO_X.

Table 2: 1990 Baseline VMT

(Simulation - 15)

SPEED RANGE (mph)	FREEWAY	MAJOR ARTERIALS	SPECIAL	TOLL	MINOR	LOAD LINK	INTRAZONAL	TOTAL
0.0 - 5	0	3,184	0	0	60,105	0	0	63,289
5.1 - 10	1,434	20,563	0	1,010	49,243	0	0	72,250
10.1 - 15	4,116	55,136	4,340	1,332	65,579	2,154,103	0	2,284,606
15.1 - 20	15,070	164,811	4,340	0	149,719	2,295	5,400	341,635
20.1 - 25	12,829	606,036	4,340	779	533,947	0	129,773	1,287,704
25.1 - 30	354,373	2,074,246	12,601	1,198	890,215	0	321,007	3,653,640
30.1 - 35	929,180	9,213,921	38,506	11,043	4,060,812	0	68,124	14,321,586
35.1 - 40	3,717,410	1,606,808	0	2,188	377,266	0	4,192	5,707,864
40.1 - 45	2,559,453	1,185,067	0	309	1,541,458	0	0	5,286,287
45.1 - 50	7,287,718	0	0	0	0	0	0	7,287,718
50.1 - 55	204,195	0	0	0	0	0	0	204,195
55.1 - 60	3,618,903	41	0	0	0	0	0	3,618,944
TOTAL	18,704,681	14,929,813	64,127	17,859	7,728,344	2,156,398	528,496	44,129,718

Table 3: 1997 Baseline VMT (Simulation - 53)

SPEED RANGE (mph)	FREEWAY	MAJOR ARTERIALS	SPECIAL	TOLL	MINOR	LOAD LINK	INTRAZONAL	TOTAL
0.0 - 5	0	3,528	0	0	52,994	0	0	56,522
5.1 - 10	0	25,376	0	0	54,645	0	0	80,021
10.1 - 15	7,701	65,423	4,520	1,621	82,758	2,212,803	5,089	2,379,915
15.1 - 20	19,780	159,446	4,520	1,984	193,051	0	130,083	508,864
20.1 - 25	48,034	605,082	4,655	493	517,830	0	338,778	1,514,872
25.1 - 30	465,112	2,155,054	12,825	3,457	931,955	0	73,993	3,642,396
30.1 - 35	1,065,515	9,452,123	38,918	9,816	4,165,894	0	4,774	14,737,040
35.1 - 40	3,915,276	1,685,335	0	2,038	411,538	0	0	6,014,187
40.1 - 45	2,916,976	1,213,381	0	348	1,682,368	0	0	5,813,073
45.1 - 50	7,077,809	0	0	0	0	0	0	7,077,809
50.1 - 55	841,038	0	0	0	0	0	0	841,038
55.1 - 60	3,369,815	44	0	0	0	0	0	3,369,859
60.1 - 65	0	0	0	0	0	0	0	0
TOTAL	19,727,056	15,364,792	65,438	19,757	8,093,033	2,212,803	552,717	46,035,596

Table 4: 1997 Action VMT (Simulation - 53)

SPEED RANGE (mph)	FREEWAY	MAJOR ARTERIALS	SPECIAL	TOLL	MINOR	LOAD LINK	INTRAZONAL	TOTAL
0.0 - 5	0	3,527	0	0	54,598	0	0	58,125
5.1 - 10	0	25,378	0	1,090	54,700	0	0	81,168
10.1 - 15	7,351	66,414	4,520	0	83,469	2,212,899	5,089	2,379,742
15.1 - 20	18,973	159,555	4,520	3,614	189,101	0	130,083	505,846
20.1 - 25	48,190	600,857	4,663	594	522,719	0	338,778	1,515,801
25.1 - 30	476,285	2,139,257	12,826	3,548	924,206	0	73,993	3,630,115
30.1 - 35	1,010,982	9,393,113	39,065	9,979	4,148,012	0	4,774	14,605,925
35.1 - 40	3,789,619	1,691,957	0	2,041	416,588	0	0	5,900,205
40.1 - 45	2,928,291	1,204,660	0	348	1,665,752	0	0	5,799,051
45.1 - 50	7,073,531	0	0	0	0	0	0	7,073,531
50.1 - 55	778,865	0	0	0	0	0	0	778,865
55.1 - 60	3,697,761	43	0	0	0	0	0	3,697,804
60.1 - 65	0	0	0	0	0	0	0	0
TOTAL	19,829,848	15,284,761	65,594	21,214	8,059,145	2,212,899	552,717	46,026,178

Table 5: 2006 Baseline VMT (Simulation - 54)

SPEED RANGE (mph)	FREEWAY	MAJOR ARTERIALS	SPECIAL	TOLL	MINOR	LOAD LINK	INTRAZONAL	TOTAL
0.0 - 5	0	12,757	0	0	83,329	0	0	96,086
5.1 - 10	4,247	33,366	0	0	51,908	0	0	89,521
10.1 - 15	6,820	91,628	4,749	1,341	145,282	2,288,127	4,687	2,542,634
15.1 - 20	16,559	165,560	4,749	1,863	210,415	0	130,479	529,625
20.1 - 25	35,683	632,338	4,749	700	501,087	0	361,692	1,536,249
25.1 - 30	498,317	2,288,339	13,401	4,481	997,390	0	81,522	3,883,450
30.1 - 35	1,389,244	9,477,087	37,491	9,464	4,472,984	0	5,522	15,391,792
35.1 - 40	4,293,148	1,724,786	0	1,954	451,680	0	0	6,471,568
40.1 - 45	2,652,115	1,302,192	0	389	1,846,490	0	0	5,801,186
45.1 - 50	7,911,630	0	0	0	0	0	0	7,911,630
50.1 - 55	1,466,273	0	0	0	0	0	0	1,466,273
55.1 - 60	3,068,683	57	0	0	0	0	0	3,068,740
60.1 - 65	0	0	0	0	0	0	0	0
TOTAL	21,342,719	15,728,110	65,139	20,192	8,760,565	2,288,127	583,902	48,788,754

Table 6: 2006 Action VMT (Simulation - 54)

SPEED RANGE (mph)	FREEWAY	MAJOR ARTERIALS	SPECIAL	TOLL	MINOR	LOAD LINK	INTRAZONAL	TOTAL
0.0 - 5	0	13,294	0	0	78,865	0	0	0
5.1 - 10	2,358	31,890	0	244	55,154	0	0	89,646
10.1 - 15	5,957	87,770	4,749	1,405	145,368	2,288,332	4,687	2,538,268
15.1 - 20	19,208	166,299	4,749	1,087	212,712	0	130,479	534,534
20.1 - 25	23,427	618,126	4,749	5,182	511,210	0	361,692	1,524,386
25.1 - 30	473,235	2,204,073	14,545	3,256	973,705	0	81,522	3,750,336
30.1 - 35	1,234,745	9,456,501	36,726	9,968	4,393,008	0	5,522	15,136,470
35.1 - 40	4,267,288	1,736,169	0	2,242	431,333	0	0	6,437,032
40.1 - 45	2,570,892	1,290,853	0	389	1,813,619	0	0	5,675,753
45.1 - 50	7,905,503	0	0	0	0	0	0	7,905,503
50.1 - 55	388,449	0	0	0	0	0	0	388,449
55.1 - 60	4,725,992	49	0	0	0	0	0	4,726,041
60.1 - 65	0	0	0	0	0	0	0	0
TOTAL	21,617,054	15,605,024	65,518	23,773	8,614,974	2,288,332	583,902	48,706,418

Table 7: 2010 Baseline VMT (Simulation - 55)

SPEED RANGE (mph)	FREEWAY	MAJOR ARTERIALS	SPECIAL	TOLL	MINOR	LOAD LINK	INTRAZONAL	TOTAL
0.0 - 5	0	14,168	0	0	92,949	0	0	107,117
5.1 - 10	4,065	34,020	0	780	59,276	0	0	98,141
10.1 - 15	7,869	90,945	4,852	492	156,298	2,320,451	4,514	2,585,421
15.1 - 20	16,848	193,397	4,852	1,304	215,287	0	130,656	562,344
20.1 - 25	19,895	659,036	4,852	575	537,496	0	371,882	1,593,736
25.1 - 30	710,791	2,274,784	13,499	4,372	1,063,546	0	84,869	4,151,861
30.1 - 35	1,444,097	9,566,997	38,034	9,994	4,498,277	0	5,855	15,563,254
35.1 - 40	4,496,889	1,795,865	0	2,241	494,569	0	0	6,789,564
40.1 - 45	2,824,852	1,306,475	0	407	1,908,031	0	0	6,039,765
45.1 - 50	7,963,604	0	0	0	0	0	0	7,963,604
50.1 - 55	1,338,951	0	0	0	0	0	0	1,338,951
55.1 - 60	3,174,084	58	0	0	0	0	0	3,174,142
60.1 - 65	0	0	0	0	0	0	0	0
TOTAL	22,001,945	15,935,745	66,089	20,165	9,025,729	2,320,451	597,776	49,967,900

Table 8: 2010 Action VMT (Simulation - 55)

SPEED RANGE (mph)	FREEWAY	MAJOR ARTERIALS	SPECIAL	TOLL	MINOR	LOAD LINK	INTRAZONAL	TOTAL
0.0 - 5	0	5,012	0	0	88,080	0	0	93,092
5.1 - 10	3,498	30,556	0	300	61,161	0	0	95,515
10.1 - 15	6,294	85,530	4,852	1,894	149,612	2,310,216	4,514	2,562,912
15.1 - 20	20,562	189,471	4,852	1,233	234,402	0	130,656	581,176
20.1 - 25	22,099	632,542	5,671	3,784	538,309	0	371,882	1,574,287
25.1 - 30	541,108	2,203,508	13,029	3,315	1,027,426	0	84,869	3,873,255
30.1 - 35	1,315,158	9,535,722	37,217	11,041	4,411,110	0	5,855	15,316,103
35.1 - 40	4,503,914	1,807,924	0	2,600	448,732	0	0	6,763,170
40.1 - 45	2,609,514	1,271,875	0	409	1,864,759	0	0	5,746,557
45.1 - 50	7,872,738	0	0	0	0	0	0	7,872,738
50.1 - 55	352,419	0	0	0	0	0	0	352,419
55.1 - 60	5,093,083	49	0	0	0	0	0	5,093,132
60.1 - 65	0	0	0	0	0	0	0	0
TOTAL	22,340,387	15,762,189	65,621	24,576	8,823,591	2,310,216	597,776	49,924,356

Table 9: Vehicle Mix and Operating Mode by Functional Classification

		LDGV	LDGT1	LDGT2	HDGV	LDDV	LDDT	HDDV	MC	Operating Mode 1 / 2 / 3
Freeway1	Urban	.894	.016	.015	.007	.001	.001	.066	.000	10.0/15.0/10.0
	Rural	.793	.013	.013	.016	.001	.001	.162	.001	
Major Arterials	Urban	.949	.012	.011	.002	.001	.001	.022	.002	15.0/20.0/15.0
	Rural	.834	.018	.018	.011	.001	.001	.114	.003	
Special2	Urban	.835	.070	.070	.000	.010	.010	.000	.005	15.0/20.0/15.0
	Rural	.835	.070	.070	.000	.010	.010	.000	.005	
Toll3	Urban	.793	.013	.013	.016	.001	.001	.162	.001	10.0/15.0/10.0
	Rural	.793	.013	013	.016	.001	.001	.162	.001	
Minor Arterials	Urban	.972	.004	.004	.001	.001	.001	.016	.001	15.0/20.0/15.0
	Rural	.894	.023	.022	.004	.001	.001	.051	.004	
Other4	Urban	.971	.008	.008	.001	.001	.001	.009	.001	15.0/20.0/15.0
	Rural	.948	.019	.019	.001	.001	.001	.010	.001	

[1]Freeway consists of Freeways, Freeway to Freeway Ramps, Expressways and the Ohio Turnpike.

[2]Special roads are limited service roads such as the Metroparks' roads.

[3]Toll constitutes Ohio Turnpike Toll Booth approach raodways.

[4]Other is local streets.

IDLFLG - IDLFLG is set to 1 for all scenarios. This directs the model not to calculate idle emission factors. This flag is not functional in Mobile5a_h (idle factors cannot be generated).

NMHFLG - NMHFLG is set to 3 for all scenarios. This directs the model to generate emission factors for the Volatile Organic Compound (VOC) component of total hydrocarbon emissions.

HCFLAG - HCFLAG is set to 1 for all scenarios. This directs the model to print only the composite (combined exhaust, evaporative, refueling, running loss, and resting loss) HC emission factor in grams per mile.

All runs incorporated oxygenated fuels sales fractions. This involved modifying the LAP record to identify that oxygenated fuels were being sold in the area and adding data on sales fractions and oxygen contents to the input file. Oxygenated fuel data, which was provided by Ohio EPA, is as follows:

Ether Blend Market Share:	3.5%
Alcohol Blend Market Share:	19.7%
Average Oxygen Content of Ether Blends (by weight):	2.7%
Average Oxygen Content of Alcohol Blends (by weight):	3.1%
Reid Vapor Pressure (RVP) Waiver:	Yes

NEWFLG - NEWFLG is set to 3 for all scenarios. This allows the model to consider Federal Motor Vehicle Control Program (FMVCP) requirements in emission factor calculations as well as the effects of the new evaporative test procedure.

Table 10: Vehicle Registration Distributions: % of Passenger Vehicles by Model Year

	25 Model Years in Descending Order (e.g., 1990-1966)												
NOACA Inputs	.075	.081	.090	.087	.080	.089	.085	.076	.050	.041	.039	.035	
	.042	.033	.028	.023	.011	.006	.005	.004	.004	.003	.002	.002	.008

SOURCE: Ohio Bureau of Motor Vehicles

Table 11: Passenger Vehicle Registration National Defaults

National	.049	.079	.083	.082	.084	.081	.077	.056	.050	.051	.050	.054	
Defaults	.047	.037	.024	.019	.014	.015	.011	.008	.006	.005	.004	.003	.010

SOURCE: USEPA

IMFLAG - IMFLAG is set to 5 for all analysis years. This allows the modeling of two I/M programs and identifies the use of alternate emission credits for Tier 1 (LDGV and LDGT) vehicles.

Program specifications are as follows:

PROGRAM 1	Program Start Year:1995
Stringency Level:	20%
First Model Year Covered:	1970
Last Model Year Covered:	2020
Waiver Rate - pre-1981:	2%
Waiver Rate - 1981 and Newer:	0%
Compliance Rate:	96%
Program Type:	Test Only
Frequency of Inspection:	Biennial
Vehicle Types Covered:	LDGV, LDGT1, LDGT2, HDGV
Test Type:	Loaded Idle
Cutpoints:	HC=220 (ppm), CO=1.20 (%), NO_x=999 (ppm)
I/M Credits:	Mobile5a_h defaults

PROGRAM 2	Program Start Year:1995
Stringency Level:	20%
First Model Year Covered:	1981
Last Model Year Covered:	2020
Waiver Rate - pre-1981:	0%
Waiver Rate - 1981 and Newer:	3%
Compliance Rate:	96%
Program Type:	Test Only
Frequency of Inspection:	Biennial
Vehicle Types Covered:	LDGV, LDGT1, LDGT2, HDGV
Test Type:	Transient Test
Cutpoints:	HC=0.80 (g/mile), CO=20.0 (g/mile), NO_x=2.00 (g/mile)
I/M Credits:	Mobile5a_h defaults

ATPFLG - ATPFLG is set to 8 for all analysis years. This tells the model to evaluate the impacts of an anti-tampering program, a functional pressure check, and a functional purge check. Anti-tampering program specifications are as follows:

Program Start Year:	1995
First Model Year Covered:	1970
Last Model Year Covered:	2020
Vehicle Types Covered:	LDGV, LDGT1, LDGT2, HDGV
Program Type:	Test Only
Inspection Frequency:	Biennial
Compliance Rate:	96%
Inspection Performed:	Air Pump system, Catalyst, Fuel Inlet Restrictor, Evaporative Emission Control System, Gas Cap

The functional pressure check is of the following specifications:

Program Start Year:	1995
First Model Year Covered:	1970
Last Model Year Covered:	2020
Vehicle Types Covered:	LDGV, LDGT1, LDGT2, HDGV
Program Type:	Test Only
Inspection Frequency:	Biennial
Compliance Rate:	96%

The functional purge check is of the following specifications:

Program Start Year:	1995
First Model Year Covered:	1981
Last Model Year Covered:	2020
Vehicle Types Covered:	LDGV, LDGT1, LDGT2, HDGV
Program Type:	Test Only
Inspection Frequency:	Biennial
Compliance Rate:	96%

RLFLAG - RLFLAG is set to 4 for all analysis years. This tells the model to model the effects of a Stage II VRS and an On-Board Vapor Recovery System (OBVRS). Program specifications for the Stage II VRS are as follows:

Program Start Year:	1993
Phase in Period:	2
Percent Efficiency for LDGV, LDGTs	86%
Percent Efficiency for HDGV	86%
Program specifications for the On-board VRS are as follows:	
Program Start Year:	1998
Vehicle Types Covered:	LDGV, LDGT1, LDGT2, HDGV

The Mobile5a_h input files for these analyses appear in Appendix 3. Emission factors from these analyses appear in the emissions tables for the various analyses in Appendix 4.

III. Coordination in the Maintenance Area

The Clean Air Act Amendments (CAAA) of 1990 and the Intermodal Surface Transportation Efficiency Act (ISTEA) require that Air Quality Conformity Analyses of the NOACA Transportation Improvement Program (TIP) be coordinated in areas whose areas encompass more than one Metropolitan Planning Organization's (MPO) planning area. Responsibilities for conformity determinations in the aforementioned eight county area are identified in Table 12.

Table 12: Agencies Responsible for Conformity Determination in Sub-Areas of CAL

Sub-Area	Lead Agency
Cuyahoga, Geauga, Lake, Lorain, and Medina Counties	NOACA
Summit and Portage Counties	AMATS
Ashtabula County	ODOT (on behalf of Ashtabula County)

To ensure this coordination, a meeting of these planning partners, FHWA, and Ohio EPA was held at NOACA on April 15, 1994, during the preparation of the SFY 1995 TIP, to discuss the planning methodologies utilized for the three sub-areas of the nonattainment area. The meeting concluded with the determination that the methodologies for the sub-areas are compatible and will allow for a conformity determination to be made for the entire nonattainment area. The methodologies used by the various areas for the conformity analyses for the SFY 97 TIP are the same as those used for previous TIPs. The Ohio Department of Transportation (ODOT) asked NOACA to coordinate the preparation of the area inclusive conformity document for the SFY 1997 TIPs. This NOACA area conformity document appears as Attachment D to that full maintenance area document.

IV. NO_X Emission Credits for CNG Bus Replacements

NO_X emission deficits in any analysis year can be offset by crediting emission reductions from the replacement of diesel buses with CNG-powered vehicles. A methodology for crediting these reductions was approved by USEPA (see Appendix 4) during 1994. The calculated NO_X emission reductions total 0.3373 Tons/day.

V. Off-Model Analyses

Capacity increasing transportation projects which are regionally significant and are outside the area covered by the transportation planning model must be analyzed as single projects for conformity purposes.

The SFY 1997 TIP includes one project, the widening of IR-71 in Medina County, meeting this description. This projects expected completion date is post 1997. It is analyzed for 2006 and 2010 conditions. Table 13 displays the emission changes generated by this project. Note that these emission values are reported in grams/day due to the small emission changes generated by a single project.

The following descriptions, as labeled on the detailed tables found in Appendix 5, provide information on data sources, calculations, and assumptions used in producing these emission estimates:

A) Average Daily Traffic (ADT) data was obtained from the Ohio Department of Transportation, Bureau of Technical Services. They provided average daily traffic projections for the years 1995 and 2015. 2006 and 2010 ADT were derived by proportioning the difference between 1995 and 2015 using the following equations:

2006 ADT = (2015 ADT - ((2015 ADT-1995 ADT)*(9/20)))

2010 ADT = (2015 ADT - ((2015 ADT-1995 ADT)*(15/20)))

B) Average Daily VMT is calculated by multiplying ADT by segment length.

C) 4-lane and 6-lane speeds were calculated using delay/congestion assumptions for the years 2006 and 2010 (calculations appear in addendum to Appendix 5).

D) 1) Emission factors in grams/mile for specific speeds were generated using the USEPA MOBILE5a emission factor model. Modelling assumptions are the same as those used for the network analysis.

2) The difference in National Default Speeds for Rural Interstates between autos-vans-pick-ups, and trucks was calculated. These defaults are listed in Attachment D of the "Interim Guidance for the Preparation of Mobile Source

Emission Inventories" (USEPA, 1992). The average speed of autos, vans and pick-ups is 57.3 mph and trucks is 43.6 mph; so trucks are travelling at 76.1% of the speed of light duty vehicles on rural interstates.

3) Total VMT for each I-71 project segment was distributed to the eight vehicle classes required for MOBILE5a using the state default vehicle-type percentages provided by ODOT for interstates.

4) The speeds generated for I-71 project segments analysis were applied to the six light duty vehicle classes in MOBILE5a (LDGV, LDGT1, LDGT2, LDDV, LDDT and MC). Speeds for heavy duty vehicles (HDDV and HDGV) were reduced to 76.1% of light duty vehicles.

E) MOBILE5a emission factors by speed by vehicle type were applied to VMT by vehicle type to estimate emission changes between baseline and action scenarios for 2006 and baseline and action scenarios for 2010. Emission estimates were summed for the eight vehicle types and four project segments to estimate a total emissions burden from the baseline and action scenarios for the project as a whole.

F) Reductions or increases are calculated for the Baseline/Action comparisons.

For the first time, the hydrocarbon and nitrous oxides emission reduction credits from area signalization projects are being reported as components of the conformity determination for the SFY 1997-2000 TIP. The signalization projects and their associated emission reductions, which are being reported this year appear in Table 14a. Detailed tables displaying the reduction analyses for these projects appear in Appendix .

VI. Timely Implementation of TCMs

The November 15, 1993 SIP submittal for the Cleveland/Akron/Lorain area includes Transportation Control Measures (TCMs). The TCMs were identified for the Cleveland metropolitan area portion of this area. Cleveland recommended 10 traffic signalization projects for implementation from 1991 through 1993, 12 traffic signalization projects for implementation between 1994 and 1996, and 10 park and ride lots for construction between 1991 and 1996. The first set of 10 signal projects and 8 of the 10 park and ride lots have been implemented. Table 14b tracks the status of the remaining Cleveland TCMs.

Table 13: IR-71 Widening Single Project Air Quality Impact Analysis

SUMMARY OF HYDROCARBON EMISSIONS (GRAMS/DAY) BY VEHICLE TYPE IN 2006 AND 2010

	VEHICLE TYPE	2006 BASELINE EMISSIONS	2006 ACTION EMISSIONS	2010 BASELINE EMISSIONS	2010 ACTION EMISSIONS
1	LDGV	67,736	70,048	60,438	61,302
2	LDGT1	1,439	1,470	1,242	1,256
3	LDGT2	2,373	2,486	2,244	2,307
4	HDGV	6,271	5,998	5,401	5,090
5	LDDV	46	45	49	47
6	LDDT	63	62	67	65
7	HDDV	39,700	37,493	42,349	39,331
8	MC	1,138	1,177	1,197	1,229
	TOTAL	118,767	118,778	112,987	110,626
		INCREASE	11	REDUCTION	2,361

SUMMARY OF OXIDES OF NITROGEN EMISSIONS (GRAMS/DAY) BY VEHICLE TYPE IN 2006 AND 2010

	VEHICLE TYPE	2006 BASELINE EMISSIONS	2006 ACTION EMISSIONS	2010 BASELINE EMISSIONS	2010 ACTION EMISSIONS
1	LDGV	124,307	139,153	108,302	122,258
2	LDGT1	2,704	3,090	2,452	2,844
3	LDGT2	4,937	5,661	4,876	5,651
4	HDGV	15,475	15,846	15,381	15,828
5	LDDV	264	303	270	311
6	LDDT	287	330	293	337
7	HDDV	221,326	229,964	218,782	228,067
8	MC	250	278	257	289
	TOTAL	369,549	394,624	350,614	375,586
		INCREASE	25,075	INCREASE	24,972

Table 14a: NOACA Signalization Project Emission Reductions (Tons/Day)

Location	Project	HC Reduction	NO_x Reduction
North Olmsted (PID 7561)	signalization	0.234	0.024
Rocky River (PID 8373)	signalization	0.153	0.016
Eastlake (8778)	signalization	0.121	0.012
Willoughby (US20) (PID 10844)	signalization	0.050	0.005
Lyndhurst/ S. Euclid (Mayfield Rd.) (PID 7778)	signalization	0.144	0.015
Beachwood (Green Rd.) (PID 5525)	signalization	0.055	0.006
Wickliffe (Lakeland Blvd.)	signalization	0.038	0.004
Mayfield Heights (SOM Center)	signalization	0.039	0.004
North Royalton	signalization	0.452	0.046
Parma Heights	signalization	0.285	0.029
Bay Village	signalization	0.058	0.006
Chagrin Falls	signalization	0.033	0.003
Fairview Park (Lorain Rd)*	signalization	0.084	0.008
Warrensville Heights (Miles Rd)*	signalization	0.100	0.010
Cleveland (Lee Rd, Buckeye Rd, Lorain Rd)*	signalization	0.131	0.012
Painesville (State,St. Clair, Richmond, Grant, etc.)*	signalization	0.136	0.014
Strongsville (Pearl Rd)*	signalization	0.189	0.019
Bedford (Broadway, Northfield, Rockside, etc.)*	signalization	0.198	0.020
Bedford Heights (Aurora Rd)*	signalization	0.222	0.022
Euclid (Euclid Ave,Lakeshore, E 260th)*	signalization	0.299	0.030
Maple Heights (Libby, Broadway, Northfield, etc)*	signalization	0.320	0.032
Westlake (US 20)*	signalization	0.329	0.033
Middleburg Heights (Pearl rd)*	signalization	0.397	0.040
Shaker Heights (US 422/SR 87)*	signalization	0.417	0.042
Cleveland (CBD Phase II)*	signalization	0.427	0.040
Parma (Brookpark, State, Ridge, Snow, etc)*	signalization	0.839	0.083
	1997 TOTAL	1.662	0.17
	2006, 2010 TOTAL	5.75	0.575

*These projects' emission reductions are included only in 2006 and 2010 analyses since their completion by the end of 1997 is not certain.

Table 14b: Cleveland SIP TCM Status

Location	Project	Implementation Schedule	Status
North Royalton (PID 11841)	signalization	FY 95	
Parma Heights (PID 12789)	signalization	FY 94	
North Olmsted (PID 7561)	signalization	FY 94	Sold. Estimated Completion Date: 11/15/96
Rocky River (PID 8373)	signalization	FY 94	Sold. Estimated Completion Date: 5/29/96
Eastlake (8778)	signalization	FY 94	Complete
Bay Village (11842)	signalization	FY 94	
Willoughby (US20) (PID 10844)	signalization	FY 94	Sold. Estimasted Completion Date: 6/30/96
Lyndhurst/ S. Euclid (Mayfield Rd.) (PID 7778)	signalization	FY 95	Sold. Estimated Completion Date: 5/9/96
Beachwood (Green Rd.) (PID 5525)	signalization	FY 96	Sold. Estimated Completion Date: 10/31/96
Wickliffe (Lakeland Blvd.)	signalization	FY 94	Complete
Mayfield Heights (SOM Center)	signalization	FY 94	Complete
Chagrin Falls (PID 12639)	signalization	FY 95	
Euclid	park-n-ride lot	1996	Open
Westlake	park-n-ride lot	1996	Open

VII. Conformity to SIP Emission Budget and Baseline/Action Comparisons

Conformity to the SIP emission budget comparisons must be made on a maintenance area basis. The area includes eight counties in northeast Ohio: Ashtabula; Cuyahoga; Geauga; Lake; Lorain; Medina; Portage; and Summit Counties. Two MPOs serve seven of these counties. The Northeast Ohio Areawide Coordinating Agency (NOACA) is the MPO for Lorain, Cuyahoga, Lake, Geauga and Medina counties. The Akron Metropolitan Area Transportation Study (AMATS) is the MPO for Summit and Portage Counties and Chippewa Township in Wayne County. Wayne County is an attainment area and is therefore, not included in AMATS' conformity process. Ashtabula is a rural county on the extreme northeast border of the area. At the request of Ashtabula County, in August and September 1993, the County, the two MPOs, OEPA, and ODOT executed a memorandum of agreement exempting Ashtabula County from the Federal 3-C urban transportation planning process and specified a process for conducting the conformity analyses. The MPOs conducts the conformity analyses for their respective areas, while ODOT conducts the analysis for Ashtabula County.

NOACA and AMATS conformity demonstrations are combined here with the Ashtabula County emissions generated by ODOT to demonstrate conformity for the entire area. The Ashtabula County emissions are included in the budget comparison.

Maintenance areas are required to have a conforming Plan and TIP. This document describes the SFY 1997-2000 TIP conformity process for the CAL area. The Transportation Plan conformity analyses for the Cleveland and Akron Metropolitan Planning Organizations were submitted to the Federal Agencies in June, 1994 and were subsequently approved. Ashtabula County does not have a metropolitan area Transportation Plan due to its exemption from the urban transportation planning process requirements.

As required in the conformity regulations, an emissions budget test was conducted for each milestone year. The milestone years for the MPOs in this area were 1997, 2006, and 2010, the final year of the TIP and Plan.

Emission reductions resulting from "off model" sources are an important component in the CAL conformity demonstration. Once again, NO_X reductions from CNG bus replacements play an important role in the NO_X conformity demonstration. Both NOACA and AMATS have CNG conversion programs scheduled for implementation in their TIPs. For the first time, NOACA is reporting the HC and NO_X emission reductions generated by signalizations projects for assistance in meeting the conformity requirements.

For every milestone year, the area transportation emissions generated by the action scenarios are less than the 1996 emission budgets, which are set for them by the SIP. Table 15 illustrates the comparison of the TIP action scenarios to the emission budgets. Additionally, for every milestone year, the area emissions resulting from the TIP action scenarios are less than than the emissions resulting from the baseline scenarios. Table 16 illustrates the TIP baseline scenario vs. action scenario results.

Final Conformity Determination

Based on the above descriptions, conformity between the combined Cleveland/Akron/Lorain area's SFY 1997-2000 transportation programs and the Ohio State Implementation Plan has been determined. As described in this document, the conformity determination analyses were conducted consistent with the *Criteria and Procedures for Determining Conformity to State or Federal Implementation Plans of Transportation Plans, Programs and Projects Funded or Approved Under Title 23 U.S.C. or the Federal Transit Act*, 40 CFR Parts 51 and 93, issued November 24, 1993. **Accordingly, the State of Ohio concurs with MPO conformity determinations for the area TIPs included in this STIP.**

Table 15: Cleveland/Akron/Lorain TIP Budget Comparison

	NOACA (tons/day)		AMATS (tons/day)		Ashtabula[1] (tons/day)		Total (tons/day)		VMT (thousands)
	HC	NOx	HC	NOx	HC	NOx	HC	NOx	
1990 Baseline	161.20	120.65	75.53	46.35	11.65	9.60	248.38	176.60	62692.50
1996 Budget	62.60	120.65	29.91	46.35	6.99	9.61	99.50	176.61	65,466.45
1997 TIP Action	52.94	76.12	27.96	31.76	6.85	7.84	87.75	115.72	65406.69
2006 Budget[2]	30.68	50.77	12.94	18.73	5.18	5.90	48.80	75.40	
2006 TIP Action	24.30	48.89	14.75	19.45	5.99	6.59	45.04	74.92	69585.14
2010 TIP Action	20.77	45.07	12.75	17.97	5.91	6.57	39.43	69.61	71439.73

1. Ashtabula has been exempted from the metropolitan planning process and therefore does not have a Plan or a separate TIP. However, the mobile inventory, including VMT growth, is shown for Ashtabula.

2. These are the current redesignation budgets for the area. They are the 2006 projections from the Redesignation request.

Table 16: Cleveland/Akron/Lorain TIP Action/Baseline Comparison

	NOACA (tons/day)		AMATS (tons/day)		Ashtabula (tons/day)		Total (tons/day)	
	HC	NOx	HC	NOx	HC	NOx	HC	NOx
1997 TIP Action	52.94	76.12	27.96	31.76	6.85	7.84	87.75	115.72
1997 TIP Baseline	54.32	76.25	28.02	31.93	6.85	7.84	89.19	116.02
2006 TIP Action	24.30	48.89	14.75	19.45	5.99	6.59	45.04	74.92
2006 TIP Baseline	29.83	49.06	14.86	19.67	5.99	6.59	50.68	75.32
2010 TIP Action	20.77	45.07	12.75	17.97	5.91	6.57	39.43	69.61
2010 TIP Baseline	26.40	45.19	12.94	18.52	5.91	6.57	45.25	70.28

REFERENCES

FHWA, PLANPAC (March 1972)

NOACA, VOC/NO_x/CO Base Year 1988 Mobile Source Inventory for the Cleveland Four County Ozone Nonattainment Area; Northeast Ohio Areawide Coordinating Agency (July 1990)

NOACA, Modeling Methodology Update: 1990-2010; (March 1992)

US Congress, Public Law 101-549 (November 15, 1990)

USEPA, Procedures for Emission Inventory Preparation Volumes I and IV Mobile Sources EPA-450-14-81-026d (Revised), December, 1988

USEPA, User's Guide to MOBILE4-1 Mobile Source Emissions Model; USEPA, Ann Arbor, Michigan; February 1989

USEPA, User's Guide to MOBILE4-1: Mobile Source Emission Factor Model; Ann Arbor, Michigan; (July 1991)

USEPA, User's Guide to MOBILE5a, Chapter 2, Ann Arbor, Michigan; (March 1993)

USEPA, Section 187 VMT Forecasting and Tracking Guidance; (January 1992)

USEPA, Interim Guidance for the Preparation of Mobile Source Emission Inventories (January 1992)

United States Government Printing Office, Federal Register Vol. 57, No. 145, July 28, 1992.

