FIX UPS TO THE

POST-1996 9% RATE-OF-PROGRESS SIP

For Beaumont/Port Arthur and Houston/Galveston

Ozone Nonattainment Area

APPENDIX 11-G

(Note: This appendix is the same as 7-K)

96109-SIP-AI, 96110-SIP-AI, 96111-SIP-AI,

96112-SIP-AI, 96113-SIP-AI

JULY 24, 1996

Houston/Galveston TCMs

Transportation Control Measure Commitments
Houston/Galveston Ozone Nonattainment Area

1993 Rate-of-Progress State Implementation Plan
Texas Natural Resource Conservation Commission

	CURRENT SIP CATEGORIES	PROJECT SIZE	ESTIMATED EMISSIONS REDUCTION (lb/day)	
1	High Occupancy Vehicle (HOV) Lanes	14.7 miles	468*	
2	Park-and-Ride Lots	3,745 spaces	57*	
3	Signalization Projects	2.9 miles	2*	
4	CTMS	22.2 miles	139*	
5	ATMS	41.0 miles	58*	
			724*	lbs/day
			0.36*	tons/day

* indicates number has been rounded for consistency

tcm-h96
6-12-96

RESOLUTION

COMMITTING TO INCLUSION OF TRANSPORTATION CONTROL MEASURES IN THE 1994 STATE IMPLEMENTATION PLAN FOR OZONE ATTAINMENT FOR THE HOUSTON-GALVESTON-BRAZORIA SEVERE OZONE NONATTAINMENT AREA

WHEREAS, the 1990 Clean Air Act Amendments mandate that the Houston-Galveston-Brazoria severe ozone nonattainment area adopt by November 15, 1994, specific, enforceable transportation control measures for inclusion in the State Implementation Plan for attainment of the ozone National Ambient Air Quality Standard; and

WHEREAS, the Texas Natural Resource Conservation Commission has enacted a regulation requiring formal commitment by Metropolitan Planning Organizations to transportation control measures prior to inclusion in the State Implementation Plan; and

WHEREAS, actions eligible for inclusion in the State Implementation Plan must demonstrate levels of implementing agency commitment to be included in a Transportation Improvement Program and be implemented after November 15, 1990; and

WHEREAS, the Texas Department of Transportation, the Metropolitan Transit Authority of Harris County and the City of Houston and other jurisdictions have included potential transportation control measures in the Transportation Improvement Programs from 1991 through 1995 and the 1995 MTP, as shown in Attachment A, for which the region may take credit in the State Implementation Plan.

NOW, THEREFORE, BE IT RESOLVED BY THE TRANSPORTATION POLICY COUNCIL FOR THE GULF COAST STATE PLANNING REGION THAT THE CANDIDATE TRANSPORTATION CONTROL MEASURE MAGNITUDE AND CATEGORIES IDENTIFIED BY THE TEXAS DEPARTMENT OF TRANSPORTATION AND THE METROPOLITAN TRANSIT AUTHORITY OF HARRIS COUNTY AS SHOWN IN ATTACHMENT A ARE APPROVED CONTINGENT UPON FORMAL COMMITMENT TO IMPLEMENTATION AND MONITORING BY THE VARIOUS IMPLEMENTING AGENCIES. MOREOVER, THE TRANSPORTATION POLICY COUNCIL SHALL:

SUPPORT THE EXPEDITIOUS IMPLEMENTATION OF THESE MEASURES THROUGH FEDERAL FUNDING ASSISTANCE AS REQUIRED BARRING INTERRUPTIONS OF FUNDING RESULTING FROM STATE OR FEDERAL ACTIONS; AND

SUPPORT THE IMPLEMENTATION OF ALTERNATIVE TCMS AS NEEDED TO ACHIEVE THE EMISSION REDUCTION TARGETS SHOWN IN ATTACHMENT A SHOULD A TCM FAIL TO BE IMPLEMENTED WITHIN THE SCHEDULE SHOWN IN ATTACHMENT A; AND

WHERE TCM IMPLEMENTATION HAS NOT OCCURRED, WITHHOLD FEDERAL FUNDING APPROVALS FROM RESPONSIBLE IMPLEMENTING AGENCIES FOR WHICH THE TPC DETERMINED THAT LACK OF TCM IMPLEMENTATION IS A RESULT OF FAILURE TO MAKE A GOOD FAITH EFFORT.

PASSED AND APPROVED this 28th day of October, 1994, at a regularly called meeting of the Transportation Policy Council for the Gulf Coast State Planning Region.

APPROVED:

Jennie Fleming

Chairman

ATTEST:

Bill Tallon

Secretary

TRANSPORTATION CONTROL MEASURES
October 28, 1994

Background

While American cars have been getting cleaner over the years, they are being driven an ever increasing number of miles. H-GAC estimates that vehicle emissions from escalating regional travel will overcome reduced emissions from cleaner vehicles and total vehicle emissions will start to rise in about 10 years. A graph of projected emissions can be found on page 3 of this item. The 1990 Clean Air Act Amendments mandate the nonattainment area to consider adopting enforceable transportation control measures (TCM) to as part of the region's clean air plan.

In 1992, H-GAC worked with the Texas Air Control Board (TACB) to develop a committal State Implementation Plan for Transportation Control Measures. This committal plan obligated Texas to submit additional analysis of future vehicle emission levels and commit to some enforceable TCM's by November 15, 1993. By November 15, 1994, additional commitments to enforceable TCM's must be made to fully demonstrate attainment of the clean air standard.

