

FIX UPS TO THE
15% RATE-OF-PROGRESS SIP
For Dallas/Fort Worth, El Paso, Beaumont Port Arthur
and Houston/Galveston Ozone Nonattainment Area

APPENDIX 7-L

96109-SIP-AI, 96110-SIP-AI, 96111-SIP-AI,
96112-SIP-AI, 96113-SIP-AI

JULY 24, 1996

ON-ROAD MOBILE ADJUSTED BASE YEAR ANALYSIS

SUPPORTING DOCUMENTATION

On-road Mobile Adjusted Base Year Analysis

This appendix contains detailed documentation supporting the on-road mobile adjusted base year analyses for the ozone nonattainment area 1996 Rate-of-Progress Plans.

MOBILE5A input files are included. The output files, too bulky to include within this document, are contained in a submittal under separate cover.

TNRCC staff developed and documented on-road mobile adjusted base year emissions inventories for the El Paso and Beaumont/Port Arthur areas, whereas, in coordination with TNRCC, the North Central Texas Council of Governments and Houston-Galveston Area Council did the same for the Dallas/Fort Worth and Houston-Galveston areas, respectively.

The discussion is organized as follows:

- Part 1: Dallas/Fort Worth On-road Mobile Adjusted Base Year Analysis,
- Part 2: El Paso On-road Mobile Adjusted Base Year Analysis,
- Part 3: Beaumont/Port Arthur On-road Mobile Adjusted Base Year Analysis,
- Part 4: Houston-Galveston On-road Mobile Adjusted Base Year Analysis.

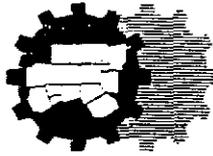
EI modelers used the EPA specified adjusted base year calculation methodology as described in Guidance on the Adjusted Base Year Emissions Inventory and the 1996 Target for the 15 Percent Rate of Progress Plans (EPA, October 1992) to produce the results as documented in this appendix.

Part 1

Dallas/Fort Worth On-road Mobile Adjusted Base Year Analysis

CONTENTS:

1. NCTCOG September 30, 1993 memorandum entitled Adjusted VOC Base Year On-road Mobile Source Emission Inventory Using MOBILE5A,
2. NCTCOG September 1, 1993 memorandum entitled Vehicle Miles-of-Travel (VMT) Adjustment Factor for Emissions Inventories,
3. TNRCC September 13, 1993 memorandum describing the interpolation procedure for projecting emissions inventories from July 1, 1996 to November 15, 1996.



North Central Texas Council Of Governments

TO: Martin Boardman
Texas Natural Resource Conservation Commission

DATE: September 30, 1993

FROM: Everett Bacon
Senior Transportation Planner

Michael Burbank
Transportation Planner I

SUBJECT: Adjusted VOC Base Year On-Road Mobile Source Emission Inventory Using
MOBILE5a

Enclosed for your review is the Adjusted Volatile Organic Compound (VOC) Base Year On-Road Mobile Source Emissions Inventory for the Dallas-Fort Worth (DFW) ozone nonattainment area developed using MOBILE5a as requested in your September 13, 1993 memorandum. The DFW nonattainment area is defined as the Counties of Collin, Dallas, Denton, and Tarrant. The methodology for this task was derived from the 1990 Base Year On-Road Mobile Source Emission Inventory for the Dallas-Fort Worth Ozone Nonattainment Area (March 1, 1993, submittal). This memorandum discusses the steps, procedures, and adjustments used to estimate Adjusted VOC Base Year Emissions. This inventory replaces those which were forwarded to you on November 3, 1992 and March 1, 1993.

Using the same methodology and input parameters to the model as required for the original Adjusted VOC Base Year document, new VOC emission factors were developed using the most current version of the U.S. Environmental Protection Agency's (EPA) Mobile Source Emission Factor Model (MOBILE5a). The input and output files for development of emission factors are included as Attachments 1 and 2, respectively. Please note that the output emission factors from the MOBILE5a model (Attachment 2) have changed very little, if any, from the March 1, 1993 submittal. Understandably, base emissions are relatively unchanged as well, showing little benefit to redoing the entire inventory.

It was necessary to make several adjustments to the emissions in this inventory to remain consistent with other inventories. Two adjustments were required and are explained in the September 13, 1993 memorandum from the Texas Natural Resource Conservation Commission (TNRCC). The adjustments made are: 1) adjustment of resulting MOBILE5a emissions to reflect consistency with 1990 Highway Performance Monitoring System (HPMS) Vehicle Miles of Travel (VMT) estimates, and 2) to adjust the resulting July 1996 emissions to reflect November 15, 1996 emissions. The procedure for adjusting NCTCOG travel demand modeled VMT to reflect HPMS VMT is presented in the September 1, 1993 memorandum titled Vehicle Miles-of-Travel (VMT) Adjustment Factor for Emission Inventories.

The 1990 ozone season vehicle miles of travel (VMT) by county, roadway functional classification, and time period for the DFW nonattainment area are provided in Table 1. This VMT was adjusted to reflect consistency with HPMS VMT estimates, and the resulting adjusted VMT is presented in Table 2. A breakdown of the 1990 ozone season VMT by vehicle classification, roadway classification, and county is provided in Table 3. This VMT was also adjusted to reflect consistency with HPMS VMT estimates and is presented in Table 4. Average loaded speeds by roadway type, time-of-day, and county, are shown in Table 5. A detailed explanation of the process for determining VMT and average loaded speeds is contained in the above referenced base year document.