United States Government Printing Office, Federal Register Vol. 58, No. 225, November 24, 1993.

Urban Analysis Group, TRANPLAN, Version 7.0 (1990)

APPENDIX 1

USEPA CORRESPONDENCE DEFINING 1997 BASELINE

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

REPLY TO THE ATTENTION OF

(AR-18J)

FEB 26 1996

Gordon Proctor, Deputy Director
Division of Multi-modal Planning
Ohio Department of Transportation
25 South Front Street
Columbus, Ohio 43215

Dear Mr. Proctor:

This letter addresses two topics: (1) the effect on conformity requirements of the 1995 particulate matter (PM) exceedances in Cuyahoga County, and (2) the interpretation of 40 CFR 51.438(b) for this year's conformity analyses.

In response to a concern regarding 1995 PM exceedances in Cuyahoga County and the possibility of requiring PM conformity analyses, the following course of action has been decided: Cleveland's 1997-2000 TIP Air Quality Conformity will not need to include PM modeling analyses.

The Ohio Environmental Protection Agency (OEPA) is currently preparing a submittal to the United States Environmental Protection Agency Region 5 that supports the fact that the PM exceedances in 1995 were due to fugitive dust sources, not to mobile source exhaust emissions. We understand that microscopic analysis performed on the respective monitor filters shows fugitive soil and roadway dust as the cause of the exceedances. A final decision on future PM conformity requirements will be made by our office after review of OEPA's submittal.

For the purposes of 40 CFR 51.438(b), the first analysis year may be assumed to be 1997 for ozone areas, since the analysis year of 1996 has passed.

If you have any questions regarding these matters please contact Patricia Morris, of my staff, at (312) 353-8656.

Sincerely yours,

Jay Bortzer, Chief
Regulation Development Section

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To Bill Davis	From Matt S.
Co. NOACA	Co. ODOT
Dept.	Phone #
Fax # (216) 621-3024	Fax #

cc: Herman Rodrigo
Federal Highway Administration Ohio Division

Chuck Gebhardt, Technical Services
Ohio Department of Transportation

Che Brewer-Coon and Harry Judson
Ohio Environmental Protection Agency

APPENDIX 2

SFY 1997 TRANSPORTATION IMPROVEMENT PROGRAM

HIGHWAY NETWORKS SUMMARY

APPENDIX 2
SFY 1997 TRANSPORTATION IMPROVEMENT PROGRAM
HIGHWAY NETWORKS SUMMARY

1990 Baseline: This is equivalent to the 1990 Cordon area portion of the network used in the 1990 SIP Baseline Inventory;

1997 Baseline*: This network is equivalent to the 1990 Baseline Network (transportation system which was open to traffic in 1990) plus completed or programmed, federally funded network changes which will be open to traffic during 1997;

96 TIP	97 TIP	COUNTY	ROUTE SECTION	PID
2006A	1997B	CUYAHOGA	SR 252 - 4.34	PID 8406 (SOLD)
2006A	1997B	LAKE	CENTER ST. EXTENSION	LOCAL PROJECT
(SOLD)				
2006A	1997B	LAKE	SR 640 - 1.18	PID 10778 (OPEN)
2006A	1997B	LORAIN	IR 80/BAUMHART RD.	TURNPIKE PROJECT
(OPEN)				

1997 Action*: This network is equivalent to the 1997 Baseline plus regionally significant, non-federally funded projects which will be open to traffic in 1997;

96 TIP	97 TIP	COUNTY	ROUTE SECTION	PID
	1997A	LORAIN	IR 80 - SR 57 to I-480	TURNPIKE PROJECT
1996A	1997A	LORAIN	IR 80 - SR 58 INTERCHANGE	TURNPIKE PROJECT

2006 Baseline*: The 2006 networks are required because analysis years may not be more than ten years apart according to the regulations. This network is equivalent to the 1997 Baseline plus programmed TIP projects which meet one or more of the following criteria:

1) Projects which are currently under construction or are undergoing right-of-way acquisition;
2) Projects which were programmed in the first three years of the SFY 1996 TIP;
3) Projects which have completed the NEPA process, and are expected to be open to traffic in 2006;

96 TIP	97 TIP	COUNTY	ROUTE SECTION	PID
2006A	2006B	CUYAHOGA	IR 71 - 00.00	PID 15717
2006A	2006B	CUYAHOGA	IR 71 - 03.32	PID 15717
2006B	2006B	CUYAHOGA	IR 271 - 05.26 (SECT. 9A)	PID 11039
2006B	2006B	CUYAHOGA	IR 271 - 05.34 (SECT. 6)	PID 11037
2006A	2006B	CUYAHOGA	IR 480 - 23.45/IR 480N - 00.00 (SECT. 9B)	PID 11040
2006A	2006B	CUYAHOGA	MILES RD.	PID 5314
1996A	2006B	CUYAHOGA	MILLER RD.	LOCAL PROJECT
2006B	2006B	CUYAHOGA	SNOW RD./ROCKSIDE RD.	PID 5248
2006B	2006B	CUYAHOGA	SR 91 - 00.00	PID 7900
2006A	2006B	CUYAHOGA	SR 176F - 10.14	PID 8448 (sold)
2006A	2006B	CUYAHOGA	SR 176F - 10.88	PID 12345
2006B	2006B	LAKE	IR 90 - 06.71	PID 5774
2006B	2006B	LAKE	SR 615 - 04.93	PID 11103
2006A	2006B	LORAIN	IR 90 - 13.01	PID 11385
2006A	2006B	LORAIN	IR 90 - 19.95	PID 5984
2006A	2006B	MEDINA	IR 71 - 15.94	PID 7885*

* These networks are forecasts.

2006 Action*: This network is equivalent to the 2006 Baseline plus 1997 Action projects plus any projects which do not meet the Baseline criteria and are expected to be open to traffic in 2006;

96 TIP	97 TIP	COUNTY	ROUTE SECTION	PID
2006A	2006A	CUYAHOGA	BAGLEY RD./PLEASANT VALLEY RD.	PID 10900
2006B	2006A	CUYAHOGA	COCHRAN RD.- RELOCATED	PID 5357
2010A	2006A	CUYAHOGA	CROCKER-STEARNS RD. EXTENSION	PID 8517
2010A	2006A	CUYAHOGA	GREEN RD.	PID 9698
2006A	2006A	CUYAHOGA	HILLIARD BLVD.	PID 8534
	2006A	CUYAHOGA	IR-80 - I-71 to SR-21	TURNPIKE PROJECT
	2006A	CUYAHOGA	IR-80 - I-480 to I-71	TURNPIKE PROJECT
2006A	2006A	CUYAHOGA	PLEASANT VALLEY RD.	PID 10901
2006A	2006A	CUYAHOGA	SR 291 - 00.88	PID 9283
2006A	2006A	LAKE	SR 84 - 8.14	PID 9670
2010A	2006A	LORAIN	COLORADO AVENUE (1)	PID 8844
2006A	2006A	LORAIN	COOPER FOSTER PARK RD. (2)	PID 7467
2006A	2006A	LORAIN	COOPER FOSTER PARK RD. (1)	PID 7466
2006B	2006A	LORAIN	E. BROAD ST.	PID 6170
	2006A	LORAIN	IR-80,W.CO.LINE to BAUMHART	TURNPIKE PROJECT
	2006A	LORAIN	IR-80,BAUMHART to SR-57	TURNPIKE PROJECT
2010A	2006A	LORAIN	SR 611 - 04.38	PID 4062
2010A	2006A	LORAIN	SR 611 - 05.66	LRTP PROJECT
2006A	2006A	LORAIN	TOWER BLVD. (1)	PID 7311

2010 Baseline*: This network is equivalent to the 2006 Baseline plus any projects which meet the Baseline criteria but are not expected to be open by the end of 2006; and

96 TIP	97 TIP	COUNTY	ROUTE SECTION	PID
2006B	2010B	CUYAHOGA	HARVARD RD. (SECT. 8)	PID 11038
2006A	2010B	CUYAHOGA	IR 90 - 00.00	PID 11738
2006B	2010B	CUYAHOGA	IR 271 - 06.53 (SECT. 7)	PID 9300
2006A	2010B	CUYAHOGA	SR 87 - 11.88/US 422 - 11.22	PID 9445
2006B	2010B	CUYAHOGA	SR 175 - 02.05 (SECT. 11)	PID 11042
2006B	2010B	CUYAHOGA	SR 175 - 03.14 (SECT. 5A)	PID 11035
2006B	2010B	CUYAHOGA	SR 175 - 03.66 (SECT. 10)	PID 11041
2006A	2010B	CUYAHOGA	SR 175 - 12.21	PID 14171
2006A	2010B	CUYAHOGA	SR 252 - 8.04	PID 9628
2006B	2010B	LAKE	IR 90 - 09.26/SR 615 - 01.83	PID 9331
2006B	2010B	LAKE	SR 615 - 02.82	PID 9332

2010 Action*: This network is equivalent to the 2010 LRTP Minimum Build Highway Network plus other regionally significant, federally or non-federally funded projects with clear funding sources which are expected to be open in 2010. The use of this network accounts for those LRTP projects which are not currently programmed but are expected to be complete by 2010.

96 TIP	97 TIP	COUNTY	ROUTE SECTION	PID
2006A	2010A	CUY/LAKE	US 6 - 28.16/00.00	PID 9246
2010A	2010A	CUYAHOGA	CLAGUE RD.	LRTP PROJECT
2010A	2010A	CUYAHOGA	E. 98TH ST. EXTENSION	PID 5369
2010A	2010A	CUYAHOGA	SPRAGUE RD.	LRTP PROJECT
2006A	2010A	CUYAHOGA	SR 82 - 00.00	PID 7848
2006A	2010A	CUYAHOGA	SR 82 - 3.66	PID 9222
2006A	2010A	CUYAHOGA	SR 82 - 4.23	PID 5557
2006A	2010A	CUYAHOGA	SR 82 - 4.87	PID 9005
2006A	2010A	CUYAHOGA	SR 82 - 8.16	PID 9223
2006A	2010A	CUYAHOGA	SR 175 - 10.98	PID 6504
2010A	2010A	CUYAHOGA	YORK ROAD	LRTP PROJECT
2006A	2010A	GEAUGA	SR 306 - 11.89/US 322 - 00.59	PID 6485
2006A	2010A	LAKE	IR 90 - 00.54/SR 84 - 00.43	PID 9247
2010A	2010A	LORAIN	ELYRIA INDUSTRIAL PARKWAY (3)	LRTP PROJECT
2006A	2010A	LORAIN	ELYRIA INDUSTRIAL PARKWAY (2)	PID 3938

APPENDIX 3

MOBILE 5A INPUT FILES FOR THE CONFORMITY ANALYSES

```
1           PROMPT - vertical flag input, no prompting
MOBILE5AH - SFY1997 TIP CONFORMITY - 3/26/96
1           TAMFLG - default tampering rates
1           SPDFLG - one speed per scenario for all vehicle types
3           VMFLAG - USER SUPPLIED MIX
3           MYMRFG - user supplied vehicle registration distributions
3           NEWFLG - default EXHAUST EMISSION RATES WITH EETP INFO
52          IMFLAG - TWO I/M PROGRAMS USING TIER 1 CREDITS
1           ALHFLG - no additional correction factor inputs
8           ATPFLG - ATP AND FUNCTIONAL PRESSURE AND PURGE TEST
4           RLFLAG - STAGE II AND ONBOARD VRS MODELLED
2           LOCFLG - single local area parameter record for all scenarios
1           TEMFLG - calculate exhaust temperatures
4           OUTFMT - 80-COLUMN DESCRIPTIVE
4           PRTFLG - HC, NOX, AND CO EMISSION FACTORS
1           IDLFLG - NO IDLE EMISSIONS CALCULATED
3           NMHFLG - VOC'S
1           HCFLAG - NO COMPONENT EMISSION FACTORS
.894.016.015.007.001.001.066.000
.075 .081 .090 .087 .080 .089 .085 .076 .050 .041
.039 .035 .042 .033 .028 .023 .011 .006 .005 .004
.004 .003 .002 .002 .008
.055 .099 .098 .092 .097 .073 .062 .033 .027 .029
.031 .047 .044 .037 .028 .017 .023 .023 .019 .013
.010 .009 .008 .006 .018
.038 .072 .071 .059 .064 .070 .067 .056 .046 .039
.029 .069 .060 .051 .039 .025 .023 .025 .018 .014
.010 .011 .010 .007 .025
.036 .062 .063 .056 .058 .063 .062 .049 .042 .035
.031 .065 .056 .050 .039 .032 .029 .033 .024 .018
.016 .016 .011 .011 .042
.075 .081 .090 .087 .080 .089 .085 .076 .050 .041
.039 .035 .042 .033 .028 .023 .011 .006 .005 .004
.004 .003 .002 .002 .008
.055 .099 .098 .092 .097 .073 .062 .033 .027 .029
.031 .047 .044 .037 .028 .017 .023 .023 .019 .013
.010 .009 .008 .006 .018
.057 .107 .103 .075 .080 .097 .089 .052 .046 .035
.042 .047 .034 .028 .012 .014 .017 .019 .012 .009
.006 .005 .005 .002 .007
.144 .168 .135 .109 .088 .070 .056 .045 .036 .029
.023 .097 .000 .000 .000 .000 .000 .000 .000 .000
.000 .000 .000 .000 .000
4
96 20.0
97 40.0
98 90.0
99 100.
95 20 70 20 02 00 096 1 2 2222 3111
95 20 81 20 00 03 096 1 2 2222 4211 0.80 20.0 2.00
95 70 20 2222 12 096. 22211212
95 70 20 2222 12 096.
95 81 20 2222 12 096..
93 2 86. 86.
98 2222
FREE IM SUM96    C  64.  94. 10.5  9.0 92 2
.035 .197 .027 .031 2
1 97 05.0 83.8 10.0 15.0 10.0  7
1 97 10.0 83.8 10.0 15.0 10.0  7
1 97 15.0 83.8 10.0 15.0 10.0  7
1 97 20.0 83.8 10.0 15.0 10.0  7
1 97 25.0 83.8 10.0 15.0 10.0  7
1 97 30.0 83.8 10.0 15.0 10.0  7
1 97 35.0 83.8 10.0 15.0 10.0  7
1 97 40.0 83.8 10.0 15.0 10.0  7
1 97 45.0 83.8 10.0 15.0 10.0  7
1 97 50.0 83.8 10.0 15.0 10.0  7
1 97 55.0 83.8 10.0 15.0 10.0  7
1 97 60.0 83.8 10.0 15.0 10.0  7
1 97 65.0 83.8 10.0 15.0 10.0  7
```

```
1           PROMPT - vertical flag input, no prompting
MOBILE5AH - SFY1997 TIP CONFORMITY - 3/26/96
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3           MYMRFG - user supplied vehicle registration distributions
3           NEWFLG - default EXHAUST EMISSION RATES WITH EETP INFO
52          IMFLAG - TWO I/M PROGRAMS USING TIER 1 CREDITS
1           ALHFLG - no additional correction factor inputs
8           ATPFLG - ATP AND FUNCTIONAL PRESSURE AND PURGE TEST
4           RLFLAG - STAGE II AND ONBOARD VRS MODELLED
2           LOCFLG - single local area parameter record for all scenarios
1           TEMFLG - calculate exhaust temperatures
4           OUTFMT - 80-COLUMN DESCRIPTIVE
4           PRTFLG - HC, NOX, AND CO EMISSION FACTORS
1           IDLFLG - NO IDLE EMISSIONS CALCULATED
3           NMHFLG - VOC'S
1           HCFLAG - NO COMPONENT EMISSION FACTORS
.949.012.011.002.001.001.022.002
.075 .081 .090 .087 .080 .089 .085 .076 .050 .041
.039 .035 .042 .033 .028 .023 .011 .006 .005 .004
.004 .003 .002 .002 .008
.055 .099 .098 .092 .097 .073 .062 .033 .027 .029
.031 .047 .044 .037 .028 .017 .023 .023 .019 .013
.010 .009 .008 .006 .018
.038 .072 .071 .059 .064 .070 .067 .056 .046 .039
.029 .069 .060 .051 .039 .025 .023 .025 .018 .014
.010 .011 .010 .007 .025
.036 .062 .063 .056 .058 .063 .062 .049 .042 .035
.031 .065 .056 .050 .039 .032 .029 .033 .024 .018
.016 .016 .011 .011 .042
.075 .081 .090 .087 .080 .089 .085 .076 .050 .041
.039 .035 .042 .033 .028 .023 .011 .006 .005 .004
.004 .003 .002 .002 .008
.055 .099 .098 .092 .097 .073 .062 .033 .027 .029
.031 .047 .044 .037 .028 .017 .023 .023 .019 .013
.010 .009 .008 .006 .018
.057 .107 .103 .075 .080 .097 .089 .052 .046 .035
.042 .047 .034 .028 .012 .014 .017 .019 .012 .009
.006 .005 .005 .002 .007
.144 .168 .135 .109 .088 .070 .056 .045 .036 .029
.023 .097 .000 .000 .000 .000 .000 .000 .000 .000
.000 .000 .000 .000 .000
4
96 20.0
97 40.0
98 90.0
99 100.
95 20 70 20 02 00 096 1 2 2222 3111
95 20 81 20 00 03 096 1 2 2222 4211 0.80 20.0 2.00
95 70 20 2222 12 096. 22211212
95 70 20 2222 12 096.
95 81 20 2222 12 096..
93 2 86. 86.
98 2222
MJOR IM SUM96    C  64.  94. 10.5  9.0 92 2
.035 .197 .027 .031 2
1 97 05.0 83.8 15.0 20.0 15.0  7
1 97 10.0 83.8 15.0 20.0 15.0  7
1 97 15.0 83.8 15.0 20.0 15.0  7
1 97 20.0 83.8 15.0 20.0 15.0  7
1 97 25.0 83.8 15.0 20.0 15.0  7
1 97 30.0 83.8 15.0 20.0 15.0  7
1 97 35.0 83.8 15.0 20.0 15.0  7
1 97 40.0 83.8 15.0 20.0 15.0  7
1 97 45.0 83.8 15.0 20.0 15.0  7
1 97 50.0 83.8 15.0 20.0 15.0  7
1 97 55.0 83.8 15.0 20.0 15.0  7
1 97 60.0 83.8 15.0 20.0 15.0  7
1 97 65.0 83.8 15.0 20.0 15.0  7
```

```
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52          IMFLAG - TWO I/M PROGRAMS USING TIER 1 CREDITS
1           ALHFLG - no additional correction factor inputs
8           ATPFLG - ATP AND FUNCTIONAL PRESSURE AND PURGE TEST
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1           TEMFLG - calculate exhaust temperatures
4           OUTFMT - 80-COLUMN DESCRIPTIVE
4           PRTFLG - HC, NOX, AND CO EMISSION FACTORS
1           IDLFLG - NO IDLE EMISSIONS CALCULATED
3           NMHFLG - VOC'S
1           HCFLAG - NO COMPONENT EMISSION FACTORS
.835.070.070.000.010.010.000.005
.075 .081 .090 .087 .080 .089 .085 .076 .050 .041
.039 .035 .042 .033 .028 .023 .011 .006 .005 .004
.004 .003 .002 .002 .008
.055 .099 .098 .092 .097 .073 .062 .033 .027 .029
.031 .047 .044 .037 .028 .017 .023 .023 .019 .013
.010 .009 .008 .006 .018
.038 .072 .071 .059 .064 .070 .067 .056 .046 .039
.029 .069 .060 .051 .039 .025 .023 .025 .018 .014
.010 .011 .010 .007 .025
.036 .062 .063 .056 .058 .063 .062 .049 .042 .035
.031 .065 .056 .050 .039 .032 .029 .033 .024 .018
.016 .016 .011 .011 .042
.075 .081 .090 .087 .080 .089 .085 .076 .050 .041
.039 .035 .042 .033 .028 .023 .011 .006 .005 .004
.004 .003 .002 .002 .008
.055 .099 .098 .092 .097 .073 .062 .033 .027 .029
.031 .047 .044 .037 .028 .017 .023 .023 .019 .013
.010 .009 .008 .006 .018
.057 .107 .103 .075 .080 .097 .089 .052 .046 .035
.042 .047 .034 .028 .012 .014 .017 .019 .012 .009
.006 .005 .005 .002 .007
.144 .168 .135 .109 .088 .070 .056 .045 .036 .029
.023 .097 .000 .000 .000 .000 .000 .000 .000 .000
.000 .000 .000 .000 .000
4
96 20.0
97 40.0
98 90.0
99 100.
95 20 70 20 02 00 096 1 2 2222 3111
95 20 81 20 00 03 096 1 2 2222 4211 0.80 20.0 2.00
95 70 20 2222 12 096. 22211212
95 70 20 2222 12 096.
95 81 20 2222 12 096..
93 2 86. 86.
98 2222
SPEC IM SUM96    C  64.  94. 10.5  9.0 92 2
.035 .197 .027 .031 2
1 97 05.0 83.8 20.0 15.0 20.0  7
1 97 10.0 83.8 20.0 15.0 20.0  7
1 97 15.0 83.8 20.0 15.0 20.0  7
1 97 20.0 83.8 20.0 15.0 20.0  7
1 97 25.0 83.8 20.0 15.0 20.0  7
1 97 30.0 83.8 20.0 15.0 20.0  7
1 97 35.0 83.8 20.0 15.0 20.0  7
1 97 40.0 83.8 20.0 15.0 20.0  7
1 97 45.0 83.8 20.0 15.0 20.0  7
1 97 50.0 83.8 20.0 15.0 20.0  7
1 97 55.0 83.8 20.0 15.0 20.0  7
1 97 60.0 83.8 20.0 15.0 20.0  7
1 97 65.0 83.8 20.0 15.0 20.0  7
```

```
1           PROMPT - vertical flag input, no prompting
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2           LOCFLG - single local area parameter record for all scenarios
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4           PRTFLG - HC, NOX, AND CO EMISSION FACTORS
1           IDLFLG - NO IDLE EMISSIONS CALCULATED
3           NMHFLG - VOC'S
1           HCFLAG - NO COMPONENT EMISSION FACTORS
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.031 .047 .044 .037 .028 .017 .023 .023 .019 .013
.010 .009 .008 .006 .018
.038 .072 .071 .059 .064 .070 .067 .056 .046 .039
.029 .069 .060 .051 .039 .025 .023 .025 .018 .014
.010 .011 .010 .007 .025
.036 .062 .063 .056 .058 .063 .062 .049 .042 .035
.031 .065 .056 .050 .039 .032 .029 .033 .024 .018
.016 .016 .011 .011 .042
.075 .081 .090 .087 .080 .089 .085 .076 .050 .041
.039 .035 .042 .033 .028 .023 .011 .006 .005 .004
.004 .003 .002 .002 .008
.055 .099 .098 .092 .097 .073 .062 .033 .027 .029
.031 .047 .044 .037 .028 .017 .023 .023 .019 .013
.010 .009 .008 .006 .018
.057 .107 .103 .075 .080 .097 .089 .052 .046 .035
.042 .047 .034 .028 .012 .014 .017 .019 .012 .009
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.144 .168 .135 .109 .088 .070 .056 .045 .036 .029
.023 .097 .000 .000 .000 .000 .000 .000 .000 .000
.000 .000 .000 .000 .000
4
96 20.0
97 40.0
98 90.0
99 100.
95 20 70 20 02 00 096 1 2 2222 3111
95 20 81 20 00 03 096 1 2 2222 4211 0.80 20.0 2.00
95 70 20 2222 12 096. 22211212
95 70 20 2222 12 096.
95 81 20 2222 12 096..
93 2 86. 86.
98 2222
TOLL IM SUM96    C  64.  94. 10.5  9.0 92 2
.035 .197 .027 .031 2
1 97 05.0 83.8 10.0 15.0 10.0  7
1 97 10.0 83.8 10.0 15.0 10.0  7
1 97 15.0 83.8 10.0 15.0 10.0  7
1 97 20.0 83.8 10.0 15.0 10.0  7
1 97 25.0 83.8 10.0 15.0 10.0  7
1 97 30.0 83.8 10.0 15.0 10.0  7
1 97 35.0 83.8 10.0 15.0 10.0  7
1 97 40.0 83.8 10.0 15.0 10.0  7
1 97 45.0 83.8 10.0 15.0 10.0  7
1 97 50.0 83.8 10.0 15.0 10.0  7
1 97 55.0 83.8 10.0 15.0 10.0  7
1 97 60.0 83.8 10.0 15.0 10.0  7
1 97 65.0 83.8 10.0 15.0 10.0  7
```

```
1           PROMPT - vertical flag input, no prompting
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4           PRTFLG - HC, NOX, AND CO EMISSION FACTORS
1           IDLFLG - NO IDLE EMISSIONS CALCULATED
3           NMHFLG - VOC'S
1           HCFLAG - NO COMPONENT EMISSION FACTORS
.972.004.004.001.001.001.016.001
.075 .081 .090 .087 .080 .089 .085 .076 .050 .041
.039 .035 .042 .033 .028 .023 .011 .006 .005 .004
.004 .003 .002 .002 .008
.055 .099 .098 .092 .097 .073 .062 .033 .027 .029
.031 .047 .044 .037 .028 .017 .023 .023 .019 .013
.010 .009 .008 .006 .018
.038 .072 .071 .059 .064 .070 .067 .056 .046 .039
.029 .069 .060 .051 .039 .025 .023 .025 .018 .014
.010 .011 .010 .007 .025
.036 .062 .063 .056 .058 .063 .062 .049 .042 .035
.031 .065 .056 .050 .039 .032 .029 .033 .024 .018
.016 .016 .011 .011 .042
.075 .081 .090 .087 .080 .089 .085 .076 .050 .041
.039 .035 .042 .033 .028 .023 .011 .006 .005 .004
.004 .003 .002 .002 .008
.055 .099 .098 .092 .097 .073 .062 .033 .027 .029
.031 .047 .044 .037 .028 .017 .023 .023 .019 .013
.010 .009 .008 .006 .018
.057 .107 .103 .075 .080 .097 .089 .052 .046 .035
.042 .047 .034 .028 .012 .014 .017 .019 .012 .009
.006 .005 .005 .002 .007
.144 .168 .135 .109 .088 .070 .056 .045 .036 .029
.023 .097 .000 .000 .000 .000 .000 .000 .000 .000
.000 .000 .000 .000 .000
4
96 20.0
97 40.0
98 90.0
99 100.
95 20 70 20 02 00 096 1 2 2222 3111
95 20 81 20 00 03 096 1 2 2222 4211 0.80 20.0 2.00
95 70 20 2222 12 096. 22211212
95 70 20 2222 12 096.
95 81 20 2222 12 096..
93 2 86. 86.
98 2222
MNOR IM SUM96     C  64.  94. 10.5  9.0 92 2
.035 .197 .027 .031 2
1 97 05.0 83.8 15.0 20.0 15.0  7
1 97 10.0 83.8 15.0 20.0 15.0  7
1 97 15.0 83.8 15.0 20.0 15.0  7
1 97 20.0 83.8 15.0 20.0 15.0  7
1 97 25.0 83.8 15.0 20.0 15.0  7
1 97 30.0 83.8 15.0 20.0 15.0  7
1 97 35.0 83.8 15.0 20.0 15.0  7
1 97 40.0 83.8 15.0 20.0 15.0  7
1 97 45.0 83.8 15.0 20.0 15.0  7
1 97 50.0 83.8 15.0 20.0 15.0  7
1 97 55.0 83.8 15.0 20.0 15.0  7
1 97 60.0 83.8 15.0 20.0 15.0  7
1 97 65.0 83.8 15.0 20.0 15.0  7
```

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1           IDLFLG - NO IDLE EMISSIONS CALCULATED
3           NMHFLG - VOC'S
1           HCFLAG - NO COMPONENT EMISSION FACTORS
.971.008.008.001.001.001.009.001
.075 .081 .090 .087 .080 .089 .085 .076 .050 .041
.039 .035 .042 .033 .028 .023 .011 .006 .005 .004
.004 .003 .002 .002 .008
.055 .099 .098 .092 .097 .073 .062 .033 .027 .029
.031 .047 .044 .037 .028 .017 .023 .023 .019 .013
.010 .009 .008 .006 .018
.038 .072 .071 .059 .064 .070 .067 .056 .046 .039
.029 .069 .060 .051 .039 .025 .023 .025 .018 .014
.010 .011 .010 .007 .025
.036 .062 .063 .056 .058 .063 .062 .049 .042 .035
.031 .065 .056 .050 .039 .032 .029 .033 .024 .018
.016 .016 .011 .011 .042
.075 .081 .090 .087 .080 .089 .085 .076 .050 .041
.039 .035 .042 .033 .028 .023 .011 .006 .005 .004
.004 .003 .002 .002 .008
.055 .099 .098 .092 .097 .073 .062 .033 .027 .029
.031 .047 .044 .037 .028 .017 .023 .023 .019 .013
.010 .009 .008 .006 .018
.057 .107 .103 .075 .080 .097 .089 .052 .046 .035
.042 .047 .034 .028 .012 .014 .017 .019 .012 .009
.006 .005 .005 .002 .007
.144 .168 .135 .109 .088 .070 .056 .045 .036 .029
.023 .097 .000 .000 .000 .000 .000 .000 .000 .000
.000 .000 .000 .000 .000
4
96 20.0
97 40.0
98 90.0
99 100.
95 20 70 20 02 00 096 1 2 2222 3111
95 20 81 20 00 03 096 1 2 2222 4211 0.80 20.0 2.00
95 70 20 2222 12 096. 22211212
95 70 20 2222 12 096.
95 81 20 2222 12 096..
93 2 86. 86.
98 2222
OTHE IM SUM96    C  64.  94. 10.5  9.0 92 2
.035 .197 .027 .031 2
1 97 05.0 83.8 15.0 20.0 15.0  7
1 97 10.0 83.8 15.0 20.0 15.0  7
1 97 15.0 83.8 15.0 20.0 15.0  7
1 97 20.0 83.8 15.0 20.0 15.0  7
1 97 25.0 83.8 15.0 20.0 15.0  7
1 97 30.0 83.8 15.0 20.0 15.0  7
1 97 35.0 83.8 15.0 20.0 15.0  7
1 97 40.0 83.8 15.0 20.0 15.0  7
1 97 45.0 83.8 15.0 20.0 15.0  7
1 97 50.0 83.8 15.0 20.0 15.0  7
1 97 55.0 83.8 15.0 20.0 15.0  7
1 97 60.0 83.8 15.0 20.0 15.0  7
1 97 65.0 83.8 15.0 20.0 15.0  7
```

```
1           PROMPT - vertical flag input, no prompting
MOBILE5AH - SFY1997 TIP CONFORMITY - 3/26/96
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4           PRTFLG - HC, NOX, AND CO EMISSION FACTORS
1           IDLFLG - NO IDLE EMISSIONS CALCULATED
3           NMHFLG - VOC'S
1           HCFLAG - NO COMPONENT EMISSION FACTORS
.894.016.015.007.001.001.066.000
.075 .081 .090 .087 .080 .089 .085 .076 .050 .041
.039 .035 .042 .033 .028 .023 .011 .006 .005 .004
.004 .003 .002 .002 .008
.055 .099 .098 .092 .097 .073 .062 .033 .027 .029
.031 .047 .044 .037 .028 .017 .023 .023 .019 .013
.010 .009 .008 .006 .018
.038 .072 .071 .059 .064 .070 .067 .056 .046 .039
.029 .069 .060 .051 .039 .025 .023 .025 .018 .014
.010 .011 .010 .007 .025
.036 .062 .063 .056 .058 .063 .062 .049 .042 .035
.031 .065 .056 .050 .039 .032 .029 .033 .024 .018
.016 .016 .011 .011 .042
.075 .081 .090 .087 .080 .089 .085 .076 .050 .041
.039 .035 .042 .033 .028 .023 .011 .006 .005 .004
.004 .003 .002 .002 .008
.055 .099 .098 .092 .097 .073 .062 .033 .027 .029
.031 .047 .044 .037 .028 .017 .023 .023 .019 .013
.010 .009 .008 .006 .018
.057 .107 .103 .075 .080 .097 .089 .052 .046 .035
.042 .047 .034 .028 .012 .014 .017 .019 .012 .009
.006 .005 .005 .002 .007
.144 .168 .135 .109 .088 .070 .056 .045 .036 .029
.023 .097 .000 .000 .000 .000 .000 .000 .000 .000
.000 .000 .000 .000 .000
4
96 20.0
97 40.0
98 90.0
99 100.
95 20 70 20 02 00 096 1 2 2222 3111
95 20 81 20 00 03 096 1 2 2222 4211 0.80 20.0 2.00
95 70 20 2222 12 096. 22211212
95 70 20 2222 12 096.
95 81 20 2222 12 096..
93 2 86. 86.
98 2222
FREE IM SUM06    C  64.  94. 10.5  9.0 92 2
.035 .197 .027 .031 2
1 06 05.0 83.8 10.0 15.0 10.0  7
1 06 10.0 83.8 10.0 15.0 10.0  7
1 06 15.0 83.8 10.0 15.0 10.0  7
1 06 20.0 83.8 10.0 15.0 10.0  7
1 06 25.0 83.8 10.0 15.0 10.0  7
1 06 30.0 83.8 10.0 15.0 10.0  7
1 06 35.0 83.8 10.0 15.0 10.0  7
1 06 40.0 83.8 10.0 15.0 10.0  7
1 06 45.0 83.8 10.0 15.0 10.0  7
1 06 50.0 83.8 10.0 15.0 10.0  7
1 06 55.0 83.8 10.0 15.0 10.0  7
1 06 60.0 83.8 10.0 15.0 10.0  7
1 06 65.0 83.8 10.0 15.0 10.0  7
```