Current Situation

H-GAC worked with other metropolitan areas, METRO, the TNRCC, the Texas Department of Transportation (TxDOT) and the U.S. Environmental Protection Agency (EPA) to define what constitutes an enforceable TCM and how TCM implementation will be affected by EPA's conformity regulation. An enforceable TCM is defined by project magnitude, project category and estimate of emission benefit, such as TPC's commitment in 1993 to 19.8 miles of high occupancy vehicle (HOV) lanes resulting in 340 pounds per day of volatile organic compound emissions reduction.

The regulatory language specifies an enforcement process focused on the Metropolitan Planning Organization. Implementing agencies commit to implement a program of TCM's specified by category, magnitude and implementation date. At the same time, the Metropolitan Planning Organization commits to make certain those TCM's in the State Implementation Plan receive priority for federal funds, commits to monitor and enforce TCM implementation, and commits to achieve specified levels of emissions reductions from the program of TCM's by specified deadlines.

TPC must withhold federal funds from an implementing agency failing to make a good faith effort to implement committed TCM's or equivalent TCM's. H-GAC must also identify substitute TCM's available for implementation or adoption into the State Implementation Plan so that the emission target can be achieved. If H-GAC fails to comply with its commitments to make TCM's in the State Implementation Plan highest priority for funding, and to enforce transportation control measures through funding withdrawal, H-GAC could be subject to State and Federal sanctions.

H-GAC has worked with the implementing agencies: METRO, TXDOT and City of Houston, to identify appropriate transportation projects and obtain formal commitments from the governing

bodies of the agencies to implement, monitor and maintain any TCM's finally included in the State Implementation Plan. Categories and magnitudes of TCM's proposed for the State Implementation Plan and an estimate of aggregate emissions reduction are given on Attachment A to the resolution. Categories and magnitudes of TCM's are also committed to be operational by milestone years 1996, 1999 and 2002 on Attachment A. In general, commitments made in 1993 are operational in the 1996 milestone and 1994 commitments in the 1999 milestone.

A listing of eligible projects was distributed to TPC at the June meeting for review; projects from that list have been combined into categories. Because of EPA's requirement that in cases of implementation failure, substitute TCM's be from the same category and implemented during the same interval as the ones replaced, only 75% of eligible TCM's in any category are proposed for commitment. This would allow implementing agencies or TPC to substitute projects without triggering a TNRCC State Implementation Plan revision every time. Substitution across categories would trigger State Implementation Plan revision. The list of projects includes all projects H-GAC and TNRCC will monitor to make certain commitments are fulfilled. Projects from the monitoring list or other projects operational by the same milestone may be substituted for delayed projects.

State and federal agencies will require formal adoption by the Transportation Policy Council of the program of transportation control measures proposed and to achieving the required emissions reductions according to the committed schedule and commitment by the H-GAC Board of Directors agreeing to the enforcement procedure.

Action Requested

Request TPC approve submission to Texas Natural Resource Conservation Commission of transportation control measures for inclusion in the State Implementation Plan for air quality.

ATTACHMENT A

HOUSTON-GALVESTON-BRAZORIA SEVERE OZONE NONATTAINMENT AREA
1996 TRANSPORTATION CONTROL MEASURE COMMITMENT

MILESTONE YEAR 1996

Arterial Traffic Management System	41.0	Miles	57.58	Pounds per day
Computer Transportation Management System	22.2	Miles	139.02	Pounds per day
High Occupant Vehicles Lane	14.7	Miles	468.26	Pounds per day
Park and Ride Lot	3,745	Spaces	57.46	Pounds per day
Signalization	2.9	Miles	2.14	Pounds per day

MILESTONE YEAR 1999

Accident Investigation Site	3.2	Miles	50.94	Pounds per day
Arterial Traffic Management System	65.8	Miles	91.38	Pounds per day
Bicycle Facility	262.3	Miles	198.95	Pounds per day
Computer Transportation Management System	70.3	Miles	320.11	Pounds per day
High Occupant Vehicles Lane	3.5	Miles	69.48	Pounds per day
Park and Ride Lot	1,643	Spaces	91.49	Pounds per day
Signalization	49.3	Miles	23.05	Pounds per day
VanPool	225	Vans	145.10	Pounds per day

MILESTONE YEAR 2007

Accident Investigation Site	30.0	Miles	221.59	Pounds per da
Arterial Traffic Management System	1.5	Miles	1.71	Pounds per da
Computer Transportation Management System	59.5	Miles	339.33	Pounds per da

ATTACHMENT B

BACKGROUND INFORMATION

TCM EVALUATION METHODOLOGY

HOV DEMAND ESTIMATION

Using the "Mezzo-level" HOV Carpool Model of the TxDOT Trip Distribution Model, forecasted demand on HOV carpool facilities was made for years 1996 and 1999 for each of the HOV facilities. This model serves as an interim HOV demand estimation tool in the H-GAC travel demand estimation procedure pending the completion of METRO's new mode-choice model, which will contain a HOV carpool element.

Additional documentation regarding this model can be found in 1990 Base Year Ozone State Implementation Plan On-Road Mobile Source Emissions Inventory For The Houston-Galveston Ozone Nonattainment Area, prepared by the Houston-Galveston Area Council, November, 1992.

Critical inputs to this estimation process are: 1) estimates of peak speeds on the "Normal" (non-HOV) highway lanes, 2) estimates of operating speeds on the HOV lanes, and 3) minimum auto occupancy needed to use the HOV lane.