To estimate emissions, the July 1, 1996, MOBILE5a VOC emission factors were multiplied by the VMT obtained from a 1990 run of the Dallas-Fort Worth Regional Travel Model. These calculations were conducted by vehicle type for each of the segments in the roadway network based on the link speeds, VMT mixes, and emission factors using a time-of-day analysis. The resulting VOC emissions by county, vehicle type, roadway classification, and time period are shown in Tables 6 through 9. In Table 10, VOC emissions are summed over the five time periods to yield daily (24-hour) totals.

According to a paper published in the January 1987 ITE Journal by Jeffrey A. Lindley titled "Urban Freeway Congestion: Quantification of the problem and Effectiveness of Potential Solutions," congestion due to incidents, or nonrecurring congestion, causes emissions which are not represented in the VMT-based calculations of the base emissions. These effects are included in Table 11 after multiplying the freeway VOC emissions by a factor of 1.049.

Diurnal emissions for each county are presented in Tables 12 through 15. These emissions are processed separately from the base emissions because the MOBILE5a model cannot adequately distribute them using a time-of-day analysis. The methodology is the same as that used for the 1990 Base Year Emission Inventory. Diurnal emissions are added to the inventory by county, vehicle type, and roadway type. Table 16 presents emissions adjusted for diurnals by functional class, vehicle type, and county.

Final July 1996 emissions, by functional classification, vehicle type, and county, are presented in Table 17. These emissions have been adjusted and are consistent with HPMS VMT estimates. Final July 1996 emissions have been summed by county, and are included in Table 18, reflecting total nonattainment area emissions.

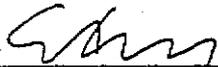
July 1996 emissions were adjusted to reflect November 15, 1996 emissions. This was done in accordance with the September 13, 1993 memorandum from TNRCC. Adjustment factors were developed which reflect the emission credit given for the extra 4.5 month period from July 1, 1996, to November 15, 1996. These adjustment factors were developed separately for urban and rural facilities and by vehicle classification. The adjustment factors were applied to the final 1996 emissions (Table 17) and the resulting emissions are presented in Table 19. Emissions from the four nonattainment area counties were summed to reflect daily (24-hour) totals and are presented in Table 20.

September 30, 1993

In summary, Tables 17 and 18 provide final July 1996 VOC emissions by county and nonattainment area, respectively. Tables 19 and 20 provide final November 1996 VOC emissions by county and nonattainment area, respectively.

Attachment 3, Electronic Data Submittal, is a computer diskette with Lotus 1-2-3 spreadsheets containing adjusted VOC emissions. Each of the four nonattainment counties are represented. This attachment includes final emissions tables for both July 1996 and November 15, 1996.

If you have any questions or require further assistance, please call.



Everett Bacon



Michael Burbank

MB:kdc
Attachments

TABLE 1

**1990 OZONE SEASON VEHICLE MILES OF TRAVEL
DFW NONATTAINMENT AREA
(thousands)**

FUNCTIONAL CLASS	DALLAS COUNTY						TARRANT COUNTY					
	TIME PERIOD						TIME PERIOD					
	1	2	3	4	5	TOTAL	1	2	3	4	5	TOTAL
FREEWAYS	548	5,365	6,605	8,012	3,314	23,844	325	3,186	3,922	4,758	1,968	14,159
PRINCIPAL ARTERIALS	167	1,639	2,018	2,448	1,013	7,285	107	1,045	1,287	1,561	646	4,646
MINOR ARTERIALS	237	2,335	2,875	3,488	1,442	10,377	112	1,106	1,361	1,651	683	4,913
COLLECTORS	84	839	1,034	1,254	518	3,729	73	726	895	1,086	448	3,228
LOCAL STREETS	90	1,036	1,262	1,487	631	4,506	64	733	893	1,052	446	3,188
RAMPS	41	401	494	599	248	1,783	23	226	278	338	140	1,005
FRONTAGE ROADS	38	377	464	563	233	1,675	11	111	136	165	68	491
TOTAL	1,205	11,992	14,752	17,851	7,399	53,199	715	7,133	8,772	10,611	4,399	31,630
FUNCTIONAL CLASS	COLLIN COUNTY						DENTON COUNTY					
	TIME PERIOD						TIME PERIOD					
	1	2	3	4	5	TOTAL	1	2	3	4	5	TOTAL
FREEWAYS	30	292	360	436	180	1,298	50	484	596	723	299	2,152
PRINCIPAL ARTERIALS	23	228	280	340	140	1,011	20	196	241	293	121	870
MINOR ARTERIALS	41	403	497	603	249	1,793	41	402	494	600	248	1,783
COLLECTORS	10	94	116	141	58	419	10	107	132	160	66	474
LOCAL STREETS	11	121	147	173	73	525	11	128	155	183	78	554
RAMPS	1	12	15	18	8	54	1	14	18	22	9	64
FRONTAGE ROADS	1	13	16	21	9	59	2	21	25	31	13	92
TOTAL	117	1,162	1,430	1,732	718	5,159	134	1,351	1,661	2,010	834	5,990

Due to the large size of this appendix, only the introduction pages are shown. To attain the full appendix in hardcopy, please contact

Eve Hou at (512) 239-5838 or ehou@tceq.state.tx.us.