```
1           PROMPT - vertical flag input, no prompting
MOBILE5AH - SFY1997 TIP CONFORMITY - 3/26/96
1           TAMFLG - default tampering rates
1           SPDFLG - one speed per scenario for all vehicle types
3           VMFLAG - USER SUPPLIED MIX
3           MYMRFG - user supplied vehicle registration distributions
3           NEWFLG - default EXHAUST EMISSION RATES WITH EETP INFO
52          IMFLAG - TWO I/M PROGRAMS USING TIER 1 CREDITS
1           ALHFLG - no additional correction factor inputs
8           ATPFLG - ATP AND FUNCTIONAL PRESSURE AND PURGE TEST
4           RLFLAG - STAGE II AND ONBOARD VRS MODELLED
2           LOCFLG - single local area parameter record for all scenarios
1           TEMFLG - calculate exhaust temperatures
4           OUTFMT - 80-COLUMN DESCRIPTIVE
4           PRTFLG - HC, NOX, AND CO EMISSION FACTORS
1           IDLFLG - NO IDLE EMISSIONS CALCULATED
3           NMHFLG - VOC'S
1           HCFLAG - NO COMPONENT EMISSION FACTORS
.949.012.011.002.001.001.022.002
.075 .081 .090 .087 .080 .089 .085 .076 .050 .041
.039 .035 .042 .033 .028 .023 .011 .006 .005 .004
.004 .003 .002 .002 .008
.055 .099 .098 .092 .097 .073 .062 .033 .027 .029
.031 .047 .044 .037 .028 .017 .023 .023 .019 .013
.010 .009 .008 .006 .018
.038 .072 .071 .059 .064 .070 .067 .056 .046 .039
.029 .069 .060 .051 .039 .025 .023 .025 .018 .014
.010 .011 .010 .007 .025
.036 .062 .063 .056 .058 .063 .062 .049 .042 .035
.031 .065 .056 .050 .039 .032 .029 .033 .024 .018
.016 .016 .011 .011 .042
.075 .081 .090 .087 .080 .089 .085 .076 .050 .041
.039 .035 .042 .033 .028 .023 .011 .006 .005 .004
.004 .003 .002 .002 .008
.055 .099 .098 .092 .097 .073 .062 .033 .027 .029
.031 .047 .044 .037 .028 .017 .023 .023 .019 .013
.010 .009 .008 .006 .018
.057 .107 .103 .075 .080 .097 .089 .052 .046 .035
.042 .047 .034 .028 .012 .014 .017 .019 .012 .009
.006 .005 .005 .002 .007
.144 .168 .135 .109 .088 .070 .056 .045 .036 .029
.023 .097 .000 .000 .000 .000 .000 .000 .000 .000
.000 .000 .000 .000 .000
4
96 20.0
97 40.0
98 90.0
99 100.
95 20 70 20 02 00 096 1 2 2222 3111
95 20 81 20 00 03 096 1 2 2222 4211 0.80 20.0 2.00
95 70 20 2222 12 096. 22211212
95 70 20 2222 12 096.
95 81 20 2222 12 096..
93 2 86. 86.
98 2222
MJOR IM SUM06    C  64.  94. 10.5  9.0 92 2
.035 .197 .027 .031 2
1 06 05.0 83.8 15.0 20.0 15.0  7
1 06 10.0 83.8 15.0 20.0 15.0  7
1 06 15.0 83.8 15.0 20.0 15.0  7
1 06 20.0 83.8 15.0 20.0 15.0  7
1 06 25.0 83.8 15.0 20.0 15.0  7
1 06 30.0 83.8 15.0 20.0 15.0  7
1 06 35.0 83.8 15.0 20.0 15.0  7
1 06 40.0 83.8 15.0 20.0 15.0  7
1 06 45.0 83.8 15.0 20.0 15.0  7
1 06 50.0 83.8 15.0 20.0 15.0  7
1 06 55.0 83.8 15.0 20.0 15.0  7
1 06 60.0 83.8 15.0 20.0 15.0  7
1 06 65.0 83.8 15.0 20.0 15.0  7
```

```
1           PROMPT - vertical flag input, no prompting
MOBILE5AH - SFY1997 TIP CONFORMITY - 3/26/96
1           TAMFLG - default tampering rates
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4           PRTFLG - HC, NOX, AND CO EMISSION FACTORS
1           IDLFLG - NO IDLE EMISSIONS CALCULATED
3           NMHFLG - VOC'S
1           HCFLAG - NO COMPONENT EMISSION FACTORS
.835.070.070.000.010.010.000.005
.075 .081 .090 .087 .080 .089 .085 .076 .050 .041
.039 .035 .042 .033 .028 .023 .011 .006 .005 .004
.004 .003 .002 .002 .008
.055 .099 .098 .092 .097 .073 .062 .033 .027 .029
.031 .047 .044 .037 .028 .017 .023 .023 .019 .013
.010 .009 .008 .006 .018
.038 .072 .071 .059 .064 .070 .067 .056 .046 .039
.029 .069 .060 .051 .039 .025 .023 .025 .018 .014
.010 .011 .010 .007 .025
.036 .062 .063 .056 .058 .063 .062 .049 .042 .035
.031 .065 .056 .050 .039 .032 .029 .033 .024 .018
.016 .016 .011 .011 .042
.075 .081 .090 .087 .080 .089 .085 .076 .050 .041
.039 .035 .042 .033 .028 .023 .011 .006 .005 .004
.004 .003 .002 .002 .008
.055 .099 .098 .092 .097 .073 .062 .033 .027 .029
.031 .047 .044 .037 .028 .017 .023 .023 .019 .013
.010 .009 .008 .006 .018
.057 .107 .103 .075 .080 .097 .089 .052 .046 .035
.042 .047 .034 .028 .012 .014 .017 .019 .012 .009
.006 .005 .005 .002 .007
.144 .168 .135 .109 .088 .070 .056 .045 .036 .029
.023 .097 .000 .000 .000 .000 .000 .000 .000 .000
.000 .000 .000 .000 .000
4
96 20.0
97 40.0
98 90.0
99 100.
95 20 70 20 02 00 096 1 2 2222 3111
95 20 81 20 00 03 096 1 2 2222 4211 0.80 20.0 2.00
95 70 20 2222 12 096. 22211212
95 70 20 2222 12 096.
95 81 20 2222 12 096..
93 2 86. 86.
98 2222
SPEC IM SUM06    C  64.  94. 10.5  9.0 92 2
.035 .197 .027 .031 2
1 06 05.0 83.8 20.0 15.0 20.0  7
1 06 10.0 83.8 20.0 15.0 20.0  7
1 06 15.0 83.8 20.0 15.0 20.0  7
1 06 20.0 83.8 20.0 15.0 20.0  7
1 06 25.0 83.8 20.0 15.0 20.0  7
1 06 30.0 83.8 20.0 15.0 20.0  7
1 06 35.0 83.8 20.0 15.0 20.0  7
1 06 40.0 83.8 20.0 15.0 20.0  7
1 06 45.0 83.8 20.0 15.0 20.0  7
1 06 50.0 83.8 20.0 15.0 20.0  7
1 06 55.0 83.8 20.0 15.0 20.0  7
1 06 60.0 83.8 20.0 15.0 20.0  7
1 06 65.0 83.8 20.0 15.0 20.0  7
```

```
1           PROMPT - vertical flag input, no prompting
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1           TAMFLG - default tampering rates
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2           LOCFLG - single local area parameter record for all scenarios
1           TEMFLG - calculate exhaust temperatures
4           OUTFMT - 80-COLUMN DESCRIPTIVE
4           PRTFLG - HC, NOX, AND CO EMISSION FACTORS
1           IDLFLG - NO IDLE EMISSIONS CALCULATED
3           NMHFLG - VOC'S
1           HCFLAG - NO COMPONENT EMISSION FACTORS
.793.013.013.016.001.001.162.001
.075 .081 .090 .087 .080 .089 .085 .076 .050 .041
.039 .035 .042 .033 .028 .023 .011 .006 .005 .004
.004 .003 .002 .002 .008
.055 .099 .098 .092 .097 .073 .062 .033 .027 .029
.031 .047 .044 .037 .028 .017 .023 .023 .019 .013
.010 .009 .008 .006 .018
.038 .072 .071 .059 .064 .070 .067 .056 .046 .039
.029 .069 .060 .051 .039 .025 .023 .025 .018 .014
.010 .011 .010 .007 .025
.036 .062 .063 .056 .058 .063 .062 .049 .042 .035
.031 .065 .056 .050 .039 .032 .029 .033 .024 .018
.016 .016 .011 .011 .042
.075 .081 .090 .087 .080 .089 .085 .076 .050 .041
.039 .035 .042 .033 .028 .023 .011 .006 .005 .004
.004 .003 .002 .002 .008
.055 .099 .098 .092 .097 .073 .062 .033 .027 .029
.031 .047 .044 .037 .028 .017 .023 .023 .019 .013
.010 .009 .008 .006 .018
.057 .107 .103 .075 .080 .097 .089 .052 .046 .035
.042 .047 .034 .028 .012 .014 .017 .019 .012 .009
.006 .005 .005 .002 .007
.144 .168 .135 .109 .088 .070 .056 .045 .036 .029
.023 .097 .000 .000 .000 .000 .000 .000 .000 .000
.000 .000 .000 .000 .000
4
96 20.0
97 40.0
98 90.0
99 100.
95 20 70 20 02 00 096 1 2 2222 3111
95 20 81 20 00 03 096 1 2 2222 4211 0.80 20.0 2.00
95 70 20 2222 12 096. 22211212
95 70 20 2222 12 096.
95 81 20 2222 12 096..
93 2 86. 86.
98 2222
TOLL IM SUM06    C  64.  94. 10.5  9.0 92 2
.035 .197 .027 .031 2
1 06 05.0 83.8 10.0 15.0 10.0  7
1 06 10.0 83.8 10.0 15.0 10.0  7
1 06 15.0 83.8 10.0 15.0 10.0  7
1 06 20.0 83.8 10.0 15.0 10.0  7
1 06 25.0 83.8 10.0 15.0 10.0  7
1 06 30.0 83.8 10.0 15.0 10.0  7
1 06 35.0 83.8 10.0 15.0 10.0  7
1 06 40.0 83.8 10.0 15.0 10.0  7
1 06 45.0 83.8 10.0 15.0 10.0  7
1 06 50.0 83.8 10.0 15.0 10.0  7
1 06 55.0 83.8 10.0 15.0 10.0  7
1 06 60.0 83.8 10.0 15.0 10.0  7
1 06 65.0 83.8 10.0 15.0 10.0  7
```

```
1           PROMPT - vertical flag input, no prompting
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4           OUTFMT - 80-COLUMN DESCRIPTIVE
4           PRTFLG - HC, NOX, AND CO EMISSION FACTORS
1           IDLFLG - NO IDLE EMISSIONS CALCULATED
3           NMHFLG - VOC'S
1           HCFLAG - NO COMPONENT EMISSION FACTORS
.972.004.004.001.001.001.016.001
.075 .081 .090 .087 .080 .089 .085 .076 .050 .041
.039 .035 .042 .033 .028 .023 .011 .006 .005 .004
.004 .003 .002 .002 .008
.055 .099 .098 .092 .097 .073 .062 .033 .027 .029
.031 .047 .044 .037 .028 .017 .023 .023 .019 .013
.010 .009 .008 .006 .018
.038 .072 .071 .059 .064 .070 .067 .056 .046 .039
.029 .069 .060 .051 .039 .025 .023 .025 .018 .014
.010 .011 .010 .007 .025
.036 .062 .063 .056 .058 .063 .062 .049 .042 .035
.031 .065 .056 .050 .039 .032 .029 .033 .024 .018
.016 .016 .011 .011 .042
.075 .081 .090 .087 .080 .089 .085 .076 .050 .041
.039 .035 .042 .033 .028 .023 .011 .006 .005 .004
.004 .003 .002 .002 .008
.055 .099 .098 .092 .097 .073 .062 .033 .027 .029
.031 .047 .044 .037 .028 .017 .023 .023 .019 .013
.010 .009 .008 .006 .018
.057 .107 .103 .075 .080 .097 .089 .052 .046 .035
.042 .047 .034 .028 .012 .014 .017 .019 .012 .009
.006 .005 .005 .002 .007
.144 .168 .135 .109 .088 .070 .056 .045 .036 .029
.023 .097 .000 .000 .000 .000 .000 .000 .000 .000
.000 .000 .000 .000 .000
4
96 20.0
97 40.0
98 90.0
99 100.
95 20 70 20 02 00 096 1 2 2222 3111
95 20 81 20 00 03 096 1 2 2222 4211 0.80 20.0 2.00
95 70 20 2222 12 096. 22211212
95 70 20 2222 12 096.
95 81 20 2222 12 096..
93 2 86. 86.
98 2222
MNOR IM SUM06    C  64.  94. 10.5  9.0 92 2
.035 .197 .027 .031 2
1 06 05.0 83.8 15.0 20.0 15.0  7
1 06 10.0 83.8 15.0 20.0 15.0  7
1 06 15.0 83.8 15.0 20.0 15.0  7
1 06 20.0 83.8 15.0 20.0 15.0  7
1 06 25.0 83.8 15.0 20.0 15.0  7
1 06 30.0 83.8 15.0 20.0 15.0  7
1 06 35.0 83.8 15.0 20.0 15.0  7
1 06 40.0 83.8 15.0 20.0 15.0  7
1 06 45.0 83.8 15.0 20.0 15.0  7
1 06 50.0 83.8 15.0 20.0 15.0  7
1 06 55.0 83.8 15.0 20.0 15.0  7
1 06 60.0 83.8 15.0 20.0 15.0  7
1 06 65.0 83.8 15.0 20.0 15.0  7
```

```
1           PROMPT - vertical flag input, no prompting
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1           IDLFLG - NO IDLE EMISSIONS CALCULATED
3           NMHFLG - VOC'S
1           HCFLAG - NO COMPONENT EMISSION FACTORS
.971.008.008.001.001.001.009.001
.075 .081 .090 .087 .080 .089 .085 .076 .050 .041
.039 .035 .042 .033 .028 .023 .011 .006 .005 .004
.004 .003 .002 .002 .008
.055 .099 .098 .092 .097 .073 .062 .033 .027 .029
.031 .047 .044 .037 .028 .017 .023 .023 .019 .013
.010 .009 .008 .006 .018
.038 .072 .071 .059 .064 .070 .067 .056 .046 .039
.029 .069 .060 .051 .039 .025 .023 .025 .018 .014
.010 .011 .010 .007 .025
.036 .062 .063 .056 .058 .063 .062 .049 .042 .035
.031 .065 .056 .050 .039 .032 .029 .033 .024 .018
.016 .016 .011 .011 .042
.075 .081 .090 .087 .080 .089 .085 .076 .050 .041
.039 .035 .042 .033 .028 .023 .011 .006 .005 .004
.004 .003 .002 .002 .008
.055 .099 .098 .092 .097 .073 .062 .033 .027 .029
.031 .047 .044 .037 .028 .017 .023 .023 .019 .013
.010 .009 .008 .006 .018
.057 .107 .103 .075 .080 .097 .089 .052 .046 .035
.042 .047 .034 .028 .012 .014 .017 .019 .012 .009
.006 .005 .005 .002 .007
.144 .168 .135 .109 .088 .070 .056 .045 .036 .029
.023 .097 .000 .000 .000 .000 .000 .000 .000 .000
.000 .000 .000 .000 .000
4
96 20.0
97 40.0
98 90.0
99 100.
95 20 70 20 02 00 096 1 2 2222 3111
95 20 81 20 00 03 096 1 2 2222 4211 0.80 20.0 2.00
95 70 20 2222 12 096. 22211212
95 70 20 2222 12 096.
95 81 20 2222 12 096..
93 2 86. 86.
98 2222
OTHE IM SUM06    C  64.  94. 10.5  9.0 92 2
.035 .197 .027 .031 2
1 06 05.0 83.8 15.0 20.0 15.0  7
1 06 10.0 83.8 15.0 20.0 15.0  7
1 06 15.0 83.8 15.0 20.0 15.0  7
1 06 20.0 83.8 15.0 20.0 15.0  7
1 06 25.0 83.8 15.0 20.0 15.0  7
1 06 30.0 83.8 15.0 20.0 15.0  7
1 06 35.0 83.8 15.0 20.0 15.0  7
1 06 40.0 83.8 15.0 20.0 15.0  7
1 06 45.0 83.8 15.0 20.0 15.0  7
1 06 50.0 83.8 15.0 20.0 15.0  7
1 06 55.0 83.8 15.0 20.0 15.0  7
1 06 60.0 83.8 15.0 20.0 15.0  7
1 06 65.0 83.8 15.0 20.0 15.0  7
```

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1           PROMPT - vertical flag input, no prompting
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1           IDLFLG - NO IDLE EMISSIONS CALCULATED
3           NMHFLG - VOC'S
1           HCFLAG - NO COMPONENT EMISSION FACTORS
.894.016.015.007.001.001.066.000
.075 .081 .090 .087 .080 .089 .085 .076 .050 .041
.039 .035 .042 .033 .028 .023 .011 .006 .005 .004
.004 .003 .002 .002 .008
.055 .099 .098 .092 .097 .073 .062 .033 .027 .029
.031 .047 .044 .037 .028 .017 .023 .023 .019 .013
.010 .009 .008 .006 .018
.038 .072 .071 .059 .064 .070 .067 .056 .046 .039
.029 .069 .060 .051 .039 .025 .023 .025 .018 .014
.010 .011 .010 .007 .025
.036 .062 .063 .056 .058 .063 .062 .049 .042 .035
.031 .065 .056 .050 .039 .032 .029 .033 .024 .018
.016 .016 .011 .011 .042
.075 .081 .090 .087 .080 .089 .085 .076 .050 .041
.039 .035 .042 .033 .028 .023 .011 .006 .005 .004
.004 .003 .002 .002 .008
.055 .099 .098 .092 .097 .073 .062 .033 .027 .029
.031 .047 .044 .037 .028 .017 .023 .023 .019 .013
.010 .009 .008 .006 .018
.057 .107 .103 .075 .080 .097 .089 .052 .046 .035
.042 .047 .034 .028 .012 .014 .017 .019 .012 .009
.006 .005 .005 .002 .007
.144 .168 .135 .109 .088 .070 .056 .045 .036 .029
.023 .097 .000 .000 .000 .000 .000 .000 .000 .000
.000 .000 .000 .000 .000
4
96 20.0
97 40.0
98 90.0
99 100.
95 20 70 20 02 00 096 1 2 2222 3111
95 20 81 20 00 03 096 1 2 2222 4211 0.80 20.0 2.00
95 70 20 2222 12 096. 22211212
95 70 20 2222 12 096.
95 81 20 2222 12 096..
93 2 86. 86.
98 2222
FREE IM SUM10    C  64.  94. 10.5  9.0 92 2
.035 .197 .027 .031 2
1 10 05.0 83.8 10.0 15.0 10.0  7
1 10 10.0 83.8 10.0 15.0 10.0  7
1 10 15.0 83.8 10.0 15.0 10.0  7
1 10 20.0 83.8 10.0 15.0 10.0  7
1 10 25.0 83.8 10.0 15.0 10.0  7
1 10 30.0 83.8 10.0 15.0 10.0  7
1 10 35.0 83.8 10.0 15.0 10.0  7
1 10 40.0 83.8 10.0 15.0 10.0  7
1 10 45.0 83.8 10.0 15.0 10.0  7
1 10 50.0 83.8 10.0 15.0 10.0  7
1 10 55.0 83.8 10.0 15.0 10.0  7
1 10 60.0 83.8 10.0 15.0 10.0  7
1 10 65.0 83.8 10.0 15.0 10.0  7
```

```
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MOBILE5AH - SFY1997 TIP CONFORMITY - 3/26/96
1           TAMFLG - default tampering rates
1           SPDFLG - one speed per scenario for all vehicle types
3           VMFLAG - USER SUPPLIED MIX
3           MYMRFG - user supplied vehicle registration distributions
3           NEWFLG - default EXHAUST EMISSION RATES WITH EETP INFO
52          IMFLAG - TWO I/M PROGRAMS USING TIER 1 CREDITS
1           ALHFLG - no additional correction factor inputs
8           ATPFLG - ATP AND FUNCTIONAL PRESSURE AND PURGE TEST
4           RLFLAG - STAGE II AND ONBOARD VRS MODELLED
2           LOCFLG - single local area parameter record for all scenarios
1           TEMFLG - calculate exhaust temperatures
4           OUTFMT - 80-COLUMN DESCRIPTIVE
4           PRTFLG - HC, NOX, AND CO EMISSION FACTORS
1           IDLFLG - NO IDLE EMISSIONS CALCULATED
3           NMHFLG - VOC'S
1           HCFLAG - NO COMPONENT EMISSION FACTORS
.949.012.011.002.001.001.022.002
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.010 .009 .008 .006 .018
.038 .072 .071 .059 .064 .070 .067 .056 .046 .039
.029 .069 .060 .051 .039 .025 .023 .025 .018 .014
.010 .011 .010 .007 .025
.036 .062 .063 .056 .058 .063 .062 .049 .042 .035
.031 .065 .056 .050 .039 .032 .029 .033 .024 .018
.016 .016 .011 .011 .042
.075 .081 .090 .087 .080 .089 .085 .076 .050 .041
.039 .035 .042 .033 .028 .023 .011 .006 .005 .004
.004 .003 .002 .002 .008
.055 .099 .098 .092 .097 .073 .062 .033 .027 .029
.031 .047 .044 .037 .028 .017 .023 .023 .019 .013
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.023 .097 .000 .000 .000 .000 .000 .000 .000 .000
.000 .000 .000 .000 .000
4
96 20.0
97 40.0
98 90.0
99 100.
95 20 70 20 02 00 096 1 2 2222 3111
95 20 81 20 00 03 096 1 2 2222 4211 0.80 20.0 2.00
95 70 20 2222 12 096. 22211212
95 70 20 2222 12 096.
95 81 20 2222 12 096..
93 2 86. 86.
98 2222
MJOR IM SUM10    C  64.  94. 10.5  9.0 92 2
.035 .197 .027 .031 2
1 10 05.0 83.8 15.0 20.0 15.0  7
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1 10 15.0 83.8 15.0 20.0 15.0  7
1 10 20.0 83.8 15.0 20.0 15.0  7
1 10 25.0 83.8 15.0 20.0 15.0  7
1 10 30.0 83.8 15.0 20.0 15.0  7
1 10 35.0 83.8 15.0 20.0 15.0  7
1 10 40.0 83.8 15.0 20.0 15.0  7
1 10 45.0 83.8 15.0 20.0 15.0  7
1 10 50.0 83.8 15.0 20.0 15.0  7
1 10 55.0 83.8 15.0 20.0 15.0  7
1 10 60.0 83.8 15.0 20.0 15.0  7
1 10 65.0 83.8 15.0 20.0 15.0  7
```

```
1           PROMPT - vertical flag input, no prompting
MOBILE5AH - SFY1997 TIP CONFORMITY - 3/26/96
1           TAMFLG - default tampering rates
1           SPDFLG - one speed per scenario for all vehicle types
3           VMFLAG - USER SUPPLIED MIX
3           MYMRFG - user supplied vehicle registration distributions
3           NEWFLG - default EXHAUST EMISSION RATES WITH EETP INFO
52          IMFLAG - TWO I/M PROGRAMS USING TIER 1 CREDITS
1           ALHFLG - no additional correction factor inputs
8           ATPFLG - ATP AND FUNCTIONAL PRESSURE AND PURGE TEST
4           RLFLAG - STAGE II AND ONBOARD VRS MODELLED
2           LOCFLG - single local area parameter record for all scenarios
1           TEMFLG - calculate exhaust temperatures
4           OUTFMT - 80-COLUMN DESCRIPTIVE
4           PRTFLG - HC, NOX, AND CO EMISSION FACTORS
1           IDLFLG - NO IDLE EMISSIONS CALCULATED
3           NMHFLG - VOC'S
1           HCFLAG - NO COMPONENT EMISSION FACTORS
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.004 .003 .002 .002 .008
.055 .099 .098 .092 .097 .073 .062 .033 .027 .029
.031 .047 .044 .037 .028 .017 .023 .023 .019 .013
.010 .009 .008 .006 .018
.038 .072 .071 .059 .064 .070 .067 .056 .046 .039
.029 .069 .060 .051 .039 .025 .023 .025 .018 .014
.010 .011 .010 .007 .025
.036 .062 .063 .056 .058 .063 .062 .049 .042 .035
.031 .065 .056 .050 .039 .032 .029 .033 .024 .018
.016 .016 .011 .011 .042
.075 .081 .090 .087 .080 .089 .085 .076 .050 .041
.039 .035 .042 .033 .028 .023 .011 .006 .005 .004
.004 .003 .002 .002 .008
.055 .099 .098 .092 .097 .073 .062 .033 .027 .029
.031 .047 .044 .037 .028 .017 .023 .023 .019 .013
.010 .009 .008 .006 .018
.057 .107 .103 .075 .080 .097 .089 .052 .046 .035
.042 .047 .034 .028 .012 .014 .017 .019 .012 .009
.006 .005 .005 .002 .007
.144 .168 .135 .109 .088 .070 .056 .045 .036 .029
.023 .097 .000 .000 .000 .000 .000 .000 .000 .000
.000 .000 .000 .000 .000
4
96 20.0
97 40.0
98 90.0
99 100.
95 20 70 20 02 00 096 1 2 2222 3111
95 20 81 20 00 03 096 1 2 2222 4211 0.80 20.0 2.00
95 70 20 2222 12 096. 22211212
95 70 20 2222 12 096.
95 81 20 2222 12 096..
93 2 86. 86.
98 2222
SPEC IM SUM10    C  64.  94. 10.5  9.0 92 2
.035 .197 .027 .031 2
1 10 05.0 83.8 20.0 15.0 20.0  7
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1 10 15.0 83.8 20.0 15.0 20.0  7
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1 10 25.0 83.8 20.0 15.0 20.0  7
1 10 30.0 83.8 20.0 15.0 20.0  7
1 10 35.0 83.8 20.0 15.0 20.0  7
1 10 40.0 83.8 20.0 15.0 20.0  7
1 10 45.0 83.8 20.0 15.0 20.0  7
1 10 50.0 83.8 20.0 15.0 20.0  7
1 10 55.0 83.8 20.0 15.0 20.0  7
1 10 60.0 83.8 20.0 15.0 20.0  7
1 10 65.0 83.8 20.0 15.0 20.0  7
```

```
1           PROMPT - vertical flag input, no prompting
MOBILE5AH - SFY1997 TIP CONFORMITY - 3/26/96
1           TAMFLG - default tampering rates
1           SPDFLG - one speed per scenario for all vehicle types
3           VMFLAG - USER SUPPLIED MIX
3           MYMRFG - user supplied vehicle registration distributions
3           NEWFLG - default EXHAUST EMISSION RATES WITH EETP INFO
52          IMFLAG - TWO I/M PROGRAMS USING TIER 1 CREDITS
1           ALHFLG - no additional correction factor inputs
8           ATPFLG - ATP AND FUNCTIONAL PRESSURE AND PURGE TEST
4           RLFLAG - STAGE II AND ONBOARD VRS MODELLED
2           LOCFLG - single local area parameter record for all scenarios
1           TEMFLG - calculate exhaust temperatures
4           OUTFMT - 80-COLUMN DESCRIPTIVE
4           PRTFLG - HC, NOX, AND CO EMISSION FACTORS
1           IDLFLG - NO IDLE EMISSIONS CALCULATED
3           NMHFLG - VOC'S
1           HCFLAG - NO COMPONENT EMISSION FACTORS
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.031 .047 .044 .037 .028 .017 .023 .023 .019 .013
.010 .009 .008 .006 .018
.038 .072 .071 .059 .064 .070 .067 .056 .046 .039
.029 .069 .060 .051 .039 .025 .023 .025 .018 .014
.010 .011 .010 .007 .025
.036 .062 .063 .056 .058 .063 .062 .049 .042 .035
.031 .065 .056 .050 .039 .032 .029 .033 .024 .018
.016 .016 .011 .011 .042
.075 .081 .090 .087 .080 .089 .085 .076 .050 .041
.039 .035 .042 .033 .028 .023 .011 .006 .005 .004
.004 .003 .002 .002 .008
.055 .099 .098 .092 .097 .073 .062 .033 .027 .029
.031 .047 .044 .037 .028 .017 .023 .023 .019 .013
.010 .009 .008 .006 .018
.057 .107 .103 .075 .080 .097 .089 .052 .046 .035
.042 .047 .034 .028 .012 .014 .017 .019 .012 .009
.006 .005 .005 .002 .007
.144 .168 .135 .109 .088 .070 .056 .045 .036 .029
.023 .097 .000 .000 .000 .000 .000 .000 .000 .000
.000 .000 .000 .000 .000
4
96 20.0
97 40.0
98 90.0
99 100.
95 20 70 20 02 00 096 1 2 2222 3111
95 20 81 20 00 03 096 1 2 2222 4211 0.80 20.0 2.00
95 70 20 2222 12 096. 22211212
95 70 20 2222 12 096.
95 81 20 2222 12 096..
93 2 86. 86.
98 2222
TOLL IM SUM10    C  64.  94. 10.5  9.0 92 2
.035 .197 .027 .031 2
1 10 05.0 83.8 10.0 15.0 10.0  7
1 10 10.0 83.8 10.0 15.0 10.0  7
1 10 15.0 83.8 10.0 15.0 10.0  7
1 10 20.0 83.8 10.0 15.0 10.0  7
1 10 25.0 83.8 10.0 15.0 10.0  7
1 10 30.0 83.8 10.0 15.0 10.0  7
1 10 35.0 83.8 10.0 15.0 10.0  7
1 10 40.0 83.8 10.0 15.0 10.0  7
1 10 45.0 83.8 10.0 15.0 10.0  7
1 10 50.0 83.8 10.0 15.0 10.0  7
1 10 55.0 83.8 10.0 15.0 10.0  7
1 10 60.0 83.8 10.0 15.0 10.0  7
1 10 65.0 83.8 10.0 15.0 10.0  7
```

```
1           PROMPT - vertical flag input, no prompting
MOBILE5AH - SFY1997 TIP CONFORMITY - 3/26/96
1           TAMFLG - default tampering rates
1           SPDFLG - one speed per scenario for all vehicle types
3           VMFLAG - USER SUPPLIED MIX
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4           PRTFLG - HC, NOX, AND CO EMISSION FACTORS
1           IDLFLG - NO IDLE EMISSIONS CALCULATED
3           NMHFLG - VOC'S
1           HCFLAG - NO COMPONENT EMISSION FACTORS
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.039 .035 .042 .033 .028 .023 .011 .006 .005 .004
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.055 .099 .098 .092 .097 .073 .062 .033 .027 .029
.031 .047 .044 .037 .028 .017 .023 .023 .019 .013
.010 .009 .008 .006 .018
.038 .072 .071 .059 .064 .070 .067 .056 .046 .039
.029 .069 .060 .051 .039 .025 .023 .025 .018 .014
.010 .011 .010 .007 .025
.036 .062 .063 .056 .058 .063 .062 .049 .042 .035
.031 .065 .056 .050 .039 .032 .029 .033 .024 .018
.016 .016 .011 .011 .042
.075 .081 .090 .087 .080 .089 .085 .076 .050 .041
.039 .035 .042 .033 .028 .023 .011 .006 .005 .004
.004 .003 .002 .002 .008
.055 .099 .098 .092 .097 .073 .062 .033 .027 .029
.031 .047 .044 .037 .028 .017 .023 .023 .019 .013
.010 .009 .008 .006 .018
.057 .107 .103 .075 .080 .097 .089 .052 .046 .035
.042 .047 .034 .028 .012 .014 .017 .019 .012 .009
.006 .005 .005 .002 .007
.144 .168 .135 .109 .088 .070 .056 .045 .036 .029
.023 .097 .000 .000 .000 .000 .000 .000 .000 .000
.000 .000 .000 .000 .000
4
96 20.0
97 40.0
98 90.0
99 100.
95 20 70 20 02 00 096 1 2 2222 3111
95 20 81 20 00 03 096 1 2 2222 4211 0.80 20.0 2.00
95 70 20 2222 12 096. 22211212
95 70 20 2222 12 096.
95 81 20 2222 12 096..
93 2 86. 86.
98 2222
MNOR IM SUM10    C  64.  94. 10.5  9.0 92 2
.035 .197 .027 .031 2
1 10 05.0 83.8 15.0 20.0 15.0  7
1 10 10.0 83.8 15.0 20.0 15.0  7
1 10 15.0 83.8 15.0 20.0 15.0  7
1 10 20.0 83.8 15.0 20.0 15.0  7
1 10 25.0 83.8 15.0 20.0 15.0  7
1 10 30.0 83.8 15.0 20.0 15.0  7
1 10 35.0 83.8 15.0 20.0 15.0  7
1 10 40.0 83.8 15.0 20.0 15.0  7
1 10 45.0 83.8 15.0 20.0 15.0  7
1 10 50.0 83.8 15.0 20.0 15.0  7
1 10 55.0 83.8 15.0 20.0 15.0  7
1 10 60.0 83.8 15.0 20.0 15.0  7
1 10 65.0 83.8 15.0 20.0 15.0  7
```

```
1           PROMPT - vertical flag input, no prompting
MOBILE5AH - SFY1997 TIP CONFORMITY - 3/26/96
1           TAMFLG - default tampering rates
1           SPDFLG - one speed per scenario for all vehicle types
3           VMFLAG - USER SUPPLIED MIX
3           MYMRFG - user supplied vehicle registration distributions
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2           LOCFLG - single local area parameter record for all scenarios
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4           OUTFMT - 80-COLUMN DESCRIPTIVE
4           PRTFLG - HC, NOX, AND CO EMISSION FACTORS
1           IDLFLG - NO IDLE EMISSIONS CALCULATED
3           NMHFLG - VOC'S
1           HCFLAG - NO COMPONENT EMISSION FACTORS
.971.008.008.001.001.001.009.001
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.055 .099 .098 .092 .097 .073 .062 .033 .027 .029
.031 .047 .044 .037 .028 .017 .023 .023 .019 .013
.010 .009 .008 .006 .018
.038 .072 .071 .059 .064 .070 .067 .056 .046 .039
.029 .069 .060 .051 .039 .025 .023 .025 .018 .014
.010 .011 .010 .007 .025
.036 .062 .063 .056 .058 .063 .062 .049 .042 .035
.031 .065 .056 .050 .039 .032 .029 .033 .024 .018
.016 .016 .011 .011 .042
.075 .081 .090 .087 .080 .089 .085 .076 .050 .041
.039 .035 .042 .033 .028 .023 .011 .006 .005 .004
.004 .003 .002 .002 .008
.055 .099 .098 .092 .097 .073 .062 .033 .027 .029
.031 .047 .044 .037 .028 .017 .023 .023 .019 .013
.010 .009 .008 .006 .018
.057 .107 .103 .075 .080 .097 .089 .052 .046 .035
.042 .047 .034 .028 .012 .014 .017 .019 .012 .009
.006 .005 .005 .002 .007
.144 .168 .135 .109 .088 .070 .056 .045 .036 .029
.023 .097 .000 .000 .000 .000 .000 .000 .000 .000
.000 .000 .000 .000 .000
4
96 20.0
97 40.0
98 90.0
99 100.
95 20 70 20 02 00 096 1 2 2222 3111
95 20 81 20 00 03 096 1 2 2222 4211 0.80 20.0 2.00
95 70 20 2222 12 096. 22211212
95 70 20 2222 12 096.
95 81 20 2222 12 096..
93 2 86. 86.
98 2222
OTHE IM SUM10    C  64.  94. 10.5  9.0 92 2
.035 .197 .027 .031 2
1 10 05.0 83.8 15.0 20.0 15.0  7
1 10 10.0 83.8 15.0 20.0 15.0  7
1 10 15.0 83.8 15.0 20.0 15.0  7
1 10 20.0 83.8 15.0 20.0 15.0  7
1 10 25.0 83.8 15.0 20.0 15.0  7
1 10 30.0 83.8 15.0 20.0 15.0  7
1 10 35.0 83.8 15.0 20.0 15.0  7
1 10 40.0 83.8 15.0 20.0 15.0  7
1 10 45.0 83.8 15.0 20.0 15.0  7
1 10 50.0 83.8 15.0 20.0 15.0  7
1 10 55.0 83.8 15.0 20.0 15.0  7
1 10 60.0 83.8 15.0 20.0 15.0  7
1 10 65.0 83.8 15.0 20.0 15.0  7
```