"Normal" highway speeds

With respect to the first set of inputs, estimates of peak speeds for the year 1996 for both freeway facilities were obtained through analysis of the level of congestion forecasted to occur when 1996 demand is placed on each freeway as it is proposed to exist in the region's 1994 TIP. Estimates of peak speeds for both freeway facilities for the milestone year were obtained through analysis of the level of congestion forecasted to occur were placed on each freeway as it is proposed to exist in the appropriate year.

HOV Operating speeds

Estimates of operating speeds on the HOV lanes were developed based on a review of a TxDOT 1991 Travel Time and Speed Survey conducted on the four HOV lanes in operation in Houston. Based on this review, 55 mph speeds were assumed for both HOV lane commitments.

Minimum carpool occupancy

It was assumed that METRO would be able to continue to operate both HOV lanes at a 2+ minimum carpool occupancy in the year 1996 and 1999. In order to derive a forecast of the benefit of the HOV lane commitment, forecasted VMT with and without the HOV lane in place was calculated; using the forecasted HOV carpool volumes and lengths of the HOV lane commitments, a forecast of VMT with HOV facility in place for each year was developed. A forecast of VMT without the HOV lane in place was developed by converting the forecasted HOV carpool vehicle trips into HOV carpool person trips using the average carpool occupancy estimated by the HOV model. This level of person travel was then converted back to "normal" highway vehicle trips using a region-wide vehicle

occupancy estimate of 1.17 persons per vehicle. The amount of VMT without HOV was forecasted by multiplying the vehicle trips without HOV by the project length.

Air Quality Analysis

The estimates of speed saving with the HOV was used to calculate the air quality benefits for each HOV. It was assumed that the vehicles on the HOV average 55 miles per hour, while the average congested speed was assumed to 43 miles per hour; the resulting emission factors for these speeds were multiplied by the total HOV ADT and VMT to give the emission benefit for each HOV. The resulting emission reductions were then converted to pounds and annualized for pounds/year reduced.

HOV

	1996.00 TCM COMMITMENT	LOCATION	Project LENGTH (miles)	WEIGHTED AVG. VOLUME (vehicles/day)	emissions calculations with HOV lane: VMT ON HOV	VOC RATE @ 55 mph (gm/mile)	VOC EMISSIONS (tons)	emissions calculations without HOV lane: VMT WITHOUT HOV	VOC RATE @ 43 mph (gm/mile)	VOC EMISSION (tons/day)	VOC REDUCTIO (tons/day)
HAR	US 59 HOV	from W OF NEWCASTLE to 0.2 MI E OF SHEPHERD	2.80	5,198	14,554.40	1.0222	0.0164	40752.3200	1.1148	0.0501	0.0337
HAR	US 59 HOV	from N OF BEECHNUT to N OF BW 8	2.50	9,144	22,860.00	1.0222	0.0258	57150.0000	1.1148	0.0702	0.0445
GAL	IH 45 HOV	from AIRPORT BLVD to 0.5 MI S OF ALMEDA-GENOA RD	2.70	6,594	17,803.80	1.0916	0.0214	48070.2600	1.1902	0.0631	0.0417
HAR	IH 45 HOV	from ALMEDA-GENOA to CHOATE RD	3.40	6,560	22,304.00	1.0222	0.0251	75833.6000	1.1148	0.0932	0.0681
HAR	IH 45 HOV	from BROADWAY to AIRPORT BLVD	2.75	5,592	15,378.00	1.0222	0.0173	42289.5000	1.1148	0.0520	0.0346
HAR	US 59 HOV	from 0.1 MI N OF BEECHNUT to 0.2 MI S OF WESTPARK	2.89	9,242	26,709.38	1.0222	0.0301	77190.1082	1.1148	0.0949	0.0648
HAR	US 59 HOV	from S OF WESTPARK to NEWCASTLE	2.60	4,624	12,022.40	1.0222	0.0135	31258.2400	1.1148	0.0384	0.0249
										TOTAL	0.3122

CALCULATIONS

VMT ON HOV = the sum of (volume * length) for all links within project limits

VOC RATE = MOBILE5a emission factor for Harris County, composite for all vehicle types on HOV lane,
assume all emission control programs scheduled (e.g. I/M) are in place
average operating speed for 1996 and 2007 on HOVs is assumed to be 55 mph
average operating speed for 1996 = 43.13 mph on freeways
average operating speed for 2007 = 44.21 mph on freeways

VOC EMISSIONS = (VMT x VOC RATE) x .002205/2000
where, .002205/2000 = grams to tons conversion factor

VMT WITHOUT H = ((link volume x HOV AVO) / 1.17 AVO) x link length) summed for all project links
where HOV AVO = 2.18 for Eastex 1996 and 2007, Southwest 1996 (from travel models, assuming 2+ carpools)
3.27 for Southwest 2007 (from travel models, assuming 3+ carpools)
1.17 AVO = Regionwide Average Vehicle Occupancy

VOC REDUCTION = (VOC EMISSIONS with HOV lane - VOC EMISSIONS without HOV lane)

TERMS

ATL	Average Trip Length (in minutes or miles)
AVO	Average Vehicle Occupancy
EPA	Environmental Protection Agency
HOV	High Occupancy Vehicle Lane
I/M	Inspection & Maintenance
MOBILE5a	EPA's Mobile Source Emissions Factor Model
VHT	Vehicle Hours of Travel
VOC	Volatile Organic Compounds
volume	traffic levels (number of vehicles)
VMT	Vehicle Miles of Travel

INTERSECTION AND TRANSPORTATION MANAGEMENT PROJECTS:

Intersection and transportation management projects may be separated into five general categories:

- Signal Installation.
- Signal Timing Upgrading.
- Traffic Management Systems.
  - (a) Arterial Traffic Management Systems (ATMS), consisting of interconnecting traffic signals to obtain a continuous and optimized signal progression on arterial streets.
  - (b) Computerized Traffic Management Systems (CTMS), consisting of installation of TV circuits and vehicle detection system, changeable message signs, fiber-optic cables and ramp metering to monitor congestion on freeway corridors.
- Grade Separations at intersections and at railroad crossings.
- Addition of lanes at the intersections.