APPENDIX 4

DETAILED SUMMARY TABLES FOR THE CONFORMITY ANALYSES

FREEWAY HYDROCARBON EMISSIONS (TONS/DAY)

SPEED RANGE (MPH)	1997 EMISSION FACTOR grams/mile	1997 BASELINE VMT (Miles)	1997 BASELINE Emissions (Tons/Day)	1997 ACTION VMT (Miles)	1997 ACTION Emissions (Tons/Day)	2006 EMISSION FACTOR grams/mile	2006 BASELINE VMT (Miles)	2006 BASELINE Emissions (Tons/Day)	2006 ACTION VMT (Miles)	2006 ACTION Emissions (Tons/Day)	2010 EMISSION FACTOR grams/mile	2010 BASELINE VMT (Miles)	2010 BASELINE Emissions (Tons/Day)	2010 ACTION VMT (Miles)	2010 ACTION Emissions (Tons/Day)
0-5	5.17	0	0.00	0	0.00	2.53	0	0.00	0	0.00	2.16	0	0.00	0	0.00
5.1 - 10	3.01	0	0.00	0	0.00	1.49	4,247	0.01	2,358	0.00	1.27	4,065	0.01	3,498	0.00
10.1 - 15	2.20	7,701	0.02	7,351	0.02	1.12	6,820	0.01	5,957	0.01	0.96	7,869	0.01	6,294	0.01
15.1 - 20	1.60	19,780	0.03	18,973	0.03	0.86	16,559	0.02	19,208	0.02	0.75	16,848	0.01	20,562	0.02
20.1 - 25	1.38	48,034	0.07	48,190	0.07	0.74	35,683	0.03	23,427	0.02	0.64	19,895	0.01	22,099	0.02
25.1 - 30	1.22	465,112	0.63	476,285	0.64	0.65	498,317	0.36	473,235	0.34	0.56	710,791	0.44	541,108	0.33
30.1 - 35	1.09	1,065,515	1.28	1,010,982	1.21	0.58	1,389,244	0.89	1,234,745	0.79	0.51	1,444,097	0.81	1,315,158	0.74
35.1 - 40	0.98	3,915,276	4.23	3,789,619	4.09	0.53	4,293,148	2.51	4,267,288	2.49	0.46	4,496,889	2.28	4,503,914	2.28
40.1 - 45	0.89	2,916,976	2.86	2,928,291	2.87	0.48	2,652,115	1.40	2,570,892	1.36	0.42	2,824,852	1.31	2,609,514	1.21
45.1 - 50	0.83	7,077,809	6.48	7,073,531	6.47	0.45	7,911,630	3.92	7,905,503	3.92	0.40	7,963,604	3.51	7,872,738	3.47
50.1 - 55	0.82	841,038	0.76	778,865	0.70	0.44	1,466,273	0.71	388,449	0.19	0.39	1,338,951	0.58	352,419	0.15
55.1 - 60	0.88	3,369,815	3.27	3,697,761	3.59	0.46	3,068,683	1.56	4,725,992	2.40	0.40	3,174,084	1.40	5,093,083	2.25
60.1 - 65	0.95	0	0.00	0	0.00	0.49	0	0.00	0	0.00	0.42	0	0.00	0	0.00
TOTAL		19,727,056	19.63	19,829,848	19.71		21,342,719	11.41	4,247	11.54		22,001,945	10.37	22,340,387	10.48

MAJOR ARTERIAL HYDROCARBON EMISSIONS (TONS/DAY)

SPEED RANGE (MPH)	1997 EMISSION FACTOR grams/mile	1997 BASELINE VMT (Miles)	1997 BASELINE Emissions (Tons/Day)	1997 ACTION VMT (Miles)	1997 ACTION Emissions (Tons/Day)	2006 EMISSION FACTOR grams/mile	2006 BASELINE VMT (Miles)	2006 BASELINE Emissions (Tons/Day)	2006 ACTION VMT (Miles)	2006 ACTION Emissions (Tons/Day)	2010 EMISSION FACTOR grams/mile	2010 BASELINE VMT (Miles)	2010 BASELINE Emissions (Tons/Day)	2010 ACTION VMT (Miles)	2010 ACTION Emissions (Tons/Day)
0-5	5.27	3,528	0.00	3,527	0.02	2.51	12,757	0.00	13,294	0.04	2.12	14,168	0.00	5,012	0.01
5.1 - 10	3.03	25,376	0.08	25,378	0.08	1.44	33,366	0.05	31,890	0.05	1.21	34,020	0.05	30,556	0.04
10.1 - 15	2.20	65,423	0.16	66,414	0.16	1.08	91,628	0.11	87,770	0.10	0.91	90,945	0.09	85,530	0.09
15.1 - 20	1.60	159,446	0.28	159,555	0.28	0.82	165,560	0.15	166,299	0.15	0.71	193,397	0.15	189,471	0.15
20.1 - 25	1.38	605,082	0.92	600,857	0.91	0.71	632,338	0.49	618,126	0.48	0.61	659,036	0.44	632,542	0.43
25.1 - 30	1.22	2,155,054	2.90	2,139,257	2.88	0.63	2,288,339	1.59	2,204,073	1.53	0.54	2,274,784	1.35	2,203,508	1.31
30.1 - 35	1.09	9,452,123	11.36	9,393,113	11.29	0.56	9,477,087	5.85	9,456,501	5.84	0.48	9,566,997	5.06	9,535,722	5.05
35.1 - 40	0.98	1,685,335	1.82	1,691,957	1.83	0.51	1,724,786	0.97	1,736,169	0.98	0.44	1,795,865	0.87	1,807,924	0.88
40.1 - 45	0.89	1,213,381	1.19	1,204,660	1.18	0.47	1,302,192	0.67	1,290,853	0.67	0.40	1,306,475	0.58	1,271,875	0.56
45.1 - 50	0.83	0	0.00	0	0.00	0.44	0	0.00	0	0.00	0.38	0	0.00	0	0.00
50.1 - 55	0.82	0	0.00	0	0.00	0.43	0	0.00	0	0.00	0.37	0	0.00	0	0.00
55.1 - 60	0.89	44	0.00	43	0.00	0.46	57	0.00	49	0.00	0.39	58	0.00	49	0.00
60.1 - 65	0.96	0	0.00	0	0.00	0.48	0	0.00	0	0.00	0.41	0	0.00	0	0.00
TOTAL		15,364,792	18.71	15,284,761	18.63		15,728,110	9.89	15,605,024	9.84		15,935,745	8.59	15,762,189	8.51

SPECIAL HYDROCARBON EMISSIONS (TONS/DAY)

SPEED RANGE (MPH)	1997 EMISSION FACTOR grams/mile	1997 BASELINE VMT (Miles)	1997 BASELINE Emissions (Tons/Day)	1997 ACTION VMT (Miles)	1997 ACTION Emissions (Tons/Day)	2006 EMISSION FACTOR grams/mile	2006 BASELINE VMT (Miles)	2006 BASELINE Emissions (Tons/Day)	2006 ACTION VMT (Miles)	2006 ACTION Emissions (Tons/Day)	2010 EMISSION FACTOR grams/mile	2010 BASELINE VMT (Miles)	2010 BASELINE Emissions (Tons/Day)	2010 ACTION VMT (Miles)	2010 ACTION Emissions (Tons/Day)
0-5	5.48	0	0.00	0	0.00	2.60	0	0.00	0	0.00	2.20	0	0.00	0	0.00
5.1 - 10	3.12	0	0.00	0	0.00	1.48	0	0.00	0	0.00	1.25	0	0.00	0	0.00
10.1 - 15	2.27	4,520	0.01	4,520	0.01	1.11	4,749	0.01	4,749	0.01	0.94	4,852	0.01	4,852	0.01
15.1 - 20	1.68	4,520	0.01	4,520	0.01	0.86	4,749	0.00	4,749	0.00	0.74	4,852	0.00	4,852	0.00
20.1 - 25	1.45	4,655	0.01	4,663	0.01	0.74	4,749	0.00	4,749	0.00	0.64	4,852	0.00	5,671	0.00
25.1 - 30	1.29	12,825	0.02	12,826	0.02	0.66	13,401	0.01	14,545	0.01	0.57	13,499	0.01	13,029	0.01
30.1 - 35	1.16	38,918	0.05	39,065	0.05	0.60	37,491	0.02	36,726	0.02	0.51	38,034	0.02	37,217	0.02
35.1 - 40	1.05	0	0.00	0	0.00	0.54	0	0.00	0	0.00	0.47	0	0.00	0	0.00
40.1 - 45	0.96	0	0.00	0	0.00	0.50	0	0.00	0	0.00	0.43	0	0.00	0	0.00
45.1 - 50	0.90	0	0.00	0	0.00	0.47	0	0.00	0	0.00	0.41	0	0.00	0	0.00
50.1 - 55	0.89	0	0.00	0	0.00	0.47	0	0.00	0	0.00	0.40	0	0.00	0	0.00
55.1 - 60	0.98	0	0.00	0	0.00	0.50	0	0.00	0	0.00	0.43	0	0.00	0	0.00
60.1 - 65	1.07	0	0.00	0	0.00	0.53	0	0.00	0	0.00	0.45	0	0.00	0	0.00
TOTAL		65,438	0.10	65,594	0.10		65,139	0.05	65,518	0.05		66,089	0.04	65,621	0.04

TOLL HYDROCARBON EMISSIONS (TONS/DAY)

SPEED RANGE (MPH)	1997 EMISSION FACTOR grams/mile	1997 BASELINE VMT (Miles)	1997 BASELINE Emissions (Tons/Day)	1997 ACTION VMT (Miles)	1997 ACTION Emissions (Tons/Day)	2006 EMISSION FACTOR grams/mile	2006 BASELINE VMT (Miles)	2006 BASELINE Emissions (Tons/Day)	2006 ACTION VMT (Miles)	2006 ACTION Emissions (Tons/Day)	2010 EMISSION FACTOR grams/mile	2010 BASELINE VMT (Miles)	2010 BASELINE Emissions (Tons/Day)	2010 ACTION VMT (Miles)	2010 ACTION Emissions (Tons/Day)
0-5	5.18	0	0.00	0	0.00	2.75	0	0.00	0	0.00	2.41	0	0.00	0	0.00
5.1 - 10	3.12	0	0.00	1,090	0.00	1.71	0	0.00	244	0.00	1.50	780	0.00	300	0.00
10.1 - 15	2.30	1,621	0.00	0	0.00	1.30	1,341	0.00	1,405	0.00	1.15	492	0.00	1,894	0.00
15.1 - 20	1.71	1,984	0.00	3,614	0.01	1.01	1,863	0.00	1,087	0.00	0.91	1,304	0.00	1,233	0.00
20.1 - 25	1.47	493	0.00	594	0.00	0.87	700	0.00	5,182	0.00	0.77	575	0.00	3,784	0.00
25.1 - 30	1.29	3,457	0.00	3,548	0.01	0.76	4,481	0.00	3,256	0.00	0.68	4,372	0.00	3,315	0.00
30.1 - 35	1.15	9,816	0.01	9,979	0.01	0.68	9,464	0.01	9,968	0.01	0.60	9,994	0.01	11,041	0.01
35.1 - 40	1.04	2,038	0.00	2,041	0.00	0.61	1,954	0.00	2,242	0.00	0.55	2,241	0.00	2,600	0.00
40.1 - 45	0.94	348	0.00	348	0.00	0.56	389	0.00	389	0.00	0.50	407	0.00	409	0.00
45.1 - 50	0.88	0	0.00	0	0.00	0.53	0	0.00	0	0.00	0.47	0	0.00	0	0.00
50.1 - 55	0.87	0	0.00	0	0.00	0.51	0	0.00	0	0.00	0.46	0	0.00	0	0.00
55.1 - 60	0.92	0	0.00	0	0.00	0.53	0	0.00	0	0.00	0.47	0	0.00	0	0.00
60.1 - 65	0.98	0	0.00	0	0.00	0.55	0	0.00	0	0.00	0.49	0	0.00	0	0.00
TOTAL		19,757	0.03	21,214	0.03		20,192	0.02	23,773	0.02		20,165	0.02	24,576	0.02

MINOR ARTERIAL HYDROCARBON EMISSIONS (TONS/DAY)

SPEED RANGE (MPH)	1997 EMISSION FACTOR grams/mile	1997 BASELINE VMT (Miles)	1997 BASELINE Emissions (Tons/Day)	1997 ACTION VMT (Miles)	1997 ACTION Emissions (Tons/Day)	2006 EMISSION FACTOR grams/mile	2006 BASELINE VMT (Miles)	2006 BASELINE Emissions (Tons/Day)	2006 ACTION VMT (Miles)	2006 ACTION Emissions (Tons/Day)	2010 EMISSION FACTOR grams/mile	2010 BASELINE VMT (Miles)	2010 BASELINE Emissions (Tons/Day)	2010 ACTION VMT (Miles)	2010 ACTION Emissions (Tons/Day)
0-5	5.24	52,994	0.00	54,598	0.32	2.47	83,329	0.00	78,865	0.21	2.08	92,949	0.00	88,080	0.20
5.1 - 10	3.00	54,645	0.18	54,700	0.18	1.41	51,908	0.08	55,154	0.09	1.18	59,276	0.08	61,161	0.08
10.1 - 15	2.18	82,758	0.20	83,469	0.20	1.05	145,282	0.17	145,368	0.17	0.89	156,298	0.15	149,612	0.15
15.1 - 20	1.57	193,051	0.33	189,101	0.33	0.80	210,415	0.19	212,712	0.19	0.69	215,287	0.16	234,402	0.18
20.1 - 25	1.36	517,830	0.78	522,719	0.78	0.69	501,087	0.38	511,210	0.39	0.59	537,496	0.35	538,309	0.35
25.1 - 30	1.20	931,955	1.23	924,206	1.22	0.61	997,390	0.67	973,705	0.65	0.52	1,063,546	0.61	1,027,426	0.59
30.1 - 35	1.07	4,165,894	4.91	4,148,012	4.89	0.55	4,472,984	2.71	4,393,008	2.66	0.47	4,498,277	2.33	4,411,110	2.29
35.1 - 40	0.96	411,538	0.44	416,588	0.44	0.50	451,680	0.25	431,333	0.24	0.43	494,569	0.23	448,732	0.21
40.1 - 45	0.87	1,682,368	1.61	1,665,752	1.60	0.45	1,846,490	0.92	1,813,619	0.90	0.39	1,908,031	0.82	1,864,759	0.80
45.1 - 50	0.81	0	0.00	0	0.00	0.43	0	0.00	0	0.00	0.37	0	0.00	0	0.00
50.1 - 55	0.80	0	0.00	0	0.00	0.42	0	0.00	0	0.00	0.36	0	0.00	0	0.00
55.1 - 60	0.87	0	0.00	0	0.00	0.44	0	0.00	0	0.00	0.38	0	0.00	0	0.00
60.1 - 65	0.94	0	0.00	0	0.00	0.47	0	0.00	0	0.00	0.40	0	0.00	0	0.00
TOTAL		8,093,033	9.69	8,059,145	9.96		8,760,565	5.36	8,614,974	5.50		9,025,729	4.74	8,823,591	4.85

LOCAL ROAD HYDROCARBON EMISSIONS (TONS/DAY)

SPEED RANGE (MPH)	1997 EMISSION FACTOR grams/mile	1997 BASELINE VMT (Miles)	1997 BASELINE Emissions (Tons/Day)	1997 ACTION VMT (Miles)	1997 ACTION Emissions (Tons/Day)	2006 EMISSION FACTOR grams/mile	2006 BASELINE VMT (Miles)	2006 BASELINE Emissions (Tons/Day)	2006 ACTION VMT (Miles)	2006 ACTION Emissions (Tons/Day)	2010 EMISSION FACTOR grams/mile	2010 BASELINE VMT (Miles)	2010 BASELINE Emissions (Tons/Day)	2010 ACTION VMT (Miles)	2010 ACTION Emissions (Tons/Day)
0-5	5.26	0	0.00	0	0.00	2.47	0	0.00	0	0.00	2.07	0	0.00	0	0.00
5.1 - 10	3.01	0	0.00	0	0.00	1.40	0	0.00	0	0.00	1.17	0	0.00	0	0.00
10.1 - 15	2.18	2,217,892	5.33	2,217,988	5.33	1.05	2,292,814	2.65	2,293,019	2.65	0.88	2,324,965	2.26	2,314,730	2.25
15.1 - 20	1.57	130,083	0.23	130,083	0.23	0.80	130,479	0.12	130,479	0.12	0.68	130,656	0.10	130,656	0.10
20.1 - 25	1.36	338,778	0.51	338,778	0.51	0.69	361,692	0.28	361,692	0.28	0.58	371,882	0.24	371,882	0.24
25.1 - 30	1.20	73,993	0.10	73,993	0.10	0.61	81,522	0.05	81,522	0.05	0.52	84,869	0.05	84,869	0.05
30.1 - 35	1.07	4,774	0.01	4,774	0.01	0.55	5,522	0.00	5,522	0.00	0.47	5,855	0.00	5,855	0.00
35.1 - 40	0.97	0	0.00	0	0.00	0.49	0	0.00	0	0.00	0.42	0	0.00	0	0.00
40.1 - 45	0.87	0	0.00	0	0.00	0.45	0	0.00	0	0.00	0.39	0	0.00	0	0.00
45.1 - 50	0.81	0	0.00	0	0.00	0.42	0	0.00	0	0.00	0.37	0	0.00	0	0.00
50.1 - 55	0.80	0	0.00	0	0.00	0.42	0	0.00	0	0.00	0.36	0	0.00	0	0.00
55.1 - 60	0.87	0	0.00	0	0.00	0.44	0	0.00	0	0.00	0.38	0	0.00	0	0.00
60.1 - 65	0.95	0	0.00	0	0.00	0.47	0	0.00	0	0.00	0.40	0	0.00	0	0.00
TOTAL		2,765,520	6.17	2,765,616	6.17		2,872,029	3.10	2,872,234	3.10		2,918,227	2.64	2,907,992	2.63

TOTAL HYDROCARBON EMISSIONS (TONS/DAY)

SPEED RANGE (MPH)	1997 BASELIN E	1997 ACTION	2006 BASELINE	2006 ACTION	2010 BASELINE	2010 ACTION
0-5	0.00	0.34	0.00	0.25	0.00	0.21
5.1 - 10	0.27	0.27	0.14	0.14	0.13	0.13
10.1 - 15	5.72	5.72	2.95	2.94	2.51	2.49
15.1 - 20	0.89	0.88	0.47	0.48	0.43	0.45
20.1 - 25	2.29	2.29	1.18	1.18	1.05	1.04
25.1 - 30	4.88	4.86	2.69	2.59	2.46	2.29
30.1 - 35	17.62	17.46	9.49	9.33	8.24	8.10
35.1 - 40	6.49	6.36	3.73	3.71	3.39	3.37
40.1 - 45	5.67	5.65	2.99	2.93	2.70	2.57
45.1 - 50	6.48	6.47	3.92	3.92	3.51	3.47
50.1 - 55	0.76	0.70	0.71	0.19	0.58	0.15
55.1 - 60	3.27	3.59	1.56	2.40	1.40	2.25
60.1 - 65	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL	54.32	54.60	29.83	30.05	26.40	26.52

FREEWAY NITROUS OXIDES EMISSIONS (TONS/DAY)

SPEED RANGE (MPH)	1997 EMISSION FACTOR grams/mile	1997 BASELINE VMT (Miles)	1997 BASELINE Emissions (Tons/Day)	1997 ACTION VMT (Miles)	1997 ACTION Emissions (Tons/Day)	2006 EMISSION FACTOR grams/mile	2006 BASELINE VMT (Miles)	2006 BASELINE Emissions (Tons/Day)	2006 ACTION VMT (Miles)	2006 ACTION Emissions (Tons/Day)	2010 EMISSION FACTOR grams/mile	2010 BASELINE VMT (Miles)	2010 BASELINE Emissions (Tons/Day)	2010 ACTION VMT (Miles)	2010 ACTION Emissions (Tons/Day)
0-5	2.23	0	0.00	0	0.00	1.40	0	0.00	0	0.00	1.28	0	0.00	0	0.00
5.1 - 10	1.91	0	0.00	0	0.00	1.20	4,247	0.01	2,358	0.00	1.10	4,065	0.00	3,498	0.00
10.1 - 15	1.74	7,701	0.01	7,351	0.01	1.09	6,820	0.01	5,957	0.01	1.00	7,869	0.01	6,294	0.01
15.1 - 20	1.64	19,780	0.04	18,973	0.03	1.02	16,559	0.02	19,208	0.02	0.93	16,848	0.02	20,562	0.02
20.1 - 25	1.61	48,034	0.09	48,190	0.09	1.00	35,683	0.04	23,427	0.03	0.91	19,895	0.02	22,099	0.02
25.1 - 30	1.60	465,112	0.82	476,285	0.84	0.99	498,317	0.54	473,235	0.52	0.90	710,791	0.71	541,108	0.54
30.1 - 35	1.61	1,065,515	1.89	1,010,982	1.79	1.00	1,389,244	1.53	1,234,745	1.36	0.91	1,444,097	1.45	1,315,158	1.32
35.1 - 40	1.64	3,915,276	7.08	3,789,619	6.85	1.02	4,293,148	4.83	4,267,288	4.80	0.92	4,496,889	4.56	4,503,914	4.57
40.1 - 45	1.69	2,916,976	5.43	2,928,291	5.46	1.05	2,652,115	3.07	2,570,892	2.98	0.95	2,824,852	2.96	2,609,514	2.73
45.1 - 50	1.83	7,077,809	14.28	7,073,531	14.27	1.13	7,911,630	9.85	7,905,503	9.85	1.03	7,963,604	9.04	7,872,738	8.94
50.1 - 55	2.11	841,038	1.96	778,865	1.81	1.29	1,466,273	2.09	388,449	0.55	1.17	1,338,951	1.73	352,419	0.45
55.1 - 60	2.43	3,369,815	9.03	3,697,761	9.90	1.48	3,068,683	5.01	4,725,992	7.71	1.34	3,174,084	4.69	5,093,083	7.52
60.1 - 65	2.83	0	0.00	0	0.00	1.71	0	0.00	0	0.00	1.56	0	0.00	0	0.00
TOTAL		19,727,056	40.62	19,829,848	41.06		21,342,719	26.99	21,617,054	27.82		22,001,945	25.18	22,340,387	26.13

MAJOR ARTERIAL NITROUS OXIDES EMISSIONS (TONS/DAY)

SPEED RANGE (MPH)	1997 EMISSION FACTOR grams/mile	1997 BASELINE VMT (Miles)	1997 BASELINE Emissions (Tons/Day)	1997 ACTION VMT (Miles)	1997 ACTION Emissions (Tons/Day)	2006 EMISSION FACTOR grams/mile	2006 BASELINE VMT (Miles)	2006 BASELINE Emissions (Tons/Day)	2006 ACTION VMT (Miles)	2006 ACTION Emissions (Tons/Day)	2010 EMISSION FACTOR grams/mile	2010 BASELINE VMT (Miles)	2010 BASELINE Emissions (Tons/Day)	2010 ACTION VMT (Miles)	2010 ACTION Emissions (Tons/Day)
0-5	1.57	3,528	0.00	3,527	0.01	0.95	12,757	0.00	13,294	0.01	0.85	14,168	0.00	5,012	0.00
5.1 - 10	1.36	25,376	0.04	25,378	0.04	0.82	33,366	0.03	31,890	0.03	0.74	34,020	0.03	30,556	0.02
10.1 - 15	1.28	65,423	0.09	66,414	0.09	0.77	91,628	0.08	87,770	0.07	0.69	90,945	0.07	85,530	0.07
15.1 - 20	1.23	159,446	0.22	159,555	0.22	0.74	165,560	0.14	166,299	0.14	0.66	193,397	0.14	189,471	0.14
20.1 - 25	1.24	605,082	0.83	600,857	0.82	0.74	632,338	0.52	618,126	0.50	0.66	659,036	0.48	632,542	0.46
25.1 - 30	1.25	2,155,054	2.97	2,139,257	2.95	0.75	2,288,339	1.89	2,204,073	1.82	0.67	2,274,784	1.68	2,203,508	1.63
30.1 - 35	1.26	9,452,123	13.13	9,393,113	13.05	0.75	9,477,087	7.84	9,456,501	7.82	0.67	9,566,997	7.07	9,535,722	7.04
35.1 - 40	1.28	1,685,335	2.38	1,691,957	2.39	0.76	1,724,786	1.45	1,736,169	1.45	0.68	1,795,865	1.35	1,807,924	1.36
40.1 - 45	1.30	1,213,381	1.74	1,204,660	1.73	0.78	1,302,192	1.12	1,290,853	1.11	0.69	1,306,475	0.99	1,271,875	0.97
45.1 - 50	1.40	0	0.00	0	0.00	0.83	0	0.00	0	0.00	0.74	0	0.00	0	0.00
50.1 - 55	1.62	0	0.00	0	0.00	0.95	0	0.00	0	0.00	0.84	0	0.00	0	0.00
55.1 - 60	1.85	44	0.00	43	0.00	1.07	57	0.00	49	0.00	0.96	58	0.00	49	0.00
60.1 - 65	2.11	0	0.00	0	0.00	1.22	0	0.00	0	0.00	1.09	0	0.00	0	0.00
TOTAL		15,364,792	21.39	15,284,761	21.28		15,728,110	13.05	15,605,024	12.96		15,935,745	11.80	15,762,189	11.69

SPECIAL NITROUS OXIDES EMISSIONS (TONS/DAY)

SPEED RANGE (MPH)	1997 EMISSION FACTOR grams/mile	1997 BASELINE VMT (Miles)	1997 BASELINE Emissions (Tons/Day)	1997 ACTION VMT (Miles)	1997 ACTION Emissions (Tons/Day)	2006 EMISSION FACTOR grams/mile	2006 BASELINE VMT (Miles)	2006 BASELINE Emissions (Tons/Day)	2006 ACTION VMT (Miles)	2006 ACTION Emissions (Tons/Day)	2010 EMISSION FACTOR grams/mile	2010 BASELINE VMT (Miles)	2010 BASELINE Emissions (Tons/Day)	2010 ACTION VMT (Miles)	2010 ACTION Emissions (Tons/Day)
0-5	1.31	0	0.00	0	0.00	0.81	0	0.00	0	0.00	0.73	0	0.00	0	0.00
5.1 - 10	1.16	0	0.00	0	0.00	0.71	0	0.00	0	0.00	0.64	0	0.00	0	0.00
10.1 - 15	1.11	4,520	0.01	4,520	0.01	0.68	4,749	0.00	4,749	0.00	0.61	4,852	0.00	4,852	0.00
15.1 - 20	1.08	4,520	0.01	4,520	0.01	0.66	4,749	0.00	4,749	0.00	0.59	4,852	0.00	4,852	0.00
20.1 - 25	1.11	4,655	0.01	4,663	0.01	0.67	4,749	0.00	4,749	0.00	0.60	4,852	0.00	5,671	0.00
25.1 - 30	1.13	12,825	0.02	12,826	0.02	0.68	13,401	0.01	14,545	0.01	0.61	13,499	0.01	13,029	0.01
30.1 - 35	1.14	38,918	0.05	39,065	0.05	0.69	37,491	0.03	36,726	0.03	0.62	38,034	0.03	37,217	0.03
35.1 - 40	1.15	0	0.00	0	0.00	0.70	0	0.00	0	0.00	0.62	0	0.00	0	0.00
40.1 - 45	1.17	0	0.00	0	0.00	0.70	0	0.00	0	0.00	0.63	0	0.00	0	0.00
45.1 - 50	1.25	0	0.00	0	0.00	0.75	0	0.00	0	0.00	0.67	0	0.00	0	0.00
50.1 - 55	1.46	0	0.00	0	0.00	0.86	0	0.00	0	0.00	0.77	0	0.00	0	0.00
55.1 - 60	1.67	0	0.00	0	0.00	0.97	0	0.00	0	0.00	0.87	0	0.00	0	0.00
60.1 - 65	1.88	0	0.00	0	0.00	1.08	0	0.00	0	0.00	0.97	0	0.00	0	0.00
TOTAL		65,438	0.08	65,594	0.08		65,139	0.05	65,518	0.05		66,089	0.04	65,621	0.04

TOLL NITROUS OXIDES EMISSIONS (TONS/DAY)

SPEED RANGE (MPH)	1997 EMISSION FACTOR grams/mile	1997 BASELINE VMT (Miles)	1997 BASELINE Emissions (Tons/Day)	1997 ACTION VMT (Miles)	1997 ACTION Emissions (Tons/Day)	2006 EMISSION FACTOR grams/mile	2006 BASELINE VMT (Miles)	2006 BASELINE Emissions (Tons/Day)	2006 ACTION VMT (Miles)	2006 ACTION Emissions (Tons/Day)	2010 EMISSION FACTOR grams/mile	2010 BASELINE VMT (Miles)	2010 BASELINE Emissions (Tons/Day)	2010 ACTION VMT (Miles)	2010 ACTION Emissions (Tons/Day)
0-5	3.75	0	0.00	0	0.00	2.43	0	0.00	0	0.00	2.25	0	0.00	0	0.00
5.1 - 10	3.18	0	0.00	1,090	0.00	2.05	0	0.00	244	0.00	1.91	780	0.00	300	0.00
10.1 - 15	2.83	1,621	0.01	0	0.00	1.82	1,341	0.00	1,405	0.00	1.69	492	0.00	1,894	0.00
15.1 - 20	2.61	1,984	0.01	3,614	0.01	1.68	1,863	0.00	1,087	0.00	1.55	1,304	0.00	1,233	0.00
20.1 - 25	2.50	493	0.00	594	0.00	1.60	700	0.00	5,182	0.01	1.48	575	0.00	3,784	0.01
25.1 - 30	2.44	3,457	0.01	3,548	0.01	1.57	4,481	0.01	3,256	0.01	1.45	4,372	0.01	3,315	0.01
30.1 - 35	2.44	9,816	0.03	9,979	0.03	1.57	9,464	0.02	9,968	0.02	1.45	9,994	0.02	11,041	0.02
35.1 - 40	2.50	2,038	0.01	2,041	0.01	1.60	1,954	0.00	2,242	0.00	1.48	2,241	0.00	2,600	0.00
40.1 - 45	2.61	348	0.00	348	0.00	1.67	389	0.00	389	0.00	1.55	407	0.00	409	0.00
45.1 - 50	2.84	0	0.00	0	0.00	1.82	0	0.00	0	0.00	1.68	0	0.00	0	0.00
50.1 - 55	3.25	0	0.00	0	0.00	2.07	0	0.00	0	0.00	1.91	0	0.00	0	0.00
55.1 - 60	3.78	0	0.00	0	0.00	2.40	0	0.00	0	0.00	2.22	0	0.00	0	0.00
60.1 - 65	4.49	0	0.00	0	0.00	2.85	0	0.00	0	0.00	2.64	0	0.00	0	0.00
TOTAL		19,757	0.05	21,214	0.06		20,192	0.04	23,773	0.04		20,165	0.03	24,576	0.04

MINOR ARTERIAL NITROUS OXIDES EMISSIONS (TONS/DAY)

SPEED RANGE (MPH)	1997 EMISSION FACTOR grams/mile	1997 BASELINE VMT (Miles)	1997 BASELINE Emissions (Tons/Day)	1997 ACTION VMT (Miles)	1997 ACTION Emissions (Tons/Day)	2006 EMISSION FACTOR grams/mile	2006 BASELINE VMT (Miles)	2006 BASELINE Emissions (Tons/Day)	2006 ACTION VMT (Miles)	2006 ACTION Emissions (Tons/Day)	2010 EMISSION FACTOR grams/mile	2010 BASELINE VMT (Miles)	2010 BASELINE Emissions (Tons/Day)	2010 ACTION VMT (Miles)	2010 ACTION Emissions (Tons/Day)
0-5	1.46	52,994	0.00	54,598	0.09	0.88	83,329	0.00	78,865	0.08	0.78	92,949	0.00	88,080	0.08
5.1 - 10	1.28	54,645	0.08	54,700	0.08	0.76	51,908	0.04	55,154	0.05	0.68	59,276	0.04	61,161	0.05
10.1 - 15	1.20	82,758	0.11	83,469	0.11	0.71	145,282	0.11	145,368	0.11	0.64	156,298	0.11	149,612	0.11
15.1 - 20	1.16	193,051	0.25	189,101	0.24	0.69	210,415	0.16	212,712	0.16	0.61	215,287	0.14	234,402	0.16
20.1 - 25	1.18	517,830	0.67	522,719	0.68	0.70	501,087	0.39	511,210	0.39	0.62	537,496	0.37	538,309	0.37
25.1 - 30	1.19	931,955	1.22	924,206	1.21	0.70	997,390	0.77	973,705	0.75	0.62	1,063,546	0.73	1,027,426	0.70
30.1 - 35	1.20	4,165,894	5.51	4,148,012	5.49	0.71	4,472,984	3.50	4,393,008	3.44	0.63	4,498,277	3.12	4,411,110	3.06
35.1 - 40	1.21	411,538	0.55	416,588	0.56	0.72	451,680	0.36	431,333	0.34	0.64	494,569	0.35	448,732	0.32
40.1 - 45	1.23	1,682,368	2.28	1,665,752	2.26	0.73	1,846,490	1.49	1,813,619	1.46	0.65	1,908,031	1.37	1,864,759	1.34
45.1 - 50	1.33	0	0.00	0	0.00	0.78	0	0.00	0	0.00	0.69	0	0.00	0	0.00
50.1 - 55	1.53	0	0.00	0	0.00	0.89	0	0.00	0	0.00	0.79	0	0.00	0	0.00
55.1 - 60	1.75	0	0.00	0	0.00	1.00	0	0.00	0	0.00	0.89	0	0.00	0	0.00
60.1 - 65	1.99	0	0.00	0	0.00	1.13	0	0.00	0	0.00	1.00	0	0.00	0	0.00
TOTAL		8,093,033	10.67	8,059,145	10.71		8,760,565	6.82	8,614,974	6.78		9,025,729	6.23	8,823,591	6.17

LOCAL ROAD NITROUS OXIDES EMISSIONS (TONS/DAY)

SPEED RANGE (MPH)	1997 EMISSION FACTOR grams/mile	1997 BASELINE VMT (Miles)	1997 BASELINE Emissions (Tons/Day)	1997 ACTION VMT (Miles)	1997 ACTION Emissions (Tons/Day)	2006 EMISSION FACTOR grams/mile	2006 BASELINE VMT (Miles)	2006 BASELINE Emissions (Tons/Day)	2006 ACTION VMT (Miles)	2006 ACTION Emissions (Tons/Day)	2010 EMISSION FACTOR grams/mile	2010 BASELINE VMT (Miles)	2010 BASELINE Emissions (Tons/Day)	2010 ACTION VMT (Miles)	2010 ACTION Emissions (Tons/Day)
0-5	1.36	0	0.00	0	0.00	0.81	0	0.00	0	0.00	0.72	0	0.00	0	0.00
5.1 - 10	1.19	0	0.00	0	0.00	0.71	0	0.00	0	0.00	0.63	0	0.00	0	0.00
10.1 - 15	1.13	2,217,892	2.76	2,217,988	2.76	0.67	2,292,814	1.69	2,293,019	1.69	0.59	2,324,965	1.51	2,314,730	1.51
15.1 - 20	1.10	130,083	0.16	130,083	0.16	0.65	130,479	0.09	130,479	0.09	0.58	130,656	0.08	130,656	0.08
20.1 - 25	1.12	338,778	0.42	338,778	0.42	0.66	361,692	0.26	361,692	0.26	0.58	371,882	0.24	371,882	0.24
25.1 - 30	1.13	73,993	0.09	73,993	0.09	0.67	81,522	0.06	81,522	0.06	0.59	84,869	0.06	84,869	0.06
30.1 - 35	1.14	4,774	0.01	4,774	0.01	0.67	5,522	0.00	5,522	0.00	0.60	5,855	0.00	5,855	0.00
35.1 - 40	1.16	0	0.00	0	0.00	0.68	0	0.00	0	0.00	0.60	0	0.00	0	0.00
40.1 - 45	1.17	0	0.00	0	0.00	0.69	0	0.00	0	0.00	0.61	0	0.00	0	0.00
45.1 - 50	1.26	0	0.00	0	0.00	0.73	0	0.00	0	0.00	0.65	0	0.00	0	0.00
50.1 - 55	1.46	0	0.00	0	0.00	0.84	0	0.00	0	0.00	0.74	0	0.00	0	0.00
55.1 - 60	1.66	0	0.00	0	0.00	0.94	0	0.00	0	0.00	0.83	0	0.00	0	0.00
60.1 - 65	1.88	0	0.00	0	0.00	1.06	0	0.00	0	0.00	0.94	0	0.00	0	0.00
TOTAL		2,765,520	3.44	2,765,616	3.44		2,872,029	2.11	2,872,234	2.11		2,918,227	1.89	2,907,992	1.89

TOTAL NITROUS OXIDES EMISSIONS (TONS/DAY)

SPEED RANGE (MPH)	1997 BASELIN E	1997 ACTION	2006 BASELINE	2006 ACTION	2010 BASELINE	2010 ACTION
0-5	0.00	0.09	0.00	0.09	0.00	0.08
5.1 - 10	0.12	0.12	0.08	0.08	0.08	0.08
10.1 - 15	2.99	2.99	1.90	1.90	1.70	1.69
15.1 - 20	0.67	0.67	0.41	0.42	0.39	0.41
20.1 - 25	2.01	2.01	1.21	1.20	1.11	1.10
25.1 - 30	5.13	5.12	3.28	3.17	3.18	2.94
30.1 - 35	20.61	20.41	12.92	12.67	11.68	11.47
35.1 - 40	10.01	9.80	6.63	6.60	6.26	6.24
40.1 - 45	9.45	9.44	5.68	5.55	5.32	5.04
45.1 - 50	14.28	14.27	9.85	9.85	9.04	8.94
50.1 - 55	1.96	1.81	2.09	0.55	1.73	0.45
55.1 - 60	9.03	9.91	5.01	7.71	4.69	7.52
60.1 - 65	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL	76.25	76.63	49.06	49.77	45.19	45.95

APPENDIX 5

COMPRESSED NATURAL GAS (CNG) BUS REPLACEMENT METHODOLOGY FOR HYDROCARBON (HC) AND OXIDES OF NITROGEN (NO_x) POLLUTANT EMISSION REDUCTIONS

COMPRESSED NATURAL GAS (CNG) BUS REPLACEMENT METHODOLOGY FOR HYDROCARBON (HC) AND OXIDES OF NITROGEN (NO_X) POLLUTANT EMISSION REDUCTIONS

FINAL

MAY 19, 1994

NORTHEAST OHIO AREAWIDE COORDINATING AGENCY
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Fiscal Year 1994 Project 01012

COMPRESSED NATURAL GAS (CNG) BUS REPLACEMENT METHODOLOGY FOR HYDROCARBON (HC) AND OXIDES OF NITROGEN (NO_x) POLLUTANT EMISSION REDUCTIONS

NOACA drafted a methodology for quantifying hydrocarbon (HC) and oxides of nitrogen (NO_x) emissions reductions attributable to local transit agency replacement of diesel buses with Compressed Natural Gas (CNG) powered vehicles. This was done as a follow-up to a teleconference with representatives of USEPA Region 5, FHWA, and ODOT on the NO_x conformity issue on March 14, 1994. USEPA Region 5 reviewed and commented on NOACA's methodology and the following addresses their concerns.

Emission Factors

USEPA provided a vehicle emissions standards summary for diesel-cycle heavy duty engines in grams/brake-horsepower-hour[1] (see Table 1) and conversion factors to convert these to grams/mile emissions[2] (see Table 2).

According to the State of California Air Resources Board (CARB) new CNG engines when certified tested at 0.6 grams/brake-horsepower-hour HC emissions and 2.0 grams/brake-horsepower hour NO_x emissions.[3] USEPA has requested that the current heavy duty standards of 1.3 grams/brake-horsepower-hour for HC and 5.0 grams/brake-horsepower-hour for NO_x be used since there is no current enforcement authority for the CNG engines below the standard. This method employs the current standards. Nevertheless, the difference in performance estimates between the CNG engines and the standards should provide a significant "cushion" for reduction estimates and allow for engine deterioration without affecting the estimated reduction (see Table 3).

TABLE 1
USEPA EMISSION STANDARDS FOR DIESEL BUSES (IN GRAMS/BRAKE-HORSEPOWER-HOUR (G/BrHpHr))

MODEL YEAR	HC	NO_x
1970 - 1989	1.3	10.7
1990	1.3	6.0
1991 - 1997	1.3	5.0
1998 - ?	1.3	4.0

SOURCE: USEPA, Mobile Source Emissions Standards Summary

The Urban Operating Level conversion factors in Table 2 are used throughout this analysis due to the belief that this will most closely reflect average emission changes across the GCRTA fleet which operates wholly in an urban operating environment.

1 Mobile Source Emissions Standards Summary (USEPA, May 1993).
2 Development of Conversion Factors for Heavy Duty Bus Engines (USEPA, July 1992).
3 Executive Order A-21-111 (State of California Air Resources Board (CARB), February 1994).

TABLE 2

CONVERSION FACTORS FROM G/BrHpHr TO GRAMS/MILE (G/MILE)

OPERATING LEVEL	HC	NO_x
INTER-CITY	1.6	3.5
URBAN	2.3	4.3
HEAVY URBAN	5.4	7.0

SOURCE: USEPA, Development of Conversion Factors for Heavy Duty Bus Engines

TABLE 3

CALIFORNIA AIR RESOURCES BOARD EMISSION FACTORS FOR CNG BUSES (GRAMS/BRAKE-HORSEPOWER-HOUR)

MODEL YEAR	HC	NO_x
1993	0.6	2.0

SOURCE: CARB, Executive Order A-21-111

Bus Replacement Program - Current GCRTA Purchases

The Greater Cleveland Regional Transit Authority (GCRTA) reports that it is replacing 80 forty foot 1979 model year diesel buses with CNG buses in calendar year 1994.[4]
Utilizing the following mileage data from federal revenue vehicle inventory reports[5] (see Table 4), pollutant emission reductions from these replacements can be calculated.

Total annual mileage for the 1979 buses which are being replaced can be calculated using the annual mileage per bus for 1979 and multiplying by the number of buses being replaced. We can assume that the new CNG buses will travel 50,362 miles per year each when new (like the current 1991 model year buses), and multiply by the number of new buses.

TABLE 4

GCRTA REVENUE VEHICLE INVENTORY DATA FOR BUSES SEATING 35 OR MORE PEOPLE

(FORM 408, SECTION 15)

MODEL YEAR	# OF ACTIVE BUSES	ACCUMULATED ANNUAL MILEAGE	ANNUAL MILEAGE PER BUS
1965	0	0	0
1979	80	1,556,000	19,450
1982	77	1,850,000	24,026
1984	57	1,371,000	24,053
1985	105	2,544,000	24,229
1988	77	2,715,000	35,260
1989	77	2,964,000	38,494
1990	150	6,873,000	45,820
1991	58	2,921,000	50,362
Total/ Average	681	22,794,000	33,471

SOURCE: GCRTA, Form 408 of Section 15 Report to FTA.

TABLE 5

EMISSION CALCULATIONS FOR BUS REPLACEMENT HYDROCARBONS

MODEL YEAR	# OF BUSES	FUEL TYPE	ANNUAL MILEAGE	EMISSION FACTOR (G/MILE)	EMISSIONS (TONS/DAY)	GAIN/ LOSS
1979	80	DIESEL	1,556,000	2.99	0.0140	LOSS
1993	80	CNG	4,028,960	2.99	0.0364	GAIN
					0.0224	NET GAIN

OXIDES OF NITROGEN

MODEL YEAR	# OF BUSES	FUEL TYPE	ANNUAL MILEAGE	EMISSION FACTOR (G/MILE)	EMISSIONS (TONS/DAY)	GAIN/ LOSS
1979	80	DIESEL	1,556,000	46.01	0.2162	LOSS
1993	80	CNG	4,028,960	21.5	0.2616	GAIN
					0.0454	NET GAIN

In addition to these emission changes due to vehicle replacement, additional emission changes would result from the elimination of mileage from the existing fleet, if overall fleet mileage is assumed to remain constant. The additional annual mileage reduction for existing buses is equivalent to the difference between the mileage estimate for the new buses and the replaced mileage. This is equal to 2,472,960 miles. Geometric means of emission standards for the existing fleet (excluding 1979 model year buses being retired) yield a 2.99 G/mile emission factor for HC and a 36.10 G/mile emission factor for NO_x. Table 6 displays the emission reductions achieved by these mileage replacements.

TABLE 6
EMISSION CALCULATION FOR MILEAGE REPLACEMENT

POLLUTANT	ANNUAL MILEAGE REPLACEMENT	EMISSION FACTOR (G/MILE)	EMISSION REDUCTION (TONS/DAY)
HC	2,472,960	2.99	0.0224
NO_x	2,472,960	36.10	0.2696

The net result of GCRTA's new purchases, therefore, is no net change in HC and a 0.2242 ton/day reduction in NO_x.

Bus Replacement Program - SFY 1995 Purchases Programmed in the SFY 1995-1998 NOACA Transportation Improvement Program (TIP)

In addition to the above purchases, GCRTA has CNG bus purchases programmed for SFY 1995 in the SFY 1995-1998 NOACA TIP. GCRTA is planning to purchase an additional 39 CNG buses in SFY 1995. These buses will replace 1982 Model Year diesel buses. Tables 7 and 8 display the emission changes resulting from these planned purchases.

TABLE 7
EMISSION CALCULATIONS FOR SFY 1995 BUS REPLACEMENT - GCRTA

HYDROCARBONS

MODEL YEAR	# OF BUSES	FUEL TYPE	ANNUAL MILEAGE	EMISSION FACTOR (G/MILE)	EMISSIONS (TONS/DAY)	GAIN/ LOSS
1982	39	DIESEL	937,014	2.99	0.0085	LOSS
1993	39	CNG	1,964,118	2.99	0.0177	GAIN
					0.0092	NET GAIN

OXIDES OF NITROGEN

MODEL YEAR	# OF BUSES	FUEL TYPE	ANNUAL MILEAGE	EMISSION FACTOR (G/MILE)	EMISSIONS (TONS/DAY)	GAIN/ LOSS
1982	39	DIESEL	937,014	46.01	0.1302	LOSS
1993	39	CNG	1,964,118	21.5	0.1275	GAIN
					0.0027	NET LOSS

TABLE 8

EMISSION CALCULATIONS FOR MILEAGE REPLACEMENT
SFY 1995 BUS REPLACEMENT - GCRTA

POLLUTANT	ANNUAL MILEAGE REPLACEMENT	EMISSION FACTOR (G/MILE)	EMISSION REDUCTION (TONS/DAY)
HC	1,027,104	2.99	0.0093
NO_x	1,027,104	35.60	0.1104

The net impact of SFY 1995 GCRTA Bus Replacement Program is, therefore, no net change in HC and a 0.113 Ton/day reduction in NO_x.

The total emission reductions achieved by GCRTA current and programmed purchases are 0.3373 Tons/day in NO_x. The current and programmed purchases will have no impact on HC emissions.

APPENDIX 6

DETAILED SUMMARY TABLES AND METHODOLOGY FOR THE IR-71 WIDENING PROJECT AIR QUALITY IMPACT ANALYSIS

IR-71 WIDENING PROJECT AIR QUALITY IMPACT ANALYSIS 24-May-94

TABLE A:
EMISSIONS (GRAMS/DAY) BY VEHICLE TYPE: HYDROCARBONS, 2006

A-1: LIGHT DUTY GASOLINE VEHICLES (LDGV)

A BEGIN-MP	A SECTION DESCRIPTION	A LENGTH	B 2006 LDGV DAILY VMT	C 2006 4-LANE SPEED	D HC EMISSION FACTOR	E NO-BUILD EMISSION	C 2006 6-LANE SPEED	D HC EMISSION FACTOR	E BUILD EMISSION	
15.94	PROJECT BEGINNING	0.91	19,984	57	0.410	8,193	60	0.420	8,393	
16.85	SR 18	1.65	67,128	51	0.400	26,851	57	0.410	27,522	
18.50	IR 271	2.4	62,318	56	0.400	24,927	59	0.420	26,174	
20.90	SR 3	0.5	19,411	51	0.400	7,764	58	0.410	7,959	
21.40	BRUNSWICK TOWNSHIP LINE	0	0	51	0.400	0	58	0.410	0	
					TOTAL	67,736			70,048	
								INCREASE	2,312	F

A-2: LIGHT DUTY GASOLINE TRUCKS 1 (LDGT1)

A BEGIN-MP	A SECTION DESCRIPTION	A LENGTH	B 2006 LDGT1 DAILY VMT	C 2006 4-LANE SPEED	D HC EMISSION FACTOR	E NO-BUILD EMISSION	C 2006 6-LANE SPEED	D HC EMISSION FACTOR	E BUILD EMISSION	
15.94	PROJECT BEGINNING	0.91	328	57	0.520	171	60	0.540	177	
16.85	SR 18	1.65	1,100	51	0.520	572	57	0.520	572	
18.50	IR 271	2.4	1,022	56	0.520	531	59	0.540	552	
20.90	SR 3	0.5	318	51	0.520	165	58	0.530	169	
21.40	BRUNSWICK TOWNSHIP LINE	0	0	51	0.520	0	58	0.530	0	
					TOTAL	1,439			1,470	
								INCREASE	30	F

A-3: LIGHT DUTY GASOLINE TRUCKS 2 (LDGT2)

A BEGIN-MP	A SECTION DESCRIPTION	A LENGTH	B 2006 LDGT2 DAILY VMT	C 2006 4-LANE SPEED	D HC EMISSION FACTOR	E NO-BUILD EMISSION	C 2006 6-LANE SPEED	D HC EMISSION FACTOR	E BUILD EMISSION	
15.94	PROJECT BEGINNING	0.91	328	57	0.880	289	60	0.930	305	
16.85	SR 18	1.65	1,100	51	0.850	935	57	0.880	968	
18.50	IR 271	2.4	1,022	56	0.860	879	59	0.910	930	
20.90	SR 3	0.5	318	51	0.850	270	58	0.890	283	
21.40	BRUNSWICK TOWNSHIP LINE	0	0	51	0.850	0	58	0.890	0	
					TOTAL	2,373			2,486	
								INCREASE	113	F

A-4: HEAVY DUTY GASOLINE VEHICLE (HDGV)

A BEGIN-MP	A SECTION DESCRIPTION	A LENGTH	B 2006 HDGV DAILY VMT	C 2006 4-LANE SPEED	D HC EMISSION FACTOR	E NO-BUILD EMISSION	C 2006 6-LANE SPEED	D HC EMISSION FACTOR	E BUILD EMISSION	
15.94	PROJECT BEGINNING	0.91	403	43	1.790	721	46	1.730	697	
16.85	SR 18	1.65	1,354	39	1.890	2,559	43	1.790	2,424	
18.50	IR 271	2.4	1,257	43	1.790	2,250	45	1.740	2,187	
20.90	SR 3	0.5	392	39	1.890	741	44	1.760	690	
21.40	BRUNSWICK TOWNSHIP LINE	0	0	39	1.890	0	44	1.760	0	
					TOTAL	6,271			5,998	
								REDUCTION	273	F

IR-71 WIDENING PROJECT AIR QUALITY IMPACT ANALYSIS

TABLE A (continued):
EMISSIONS (GRAMS/DAY) BY VEHICLE TYPE: HYDROCARBONS, 2006

A-5: LIGHT DUTY DIESEL VEHICLES (LDDV)

A BEGIN-MP	A SECTION DESCRIPTION	A LENGTH	B 2006 LDDV DAILY VMT	C 2006 4-LANE SPEED	D HC EMISSION FACTOR	E NO-BUILD EMISSION	C 2006 6-LANE SPEED	D HC EMISSION FACTOR	E BUILD EMISSION	
15.94	PROJECT BEGINNING	0.91	25	57	0.210	5	60	0.210	5	
16.85	SR 18	1.65	85	51	0.220	19	57	0.210	18	
18.50	IR 271	2.4	79	56	0.210	17	59	0.210	17	
20.90	SR 3	0.5	24	51	0.220	5	58	0.210	5	
21.40	BRUNSWICK TOWNSHIP LINE	0	0	51	0.220	0	58	0.210	0	
					TOTAL	46			45	
								REDUCTION	1	F

A-6: LIGHT DUTY DIESEL TRUCKS (LDDT)

A BEGIN-MP	A SECTION DESCRIPTION	A LENGTH	B 2006 LDDT DAILY VMT	C 2006 4-LANE SPEED	D HC EMISSION FACTOR	E NO-BUILD EMISSION	C 2006 6-LANE SPEED	D HC EMISSION FACTOR	E BUILD EMISSION	
15.94	PROJECT BEGINNING	0.91	25	57	0.290	7	60	0.290	7	
16.85	SR 18	1.65	85	51	0.300	26	57	0.290	25	
18.50	IR 271	2.4	79	56	0.290	23	59	0.290	23	
20.90	SR 3	0.5	24	51	0.300	7	58	0.290	7	
21.40	BRUNSWICK TOWNSHIP LINE	0	0	51	0.300	0	58	0.290	0	
					TOTAL	63			62	
								REDUCTION	1	F

A-7: HEAVY DUTY DIESEL VEHICLES (HDDV)

A BEGIN-MP	A SECTION DESCRIPTION	A LENGTH	B 2006 HDDV DAILY VMT	C 2006 4-LANE SPEED	D HC EMISSION FACTOR	E NO-BUILD EMISSION	C 2006 6-LANE SPEED	D HC EMISSION FACTOR	E BUILD EMISSION	
15.94	PROJECT BEGINNING	0.91	4,083	43	1.110	4,532	46	1.060	4,328	
16.85	SR 18	1.65	13,713	39	1.190	16,318	43	1.110	15,221	
18.50	IR 271	2.4	12,731	43	1.110	14,131	45	1.070	13,622	
20.90	SR 3	0.5	3,965	39	1.190	4,718	44	1.090	4,322	
21.40	BRUNSWICK TOWNSHIP LINE	0	0	39	1.190	0	44	1.090	0	
					TOTAL	39,700			37,493	
								REDUCTION	2,207	F

A-8: MOTORCYCLES (MC)

A BEGIN-MP	A SECTION DESCRIPTION	A LENGTH	B 2006 MC DAILY VMT	C 2006 4-LANE SPEED	D HC EMISSION FACTOR	E NO-BUILD EMISSION	C 2006 6-LANE SPEED	D HC EMISSION FACTOR	E BUILD EMISSION	
15.94	PROJECT BEGINNING	0.91	25	57	5.440	136	60	5.650	141	
16.85	SR 18	1.65	85	51	5.300	451	57	5.440	462	
18.50	IR 271	2.4	79	56	5.370	424	59	5.580	441	
20.90	SR 3	0.5	24	51	5.300	127	58	5.510	132	
21.40	BRUNSWICK TOWNSHIP LINE	0	0	51	5.300	0	58	5.510	0	
					TOTAL	1,138			1,177	
								INCREASE	39	F

TABLE B:
EMISSIONS (GRAMS/DAY) BY VEHICLE TYPE: HYDROCARBONS, 2010

B-1: LIGHT DUTY GASOLINE VEHICLES (LDGV)

A BEGIN-MP	A SECTION DESCRIPTION	A LENGTH	B 2010 LDGV DAILY VMT	C 2010 4-LANE SPEED	D HC EMISSION FACTOR	E NO-BUILD EMISSION	C 2010 6-LANE SPEED	D HC EMISSION FACTOR	E BUILD EMISSION	
15.94	PROJECT BEGINNING	0.91	20,916	57	0.340	7,111	60	0.350	7,321	
16.85	SR 18	1.65	70,889	49	0.340	24,102	56	0.340	24,102	
18.50	IR 271	2.4	65,470	56	0.340	22,260	59	0.350	22,915	
20.90	SR 3	0.5	20,483	51	0.340	6,964	57	0.340	6,964	
21.40	BRUNSWICK TOWNSHIP LINE	0	0	51	0.340	0	57	0.340	0	
					TOTAL	60,438			61,302	
								INCREASE	864	F

B-2: LIGHT DUTY GASOLINE TRUCKS 1 (LDGT1)

A BEGIN-MP	A SECTION DESCRIPTION	A LENGTH	B 2010 LDGT1 DAILY VMT	C 2010 4-LANE SPEED	D HC EMISSION FACTOR	E NO-BUILD EMISSION	C 2010 6-LANE SPEED	D HC EMISSION FACTOR	E BUILD EMISSION	
15.94	PROJECT BEGINNING	0.91	343	57	0.430	147	60	0.440	151	
16.85	SR 18	1.65	1,162	49	0.430	500	56	0.420	488	
18.50	IR 271	2.4	1,073	56	0.420	451	59	0.440	472	
20.90	SR 3	0.5	336	51	0.430	144	57	0.430	144	
21.40	BRUNSWICK TOWNSHIP LINE	0	0	51	0.430	0	57	0.430	0	
					TOTAL	1,242			1,256	
								INCREASE	13	F

B-3: LIGHT DUTY GASOLINE TRUCKS 2 (LDGT2)

A BEGIN-MP	A SECTION DESCRIPTION	A LENGTH	B 2010 LDGT2 DAILY VMT	C 2010 4-LANE SPEED	D HC EMISSION FACTOR	E NO-BUILD EMISSION	C 2010 6-LANE SPEED	D HC EMISSION FACTOR	E BUILD EMISSION	
15.94	PROJECT BEGINNING	0.91	343	57	0.780	268	60	0.820	281	
16.85	SR 18	1.65	1,162	49	0.770	895	56	0.770	895	
18.50	IR 271	2.4	1,073	56	0.770	826	59	0.810	869	
20.90	SR 3	0.5	336	51	0.760	255	57	0.780	262	
21.40	BRUNSWICK TOWNSHIP LINE	0	0	51	0.760	0	57	0.780	0	
					TOTAL	2,244			2,307	
								INCREASE	63	F

B-4: HEAVY DUTY GASOLINE VEHICLE (HDGV)

A BEGIN-MP	A SECTION DESCRIPTION	A LENGTH	B 2010 HDGV DAILY VMT	C 2010 4-LANE SPEED	D HC EMISSION FACTOR	E NO-BUILD EMISSION	C 2010 6-LANE SPEED	D HC EMISSION FACTOR	E BUILD EMISSION	
15.94	PROJECT BEGINNING	0.91	422	43	1.440	606	46	1.390	587	
16.85	SR 18	1.65	1,430	37	1.580	2,259	43	1.440	2,059	
18.50	IR 271	2.4	1,321	43	1.440	1,902	45	1.400	1,849	
20.90	SR 3	0.5	413	39	1.530	632	43	1.440	595	
21.40	BRUNSWICK TOWNSHIP LINE	0	0	39	1.530	0	43	1.440	0	
					TOTAL	5,401			5,090	
								REDUCTION	311	F

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TABLE B (continued):
EMISSIONS (GRAMS/DAY) BY VEHICLE TYPE: HYDROCARBONS, 2010

B-5: LIGHT DUTY DIESEL VEHICLES (LDDV)

A BEGIN-MP	A SECTION DESCRIPTION	A LENGTH	B 2010 LDDV DAILY VMT	C 2010 4-LANE SPEED	D HC EMISSION FACTOR	E NO-BUILD EMISSION	C 2010 6-LANE SPEED	D HC EMISSION FACTOR	E BUILD EMISSION	
15.94	PROJECT BEGINNING	0.91	26	57	0.210	5	60	0.210	5	
16.85	SR 18	1.65	89	49	0.230	20	56	0.210	19	
18.50	IR 271	2.4	83	56	0.210	17	59	0.210	17	
20.90	SR 3	0.5	26	51	0.220	6	57	0.210	5	
21.40	BRUNSWICK TOWNSHIP LINE	0	0	51	0.220	0	57	0.210	0	
					TOTAL	49			47	
								REDUCTION	2	F

B-6: LIGHT DUTY DIESEL TRUCKS (LDDT)

A BEGIN-MP	A SECTION DESCRIPTION	A LENGTH	B 2010 LDDT DAILY VMT	C 2010 4-LANE SPEED	D HC EMISSION FACTOR	E NO-BUILD EMISSION	C 2010 6-LANE SPEED	D HC EMISSION FACTOR	E BUILD EMISSION	
15.94	PROJECT BEGINNING	0.91	26	57	0.290	8	60	0.280	7	
16.85	SR 18	1.65	89	49	0.310	28	56	0.290	26	
18.50	IR 271	2.4	83	56	0.290	24	59	0.290	24	
20.90	SR 3	0.5	26	51	0.300	8	57	0.290	8	
21.40	BRUNSWICK TOWNSHIP LINE	0	0	51	0.300	0	57	0.290	0	
					TOTAL	67			65	
								REDUCTION	2	F

B-7: HEAVY DUTY DIESEL VEHICLES (HDDV)

A BEGIN-MP	A SECTION DESCRIPTION	A LENGTH	B 2010 HDDV DAILY VMT	C 2010 4-LANE SPEED	D HC EMISSION FACTOR	E NO-BUILD EMISSION	C 2010 6-LANE SPEED	D HC EMISSION FACTOR	E BUILD EMISSION	
15.94	PROJECT BEGINNING	0.91	4,273	43	1.100	4,700	46	1.050	4,487	
16.85	SR 18	1.65	14,482	37	1.240	17,958	43	1.100	15,930	
18.50	IR 271	2.4	13,375	43	1.100	14,713	45	1.070	14,311	
20.90	SR 3	0.5	4,184	39	1.190	4,979	43	1.100	4,602	
21.40	BRUNSWICK TOWNSHIP LINE	0	0	39	1.190	0	43	1.100	0	
					TOTAL	42,349			39,331	
								REDUCTION	3,019	F

B-8: MOTORCYCLES (MC)

A BEGIN-MP	A SECTION DESCRIPTION	A LENGTH	B 2010 MC DAILY VMT	C 2010 4-LANE SPEED	D HC EMISSION FACTOR	E NO-BUILD EMISSION	C 2010 6-LANE SPEED	D HC EMISSION FACTOR	E BUILD EMISSION	
15.94	PROJECT BEGINNING	0.91	26	57	5.440	141	60	5.650	147	
16.85	SR 18	1.65	89	49	5.300	472	56	5.370	478	
18.50	IR 271	2.4	83	56	5.370	446	59	5.580	463	
20.90	SR 3	0.5	26	51	5.300	138	57	5.440	141	
21.40	BRUNSWICK TOWNSHIP LINE	0	0	51	5.300	0	57	5.440	0	
					TOTAL	1,197			1,229	
								INCREASE	33	F

TABLE C:
EMISSIONS (GRAMS/DAY) BY VEHICLE TYPE: OXIDES OF NITROGEN, 2006

C-1: LIGHT DUTY GASOLINE VEHICLES (LDGV)

A BEGIN-MPSECTION	A DESCRIPTION	A LENGTH	B 2006 LDGV DAILY VMT	C 2006 4-LANE SPEED	D NOx EMISSION FACTOR	E NO-BUILD EMISSION	C 2006 6-LANE SPEED	D NOx EMISSION FACTOR	E BUILD EMISSION	
15.94	PROJECT BEGINNING	0.91	19,984	57	0.800	15,987	60	0.860	17,186	
16.85	SR 18	1.65	67,128	51	0.690	46,318	57	0.800	53,702	
18.50	IR 271	2.4	62,318	56	0.780	48,608	59	0.840	52,347	
20.90	SR 3	0.5	19,411	51	0.690	13,394	58	0.820	15,917	
21.40	BRUNSWICK TOWNSHIP LINE	0	0	51	0.690	0	58	0.820	0	
					TOTAL	124,307			139,153	
								INCREASE	14,846	F

C-2: LIGHT DUTY GASOLINE TRUCKS 1 (LDGT1)

A BEGIN-MPSECTION	A DESCRIPTION	A LENGTH	B 2006 LDGT1 DAILY VMT	C 2006 4-LANE SPEED	D NOx EMISSION FACTOR	E NO-BUILD EMISSION	C 2006 6-LANE SPEED	D NOx EMISSION FACTOR	E BUILD EMISSION	
15.94	PROJECT BEGINNING	0.91	328	57	1.080	354	60	1.170	384	
16.85	SR 18	1.65	1,100	51	0.900	990	57	1.080	1,188	
18.50	IR 271	2.4	1,022	56	1.050	1,073	59	1.140	1,165	
20.90	SR 3	0.5	318	51	0.900	286	58	1.110	353	
21.40	BRUNSWICK TOWNSHIP LINE	0	0	51	0.900	0	58	1.110	0	
					TOTAL	2,704			3,090	
								INCREASE	386	F

C-3: LIGHT DUTY GASOLINE TRUCKS 2 (LDGT2)