Benefits resulting from intersections and transportation management projects are measured in terms of changes in delay experienced by people using the roadways. That is, existing intersection delay (hours per day) is compared to an estimated intersection delay after project completion. This is the reduction in delay for the project. This delay reduction (DR) is calculated using the delay reduction factors obtained from METRO (shown in the table below).

Delay Reduction Factors (DRF) by Project Type

Project Type	DRF
ignal Installations	0.320
ignal Timing Upgrades	0.115
raffic Management Systems	0.100
rade Separations (at intersections and at rail-road rossings)	0.600

Existing delay is obtained from METRO's look-up tables for six different intersection configurations (types), which correspond to the current intersection configuration (current type). Following is a list of the six standard intersection types with their approach layouts.

Type 1 - Two lane roadways; one approach lane provides for all of the left-through-right turn movements.

Type 2 - Two lane roadways; each approach provides a single protected left-turn lane, and a single shared through-right lane.

Type 3 - Four lane roadways; each approach provides a single shared left-through lane, and a single shared through-right lane.

Type 4 - Four lane roadways; each approach provides for a single protected left-turn lane, a single dedicated through lane, and a single shared through-right lane.

Type 5 - Six lane roadways; each approach provides for a single protected left-turn lane, two dedicated through lanes, and a single shared through-right lane.

Type 6 - Six lane roadways; each approach provides for dual protected left-turn lanes, two dedicated through lanes, and a single shared through-right lane.

To Use the look-up tables, the average daily traffic (ADT) on the major street and the percentage of minor to major street traffic should be known. The existing delay is obtained from the major street ADT and percentage of minor to major streets ADT, in hours per day. Proposed daily delay reduction (DR) after the project completion is derived by the following formula:

Delay Reduction (DR) = Existing Delay * Delay Reduction Factor

The delay reduction for adding lanes is the difference between the existing delay with existing configuration and proposed delay with the proposed configuration.

Delay Reduction (DR) = Existing Delay - Delay

The look-up table delay values are then reduced to reflect the saturation flow rate of 1800 pcphgpl used for all roadway projects, since the look-up tables are base don a flow rate of 1600 pcphgpl.

The ADT used for the intersection analyses is the higher of the provided ADT and the 1996 travel demand model volume.

The STP projects were analyzed for both benefit/cost and cost effectiveness, whereas the CMAQ projects were analyzed for cost effectiveness.

Air Quality Analysis

The air quality benefits for intersection, grade separation at intersection and at railroad crossings, construction of lanes at intersection and ATMS projects are derived from the reduction in idling emissions based on the reduction in total idling time. The idling emissions result when the vehicles are either slowed down or stopped the intersections. The emissions are proportional to the idling time (due to vehicles approaching, stopped, and queue dissipation). The idling time is reduced by improving the intersections and at railroad crossings, thus reducing emissions due to idling of the vehicles. The existing delay at intersections are obtained by the procedure mentioned above. For the intersection at railroad crossing the existing delay at intersections are obtained by the procedure mentioned above. For the intersection at railroad crossing the existing delay per train is from vehicles stopped and queue dissipation. Then based on the number of train movements the existing delay. The idling emissions reduced for both VOC and NOx is then the product of the delay reduced and idling emission factors.

The emissions are estimated based on the either 1996, 2007, or 1999 summer season freeway emission factors for Harris County or non-Harris County depending on appropriate milestone year and project location .

Delay reductions for grade separations at railroad crossings are calculated according to the following five steps.

Step 1 Estimate the length of time (delay in minutes) per train crossing.
train delay = length of train / (speed of train+time for gates to open and close)
5.9 minutes = 4,745 feet / (or 880 feet per minute)
time for gates to open and close per train is assumed to be 0.5 minute

Step 2 Estimate the number of vehicles stopped per train crossing.

vehicles stopped = delay per train crossing * vehicles per minute crossing 6 a.m.-8 p.m.
= 5.9 minutes * 90% * ADT / 840 minutes
where,
the portion of daily traffic crossing the RR tracks between 6 a.m. and 8 p.m. is assumed to be 90%, and the number of minutes in the period 6 a.m. - 8 p.m. = 840.

Step 3 Estimate the length of time needed for the queue to dissipate.