A BEGIN-MPSECTION	A DESCRIPTION	A LENGTH	B 2006 LDGT2 DAILY VMT	C 2006 4-LANE SPEED	D NOx EMISSION FACTOR	E NO-BUILD EMISSION	C 2006 6-LANE SPEED	D NOx EMISSION FACTOR	E BUILD EMISSION	
15.94	PROJECT BEGINNING	0.91	328	57	1.980	649	60	2.140	702	
16.85	SR 18	1.65	1,100	51	1.640	1,804	57	1.980	2,178	
18.50	IR 271	2.4	1,022	56	1.920	1,962	59	2.090	2,136	
20.90	SR 3	0.5	318	51	1.640	522	58	2.030	646	
21.40	BRUNSWICK TOWNSHIP LINE	0	0	51	1.640	0	58	2.030	0	
					TOTAL	4,937			5,661	
								INCREASE	724	F

C-4: HEAVY DUTY GASOLINE VEHICLE (HDGV)

A BEGIN-MPSECTION	A DESCRIPTION	A LENGTH	B 2006 HDGV DAILY VMT	C 2006 4-LANE SPEED	D NOx EMISSION FACTOR	E NO-BUILD EMISSION	C 2006 6-LANE SPEED	D NOx EMISSION FACTOR	E BUILD EMISSION	
15.94	PROJECT BEGINNING	0.91	403	43	4.610	1,858	46	4.710	1,898	
16.85	SR 18	1.65	1,354	39	4.480	6,066	43	4.610	6,242	
18.50	IR 271	2.4	1,257	43	4.610	5,795	45	4.680	5,883	
20.90	SR 3	0.5	392	39	4.480	1,756	44	4.650	1,823	
21.40	BRUNSWICK TOWNSHIP LINE	0	0	39	4.480	0	44	4.650	0	
					TOTAL	15,475			15,846	
								INCREASE	371	F

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TABLE C (continued):
EMISSIONS (GRAMS/DAY) BY VEHICLE TYPE: OXIDES OF NITROGEN, 2006

C-5: LIGHT DUTY DIESEL VEHICLES (LDDV)

A BEGIN-MPSECTION	A DESCRIPTION	A LENGTH	B 2006 LDDV DAILY VMT	C 2006 4-LANE SPEED	D NOx EMISSION FACTOR	E NO-BUILD EMISSION	C 2006 6-LANE SPEED	D NOx EMISSION FACTOR	E BUILD EMISSION	
15.94	PROJECT BEGINNING	0.91	25	57	1.360	34	60	1.520	38	
16.85	SR 18	1.65	85	51	1.150	98	57	1.360	116	
18.50	IR 271	2.4	79	56	1.320	104	59	1.460	115	
20.90	SR 3	0.5	24	51	1.150	28	58	1.410	34	
21.40	BRUNSWICK TOWNSHIP LINE	0	0	51	1.150	0	58	1.410	0	
					TOTAL	264			303	
								INCREASE	39	F

C-6: LIGHT DUTY DIESEL TRUCKS (LDDT)

A BEGIN-MPSECTION	A DESCRIPTION	A LENGTH	B 2006 LDDT DAILY VMT	C 2006 4-LANE SPEED	D NOx EMISSION FACTOR	E NO-BUILD EMISSION	C 2006 6-LANE SPEED	D NOx EMISSION FACTOR	E BUILD EMISSION	
15.94	PROJECT BEGINNING	0.91	25	57	1.480	37	60	1.650	41	
16.85	SR 18	1.65	85	51	1.250	106	57	1.480	126	
18.50	IR 271	2.4	79	56	1.440	114	59	1.590	126	
20.90	SR 3	0.5	24	51	1.250	30	58	1.540	37	
21.40	BRUNSWICK TOWNSHIP LINE	0	0	51	1.250	0	58	1.540	0	
					TOTAL	287			330	
								INCREASE	43	F

C-7: HEAVY DUTY DIESEL VEHICLES (HDDV)

A BEGIN-MPSECTION	A DESCRIPTION	A LENGTH	B 2006 HDDV DAILY VMT	C 2006 4-LANE SPEED	D NOx EMISSION FACTOR	E NO-BUILD EMISSION	C 2006 6-LANE SPEED	D NOx EMISSION FACTOR	E BUILD EMISSION	
15.94	PROJECT BEGINNING	0.91	4,083	43	6.550	26,744	46	6.860	28,009	
16.85	SR 18	1.65	13,713	39	6.290	86,255	43	6.550	89,820	
18.50	IR 271	2.4	12,731	43	6.550	83,388	45	6.740	85,807	
20.90	SR 3	0.5	3,965	39	6.290	24,940	44	6.640	26,328	
21.40	BRUNSWICK TOWNSHIP LINE	0	0	39	6.290	0	44	6.640	0	
					TOTAL	221,326			229,964	
								INCREASE	8,638	F

C-8: MOTORCYCLES (MC)

A BEGIN-MPSECTION	A DESCRIPTION	A LENGTH	B 2006 MC DAILY VMT	C 2006 4-LANE SPEED	D NOx EMISSION FACTOR	E NO-BUILD EMISSION	C 2006 6-LANE SPEED	D NOx EMISSION FACTOR	E BUILD EMISSION	
15.94	PROJECT BEGINNING	0.91	25	57	1.270	32	60	1.360	34	
16.85	SR 18	1.65	85	51	1.100	94	57	1.270	108	
18.50	IR 271	2.4	79	56	1.240	98	59	1.330	105	
20.90	SR 3	0.5	24	51	1.100	26	58	1.300	31	
21.40	BRUNSWICK TOWNSHIP LINE	0	0	51	1.100	0	58	1.300	0	
					TOTAL	250			278	
								INCREASE	29	F

TABLE D:
EMISSIONS (GRAMS/DAY) BY VEHICLE TYPE: OXIDES OF NITROGEN, 2010

D-1: LIGHT DUTY GASOLINE VEHICLES (LDGV)

A BEGIN-MP	A SECTION DESCRIPTION	A LENGTH	B 2010 LDGV DAILY VMT	C 2010 4-LANE SPEED	D NOx EMISSION FACTOR	E NO-BUILD EMISSION	C 2010 6-LANE SPEED	D NOx EMISSION FACTOR	E BUILD EMISSION	
15.94	PROJECT BEGINNING	0.91	20,916	57	0.680	14,223	60	0.720	15,060	
16.85	SR 18	1.65	70,889	49	0.550	38,989	56	0.660	46,787	
18.50	IR 271	2.4	65,470	56	0.660	43,210	59	0.710	46,484	
20.90	SR 3	0.5	20,483	51	0.580	11,880	57	0.680	13,928	
21.40	BRUNSWICK TOWNSHIP LINE	0	0	51	0.580	0	57	0.680	0	
					TOTAL	108,302			122,258	
								INCREASE	13,956	F

D-2: LIGHT DUTY GASOLINE TRUCKS 1 (LDGT1)

A BEGIN-MP	A SECTION DESCRIPTION	A LENGTH	B 2010 LDGT1 DAILY VMT	C 2010 4-LANE SPEED	D NOx EMISSION FACTOR	E NO-BUILD EMISSION	C 2010 6-LANE SPEED	D NOx EMISSION FACTOR	E BUILD EMISSION	
15.94	PROJECT BEGINNING	0.91	343	57	0.960	329	60	1.040	357	
16.85	SR 18	1.65	1,162	49	0.740	860	56	0.930	1,081	
18.50	IR 271	2.4	1,073	56	0.930	998	59	1.010	1,084	
20.90	SR 3	0.5	336	51	0.790	265	57	0.960	323	
21.40	BRUNSWICK TOWNSHIP LINE	0	0	51	0.790	0	57	0.960	0	
					TOTAL	2,452			2,844	
								INCREASE	391	F

D-3: LIGHT DUTY GASOLINE TRUCKS 2 (LDGT2)

A BEGIN-MP	A SECTION DESCRIPTION	A LENGTH	B 2010 LDGT2 DAILY VMT	C 2010 4-LANE SPEED	D NOx EMISSION FACTOR	E NO-BUILD EMISSION	C 2010 6-LANE SPEED	D NOx EMISSION FACTOR	E BUILD EMISSION	
15.94	PROJECT BEGINNING	0.91	343	57	1.900	652	60	2.060	707	
16.85	SR 18	1.65	1,162	49	1.470	1,708	56	1.850	2,150	
18.50	IR 271	2.4	1,073	56	1.850	1,985	59	2.010	2,157	
20.90	SR 3	0.5	336	51	1.580	531	57	1.900	638	
21.40	BRUNSWICK TOWNSHIP LINE	0	0	51	1.580	0	57	1.900	0	
					TOTAL	4,876			5,651	
								INCREASE	776	F

D-4: HEAVY DUTY GASOLINE VEHICLE (HDGV)

A BEGIN-MP	A SECTION DESCRIPTION	A LENGTH	B 2010 HDGV DAILY VMT	C 2010 4-LANE SPEED	D NOx EMISSION FACTOR	E NO-BUILD EMISSION	C 2010 6-LANE SPEED	D NOx EMISSION FACTOR	E BUILD EMISSION	
15.94	PROJECT BEGINNING	0.91	422	43	4.380	1,848	46	4.480	1,891	
16.85	SR 18	1.65	1,430	37	4.190	5,992	43	4.380	6,263	
18.50	IR 271	2.4	1,321	43	4.380	5,786	45	4.440	5,865	
20.90	SR 3	0.5	413	39	4.250	1,755	43	4.380	1,809	
21.40	BRUNSWICK TOWNSHIP LINE	0	0	39	4.250	0	43	4.380	0	
					TOTAL	15,381			15,828	
								INCREASE	447	F

TABLE D (continued):
EMISSIONS (GRAMS/DAY) BY VEHICLE TYPE: OXIDES OF NITROGEN, 2010

D-5: LIGHT DUTY DIESEL VEHICLES (LDDV)

A BEGIN-MP	A SECTION DESCRIPTION	A LENGTH	B 2010 LDDV DAILY VMT	C 2010 4-LANE SPEED	D NOx EMISSION FACTOR	E NO-BUILD EMISSION	C 2010 6-LANE SPEED	D NOx EMISSION FACTOR	E BUILD EMISSION	
15.94	PROJECT BEGINNING	0.91	26	57	1.350	35	60	1.500	39	
16.85	SR 18	1.65	89	49	1.090	97	56	1.310	117	
18.50	IR 271	2.4	83	56	1.310	109	59	1.450	120	
20.90	SR 3	0.5	26	51	1.140	30	57	1.350	35	
21.40	BRUNSWICK TOWNSHIP LINE	0	0	51	1.140	0	57	1.350	0	
					TOTAL	270			311	
								INCREASE	41	F

D-6: LIGHT DUTY DIESEL TRUCKS (LDDT)

A BEGIN-MP	A SECTION DESCRIPTION	A LENGTH	B 2010 LDDT DAILY VMT	C 2010 4-LANE SPEED	D NOx EMISSION FACTOR	E NO-BUILD EMISSION	C 2010 6-LANE SPEED	D NOx EMISSION FACTOR	E BUILD EMISSION	
15.94	PROJECT BEGINNING	0.91	26	57	1.460	38	60	1.630	42	
16.85	SR 18	1.65	89	49	1.180	105	56	1.420	126	
18.50	IR 271	2.4	83	56	1.420	118	59	1.570	130	
20.90	SR 3	0.5	26	51	1.230	32	57	1.460	38	
21.40	BRUNSWICK TOWNSHIP LINE	0	0	51	1.230	0	57	1.460	0	
					TOTAL	293			337	
								INCREASE	44	F

D-7: HEAVY DUTY DIESEL VEHICLES (HDDV)

A BEGIN-MP	A SECTION DESCRIPTION	A LENGTH	B 2010 HDDV DAILY VMT	C 2010 4-LANE SPEED	D NOx EMISSION FACTOR	E NO-BUILD EMISSION	C 2010 6-LANE SPEED	D NOx EMISSION FACTOR	E BUILD EMISSION	
15.94	PROJECT BEGINNING	0.91	4,273	43	6.180	26,407	46	6.470	27,646	
16.85	SR 18	1.65	14,482	37	5.860	84,865	43	6.180	89,499	
18.50	IR 271	2.4	13,375	43	6.180	82,658	45	6.360	85,065	
20.90	SR 3	0.5	4,184	39	5.940	24,853	43	6.180	25,857	
21.40	BRUNSWICK TOWNSHIP LINE	0	0	39	5.940	0	43	6.180	0	
					TOTAL	218,782			228,067	
								INCREASE	9,285	F

D-8: MOTORCYCLES (MC)

A BEGIN-MP	A SECTION DESCRIPTION	A LENGTH	B 2010 MC DAILY VMT	C 2010 4-LANE SPEED	D NOx EMISSION FACTOR	E NO-BUILD EMISSION	C 2010 6-LANE SPEED	D NOx EMISSION FACTOR	E BUILD EMISSION	
15.94	PROJECT BEGINNING	0.91	26	57	1.270	33	60	1.360	35	
16.85	SR 18	1.65	89	49	1.040	93	56	1.240	110	
18.50	IR 271	2.4	83	56	1.240	103	59	1.330	110	
20.90	SR 3	0.5	26	51	1.100	29	57	1.270	33	
21.40	BRUNSWICK TOWNSHIP LINE	0	0	51	1.100	0	57	1.270	0	
					TOTAL	257			289	
								INCREASE	32	F

ADDENDUM:

Speed Calculation Materials

I-11 / 2006 Traffic (1)

Roadway Segment	2006 ADT	(2) K	(3) D	(4) % T	(4) f_{HV}	(5) DIR PCE	(6) 4-Lane Freeway v/c	(6) 4-Lane Freeway Speed	(7) 6-Lane Freeway v/c	(7) 6-Lane Freeway Speed
South of SR-18	27,693	0.10	0.55	8%	0.95	1781	.45	57	.30	60
SR-18 To I-271	51304	0.10	0.55	8%	0.95	3300	.83	51	.55	57
I-271 To SR-3	32,744	0.10	0.55	8%	0.95	2106	.53	56	.35	59
SR-3 To SR-303	48,956	0.10	0.55	8%	0.95	3149	.79	51	.52	58

(1) Traffic Forecast using ODOT 1995 & 2015 Forecast and applying Yearly growth factors

(2) K = Percent of ADT during design hour. - generated by ODOT

(3) D = Directional distribution during the design HR " " "

(4) T = Percent of trucks during the design HR. " " "

f_{HV} = factor for Heavy vehicles = $\frac{1}{1 + \%T(1.7-1)}$ .. Assuming Level Terrain = $\frac{1}{1+.8(.7)}$ = = 0.95

(5) DIR, PCE = Passenger - Car Equivalents (Directional) = $\frac{(1) \times (2) \times (3)}{f_{HV} \times 0.9^*}$

* 0.9 = Peak hour factor

(6) v/c = $\frac{\text{Volume}}{\text{Capacity}} = \frac{(5)}{\left[2000 \times \frac{\#\text{Lanes}}{2}\right]}$

Speed = Speed MPH at the Calculated v/c Ratio taken from Table 3-11, 1985 Highway Capacity Manual (Page 3-22) & Figure 3-6 Page 3-20

I-71/2010 Traffic

Roadway Segment	(1) ADT (2010)	(2) K	(3) D	(4) T %	(4) T fHV	(5) Dir Pce	(6) 4-Lanes V/c	(6) 4-Lanes Speed	(7) 6-Lanes V/c	(7) 6-Lanes Speed
South of SR-18	28985	0.1	0.55	8%	0.95	1865	0.47	57	0.31	60
SR-18 To I-271	54178	0.1	0.55	8%	0.95	3485	0.87	49	0.58	56
I-271 To SR-3	34400	0.1	0.55	8%	0.95	2218	0.55	56	0.37	59
SR-3 To SR-303	51660	0.1	0.55	8%	0.95	3323	0.83	51	0.55	57

(1) Traffic Forecast Using ODOT 1995 & 2015 Forecast and applying yearly growth factors

(2) K = Percent of ADT during design hour. - generated by ODOT

(3) D = Directional distribution during the design HR " " "

(4) T = Percent of trucks during the design HR. " " "

f_{HV} = factor for Heavy vehicles $= \frac{1}{1 + \%T(1.7-1)}$ .. Assuming Level Terrain $= \frac{1}{1+.8(.7)} = 0.95$

(5) DIR, Pce = Passenger - Car Equivalents (Directional) $= \frac{(1) \times (2) \times (3)}{f_{HV} \times 0.9^*}$

* 0.9 = Peak hour factor

(6) & (7) $V/c = \frac{\text{Volume}}{\text{Capacity}} = \frac{(5)}{\left[2000 \times \frac{\#\text{Lanes}}{2}\right]}$

Speed = Speed MPH at the Calculated V/c Ratio taken from Table 3-11, 1985 Highway Capacity Manual (Page 3-22) & Figure 3-6 Page 3-20 (Design Speed = 70 MPH)

maximum value for LOS D), but more than 1,550 pcphpl (the maximum value for LOS C), the segment is operating at level-of-service D.

Further, Figures 3-3 and 3-4 would be entered with 1,685 pcphpl to find the approximate speed and density as shown in Figure 3-6. The results are a speed of 51 mph and a density of 32 pc/mi/ln, as illustrated in Figure 3-6.

Interpretation of Results

The results of an operational analysis yield a description of the probable operating conditions for a given traffic stream on a given segment of freeway. These estimates are based on the typical speed-flow-density conditions illustrated herein. There will, however, be some variation from these estimates because of regional driver habits or other unique local characteristics.

Densities greater than 42 pc/mi/ln are generally unstable, and small increases in flow or minor incidents will cause rapid breakdown of the traffic stream. This is the same flow range in which speed deteriorates rapidly with small increases in flow.

Operational analysis of freeway segments can be used to evaluate current operations or likely future operations. It is also used to find and evaluate "trouble spots" of congestion and potential remedies to such situations.

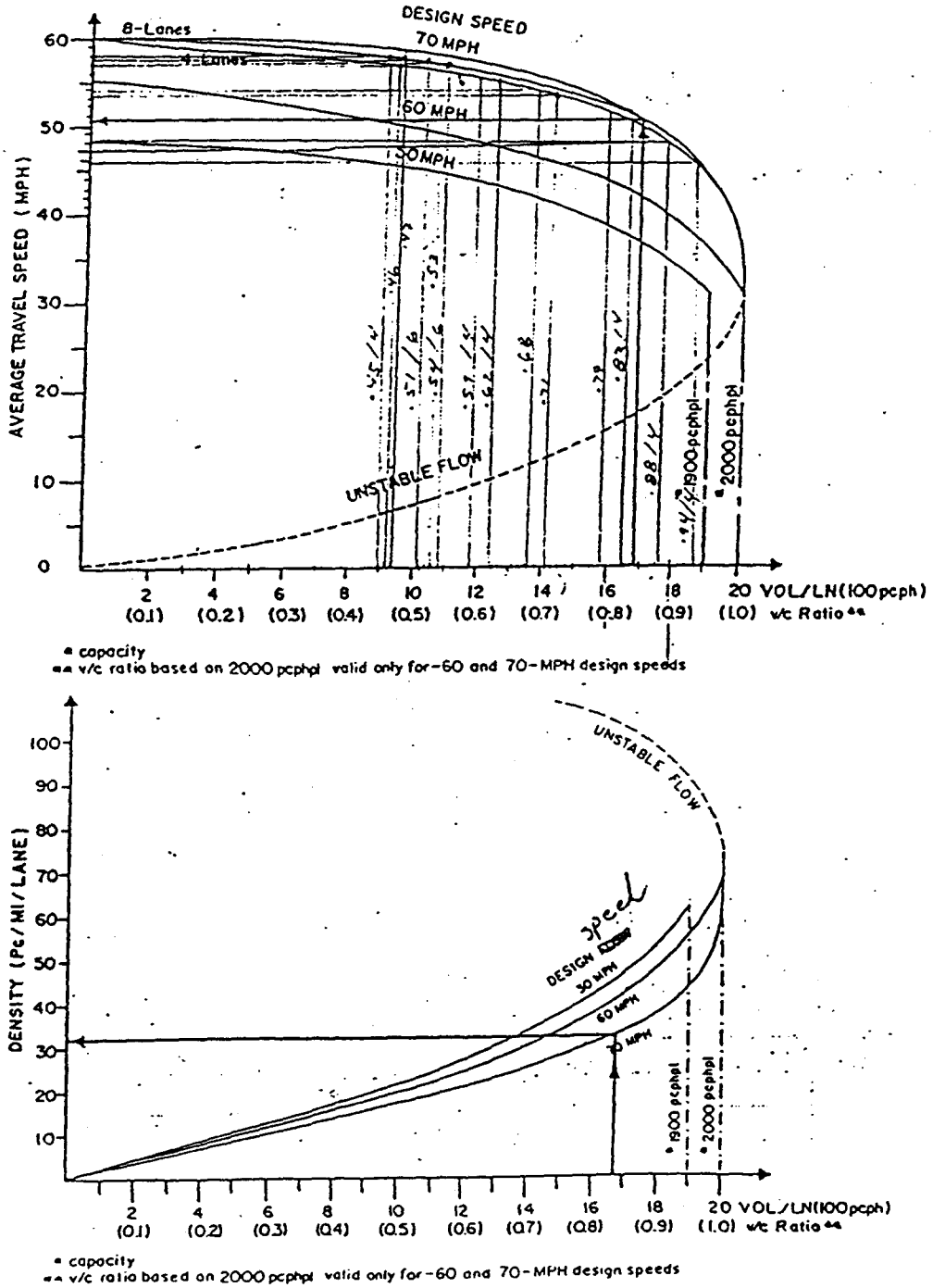

Figure 3-6. Example solutions for approximate density and speed of a freeway traffic stream.

TABLE 3-11. VALUES OF VOLUME-TO-CAPACITY RATIO FOR USE IN DESIGN

v/c RATIO	MSF[a] (PCPHPL)	RESULTING PERFORMANCE CHARACTERISTICS		
		LOS[b]	DENSITY (PC/MI/LN)	SPEED (MPH)
70-MPH ELEMENTS				
0.30	600	A	10.5	60
0.35[c]	700	A	12.0	60
0.40	800	B	14.0	59
0.50	1,000	B	17.5	58
0.54[c]	1,100	B	20.0	57
0.60	1,200	C	21.0	56
0.70	1,400	C	25.0	55
0.77[c]	1,550	C	30.0	54
0.80	1,600	D	30.5	52
60-MPH ELEMENTS				
0.30	600	B	12.0	52
0.40	800	B	15.5	52
0.49[c]	1,000	B	20.0	50
0.60	1,200	C	25.0	48
0.69[c]	1,400	C	30.0	47
0.80	1,600	D	37.5	43
50-MPH ELEMENTS				
0.30	550	C	13.0	47
0.40	750	C	17.0	47
0.50	950	C	22.0	45
0.60	1,150	C	27.0	44
0.67[c]	1,300	C	30.0	43
0.70	1,350	D	34.0	41
0.80	1,500	D	42.0	40

[a] Values rounded to the nearest 50 pcphpl.
[b] Design may be within LOS bounds, not necessarily at maximum condition for LOS.
[c] Maximum permissible value for the LOS shown.

Interpretation of Results

The design procedure results in a direct computation of N for a given freeway segment. Care should be exercised in such design computations because N may be different for successive segments (geometric and/or traffic conditions change) or even for two directions of the same segment (particularly on significant grades).

A special procedure for the consideration of truck climbing lanes is given later in this chapter, and should be consulted wherever the initial analysis indicates an additional lane or lanes are required on the upgrade.

Also note that the solution for N will most often yield a fractional result. A decision must then be made to go either to the next full integer, or to raise the design v/c value to allow the next smaller integer value. This is often a complex decision that may include economic and other considerations. The operational result of either option should be investigated by subjecting the alternative designs to operational analysis as described in the previous section.

It should also be noted that a decision on the number of lanes to be used on a specific segment of freeway cannot be made without a review of the lane requirements throughout the freeway system in question. Lane additions or subtractions for specific segments must consider the availability of appropriate locations for such changes. Lane continuity related to major traffic flows must also be considered. Consult Chapter 6 for a more detailed discussion of freeway system requirements and analysis.

Figure 3-7 presents a worksheet which may be used in conjunction with design computations.

PLANNING

Objectives in Freeway Planning

The objectives of a freeway capacity analysis at the planning level are principally the same as those of a design analysis: determine the number of freeway lanes needed to achieve a

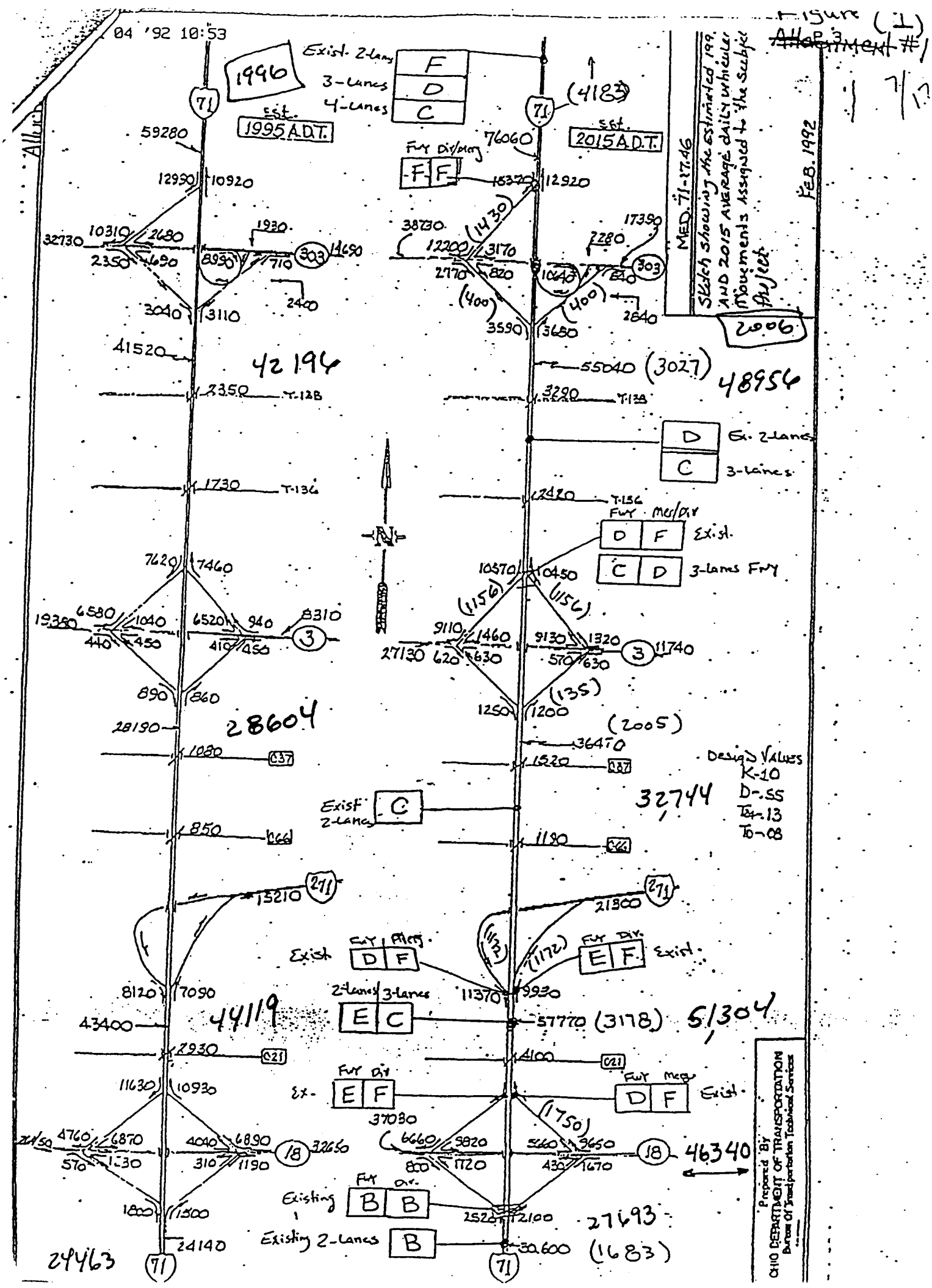
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Figure (1)
Attachment #1
1996
Exist. 2-lanes
3-lanes
4-lanes
F
D
C
est. 1995 A.D.T.
est. 2015 A.D.T.
(4183)
Fwy Div/Merg
F F
MED-71-17.46
Sketch showing the estimated 1996 AND 2015 AVERAGE daily vehicular movements assigned to the subject
FEB. 1992
2006
59280
12990
10920
76060
15370
12920
32730
10310
2680
23500
690
8930
710
1930
1460
2400
3040
3110
38730
(1430)
12200
3170
2770
820
17390
2280
10640
840
2640
(400)
3590
3680
41520
42196
55040
(3027)
48956
23350
T-12B
3290
T-13B
D
C
Ex. 2-lanes
3-lanes
17320
T-13A
24120
T-15A
Fwy Merg/Div
D F
C D
Exist.
3-lanes Fwy
7620
7460
19380
6580
1040
440
450
6520
940
410
450
8310
3
10570
10450
(1156)
9110
1460
620
630
9130
1320
570
630
11740
27130
890
860
28604
(135)
1250
1200
(2005)
28190
1080
C37
36470
15220
C37
Design Values
K-10
D-.55
T=.13
To-08
32744
Exist 2-lanes
C
850
C66
1180
C46
271
15210
21800
Exist
Fwy Merg
D F
(1173)
(1172)
Fwy Div.
E F
Exist
8120
7090
2-lanes/3-lanes
11370
9930
44119
E C
57770
(3178)
51304
43400
2930
C21
4100
C21
11630
10930
Ex-
Fwy Div
E F
Fwy Merg
D F
Exist
37080
(1750)
4760
6870
570
1130
4040
6890
310
1190
18
32660
6660
9820
800
1120
5260
3650
430
1670
18
46340
Existing
Fwy Div.
B B
25220
22100
27693
1800
11500
24140
Existing 2-lanes
B
30600
(1683)
24463
71
Prepared By
OHIO DEPARTMENT OF TRANSPORTATION
Bureau of Transportation Technical Services

APPENDIX 7

SUMMARY TABLES
FOR THE
NOACA AREA SIGNALIZATION PROJECTS

North Olmsted

	HC	NO_x
1990 VMT	140,322	140,322
1996 VMT = 1990 vmt * 1.037	145,514	145,514
Emission Factor @ 10 mph (gm/vmt)	3.760	1.799
Emission Factor @ 18 mph (gm/vmt)	2.300	1.649
Emission Reduction (gm/vmt)	1.460	0.150
Emission Reduction (tons/day)	0.234	0.024

Rocky River

	HC	NO_x
1990 VMT	91,546	91,546
1996 VMT = 1990 vmt * 1.037	94,933	94,933
Emission Factor @ 10 mph (gm/vmt)	3.760	1.799
Emission Factor @ 18 mph (gm/vmt)	2.300	1.649
Emission Reduction (gm/vmt)	1.460	0.150
Emission Reduction (tons/day)	0.153	0.016

East Lake

	HC	NO_x
1990 VMT	72,577	72,577
1996 VMT = 1990 vmt * 1.037	75,262	75,262
Emission Factor @ 10 mph (gm/vmt)	3.760	1.799
Emission Factor @ 18 mph (gm/vmt)	2.300	1.649
Emission Reduction (gm/vmt)	1.460	0.150
Emission Reduction (tons/day)	0.121	0.012

Willoughby

	HC	NO_x
1990 VMT	29,703	29,703
1996 VMT = 1990 vmt * 1.037	30,802	30,802
Emission Factor @ 10 mph (gm/vmt)	3.760	1.799
Emission Factor @ 18 mph (gm/vmt)	2.300	1.649
Emission Reduction (gm/vmt)	1.460	0.150
Emission Reduction (tons/day)	0.050	0.005

Lyndhurst / S. Euclid

	HC	NO_x
1990 VMT	86,213	86,213
1996 VMT = 1990 vmt * 1.037	89,403	89,403
Emission Factor @ 10 mph (gm/vmt)	3.760	1.799
Emission Factor @ 18 mph (gm/vmt)	2.300	1.649
Emission Reduction (gm/vmt)	1.460	0.150
Emission Reduction (tons/day)	0.144	0.015

Beachwood

	HC	NO_x
1990 VMT	32,705	32,705
1996 VMT = 1990 vmt * 1.037	33,915	33,915
Emission Factor @ 10 mph (gm/vmt)	3.760	1.799
Emission Factor @ 18 mph (gm/vmt)	2.300	1.649
Emission Reduction (gm/vmt)	1.460	0.150
Emission Reduction (tons/day)	0.055	0.006

Wickliffe

	HC	NO_x
1990 VMT	22,965	22,965
1996 VMT = 1990 vmt * 1.037	23,815	23,815
Emission Factor @ 10 mph (gm/vmt)	3.760	1.799
Emission Factor @ 18 mph (gm/vmt)	2.300	1.649
Emission Reduction (gm/vmt)	1.460	0.150
Emission Reduction (tons/day)	0.038	0.004

Mayfield Heights

	HC	NO_x
1990 VMT	23,326	23,326
1996 VMT = 1990 vmt * 1.037	24,189	24,189
Emission Factor @ 10 mph (gm/vmt)	3.760	1.799
Emission Factor @ 18 mph (gm/vmt)	2.300	1.649
Emission Reduction (gm/vmt)	1.460	0.150
Emission Reduction (tons/day)	0.039	0.004

North Royalton

	HC	NO_x
1990 VMT	270,922	270,922
1996 VMT = 1990 vmt * 1.037	280,946	280,946
Emission Factor @ 10 mph (gm/vmt)	3.760	1.799
Emission Factor @ 18 mph (gm/vmt)	2.300	1.649
Emission Reduction (gm/vmt)	1.460	0.150
Emission Reduction (tons/day)	0.452	0.046

Parma Heights

	HC	NO_x
1990 VMT	171,034	171,034
1996 VMT = 1990 vmt * 1.037	177,362	177,362
Emission Factor @ 10 mph (gm/vmt)	3.760	1.799
Emission Factor @ 18 mph (gm/vmt)	2.300	1.649
Emission Reduction (gm/vmt)	1.460	0.150
Emission Reduction (tons/day)	0.285	0.029

Bay Village

	HC	NO_x
1990 VMT	34,989	34,989
1996 VMT = 1990 vmt * 1.037	36,284	36,284
Emission Factor @ 10 mph (gm/vmt)	3.760	1.799
Emission Factor @ 18 mph (gm/vmt)	2.300	1.649
Emission Reduction (gm/vmt)	1.460	0.150
Emission Reduction (tons/day)	0.058	0.006

Chagrin Falls

	HC	NO_x
1990 VMT	19,477	19,477
1996 VMT = 1990 vmt * 1.037	20,198	20,198
Emission Factor @ 10 mph (gm/vmt)	3.760	1.799
Emission Factor @ 18 mph (gm/vmt)	2.300	1.649
Emission Reduction (gm/vmt)	1.460	0.150
Emission Reduction (tons/day)	0.033	0.003

CMAQ FUNDED SIGNALIZATION PROJECT STATUS REPORT

04/03/96

PID NO.	COUNTY-ROUTE-SECTION	CITY (ROUTES)	NO. OF ROUTES	TIP SFY	TOTAL COST (in Millions)	NO. OF SIGNALS	AIR QUALITY EMISSION REDUCTION ANALYSIS				TYPE	Emissions in Ton(s)					
							REQUESTED	PERFORMED	SUBMITTED TO EPA	ELIGIBILITY BY EPA		HC		CO		NOx	
												PER DAY	PER YEAR	PER DAY	PER YEAR	PER DAY	PER YEAR
		Willoughby (SR 91/SR 84)	1	1991		4					Attainment	[a]					
N/A	CUY US 422 – 9.96			SUPP	0.932												
		Mayfield Hts. (Lander Rd.)	1	1992		4					Attainment	0.020	7.300				
		Wickliffe (Lakeland Blvd.)		1994 [b]	[c]						Attainment	0.038	13.870				
		Mayfield Hts. (Mayfield Rd.)	3	1994	0.350	22					Maintenance	0.038	13.870				
		Mayfield Hts. (SOM Center Rd.)		1994 [b]							Attainment	0.039	14.235				
		Mayfield Village (Wilson Mills Rd.)	1	1991		8					Attainment	0.046	16.790				
		Willoughby (Euclid Ave.)	1	1991		15					Attainment	0.049	17.885				
		Beachwood (Green Rd.)		1996 [b]	[c]						Attainment	0.055	20.075				
		Brooklyn (Tiedeman Rd.)		1993							Attainment	0.069	25.185				
		Solon (Cochran/Harper Rd., SOM Center Rd.)		1994							Maintenance	0.070	25.550				
		Wickliffe (Euclid Ave., Ridge Rd.)	2	1993		14					Attainment	0.076	27.740				
		Beachwood (Cedar Rd.)	1	1992		11					Attainment	0.108	39.420				
		Eastlake	3	1994	0.900	14					Attainment	0.121	44.165				
		Solon (Aurora Rd., Solon Rd., SOM Center Rd.)	3	1991		14					Attainment	0.139	50.735				
		Lyndhurst/S. Euclid (Mayfield Rd.)		1995 [b]	[c]						Attainment	0.144	52.560				
		Cleveland Hts. (Mayfield Rd.)	1	1993		12					Attainment	0.147	53.655				
		Rocky River	4	1994	1.620	28					Attainment	0.153	55.845				
		Mentor (SR 306, US 20, SR 84, SR 615)	6	1993		53					Attainment	0.515	187.975				
N/A	CUY COVENTRY RD.	Cleveland Hts.	1	SUPP	0.355	6	Yes	Yes				0.026	9.611	0.141	51.497	0.003	0.956
12639	CUY MAIN ST.	Chagrin Falls	3	1996	0.500	10	Yes	Yes	Yes	Yes	Attainment	0.033	11.885	0.180	65.743	0.003	1.219
15381	CUY MEMPHIS AVE.	Brooklyn (Memphis Ave.)	1	SUPP	0.585	9	Yes	Yes			Maintenance	0.034	12.591	0.185	67.465	0.003	1.253
N/A	GEA SR 044 – 17.04	Chardon (Water, Center, South–Main–E. Park)	3		0.600	9	Yes	Yes				0.041	14.822	0.218	79.415	0.004	1.475
10844	LAK US 020 – 2.70	Willoughby (US 20,SR 84,SR 91,SR 640,Lost Nation Rd.)	5	1994	1.300	32	Yes	Yes	Yes	Yes	Attainment	0.050	18.094	0.251	91.436	0.005	1.696
N/A	CUY SR 021	Brecksville (Brecksvie Rd., Royalton Rd. – Chippewa Rd.)	2		0.750	15	Yes	Yes				0.052	19.008	0.279	101.647	0.005	1.891
11842	CUY US 006 – 4.89	Bay Village	3	1996	1.004	14	Yes	Yes	Yes		Attainment	0.068	24.866	0.376	137.132	0.007	2.543
N/A	LAK SR 283	Willowick (Lakeshore, E. 305th, Vine)	3		0.315	12	Yes	Yes				0.069	25.260	0.371	135.344	0.007	2.513
14939	CUY SR 010 – 6.00	Fairview Park (Lorain Rd.)	1	1996	0.550	11	Yes	Yes	Yes	Yes	Maintenance	0.084	30.741	0.451	164.712	0.008	3.058
N/A	CUY SR 175 –	Lyndhurst (Richmond Rd, Brainard Rd)	2	SUPP	0.715	12	Yes	Yes				0.100	36.559	0.537	195.883	0.010	3.637
15399	CUY SR 043/MILES RD.	Warrensville Hts. (Miles Rd.)	1	SUPP	0.037	12	Yes	Yes	Yes	Yes	Maintenance	0.100	36.579	0.537	195.991	0.010	3.639
5248	CUY SNOWRD./ROCKSIDE RD.	Independence, Seven Hills, Parma	1	1996	1.000	11	Yes	Yes	Yes	Yes	Attainment	0.104	37.908	0.556	203.113	0.010	3.772
N/A	CUY SR 237	Berea (Bagley, Prospect, Riverside, N Rocky River, W Bridge)	6			25						0.109	39.670	0.582	212.554	0.011	3.947
14089	CUY SR 010 – 8.96	Cleveland (Lee Rd., Buckeye Rd., Lorain Rd.)	3	1996	2.255	41	Yes	Yes	Yes	Yes	Maintenance	0.131	47.933	0.664	242.224	0.012	4.498
13992	LAK US 020 – 14.24	Painesville (State,St. Clair,Richmond,Grant,Mentor,Jackson)	6	1996	1.700	32	Yes	Yes				0.136	49.767	0.731	266.652	0.014	4.951
N/A	CUY SR 014	Garfield Hts. (Turney,Garfld Blvd.,Granger,Rockside, Broadway, E. 131st)	6		0.950	34	Yes	Yes				0.182	66.299	0.973	355.234	0.018	6.596
14943	CUY US 042 – 0.00	Strongsville	2	1996	1.950	37	Yes	Yes	Yes			0.189	69.142	1.015	370.464	0.019	6.879
14945	CUY SR 008 – 2.00 VARIOUS	Bedford (Broadway Ave., Northfield Rd., Rockside Rd., Warrensville Center Rd.)	4	1996	1.500	29	Yes	Yes	Yes	Yes	Maintenance	0.198	72.204	1.060	386.869	0.020	7.184
15377	CUY SR 043 – 9.95	Bedford Hts. (Aurora Rd.)	1	SUPP	0.250	5	Yes	Yes	Yes	Yes	Maintenance	0.222	81.117	1.191	434.629	0.022	8.071
7561	CUY SR 010 – 0.00	North Olmsted	6	1996	1.900	32	Yes	Yes	Yes	Yes	Attainment	0.234	85.478	1.298	473.842	0.024	8.782
12789	CUY US 042 – 8.33	Parma Hts.	7	1996	1.500	29	Yes	Yes	Yes	Yes	Attainment	0.285	104.186	1.582	577.307	0.029	10.704
11843	CUY US 006 – 25.01	Euclid (Euclid Ave., Lakeshore Blvd., E. 260th St.)	3	1996	2.640	62	Yes	Yes			Maintenance	0.299	109.099	1.662	584.556	0.030	10.854
14818	CUY SR 008 – 4.15	Maple Hts. (Libby Rd., Broadway Ave., Northfield Rd., Warrensville Center Rd., Lee Rd., Rockside Rd., Dunham Rd., Turney Rd.)	8	1996	2.025	42	Yes	Yes	Yes	Yes	Maintenance	0.320	116.916	1.716	626.439	0.032	11.632
14892	CUY US 020 – 0.00	Westlake	8	SUPP	2.500	45	Yes	Yes	Yes	Yes		0.329	120.001	1.762	642.967	0.033	11.939
15399	CUY SR 017 – 4.46	Brookpark	8	SUPP	2.000	42	Yes	Yes				0.333	121.681	1.786	651.968	0.033	12.106
12728	CUY US 042 – 5.46	Middleburg Hts.	9	1996	2.100	42	Yes	Yes			Maintenance	0.397	144.983	2.128	776.823	0.040	14.425
13223	CUY US 422 – 6.68/SR 087 – 6.01	Shaker Hts.	12	1996	2.800	53	Yes	Yes	Yes		Maintenance	0.417	152.299	2.236	816.024	0.042	15.153
14889	CUY US 006 – 15.55	Cleveland (CBD Phase II)	20	1996	2.500	64	Yes	Yes	Yes	Yes	Maintenance	0.427	155.990	2.290	788.282	0.040	14.637
N/A	CUY BROADWAY	Cleveland (Broadway,Broadview,Detroit,E. 105th,Kinsman,Superior)	6		6.945	120	Yes	Yes				0.439	160.288	2.353	858.827	0.044	15.947
11841	CUY SR 003 – 1.51	North Royalton	11	1996	1.440	29	Yes	Yes	Yes	Yes	Attainment	0.452	165.075	2.506	914.698	0.046	16.960
N/A	CUY SR 003 – 5.32	Parma (Brkprk,state,w. 54,york,plsnt vly,) rdge,snow,stumph,pearl,rdgewd,day,brdvw)	12	SUPP	3.335	112	Yes	Yes	Yes	Yes		0.839	306.235	4.495	1640.815	0.083	30.468

B:\ERASTATS.WK1

[a] – The SR 91/SR 84 is a triangular intersection only.
[b] – Completion Date
[c] – Programmed as Part of ODOT Reconstruction Project

SUPP – Supplemental Highway and Bikeway Element Beyond SFY 1999 (For Information Only)

ATTACHMENT D

Akron Metropolitan Area Transportation Study
SFY 1997-2000 Conformity Determination Documentation

AMATS

TECHNICAL MEMORANDUM

AIR QUALITY CONFORMITY ANALYSIS

FOR THE

FY 1997-2000 TRANSPORTATION IMPROVEMENT PROGRAM

AKRON METROPOLITAN AREA TRANSPORTATION STUDY
806 CITICENTER
146 SOUTH HIGH STREET
AKRON, OHIO 44308

MARCH 29, 1996

This report is the product of a study financed (in part) by the U.S. Department of Transportation and the Ohio Department of Transportation.

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CHAPTER I
Introduction

The Cleveland/Akron area has been designated as a moderate nonattainment area for ozone by the U.S. Environmental Protection Agency. This nonattainment area includes eight counties; Ashtabula, Cuyahoga, Geauga, Lake, Lorain, Medina, Portage and Summit Counties. Two Metropolitan Planning Organizations serve seven of these counties. The Northeast Ohio Areawide Coordinating Agency (NOACA) serves Lorain, Cuyahoga, Lake, Geauga and Medina counties and the Akron Metropolitan Area Transportation Study (AMATS) serves Summit and Portage Counties. Chippewa Township is also served by AMATS but Wayne County is an attainment area and is therefore, not included in the AMATS conformity process.

Transportation plans and programs supported with federal funds must show conformity to a region's air quality implementation plan as established under the Clean Air Act as amended in 1990. Specifically, the Clean Air Act defines conformity to an air quality implementation plan to mean:

> "Conformity to the plan's purpose of eliminating or reducing the severity and number of violations of the national ambient air quality standards and achieving expeditious attainment of such standards; and that such activities will not (i) cause or contribute to any new violation of any standards in any area; (ii) increase the frequency or severity of any existing violation of any standard in any area; or (iii) delay timely attainment of any standard or any required interim emission reductions or other milestones in any area"

In order for the Cleveland/Akron Area to show air quality conformity, the TIPs for each area must be analyzed and the combined mobile emissions impact for specified pollutants must meet the following conditions.

Condition 1 - There must be a declining trend in both volatile organic compounds (VOC) and oxides of nitrogen (NO_x) emissions between 1990 and 2010.

Condition 2 - Emissions levels forecasted for VOC and NO_x emissions in 1997, 2006 and 2010 must be less than emissions levels established in the air quality emissions budget included in the Ozone State Implementation Plan for improving air quality prepared by the Ohio Environmental Protection Agency.

Condition 3 - Levels forecasted for VOC and NO_x emissions for 1997, 2006, and 2010 must be analyzed by comparing two scenarios - an action or BUILD scenario and a NO-BUILD scenario. VOC and NO_x emissions levels under the BUILD scenario must be less than the NO-Build scenario to establish conformity.

The purpose of this Technical Memorandum is to document the manner in which mobile emissions have been forecasted for the AMATS FY 1997-2000 TIP. Mobile emissions of three pollutants; volatile organic compounds, oxides of nitrogen and carbon monoxide have been forecasted for 1997 - the first year of the TIP, 2006 - ten years after the attainment date specified in the Clean Air Act for meeting air quality standards for ozone, and 2010 - the year in which the last project programmed in the proposed FY 1997-2000 TIP is expected to be completed. These emission forecasts will be combined with those of NOACA and Ashtabula County to determine conformity with the Clean Air Act.

This Technical Memorandum contains three main Chapters. In Chapter 2 the results of emissions forecasts using standard transportation planning and emissions forecasting models are reported. This work was completed with the cooperation of the Ohio Department of Transportation.

In Chapter 3 off-model transportation projects are analyzed and emissions adjustments are reported. This chapter reports the results of the analysis of planned or programmed transportation improvements which cannot be evaluated using standard transportation models.

Finally, the results of emissions forecasts using standard transportation models are combined with emission forecasts from the off-model project analyses. This is discussed in Chapter 4.

CHAPTER II
Emissions Forecasts
Using
Transportation Planning Models

In this chapter, forecasts of VOC, NO_x, and CO emissions are presented for 1997, 2006 and 2010. The chapter includes three main sections. In section 1, emissions forecasts derived directly from urban transportation planning models are presented. In section 2, calibration factors are presented to relate network emissions forecasting models to emissions forecasting models used in air quality planning for the State Implementation Plan. Finally, adjusted forecasts of 1997, 2006 and 2010 emissions are presented.

MODELED NETWORK EMISSIONS FORECAST - URBAN TRANSPORTATION PLANNING MODELS

AMATS, with the cooperation of the Ohio Department of Transportation Bureau of Technical Services maintains a set of validated urban transportation planning models for Summit and Portage Counties in Ohio. These models utilize forecasts of land use and socio-economic activities to forecast travel on key roadways in the AMATS area. (Other types of transportation projects are discussed in Chapter 3.)

The Ohio Department of Transportation has written a set of computer programs to utilize the output of these transportation planning models with emissions factors from Mobile 5AH to forecast mobile source emissions by year. (A more detailed discussion of both the process and assumptions used in the forecasts can be obtained by contacting the Ohio Department of Transportation Bureau of Technical Services.)

Federal regulations require the future transportation system that will result from the implementation of the proposed TIP be analyzed. Also required is the analysis of other regionally significant projects expected to be completed in the time frame of the TIP. The last project programmed in the proposed FY 1997-2000 TIP is expected to be completed in 2010. Therefore, all improvements expected to be completed by 2010 were considered for the analysis. This included projects in the proposed FY 1997-2000 TIP, the AMATS Year 2010 Transportation Plan and other regionally significant non-federally funded projects with clear funding sources and firm commitments to implement.

To identify appropriate improvements to evaluate, all regionally significant highway improvements were categorized in a multiple step process. In the first step, all projects were classified as either exempt or analyzed. Exempt projects are those project types specified under 40 CFR 51.460 and 40 CFR 51.462 of the Intermodal Surface Transportation Efficiency Act of 1991 as exempt from regional emissions analysis. In the second step, all

non-exempt projects were assigned implementation groups for the years 1997, 2006 and 2010. Project groupings used in the conformity evaluation are included in Appendix A. To complete this step, the TIP and the Long Range Plan were reviewed and the implementation year of each project was estimated. For non-federally funded projects, the project sponsor was consulted to obtain this information.

In the final step, computer networks were coded using estimated highway implementation groupings. A total of 7 modeled network travel forecasts were completed to evaluate the TIP. The following summarizes these forecasts:

Year	No Build Forecast	Build Forecast
1990	x	
1997	x	x
2006	x	x
2010	x	x

The following describes the conditions of each travel forecast:

1990 Base Emissions

The 1990 traffic assignment network represents a base condition and includes the existing roadways in-place in 1990. The 1990 traffic assignment is completed using 1990 trips. The air quality analysis includes 1990 emission factors (EF) which assume no inspection and maintenance program (I/M), no anti-tampering program (ATP), no pressure test and no Stage II Vapor Recovery System (VRS).

1997 Forecasts

The 1997 No-Build travel forecast utilizes a no-build network loaded with 1997 trips. This network represents the existing highway network plus those non-exempt highway projects meeting any of the following conditions: NEPA approval in the last three years, final design started, acquisition of significant portions of right-of-way or approval of plans, specifications and estimates. The NO-BUILD traffic assignment applies 1997 EF with I/M, ATP, pressure test and Stage II VRS.

The 1997 Build travel forecast utilizes a 1997 network loaded with 1997 trips. The 1997 network includes projects in the no-build network plus those non-exempt projects expected to be completed by 1997. The traffic forecast assumes 1997 EF with I/M, ATP, pressure test and Stage II VRS.

2006 Forecasts

The 2006 No-Build travel forecast uses the no-build network loaded with 2006 trips and assumes 2006 EF with I/M, ATP, pressure test and Stage II VRS.

TABLE II-1

FY 1997-2000 TRANSPORTATION IMPROVEMENT PROGRAM

MODELED NETWORK AIR QUALITY
EMISSIONS FORECASTS
(unadjusted)

	VMT	EMISSIONS IN TONS/DAY HC	NOx	CO
YEAR 2010				
A. NO BUILD	18,188,173	11.724	23.905	60.736
B. BUILD	18,188,618	11.612	23.510	60.342
NET BUILD EMISSIONS IMPACT		(0.112)	(0.395)	(0.394)
YEAR 2006				
A. NO BUILD	17,682,136	13.466	25.388	68.134
B. BUILD	17,680,748	13.428	25.418	67.859
NET BUILD EMISSIONS IMPACT		(0.038)	0.030	(0.275)
YEAR 1997				
A. NO BUILD	16,472,291	25.388	41.221	158.908
B. BUILD	16,472,291	25.388	41.221	158.908
NET BUILD EMISSIONS IMPACT		0.000	0.000	0.000

NOTE: A negative number indicates an emissions reduction.

TABLE II-2

CALCULATION OF CALIBRATION FACTORS

FOR

CONFORMITY ANALYSIS

1990 INVENTORY (HPMS)	VOC(TPD)	NOx(TPD)
PORTAGE COUNTY	17.59	14.17
SUMMIT COUNTY	57.94	32.18
	75.53	46.35

SOURCE: OEPA 15% RATE OF PROGRESS PLAN, 3/15/94

1990 INVENTORY (HIGHWAY MODEL)	68.442	59.832

SOURCE: ODOT MODELING, 5/10/94

CALIBRATION FACTOR

VOC		NOx	
75.53/68.442 =	1.104	46.35/59.832 =	0.775

TABLE II-3

FY 1997-2000 TRANSPORTATION IMPROVEMENT PROGRAM

MODELED NETWORK AIR QUALITY
EMISSIONS FORECASTS
(adjusted)

	VMT	EMISSIONS IN TONS/DAY HC	NOx	CO
YEAR 2010				
A. NO BUILD	18,188,173	12.938	18.518	60.736
B. BUILD	18,188,618	12.815	18.212	60.342
NET BUILD EMISSIONS IMPACT		(0.124)	(0.306)	(0.394)
YEAR 2006				
A. NO BUILD	17,682,136	14.861	19.667	68.134
B. BUILD	17,680,748	14.819	19.691	67.859
NET BUILD EMISSIONS IMPACT		(0.042)	0.023	(0.275)
YEAR 1997				
A. NO BUILD	16,472,291	28.017	31.933	158.908
B. BUILD	16,472,291	28.017	31.933	158.908
NET BUILD EMISSIONS IMPACT		0.000	0.000	0.000

NOTE: A negative number indicates an emissions reduction.

CHAPTER III
Off-Model Project Evaluations

The air quality impacts of many types of transportation improvements cannot be evaluated using AMATS model-based urban transportation planning procedures. As a result, the air quality implications of these TIP projects must be evaluated in other ways.

The purpose of this chapter is to document the air quality evaluation of off-model transportation projects. Specific sections are devoted to new bus service, vanpool projects, traffic flow improvements, and bus replacements.

New Bus Service

The METRO Regional Transit Authority (METRO) operates public transportation services in Summit County. The majority of the transit projects included in the TIP are planned to support existing services and make area transit systems operate more efficiently and attract new riders. By attracting additional riders, auto vehicle miles travelled (VMT) will not be increased and, therefore, emissions related to auto usage should be maintained or reduced. As a result, all transit projects included in the TIP are consistent with the State Implementation Plan for improving air quality. The VMT impacts of most of these projects, however, tend to be minimal and as a result their emission effects are not quantified.

New public transportation service, however, has the potential to reduce auto VMT and have quantifiable air quality benefits. As part of this section, 2 new services are discussed and the methodology used in their evaluation is documented. These two services include: 1) University of Akron Service and 2) Akron-Cleveland Service.

1. University of Akron Service

   This project is designed to increase METRO ridership to the University of Akron. The University of Akron, located just east of downtown Akron, has a student body of 27,000 students and a faculty and staff of some 4,500. This represents one of METRO's largest markets.

   METRO currently provides significant service on Carroll Street, East Exchange Street, Union Street, University Avenue and East Mill Street. Approximately 1,900 students, faculty, and staff use the METRO service on a daily basis. METRO estimates that its service provides a savings to the University of approximately 1,400 parking spaces, or a parking deck.

   With current parking problems and the inability of the University to significantly expand parking facilities,

METRO proposes to work with the University to increase student use of METRO services and reduce the demand for University parking facilities.

METRO has implemented a package of new transit services to supplement service already provided in the University of Akron area. This package of services has two parts: first, a campus circulator service which focuses on student travel between off-campus housing, the growing Polsky/ College of Business Administration area in downtown Akron and the Human Resources Building, and second, free service for students, faculty and staff who use METRO's line countywide, neighborhood, and SCAT services.

The following describes the package of services in more detail:

a. Campus Circulator
   Routes have been designated to connect off-campus housing areas along Buchtel Avenue and Carroll Street east of campus, the area south of East Exchange Street between Grant and Spicer Streets, the downtown Polsky/College of Business Administration area and the Human Resources Building with the main campus. Weekday service generally operates between the hours of 7:30 a.m. and 10:30 p.m. Weekday service is provided with 3 buses.

b. METRO Line and SCAT Services
   Free fare access is provided to METRO's 42 line service bus routes on weekdays between the hours of 4:45 a.m. and 11:15 p.m., 30 line service bus routes on Saturdays between the hours of 5:15 a.m. and 10:00 p.m., and 16 line service bus routes on Sunday between the hours of 11:00 a.m. and 6:00 p.m.

Ridership of all services oriented to the University of Akron is estimated by METRO to be 2,400 daily. This is an increase of approximately 50% over previously existing ridership.

The air quality impacts of implementing the new service are estimated in the following manner:

a. Reduction in Auto Emissions

   1. Net increase in passengers is estimated (1110/day)

   2. Using estimated trip lengths and average auto occupancy factors (8.32 and 1.26 respectively calculated from AMATS planning models), the reduction in daily vehicle miles is calculated as follows:

$$1110 \frac{\text{Pass}}{\text{Day}} \times 8.32 \frac{\text{Miles}}{\text{Day}} \times \frac{1}{1.26} \frac{\text{Trips}}{\text{Pass}} = 7329 \frac{\text{Miles}}{\text{Day}}$$

3. Using average auto trip speeds (32 MPH), emissions factors from MOBILE 5A are applied. This was estimated by averaging Principal Arterial and Minor Arterial factors, assuming an Enhanced Auto Inspection and Maintenance Program and Stage 2 Vapor Recovery.

b. Increase in Bus Emissions

1. This is estimated using the increase in bus vehicle miles travelled (541.2) and the emission factors for heavy duty diesel vehicles operating at 15 MPH.

c. Net Emissions Impacts are calculated in Tons Per Day as follows:

1997			2006			2010		
VOC	CO	NO_x	VOC	CO	NO_x	VOC	CO	NO_x
(0.009)	(0.054)	(0.003)	(0.004)	(0.015)	0.001	(0.003)	(0.012)	0.001

2. Akron-Cleveland Transportation Demand Management Project

This project is part of a comprehensive Express Transit/ Vanpool Subsidy project to reduce tripmaking to the Akron and Cleveland central business districts (CBD). (The vanpool subsidy part of this project will be discussed in section 2.) This project includes establishing two new express bus routes. Both will originate and end in the Akron CBD and Cleveland CBD. Other potential destinations include University Circle in Cleveland and the Goodyear-Harwick Chemical-General Complex in Akron.

The air quality impacts of implementing the new express bus services are estimated in the following manner:

a. Reduction in Auto Emissions

1. Net increase in passengers is estimated (608/day).

2. Using trip lengths measured from each origin and destination and an average auto occupancy factor (1.26), the daily reduction in vehicle miles is calculated to equal 11,112.4.

3. Using an average auto trip speed of 40 MPH, emissions factors from MOBILE 5A are applied. This was estimated by using Interstate emissions factors, assuming an Enhanced Auto Inspection and Maintenance Program and Stage 2 Vapor Recovery.

b. Increase in Bus Emissions

1. This is estimated using the increase in bus vehicle miles travelled (546.5) and the emission factors for a heavy duty diesel vehicle operating at 40 MPH.

c. Net Emission Impacts in Tons Per Day are calculated as follows:

1997			2006			2010		
VOC	CO	NO_x	VOC	CO	NO_x	VOC	CO	NO_x
(0.012)	0.021	(0.008)	(0.005)	0.071	(0.001)	(0.004)	0.075	0.000

Vanpools

Both METRO RTA and Portage Area Regional Transit Authority (PARTA) (which operates transit service in portions of Portage County) are proposing to implement vanpool programs. This includes subsidizing the capital leasing costs of vanpools for 24 months. When fully implemented, METRO plans to subsidize 25 vans while PARTA plans to subsidize 20. It is anticipated that the program would continue if it attracts sufficient users to become self-sufficient. Initially it is anticipated that METRO will subsidize 15 vans and PARTA will subsidize 5 vans.

The air quality impacts of implementing these vanpool subsidies are estimated as follows:

a. Reduction in Auto Emissions

1. The decrease in auto trips is estimated assuming 2 one-way trips per day, an average work trip length of 28 miles, and an 80% average vanpool occupancy rate. Other assumptions include:

1. Van Capacity = 15
2. Auto Occupancy = 1.26

VMT reductions for one van are calculated as follows:

1. $\frac{15 \times 0.8}{1.26} \times 28 \times 2 = 533.12$ VMT

2. The increase in van VMT = 28 x 2 = 56 VMT

3. Net decrease in VMT = 533.12 - 56 = 477.12

4. Emission factors are identified from MOBILE 5A using an average trip speed of 32 MPH. These factors were estimated by averaging Principal

Arterial and Minor Arterial emission factors, assuming an Enhanced Auto Inspection and Maintenance Program and Stage 2 Vapor Recovery.

b. The following summarizes the emissions benefits in Tons Per Day of the METRO and PARTA Projects for the TIP.

	1997 METRO 15 Vans PARTA 5 Vans			2006 METRO 25 Vans PARTA 20 Vans			2010 METRO 25 Vans PARTA 20 Vans		
	VOC	CO	NO_x	VOC	CO	NO_x	VOC	CO	NO_x
METRO-	(0.011)	(0.062)	(0.011)	(0.009)	(0.038)	(0.010)	(0.007)	(0.034)	(0.009)
PARTA-	(0.004)	(0.020)	(0.004)	(0.007)	(0.031)	(0.008)	(0.006)	(0.027)	(0.007)

Traffic Flow Improvements

Five traffic flow improvements are included in the TIP. These projects include:

1. Crain Ave/Mantua St/Fairchild Intersection - Kent
2. SR 14/43/303 Signal System - Streetsboro
3. Portage Trail Signal System - Cuyahoga Falls
4. SR 91/Graham/Stow Signals and Intersections - Stow
5. Tallmadge Avenue Signals and Intersections - Akron

Emissions reductions from arterial signal coordination projects are calculated using a two step process. The first step in this process utilizes the estimated operating speeds of vehicles and emissions factors based on that speed. The second step consists of calculating intersection delay along an arterial and then estimating emissions from idling vehicles. The emissions reductions achieved from both parts of the process yield the total emissions reductions for the project.

The first part of the procedure is based on traveling speeds and emissions based on speeds. There are four variables that are needed to complete this part of the evaluation. The first is the length of project. This was obtained from the AMATS Road and Street Inventory. The second variable is Vehicle Miles Travelled (VMT). This figure is calculated using counted Average Daily Traffic (ADT) volumes along the arterial. The length of the project multiplied by the applicable ADT yields the VMT. The last two variables are the operating speeds during both the peak and off-peak periods. These figures were obtained from AMATS Speed and Delay Studies or estimated.

Emission factors can be calculated using peak and off-peak speeds. These emissions factors are from MOBILE 5A and are categorized by vehicle speed and functional classification. The appropriate factors are multiplied by the peak and off-peak VMT

to estimate total existing emissions. Peak VMT is estimated to be 40% of daily VMT.

The same procedure is followed for calculating emissions under proposed conditions. The proposed condition includes the assumption that the traveling speed will increase. It is assumed that the proposed off-peak speed will be the posted speed limit. The proposed peak speed is estimated using the ratio of existing off-peak speeds to proposed off-peak speeds. Total emissions under future conditions are calculated and subtracted from the existing emissions to produce the net emissions improvement.

The second part of the process uses vehicle delay at intersections based on counted traffic volume, signal timing and idle emissions factors. The vehicle delay is calculated using procedures for signalized intersections in Chapter 9 of the Highway Capacity Manual.

Existing roadway conditions are analyzed first in this procedure. The input variables consist of peak and off-peak hourly traffic volumes and existing signal timing. The HCM procedure uses this information to calculate vehicle delay by approach and for the entire intersection. The intersection delay is multiplied by the approach volume to calculate total delay for both peak and off-peak conditions. Peak hour calculations are multiplied by four and off-peak calculations by twenty to estimate daily emissions.

The same procedure is followed for proposed roadway conditions. The proposed condition consists of any lane configuration changes planned by the project sponsor and changing arrival type from 3 to 5. An arrival type of 5 is considered the most favorable platoon condition while 3 is considered the average condition. Other signal improvements were not included in this analysis because detailed traffic engineering studies have not yet been completed.

The delay reduction is calculated by calculating the difference in delay under both peak and off-peak conditions. These differences are then multiplied by idle emission factors to estimate total emissions reductions for one intersection. For projects that have more than one intersection, a typical intersection, or intersections, was chosen to determine the emissions reduction. Average daily intersection emissions reductions were then multiplied by the total number of intersections to estimate the total emissions improvements based on reductions in intersection delay.

The emissions reductions achieved from increases in traveling speed and reductions in intersection delay are added together. This result is the total emissions reduction, by pollutant, for the entire project. This total is expressed in tons per day.

The following summarizes emissions benefits in tons per day, by pollutant and by year, of implementing individual traffic flow improvements.

	1997			2006			2010		
	VOC	CO	NO_x	VOC	CO	NO_x	VOC	CO	NO_x
1. Crain Ave.	(N/A)	(N/A)	(N/A)	(0.002)	(0.034)	(0.001)	(0.002)	(0.034)	(0.001)
2. SR 14/43/303	(N/A)	(N/A)	(N/A)	(0.009)	(0.158)	(0.002)	(0.008)	(0.156)	(0.002)
3. Portage Trail	(N/A)	(N/A)	(N/A)	(0.015)	(0.305)	(0.004)	(0.015)	(0.303)	(0.004)
4. SR 91	(0.006)	(0.100)	(0.001)	(0.005)	(0.092)	(0.001)	(0.005)	(0.092)	(0.001)
5. Tallmadge Ave.	(0.017)	(0.332)	(0.005)	(0.015)	(0.319)	(0.005)	(0.015)	(0.332)	(0.005)

Bus Replacements

METRO RTA is planning to replace some of its large bus fleet and convert a portion of the remaining fleet from diesel powered vehicles to compressed natural gas (CNG) powered vehicles. As part of this process METRO also plans to construct a CNG refueling facility.

The following summarizes the number of buses expected to be replaced for each analysis year.

Bus Replacements by Analysis Year

1997	2006	2010
62	132	182

To calculate the emissions impacts of replacing buses, a methodology was used similar to one prepared by the Northeast Ohio Areawide Coordinating Agency (NOACA) and approved by the US EPA. (The NOACA methodology is included in Appendix B).

The following summarizes the multiple step process to complete the emissions forecast, by pollutant:

1) The number of bus replacements by year, is identified.

2) The average number of daily VMT for the METRO large bus fleet is (26,687) calculated using METRO 1993 Performance Reports.