Step 4 Estimate the delay per train crossing.

delay per train = average wait-time x number of vehicles stopped + queue dissipation time
where,
average wait-time = 5.9 / 2

Step 5 Total Delay at the intersection (hours/day) = Delay per train crossing * Number of trains/day

ATMS

COMM. YEAR	H-GAC Proj Number	CO	Street Name	Project Limits	ADT	LENGTH	BEF SP	AFT SP	1996 VOC EF BEF SP	1996 VOC EF AFT SP	1996 EMISSIONS REDUCTION (tons/day)
1996	930520	HAR	SH 6	US 290 - FM 529	13120	3.03	30	33	1.4268	1.3346	0.00405
1996	930559	FOR	SH 6	FB CO LINE - OLD RICHMOND	9104	7.01	35	38	1.3626	1.2898	0.00512
1996	930564	BRA	BS 35-C	SH 6 - FM 1462	6075	1.95	35	38	1.3626	1.2898	0.00095
1996	930566	FOR	SH 36	US 90A - US 59	8494	1.80	45	48	1.1564	1.1108	0.00077
1996	930570	MON	SH 75	FM 3083 - SH 105	6806	2.60	45	48	1.1564	1.1108	0.00089
1996	930571	MON	SH 75	SH 105 - GLADSTELL	6694	1.28	40	43	1.2471	1.1902	0.00054
1996	930572	FOR	US 90A	FM 723 - MILLIE	14063	2.59	45	48	1.1564	1.1108	0.00183
1996	930573	MON	SH 105	LOOP 336 - SH 75	11250	2.30	45	48	1.1564	1.1108	0.00130
1996	930574	MON	SH 105	SH 75 - FM 1485	10800	3.97	45	48	1.1564	1.1108	0.00215
1996	930577	MON	LP 336	LONGMIRE - N. THOMPSON	14063	1.70	45	48	1.1564	1.1108	0.00120
1996	930581	FOR	FM 1640	SH 36 - FM 762	8663	3.09	45	48	1.1564	1.1108	0.00135
1996	930584	HAR	BF1960A	LEE RD - WILSON	5906	3.47	45	48	1.0821	1.0381	0.00100
1996	930585	FOR	FM 3155	US 90A - COLLINS	6300	0.25	45	48	1.1564	1.1108	0.00008
1999	930557	BRA	SH 6	SECOND - BS 350	36975	0.72	35	38	1.3626	1.2898	—
1999	930560	BRA	SH 35	ORANGE - WALNUT	19750	1.22	45	48	1.1564	1.1108	—
1999	930561	BRA	SH 35	FM 528 - SH 6	21000	1.90	45	48	1.1564	1.1108	—
1999	930562	BRA	SH 35	SH 6 - FM 1462	30000	1.97	45	48	1.1564	1.1108	—
1999	930563	BRA	SH 35	BS 288B - FM 523 OR 323	14375	3.66	45	48	1.1564	1.1108	—
1999	930565	BRA	SH 35	BS 288B - SH 288	13875	1.31	40	43	1.2471	1.1902	—
1999	930575	BRA	BS 288B	SH 35 - PHILLIPS	16625	1.88	45	48	1.1564	1.1108	—
1999	930576	BRA	BS 288B	FM 523 - MYRTLE	19875	2.64	40	43	1.2471	1.1902	—
1999	930582	HAR	FM 1960	IMP VALLETO - LEE RD	41250	6.67	45	48	1.0821	1.0381	—
1999	930589	GAL	SH 3	FM 1765 - FM 519	8250	1.83	45	48	1.1564	1.1108	—
1999	930591	GAL	SH 146	FM 1764 - FM 1765	17375	1.11	45	48	—	—	—
1999	930592	GAL	LP 197	SH 146 - 21ST NORTH	11250	1.86	45	48	—	—	—
1999	930603	GAL	FM 1764	SH 146 - 14TH	32500	2.23	40	43	—	—	—
1999	930604	GAL	FM 1765	SH 3 - LP 197	23875	4.13	45	48	—	—	—
1999	930605	GAL	FM 1765	IH 45 - SH 3	16750	2.17	45	48	—	—	—