3) Emissions levels for old buses and replacement buses are calculated using average daily VMT levels and the following emission factors and conversion factors (from Appendix B):

U.S. EPA Standards for Diesel Buses
(in Grams/Brake - Horsepower Hour)

Model Year	HC	NO_x
1970-89	1.3	10.7
1990	1.3	6.0
1991-97	1.3	5.0
1998+	1.3	4.0

Model Year	CO
1974-78	40
1979-84	25
1985+	15.5

Conversion Factors From G/BrHpHr to Grams/Mile

	HC	CO	NO_x
Urban Operating Level	2.3	10.6	4.3

4) The calculated difference constitutes the emissions savings of replacing buses.

The following summarizes the emissions impacts of replacing METRO's old diesel powered buses:

1997			2006			2010		
VOC	CO	NO_x	VOC	CO	NO_x	VOC	CO	NO_x
0.000	(1.158)	(0.146)	0.000	(1.158)	(0.215)	0.000	(1.158)	(0.215)

SUMMARY

Table III-1 summarizes the emissions impacts of the off-model transportation improvements

TABLE III-1
EMISSIONS IMPACTS OF OFF-MODEL
TRANSPORTATION IMPROVEMENTS

	1997			2006			2010		
FY 1997 - 2000 TIP	VOC	CO	NOx	VOC	CO	NOx	VOC	CO	NOx
1. Bus Replacements	0.000	(1.158)	(0.146)	(0.000)	(1.158)	(0.215)	(0.000)	(1.158)	(0.215)
2. Akron-Cleve Service	(0.012)	0.021	(0.008)	(0.005)	0.071	(0.001)	(0.004)	0.075	0.000
3. Univ. of Akron Service	(0.009)	(0.054)	(0.003)	(0.004)	(0.015)	0.001	(0.003)	(0.012)	0.001
4. Vanpools									
A. METRO	(0.011)	(0.062)	(0.011)	(0.009)	(0.038)	(0.010)	(0.007)	(0.034)	(0.009)
B. PARTA	(0.004)	(0.020)	(0.004)	(0.007)	(0.031)	(0.008)	(0.006)	(0.027)	(0.007)
5. Traffic Flow Improvements									
A. Crain/Mantua/Fairchild	NA	NA	NA	(0.002)	(0.034)	(0.001)	(0.002)	(0.034)	(0.001)
B. SR 14/43/303	NA	NA	NA	(0.009)	(0.158)	(0.002)	(0.008)	(0.156)	(0.002)
C. Portage Trail	NA	NA	NA	(0.015)	(0.305)	(0.004)	(0.015)	(0.303)	(0.004)
D. SR 91/Graham/Stow	(0.006)	(0.100)	(0.001)	(0.005)	(0.092)	(0.001)	(0.005)	(0.092)	(0.001)
E. Tallmadge Ave.	(0.017)	(0.332)	(0.005)	(0.015)	(0.319)	(0.005)	(0.015)	(0.332)	(0.005)
TOTAL OFF-MODEL IMPACTS	(0.058)	(1.707)	(0.177)	(0.070)	(2.079)	(0.246)	(0.065)	(2.073)	(0.243)

NOTE: A negative number indicates an emissions reduction.

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CHAPTER IV
Combined Emissions Forecast

In this chapter the results of emissions forecasts using standard transportation models are combined with results from off-model project analyses.

Table IV has been prepared to show the combined emissions forecasts for VOC and NO_x for the AMATS area. This table includes the 1990 emissions inventory and forecasts for 1997, 2006 and 2010. BUILD condition forecasts include the emissions of both the modeled network (from Chapter II) and off-model transportation improvements (from Chapter III). These emissions forecasts will be combined with those of NOACA and Ashtabula County to show conformity with the State Implementation Plan for the Cleveland/Akron nonattainment area.

TABLE IV-1

EMISSIONS FORECASTS FOR THE AMATS FY 1997-2000
TRANSPORTATION IMPROVEMENT PROGRAM

(TONS/DAY)

	VOC	NO_x
1990 INVENTORY	75.530	46.350
1997 NO BUILD	28.017	31.933
1997 BUILD	27.959	31.756
2006 NO BUILD	14.861	19.667
2006 BUILD	14.749	19.445
2010 NO BUILD	12.938	18.518
2010 BUILD	12.750	17.969

APPENDIX A

Implementation Years of Projects Analyzed

NO BUILD NETWORK

The No Build Network includes all projects open to traffic in 1996 and the following projects which have satisfied the requirements of 40 CFR 51.394.

PID #	CO-RTE-SECTION	LOCATION & TERMINI	TYPE OF WORK
7566	POR-SR 59- 5.78	EAST OF BRADY LAKE ROAD TO MORGAN ROAD (TR 601)	BRDG REPLACEMENT WIDENING
11430	POR-SR 59- 6.38	EAST OF BRADY LAKE ROAD TO MORGAN ROAD (TR 601)	WIDENING
	POR-IR 80	SR 44 TO TRUMBULL CO LINE	2 ADDITIONAL LANES
7171	SUM-GILCHRIST RD	AKRON. SR 91 TO IR-76. (MPO'S STP)	WIDENING
LOCAL	SUM-HOME AVE	INDEPENDENCE AVE TO HOWE AVE	WIDEN TO 5 LANES
7199	SUM-SMITH RD	FAIRLAWN. MARKET ST TO 500' WEST OF GHENT RD. (MPO'S STP)	WIDEN UPGRADE SIGNALS
7198	SUM-SMITH/GHENT	FAIRLAWN/AKRON. SMITH AND GHENT RD INTERSECTION. (MPO'S STP)	WIDEN APPROACHES LOWER PROFILES
6382	SUM-SR 82- 3.40	MACEDONIA. AURORA RD, SR 8 TO S BEDFORD RD. (MPO'S STP)	WIDENING
7642	SUM-SR241- 9.28	AKRON, GEO WASHINGTON BLVD. RELOCATE TO HILBISH AT TRIPLETT BLVD (MPO'S STP)	RELOCATION

1997 NETWORK

The 1997 Network includes those projects shown in the 1996 Network plus the following projects.

PID #	CO-RTE-SECTION	LOCATION & TERMINI	TYPE OF WORK
	SUM-IR 80	CUYAHOGA CO LINE TO SR 21	2 ADDITIONAL LANES
	SUM-IR 80	SR 14/IR 480 TO SR 44	2 ADDITIONAL LANES

2006 NETWORK

The 2006 Network includes those projects shown in the 1997 Network plus the following projects.

PID #	CO-RTE-SECTION	LOCATION & TERMINI	TYPE OF WORK
	POR-SR 43	MELOY RD TO SR 261	4 LANES WITH TURN LANES
9693	POR-SR 43- 7.70	TALLMADGE ROAD TO MELOY ROAD	WIDEN TO 4 LANES
8318	SUM-CLEVE-MASS RD	NORTON/BARBERTON. WOOSTER RD W TO I-76. (MPO'S STP)	WIDENING
10300	SUM-FISHCREEK RD	SR 59 TO LAURAL WOODS BLVD (MPO'S STP)	WIDENING UPGRADE SIGNALS
	SUM-FISHCREEK RD	STOW RD TO LAURAL WOODS BLVD	4 LANES WITH TURN LANES
10982	SUM-KELLY AVE	GOODYEAR BLVD TO TALLMADGE AVE	CONSTRUCT 4-LANE ARTERIAL
11415	SUM-MULL AVE	WHITE POND DR TO HAWKINS AVE (MPO'S STP)	WIDENING RECONSTRUCTION
9003	SUM-N PORTAGE PATH	MERRIMAN ROAD TO PORTAGE TRAIL (MPO'S STP)	WIDENING
	SUM-NORTON/SEASONS	NORTON RD TO SEASONS RD	NEW 2-LANE ROADWAY
11351	SUM-S MAIN ST	FIRESTONE BLVD TO COLE AVE (MPO'S STP)	WIDENING SIGNALIZATION

2006 NETWORK

The 2006 Network includes those projects shown in the 1997 Network plus the following projects.

PID #	CO-RTE-SECTION	LOCATION & TERMINI	TYPE OF WORK
11372	SUM-TRIPLETT BLVD	HILBISH AVE TO CANTON RD (MPO'S STP)	WIDENING
	SUM-WATERLOO RD	I-77 TO ARLINGTON ST (MPO'S STP)	WIDENING
7663	SUM-WHITE POND SUM-FRANK BLVD	AKRON. 0.09 MI NORTH OF MULL AVE TO W MARKET ST. (MPO'S STP)	RECONSTRUCTION WIDENING
11661	SUM-SR 8-10.66	SR 8 AT SEASONS RD	CONSTRUCT INTERCHANGE
7861	SUM-CR 17	CLEVELAND-MASSILLON RD RIDGEWOOD RD TO SR 18 (MPO'S STP)	WIDEN, REALIGN INTERSECTION
14180	SUM-SR 21- 1.79	SR 21 AT DOROTHY AVE	CONSTRUCT INTERCHANGE
8310	SUM-CR 50	S MAIN ST. TURKEYFOOT LAKE RD TO PORTAGE LAKES DR. (MPO'S STP)	WIDENING
	SUM-IR 76	SR 21 TO IR 277	2 ADDITIONAL LANES
13975	SUM-IR 77- 0.00 STA-IR 77-12.74	US 62 TO SUMMIT CO LINE; SUMMIT CO LINE TO AKRON-CANTON AIRPORT	WIDEN TO 6 LANES
	SUM-IR 77- 0.53	AKRON-CANTON AIRPORT TO SR 241	WIDEN TO 6 LANES

2006 NETWORK

The 2006 Network includes those projects shown in the 1997 Network plus the following projects.

PID #	CO-RTE-SECTION	LOCATION & TERMINI	TYPE OF WORK
14152	SUM-IR 77- 4.55	SR 241 TO ARLINGTON RD	WIDEN TO 6 LANES
8950	SUM-IR 77-18.34	AKRON. WHITE POND DR BRIDGE	BRIDGE REHABILITATION
	SUM-IR 77	CLEVE-MASS RD TO WHEATLEY RD	2 ADDITIONAL LANES
	SUM-IR 77/IR 80		NEW INTERCHANGE
	SUM-IR 80	SR 21 TO SR 14/IR 480	2 ADDITIONAL LANES
7825	SUM-SR 91- 2.41	AKRON. DARROW RD, GILCHRIST RD. TO EASTWOOD AVE. (MPO'S STP)	ADD FIFTH LANE UPGRADE SIGNALS
	SUM-IR271	SR 8 TO SW OF IR 480	2 ADDITIONAL LANES

2010 NETWORK

The 2010 Network includes those projects shown in the 2006 Network plus the following projects.

PID #	CO-RTE-SECTION	LOCATION & TERMINI	TYPE OF WORK
	POR-MIDDLEBURY RD	OVER CSX RR	BRDG REPLACEMENT ROAD REALIGNMNT
	POR-SR 59	SR 261 TO BRADY LAKE RD	WIDEN TO 4 LANES
	SUM-ARLINGTON RD	GREENSBURG RD TO KILLIAN RD	WIDEN TO 4/5 LANES
	SUM-CUYAHOGA FALLS	FRONT ST TO SR 8	WIDEN TO 4 LANES
	SUM-NORTON/SEASONS	NORTON RD TO SEASONS RD	NEW 4-LANE ROADWAY
	SUM-TALLMADGE RD	CUYAHOGA FALLS. TALLMADGE RD BAILEY RD AND HOWE AVE.	RELOCATION
	SUM-SR 8	INTERCHANGE IMPROVEMENTS AT HOWE AVE	RECONSTRUCT RR BRIDGES
7867	SUM-SR 8- 0.38	AKRON. CENTRAL INTERCHANGE TO VIADUCT.	MAJOR UPGRADING
11045	SUM-SR 8-12.75	SR 303 TO IR 271 (MPO'S FAMA - FOR PE ONLY)	UPGRADE TO FREE-WAY STANDARDS
	SUM-IR 77	ARLINGTON RD TO US 224	WIDEN TO 8 LANES

2010 NETWORK

The 2010 Network includes those projects shown in the 2006 Network plus the following projects.

PID #	CO-RTE-SECTION	LOCATION & TERMINI	TYPE OF WORK
	SUM-IR 77	SR 162 TO SR 18	WIDEN TO 6 LANES
	SUM-IR 77	WHEATLY RD (SR 176) TO CUYAHOGA CO LINE	WIDEN TO 6 LANES
	SUM-SR 82	S BEDFORD RD TO VALLEYVIEW RD	WIDEN TO 4 LANES WITH TURN LANES
	SUM-SR 91	HOWE RD TO S OF KENT RD (SR 59)	WIDEN TO 4 LANES WITH TURN LANES

APPENDIX B

NOACA CNG Bus Replacement Emissions Forecasting Methodology and US Environmental Protection Agency Approval Letter

COMPRESSED NATURAL GAS (CNG) BUS REPLACEMENT METHODOLOGY FOR HYDROCARBON (HC) AND OXIDES OF NITROGEN (NO_x) POLLUTANT EMISSION REDUCTIONS

FINAL

MAY 19, 1994

NORTHEAST OHIO AREAWIDE COORDINATING AGENCY
ATRIUM OFFICE PLAZA - 4TH FLOOR
668 EUCLID AVENUE
CLEVELAND, OHIO 44114-3000

Principal Author: Bill Davis
Division Director: John Beeker, Environmental Planning
Executive Director: Howard R. Maier

Preparation of this document has been financed through grants received from the Federal Highway Administration and the Ohio Department of Transportation and appropriations from the counties of and municipalities within Cuyahoga, Geauga, Lake, Lorain and Medina. The contents do not necessarily reflect the official views or policy of the U.S. Department of Transportation. This report does not constitute a standard or regulation.

Fiscal Year 1994 Project 01012

COMPRESSED NATURAL GAS (CNG) BUS REPLACEMENT METHODOLOGY FOR HYDROCARBON (HC) AND OXIDES OF NITROGEN (NO_x) POLLUTANT EMISSION REDUCTIONS

NOACA drafted a methodology for quantifying hydrocarbon (HC) and oxides of nitrogen (NO_x) emissions reductions attributable to local transit agency replacement of diesel buses with Compressed Natural Gas (CNG) powered vehicles. This was done as a follow-up to a teleconference with representatives of USEPA Region 5, FHWA, and ODOT on the NO_x conformity issue on March 14, 1994. USEPA Region 5 reviewed and commented on NOACA's methodology and the following addresses their concerns.

Emission Factors

USEPA provided a vehicle emissions standards summary for diesel-cycle heavy duty engines in grams/brake-horsepower-hour[1] (see Table 1) and conversion factors to convert these to grams/mile emissions[2] (see Table 2).

According to the State of California Air Resources Board (CARB) new CNG engines when certified tested at 0.6 grams/brake-horsepower-hour HC emissions and 2.0 grams/brake-horsepower hour NO_x emissions.[3] USEPA has requested that the current heavy duty standards of 1.3 grams/brake-horsepower-hour for HC and 5.0 grams/brake-horsepower-hour for NO_x be used since there is no current enforcement authority for the CNG engines below the standard. This method employs the current standards. Nevertheless, the difference in performance estimates between the CNG engines and the standards should provide a significant "cushion" for reduction estimates and allow for engine deterioration without affecting the estimated reduction (see Table 3).

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1 Mobile Source Emissions Standards Summary (USEPA, May 1993).

2 Development of Conversion Factors for Heavy Duty Bus Engines (USEPA, July 1992).

3 Executive Order A-21-111 (State of California Air Resources Board (CARB), February 1994).

TABLE 1

USEPA EMISSION STANDARDS FOR DIESEL BUSES
(IN GRAMS/BRAKE-HORSEPOWER-HOUR (G/BrHpHr))

	DIESEL BUSES	
MODEL YEAR	HC	NO_X
1970 - 1989	1.3	10.7
1990	1.3	6.0
1991 - 1997	1.3	5.0
1998 - ?	1.3	4.0

SOURCE: USEPA, Mobile Source Emissions Standards Summary

TABLE 2

CONVERSION FACTORS FROM G/BrHpHr TO GRAMS/MILE (G/MILE)

OPERATING LEVEL	HC	NO_X
INTER-CITY	1.6	3.5
URBAN	2.3	4.3
HEAVY URBAN	5.4	7.0

SOURCE: USEPA, Development of Conversion Factors for Heavy Duty Bus Engines

TABLE 3

CALIFORNIA AIR RESOURCES BOARD EMISSION FACTORS
FOR CNG BUSES (GRAMS/BRAKE-HORSEPOWER-HOUR)

	CNG BUSES	
MODEL YEAR	HC	NO_X
1993	0.6	2.0

SOURCE: CARB, Executive Order A-21-111

The Urban Operating Level conversion factors in Table 2 are used throughout this analysis due to the belief that this will most closely reflect average emission changes across the GCRTA fleet which operates wholly in an urban operating environment.

Bus Replacement Program - Current GCRTA Purchases

The Greater Cleveland Regional Transit Authority (GCRTA) reports that it is replacing 80 forty foot 1979 model year diesel buses with CNG buses in calendar year 1994.[4]

Utilizing the following mileage data from federal revenue vehicle inventory reports[5] (see Table 4), pollutant emission reductions from these replacements can be calculated.

TABLE 4

GCRTA REVENUE VEHICLE INVENTORY DATA FOR BUSES SEATING 35 OR MORE PEOPLE
(FORM 408, SECTION 15)

MODEL YEAR	# OF ACTIVE BUSES	ACCUMULATED ANNUAL MILEAGE	ANNUAL MILEAGE PER BUS
1965	0	0	0
1979	80	1,556,000	19,450
1982	77	1,850,000	24,026
1984	57	1,371,000	24,053
1985	105	2,544,000	24,229
1988	77	2,715,000	35,260
1989	77	2,964,000	38,494
1990	150	6,873,000	45,820
1991	58	2,921,000	50,362
TOTAL/AVERAGE	681	22,794,000	33,471

SOURCE: GCRTA, Form 408 of Section 15 Report to FTA.

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4 Bus Improvement Program (GCRTA, December 21, 1993).

Total annual mileage for the 1979 buses which are being replaced can be calculated using the annual mileage per bus for 1979 and multipling by the number of buses being replaced. We can assume that the new CNG buses will travel 50,362 miles per year each when new (like the current 1991 model year buses), and multiply by the number of new buses.

TABLE 5

EMISSION CALCULATIONS FOR BUS REPLACEMENT

HYDROCARBONS

MODEL YEAR	# OF BUSES	FUEL TYPE	ANNUAL MILEAGE	EMISSION FACTOR (G/MILE)	EMISSIONS (TONS/DAY)	GAIN/ LOSS
1979	80	DIESEL	1,556,000	2.99	0.0140	LOSS
1993	80	CNG	4,028,960	2.99	0.0364	GAIN
					0.0224	NET GAIN

OXIDES OF NITROGEN

MODEL YEAR	# OF BUSES	FUEL TYPE	ANNUAL MILEAGE	EMISSION FACTOR (G/MILE)	EMISSIONS (TONS/DAY)	GAIN/ LOSS
1979	80	DIESEL	1,556,000	46.01	0.2162	LOSS
1993	80	CNG	4,028,960	21.5	0.2616	GAIN
					0.0454	NET GAIN

Therefore, the replacement of 80 1979 diesel buses with 80 new CNG buses will yield a 0.0224 ton/day increase in HC emissions and a 0.0454 ton/day increase in NO_x emissions before annual mileage replacement is taken into account (see Table 5).

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5 Form 408 of GCRTA's Section 15 Report to FTA.

In addition to these emission changes due to vehicle replacement, additional emission changes would result from the elimination of mileage from the existing fleet, if overall fleet mileage is assumed to remain constant. The additional annual mileage reduction for existing buses is equivalent to the difference between the mileage estimate for the new buses and the replaced mileage. This is equal to 2,472,960 miles. Geometric means of emission standards for the existing fleet (excluding 1979 model year buses being retired) yield a 2.99 G/mile emission factor for HC and a 36.10 G/mile emission factor for NO_x. Table 6 displays the emission reductions achieved by these mileage replacements.

TABLE 6

EMISSION CALCULATION FOR MILEAGE REPLACEMENT

POLLUTANT	ANNUAL MILEAGE REPLACEMENT	EMISSION FACTOR (G/MILE)	EMISSION REDUCTION (TONS/DAY)
HC	2,472,960	2.99	0.0224
NO_x	2,472,960	36.10	0.2696

The net result of GCRTA's new purchases, therefore, is no net change in HC and a 0.2242 ton/day reduction in NO_x.

Bus Replacement Program - SFY 1995 Purchases Programmed in the SFY 1995-1998 NOACA Transportation Improvement Program (TIP)

In addition to the above purchases, GCRTA has CNG bus purchases programmed for SFY 1995 in the SFY 1995-1998 NOACA TIP. GCRTA is planning to purchase an additional 39 CNG buses in SFY 1995. These buses will replace 1982 Model Year diesel buses. Tables 7 and 8 display the emission changes resulting from these planned purchases.

TABLE 7

EMISSION CALCULATIONS FOR SFY 1995 BUS REPLACEMENT - GCRTA

HYDROCARBONS

MODEL YEAR	# OF BUSES	FUEL TYPE	ANNUAL MILEAGE	EMISSION FACTOR (G/MILE)	EMISSIONS (TONS/DAY)	GAIN/ LOSS
1982	39	DIESEL	937,014	2.99	0.0085	LOSS
1993	39	CNG	1,964,118	2.99	0.0177	GAIN
					0.0092	NET GAIN

OXIDES OF NITROGEN

MODEL YEAR	# OF BUSES	FUEL TYPE	ANNUAL MILEAGE	EMISSION FACTOR (G/MILE)	EMISSIONS (TONS/DAY)	GAIN/ LOSS
1982	39	DIESEL	937,014	46.01	0.1302	LOSS
1993	39	CNG	1,964,118	21.5	0.1275	GAIN
					0.0027	NET LOSS

TABLE 8

EMISSION CALCULATIONS FOR MILEAGE REPLACEMENT
SFY 1995 BUS REPLACEMENT - GCRTA

POLLUTANT	ANNUAL MILEAGE REPLACEMENT	EMISSION FACTOR (G/MILE)	EMISSION REDUCTION (TONS/DAY)
HC	1,027,104	2.99	0.0093
NO_x	1,027,104	35.60	0.1104

The net impact of SFY 1995 GCRTA Bus Replacement Program is, therefore, no net change in HC and a 0.113 Ton/day reduction in NO_x.

The total emission reductions achieved by GCRTA current and programmed purchases are 0.3373 Tons/day in NO_x. The current and programmed purchases will have no impact on HC emissions.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

MAY 19 1994

REPLY TO THE ATTENTION OF:
(AE-17J)

John Beeker, Environmental Planning Director
Northeast Ohio Areawide Coordinating Agency
668 Euclid Avenue
Atrium Office Plaza
Cleveland, Ohio 44114

Dear Mr. Beeker:

This letter is in response to your letter dated May 13, 1994, regarding the revised methodology for evaluating hydrocarbon and nitrogen oxide emissions impacts of the Compressed Natural Gas (CNG) Bus Replacement Program. Bill Davis, of your staff, addressed the United States Environmental Protection Agency's (USEPA's) comments and sent a revised text of the document included in your letter. The USEPA accepts the methodology presented in the final version dated May 19, 1994, which is enclosed. In the future, it will be important to track the actual mileage of the new CNG buses as well as the diesel buses to verify the emission reductions that have been credited. The USEPA appreciates your patience and cooperation in this matter.

Sincerely,

William L. MacDowell

William L. MacDowell, Chief
Regulation Development Section
Air Enforcement Branch

Enclosure

cc: Phillip Carlson, Project Manager
Office of Mobile Sources

Robert Hodanbosi, Chief
Division of Air Pollution Control
Ohio Environmental Protection Agency

Paul Fish, Transportation Representative
Office of Grant Assistance
Federal Transit Administration

Samuel Herrera, Transportation Planning Engineer
Federal Highway Administration

ATTACHMENT E

County of Ashtabula
SFY 1997-2000 STIP Conformity Documentation

OHIO DEPARTMENT OF TRANSPORTATION

CENTRAL OFFICE, 25 S. FRONT STREET, P.O. BOX 899, COLUMBUS, OHIO 43216-0899

May 6, 1996

Mr. John Beeker
Northeast Ohio Areawide Coordinating Agency
668 Euclid Ave. 4th Floor
Cleveland, Ohio 44114-3000

Re: FY 1997-2000 STIP Conformity Analysis

Dear Mr. Beeker,

The April 4, 1996 US EPA redesignation action for the Cleveland/Akron Nonattainment Area changes the requirements under which the area demonstrates conformity. Conformity is now demonstrated based on a budget test using the year 2006 SIP redesignation budget. Our March 6, 1996 Memorandum initiating the FY 1997-2000 STIP Cleveland/Akron conformity consultation process provided data for the Ashtabula County portion of the area based on a SIP 15% budget test and a build/no build test. We are now updating this data based upon the redesignation requirements. The table below reflects the 2006 budget test data for the Ashtabula County portion of the Cleveland/Akron Nonattainment Area. Please incorporate this data with the AMATS and NOACA information.

Ashtabula County Portion
of the
Cleveland/Akron Nonattainment Area
Budget Test

	Ashtabula tons/day		**VMT**
	HC	NOx	
1990 Baseline	11.65	9.61	2,682,870
1997 Action	6.849	7.838	2,908,225
2006 Redesignation Budget	5.18	5.90	
2006 Action	5.993	6.588	3,197,974
2010 Action	5.909	6.570	3,326,752

Respectfully,

Larry F. Sutherland

Larry F. Sutherland
Acting Administrator, Office of Planning

LFS:dm

Ashtabula County

Introduction

Ashtabula County is a rural county on the northeastern edge of the Cleveland/Akron moderate ozone non-attainment area. In September 1993. at the request of the county, an agreement was executed between the county, the Cleveland and Akron MPOs, OEPA and ODOT exempting Ashtabula County from the Federal 3-C urban transportation planning process. This agreement also established an interagency consultation process that is used to meet the transportation conformity requirements for the nonattainment area. The Agreement provides for ODOT to conduct the conformity analysis for the Ashtabula County portion of the nonattainment area while the Cleveland and Akron MPOs conduct analyses for their respective portions of the area. Following these individual efforts, the agencies combine the data to generate one conformity analysis for the entire area.

The following narrative documents how the Ashtabula County STIP projects meet the applicable conformity criteria and procedures of the November 24, 1993 US EPA Conformity rule.

§ 51.412 - Latest Planning Assumptions

The conformity analysis for Ashtabula County is based on the FHWA Highway Performance Monitoring System (HPMS) vehicle miles of travel (VMT) estimates. The base year 1990 VMT data is taken directly from the HPMS information that was used to develop the State Implementation Plan (SIP). The VMT estimates are generated on a county-wide basis by highway functional classification. Attainment and milestone year VMT rates for conformity analyses are derived by applying HPMS growth factors, by highway functional classification, to the base year VMT estimates. The Ashtabula County VMT growth factors and resulting VMT estimates for the FY 1997-2000 STIP conformity analysis are reflected in the table below.

HPMS VMT Estimates

Analysis Year	HPMS Growth Rate	VMT Estimate
1990	1.012	2,682,870
1997	1.012	2,908,225
2006	1.012	3,197,974
2010	1.012	3,326,752

Establishing Conformity Analysis Year Emission Burdens

Emission burdens for the conformity tests are generated by running the USEPA Mobile 5AH software using the HPMS derived VMT estimates. Attainment and milestone year emission burdens are developed, with Mobile 5AH for each highway system functional classification within the county. The Mobile 5AH input parameters are the same as were used in developing the SIP. The factors include vehicle travel speed, vehicle mix, percentage of hot and cold starts, OEPA supplied seasonal temperature for the Cleveland/Akron nonattainment area, etc. The data from each functional class is then totaled to establish a case condition for the attainment and milestone year analyses.

Following establishment of the future base case emission burdens, the impact of any capacity addition projects on the base case is quantified. The difference in the pollutant burdens, based on changes in VMT and speeds between the project build and no-build scenarios is determined by using Mobile 5AH emission factors. This figure is added to the future base condition to evaluate the impacts associated with new projects.

The FY 1997-2000 STIP for Ashtabula County is comprised entirely of air quality exempt projects as defined in §51.460 of the November 24, 1993 US EPA Conformity Rule . As a result, the action scenario emission burdens for Ashtabula County will be the same as the base case emission burdens that were established for the HPMS County-wide VMT growth totals.

§ 51.416 - Consultation Procedures

Public Involvement Process for Ashtabula County FY 1997-2000 STIP Projects

Since Ashtabula County is not included in an MPO, the transportation improvement projects scheduled for the county are included in the Ohio State Transportation Improvement Program (STIP).

The Public involvement effort for the Ashtabula County FY 1997-2000 STIP projects is incorporated into the Ohio STIP public involvement process. The Ohio STIP public involvement activities for Ashtabula County included the following efforts:

- ODOT issued an April 4, 1996 press release notifying the public that the public involvement period for review of the draft STIP was being conducted from April 8, 1996 to April 19, 1996.
- A legal notice was placed in the April 1, 1996 newspapers serving Ashtabula County notifying the public of that the draft STIP was availability of the for review at the ODOT District Office in Ravenna, Ohio, at the Eastgate Development and Transportation Agency in Youngstown, Ohio and at the Northeast Ohio Areawide Coordinating Agency in Cleveland, Ohio. The legal notice appeared in the Cleveland Plain Dealer, the Cleveland Call and Post, the Youngstown Vindicator, the Gazette, the Star Beacon, the News Herald, and the Valley News.

- ODOT District 4 held a public meeting to review the STIP in Jefferson, Ohio (the Ashtabula County Seat) on April 18, 1996. District 4 personnel conducted outreach activities to generate publicity regarding this meeting.
- Any comments concerning the STIP Ashtabula County projects and ODOT's response to the comments will be documented in the final STIP.

Cleveland/Akron Nonattainment Area Conformity Consultation Procedures

The general public, regional transportation implementing and planning agencies, and the Ohio Environmental Protection Agency have been afforded opportunities to participate in the development and review of the Ashtabula County STIP projects and the associated air quality conformity analysis. Following the procedures established September 1993 Conformity Agreement AMATS, NOACA, OEPA, and ODOT have coordinated development of a single conformity determination for the Cleveland/Akron nonattainment area. The complete Cleveland/Akron nonattainment area conformity document will be published by NOACA as an appendix to the Agency's FY 1997 - 2000 TIP.

The STIP public involvement activities and the consultation procedures among ODOT, OEPA, and the Cleveland and Akron MPOs embodied in the September 1993 Ashtabula Conformity agreement, meet the consultation procedures requirement of Part 51.416.

§51.418 - Timely Implementation of Transportation Control Measures

The Ohio SIP does not contain any TCMs for Ashtabula County. The only TCMs in the SIP for the Cleveland/Akron nonattainment area are within the geographic boundary of the Cleveland MPO. The implementation status of these TCMs is recorded in the NOACA FY 1997-2000 TIP Conformity Document.

§ 51.422 - Transportation Plan

The Ohio Statewide Transportation Plan, Access Ohio, consists of two parts, a Macro Phase focusing on broad statewide policies and goals; and a Micro Phase focusing on system needs and priorities. The Macro Phase was issued in October, 1993 and the Micro Phase in June, 1995. The Statewide plan identifies multi-modal transportation system needs, it does not identify specific projects that the State will pursue. Accordingly, a conformity determination can not be performed on the rural nonattainment areas covered by the Statewide plan. Conformity for the rural nonattainment areas is performed on the projects included in the STIP.

The Ashtabula County projects listed in the STIP are consistent with the policies, goals, and needs established in the Ohio Statewide Transportation Plan, Access Ohio.

§ 51.430 & 51.438 - Conformity Tests

The VOC and NOx pollutant burdens in tons/day for Ashtabula County were calculated using the methods described in the Latest Planning Assumptions portion of this narrative. The tables below reflect the FY 1997 - 2000 conformity analysis data for Ashtabula County. These pollutant burdens will be combined with the burdens for the Akron and Cleveland areas to demonstrate conformity for the entire Cleveland/Akron non-attainment area.

The Cleveland/Akron area is classified as a moderate nonattainment area for the pollutant ozone and is in the transitional conformity criteria period. The conformity tests required for this area are build/no build tests and budget tests using the March 14, 1994 Cleveland/Akron 15% SIP.

Cleveland/Akron Nonattainment Area
Budget Test

	NOACA tons/day		**AMATS** tons/day		**Ashtabula** tons/day		**Total** tons/day		****VMT**
	HC	NOx	HC	NOx	HC	NOx	HC	NOx	
1990 Baseline	161.2	120.62	75.52	46.35	11.65	9.61	248.37	176.58	2,682,870
1997 Action					6.849	7.838			2,908,225
2006 15% Budget	62.6	120.62	29.91	46.35	6.989	*9.61	99.499	176.58	
2006 Action					5.993	6.588			3,197,974
2010 Action					5.909	6.570			3,326,752

* NOx 15% Budget is from 1990 SIP budget because the 15% plan did not include a NOx Budget

** VMT reflects only Ashtabula County. Joint AMATS, NOACA, ODOT conformity document will reflect VMT for entire nonattainment area.

Cleveland/Akron Nonattainment Area
Build/No Build Comparison

	NOACA tons/day		AMATS tons/day		Ashtabula tons/day		Total tons/day		**VMT
	HC	NOx	HC	NOx	HC	NOx	HC	NOx	
1997 Baseline					6.849	7.838			2,908,225
1997 Action					6.849	7.838			2,908,225
2006 Baseline					5.993	6.588			3,197,974
2006 Action					5.993	6.588			3,197,974
2010 Baseline					5.909	6.570			3,326,752
2010 Action					5.909	6.570			3,326,752

** VMT reflects only Ashtabula County. Joint AMATS, NOACA, ODOT conformity document will reflect VMT for entire nonattainment area.

Conformity Determination

The conformity analysis data presented in this narrative will be incorporated into the joint AMATS, NOACA, and ODOT conformity document. Following publication of this document, the State of Ohio joins with the AMATS and NOACA MPOs in requesting a conformity determination for the Cleveland/Akron nonattainment area portion of the FY 1997-2000 State Transportation Improvement Program.