ATMS

COMM. YEAR	H-GAC Proj Number	CO	Street Name	Project Limits	VOC 1996 IDLE EF g/mile	VOC 1999 IDLE EF g/mile	VOC 2007 IDLE EF g/mile	NOx 1996 IDLE E g/mile	NOx 1999 IDLE EF g/mile	NOx 2007 IDLE EF g/mile	HRS Delay Reduction	VOC 1996 tons/day	VOC 1999 tons/day	VOC 2007 tons/day
1996	930519	GAL	SH 3	FM 518 TO WALKER	29.1604	25.3667	17.4282	8.8582	7.9401	6.6954	27.238	0.00088	——	——
1996	930536	HAR	SH 249	SETON LAKE TO DEER TRAIL	27.4882	20.9924	14.0588	8.5764	7.5964	6.4103	44.15	0.00134	——	——
1996	930538	BRA	SH 332	FM 2004 TO MAIN ST	29.1604	25.3667	17.4282	8.8582	7.9401	6.6954	15.67	0.00050	——	——
1996	930539	GAL	FM 518	LANDING TO FM 2094	29.1604	25.3667	17.4282	8.8582	7.9401	6.6954	28.13	0.00090	——	——
1996	930546	GAL	FM 2004	SH 332 TO SB 288B	29.1604	25.3667	17.4282	8.8582	7.9401	6.6954	192.05	0.00617	——	——
1996	930547	GAL	FM 2094	FM 518 TO SOUTH SHORE BLVD	29.1604	25.3667	17.4282	8.8582	7.9401	6.6954	38.41	0.00123	——	——
1996	930558	HAR	SH 6	PARK ROW TO FORT BEND C/L	27.4882	20.9924	14.0588	8.5764	7.5964	6.4103	151.08	0.00458	——	——
1996	940286	FOR	US 90A	LP 762 TO MILLIE	29.1604	25.3667	17.4282	8.8582	7.9401	6.6954	48.19	0.00155	——	——
1999	930583	HAR	FM 1960	LEE RD TO N HOUSTON RD	27.4882	20.9924	14.0588	8.5764	7.5964	6.4103	151.84	——	0.00351	——
1999	930590	FOR	US 90A	FM 1092 - FM 2234	29.1604	25.3667	17.4282	8.8582	7.9401	6.6954	29.10	——	0.00081	——
1999	930594	HAR	SH 249	TOMBALL HILLS - GRAHAM	27.4882	20.9924	14.0588	8.5764	7.5964	6.4103	46.30	——	0.00107	——
1999	930595	BRA	FM 518	HARKEY O'DAY - WESTMINSTE	29.1604	25.3667	17.4282	8.8582	7.9401	6.6954	32.07	——	0.00090	——
1999	930596	HAR	FM 528	GALVESTON C/L -BAY AREA BL	27.4882	20.9924	14.0588	8.5764	7.5964	6.4103	35.32	——	0.00082	——
1999	930597	GAL	FM 528	FM 518 - HARRIS C/L	29.1604	25.3667	17.4282	8.8582	7.9401	6.6954	25.20	——	0.00070	——
1999	930598	GAL	FM 528	SUNSET - WEST OF FM 518	29.1604	25.3667	17.4282	8.8582	7.9401	6.6954	7.20	——	0.00020	——
1999	930606	FOR	FM 2234	US 90A - QUAIL RUN	29.1604	25.3667	17.4282	8.8582	7.9401	6.6954	69.66	——	0.00195	——
1999	930607	HAR	FM 2351	GALVESTON C/L -BEAMER RD	27.4882	20.9924	14.0588	8.5764	7.5964	6.4103	33.50	——	0.00078	——
1999	930608	GAL	FM 2351	HARRIS C/L - SUNSET	29.1604	25.3667	17.4282	8.8582	7.9401	6.6954	29.00	——	0.00081	——
1999	930609	HAR	FM 2920	SH 249 - CHERRY	27.4882	20.9924	14.0588	8.5764	7.5964	6.4103	10.40	——	0.00024	——
1999	930610	FOR	FM 3345	FM 1092 - FM 2234	29.1604	25.3667	17.4282	8.8582	7.9401	6.6954	43.90	——	0.00123	——
1999	940241	HAR	US 90	UVALDE - SHELDON	27.4882	20.9924	14.0588	8.5764	7.5964	6.4103	32.53	——	——	——
1999	940254	HAR	FM 529	BARKER CYPRESS TO ELDRIDG	27.4882	20.9924	14.0588	8.5764	7.5964	6.4103	56.80	——	0.00131	——
1999	940255	GAL	FM 518	FM 2351 TO FM 528	29.1604	25.3667	17.4282	8.8582	7.9401	6.6954	23.96	——	0.00067	——
1999	940270	BRA	SH 288	PARK TO SH 36 (2ND ST)	29.1604	25.3667	17.4282	8.8582	7.9401	6.6954	47.54	——	0.00133	——
1999	940271	BRA	SH 35	14TH ST TO SH 36	29.1604	25.3667	17.4282	8.8582	7.9401	6.6954	16.42	——	0.00046	——
1999	940272	BRA	SH 36	GAINES TO MPRR	29.1604	25.3667	17.4282	8.8582	7.9401	6.6954	12.44	——	0.00035	——
1999	940273	BRA	SH 36	MPRR TO FM 521 S	29.1604	25.3667	17.4282	8.8582	7.9401	6.6954	2.18	——	0.00006	——
1999	940276	HAR	BS 146D	SH 146 TO FAIRMONT PKWY	27.4882	20.9924	14.0588	8.5764	7.5964	6.4103	20.54	——	0.00048	——
1999	940277	HAR	FM 525	HARDY RD TO LEE RD	27.4882	20.9924	14.0588	8.5764	7.5964	6.4103	22.88	——	0.00053	——
1999	940278	HAR	FM 1942	BU 90 U TO FM 1942	27.4882	20.9924	14.0588	8.5764	7.5964	6.4103	36.18	——	0.00084	——
1999	940279	HAR	FM 1960	N HOUSTON AVE TO ATASCOSI	27.4882	20.9924	14.0588	8.5764	7.5964	6.4103	36.67	——	0.00085	——
1999	940283	FOR	US 90	FM 1463 TO HAR C/L	29.1604	25.3667	17.4282	8.8582	7.9401	6.6954	12.51	——	0.00035	——
1999	940284	HAR	US 90	FOR C/L TO KATY-FORT BEND R	27.4882	20.9924	14.0588	8.5764	7.5964	6.4103	7.04	——	0.00016	——
1999	940285	FOR	FM 1876	US 90A TO BELLFORT	29.1604	25.3667	17.4282	8.8582	7.9401	6.6954	27.20	——	0.00076	——
1999	940287	BRA	SH 6	BS 35 C TO SH 35	29.1604	25.3667	17.4282	8.8582	7.9401	6.6954	13.28	——	0.00037	——
2007	940274	HAR	SH 146	RED BLUFF TO NASA 1	27.4882	20.9924	14.0588	8.5764	7.5964	6.4103	43.94	——	——	0.00068
2007	940275	GAL	SH 146	6TH ST TO FM 518	29.1604	25.3667	17.4282	8.8582	7.9401	6.6954	23.98	——	——	0.00046

Signal Upgrade

H-GAC Proj #	CO	Project Description	Street Name	Project Limits	VOC 1996 IDLE EF g/mile	VOC 1999 IDLE EF g/mile	VOC 2007 IDLE EF g/mile	HRS Delay Reduction	VOC 1996 tons/day	VOC 1999 tons/day	VOC 2007 tons/day
940250	MON	Signal Upgrade (fixed to actuated)	SH 75	@ Loop 336 (S)	29.1604	25.3667	17.4282	4.84	0.00016	----	----
940253	MON	Signal Upgrade (fixed to actuated)	IH 45	Loop 336 (S) to Loop 336 (N)	29.1604	25.3667	17.4282	39.47	0.00127	----	----
940238	HAR	Signal Upgrade (fixed to actuated)	BW 8	Clay Rd to SH 249	----	20.9924	14.0588	131.53	----	0.00304	0.00204
940239	HAR	Signal Upgrade (fixed to actuated)	BW 8	Hardy to Wilson Oaks	----	20.9924	14.0588	66.17	----	0.00153	0.00103
940240	HAR	Signal Upgrade (fixed to actuated)	BW 8	Lockwood to IH 10	----	20.9924	14.0588	84.49	----	0.00196	0.00131
940241	HAR	Signal Upgrade (fixed to actuated)	US 90	Uvalde to Sheldon	----	20.9924	14.0588	32.53	----	0.00075	0.00050
940242	BRA	Signal Upgrade (fixed to actuated)	SH 288	@ FM 518	----	25.3667	17.4282	4.87	----	0.00014	0.00009
940243	BRA	Signal Upgrade (fixed to actuated)	SH 288	@ Oyster Creek	----	25.3667	17.4282	4.88	----	0.00014	0.00009
940245	GAL	Signal Upgrade (fixed to actuated)	SH 146	Loop 197 N to FM 1764	----	25.3667	17.4282	13.31	----	0.00037	0.00026
940246	GAL	Signal Upgrade (fixed to actuated)	IH 45 S	FM 519 to FM 517	----	25.3667	17.4282	18.08	----	0.00051	0.00035
940247	GAL	Signal Upgrade (fixed to actuated)	FM 1764	FM 2004 to Amburn	----	25.3667	17.4282	12.39	----	0.00035	0.00024
940248	HAR	Signal Upgrade (fixed to actuated)	IH 10	Campbell to Bingle	----	20.9924	14.0588	29.38	----	0.00068	0.00046
940249	HAR	Signal Upgrade (fixed to actuated)	IH 10	Sheldon to N Main	----	20.9924	14.0588	2.97	----	0.00007	0.00005
940251	MON	Signal Upgrade (fixed to actuated)	US 59	FM 1485 to FM 1314	----	25.3667	17.4282	15.15	----	0.00042	0.00029
940244A	FOR	Signal Upgrade (fixed to actuated)	US 59 S	AIRPORT BLVD-W OF S KIRKWOOD	----	25.3667	17.4282	64.49	----	0.00180	0.00124
940244B	FOR	Signal Upgrade (fixed to actuated)	US 59 S	W OF S KIRKWOOD-41/SUGAR CREEK BLVD	----	25.3667	17.4282	64.49	----	0.00180	0.00124
940244C	FOR	Signal Upgrade (fixed to actuated)	US 59 S	RAMPS @ SP 41/SUGAR CRK BLVD-SH 6	----	25.3667	17.4282	64.49	----	0.00180	0.00124

COMPUTERIZED TRAFFIC MANAGEMENT SYSTEMS:

The methodology developed by the TTI is adopted to analyze the CTMS projects in the 1995 TIP. The projects were analyzed for the impacts of CTMS development on air quality by improving average speeds during peak periods. The analysis was performed for speed improvement and idling time and combined for total emissions reduced.

Emissions due to speed improvement

Emission reduction due to speed improvement was based on the assumptions that the congested peak period speeds increase from 30 mph to 35 mph in the first hour and from 40 mph to 45 mph in the second hour. The emissions (VOC and NOx) for AM and PM peak periods for 30, 35, 40 and 45 mph are calculated based on emission factors for these speeds for both VOC and NOx, project length and peak period volume. Emission reduction in the first and second hour are obtained from the difference in emissions from the speed increases in each hour and added for total emission reduction from speed improvement. Emissions reduced are converted to pounds and annualized for pounds/year reduced.

Emissions due to idling

Emission reduced due to idling is based on the idling time reduced. It is assumed that average congested speed is increased from 30 mph to 35 mph assuming a free flow speed of 50 mph. The delay savings are calculated from the difference of travel time savings between the congested average speeds and free flow speed. The savings in delay is calculated for the project applying the length and peak period volume. Assuming 60% of the delay is due to incidents and 67% of incident delay is the idling time, the reduction in idling time is the total savings in delay for the project * 0.60 * 0.67. The idling emissions (VOC+NOx) is a product of idling emission factor and reduction in idling time. The emission reduced in converted to pounds and annualized for pounds/year.

1996 CTMS projects

Com. Year		County	Project Description	Street Name	Limits From	To	ADT	LENGTH	VOC EF @ 50 MPH 1996	1999	2007	VOC EMISSIONS (tons/day) 1996	1999	2007
1996	930521	HAR	CTMS	IH 10	SH 6	IH 610 (W)	161494	11.25	1.03271	0.80811	0.56329	0.03072	0.02404	0.01676
1996	930527	HAR	CTMS	IH 45	DUMBLE ST	IH 10	65003	3.60	1.03271	0.80811	0.56329	0.00396	0.00310	0.00216
1996	930531	HAR	CTMS	US 59	W BELLFORT	S SHEPHERD	132638	11.50	1.03271	0.80811	0.56329	0.02579	0.02018	0.01407
1996	930567	HAR	CTMS	IH 45	GAL C/L	CHOATE RD	84493	4.50	1.03271	0.80811	0.56329	0.00643	0.00503	0.00351
1996	930569	HAR	CTMS	IH 45	CHOATE ROAD	IH 610 (S)	105098	9.94	1.03271	0.80811	0.56329	0.01766	0.01382	0.00963

NON RECURRING INCIDENTS = 8.25%
EFFECTIVENESS RATE = 18.00%

1999 CTMS projects

Com. Year		County	Project Description	Street Name	Limits From	To	ADT	LENGTH	VOC EF @ 50 MPH 1996	1999	2007	VOC EMISSIONS (tons/day) 1999	1999	2007
1999	930578	HAR	CTMS	IH 610	OLD KATY RD	US 59 (N)	146070	8.33	1.03271	0.80811	0.56329	0.02057	0.01610	0.01122
1999	930579	HAR	CTMS	IH 610	SH 288	N BRAESWOO	142425	4.94	1.03271	0.80811	0.56329	0.01190	0.00931	0.00649
1999	930580	HAR	CTMS	IH 610	SOUTH BRAESWOO	OLD KATY RD	147555	7.05	1.03271	0.80811	0.56329	0.01759	0.01376	0.00959
1999	930593	HAR	CTMS	SH 225	E OF IH 610	SH 134	126900	11.89	1.03271	0.80811	0.56329	0.02551	0.01996	0.01392
1999	930599	HAR	CTMS	IH 610	US 59	GELLHORN	205200	5.25	1.03271	0.80811	0.56329	0.01821	0.01425	0.00994
1999	930600	HAR	CTMS	IH 610	GELLHORN	BISBEE ST	187650	5.45	1.03271	0.80811	0.56329	0.01729	0.01353	0.00943
1999	930601	HAR	CTMS	IH 610	W OF SH 35	SH 288	176850	5.51	1.03271	0.80811	0.56329	0.01648	0.01289	0.00899
1999	930602	HAR	CTMS	IH 610	BISBEE ST	W OF SH 35	148500	1.48	1.03271	0.80811	0.56329	0.00372	0.00291	0.00203

NON RECURRING INCIDENTS = 8.25%
EFFECTIVENESS RATE = 18.00%

1999 CTMS projects

	Project Number	County	Project Description	Street Name	Limits From	Limits To	Idling Delay Savings (hrs.)	Idling Emissions Reductions: Emission Factors VOC (gm/hr)	Emission Factors NOx (gm/hr)	Idling Emission Reduction VOC (lbs/day)	Idling Emission Reduction NOx (lbs/day)	Project Length (mi)	Estimated Peak Period VMT	Emissions Reduction VOC (lbs/day)	Emissions Reduction NOx (lbs/day)	1999 Total Emissions Reduction VOC (tons/day)	1999 Total Emissions Reduction NOx (tons/day)
1999	940268	HAR	CTMS	SH 288	US 59	BRAZORIA C/L	360.56	20.9924	7.5964	16.69	6.04	11.39	359,180	74.21	(20.21)	0.04545	-0.00709
1999	950167	HAR	CTMS	BW 8	IH 45	US 59	380.90	20.9924	7.5964	17.63	6.38	7.18	276,390	57.11	(15.55)	0.03737	-0.00459
1999	950177	HAR	CTMS	IH 10	SH 6	FORT BEND C/	480.25	20.9924	7.5964	22.23	8.04	6.00	37,711	7.79	(2.12)	0.01501	0.00296

CTMS Projects assumed to reduce idling delay and improve speed.

CTMS Speed Improvements assumed to be (based on CTMS analysis by TTI)
from 30 to 35 mph in 1st hour of both AM and PM peak hour
and from 40 to 45 mph in 2nd hour of peak hour

EMISSION FACTORS

SPEED (M/HR)	VOC (G/MI)	NOx (G/MI)
1999 HARRIS		
30	1.12587	1.78942
35	1.00945	1.80685
40	0.91992	1.83116
45	0.84693	1.86477
1999 NON-HARRIS		
30	1.33608	1.86705
35	1.19784	1.88485
40	1.09233	1.91015
45	1.00935	1.94547

BICYCLE PROJECTS:

The methodology used to analyze bikeways was based on the Texas Department of Transportation (TxDOT) methodology contained in "Estimating Travel and Emission of TCM", prepared by Systems Application International.

Travel Benefit

The travel benefit due to bikeways was estimated by determining the number of vehicle miles traveled (VMT) displaced by bicycles. In order to determine total VMT removed by each bikeway, it was assumed that bikeways will remove only home-based vehicle trips (HBVT). Based on this assumption the number of HBVT generated within a two mile buffer area for each bikeway was determined. It was furthermore assumed that approximately 5% of the total HBVT generated within a buffer area will be made be bicycle. The resulting bicycle trips were multiplied by the 4 miles to determine the total VMT displaced.

Air Quality Analysis

The estimates of displaced VMT were used to calculate the air quality benefits for each bikeway. It was assumed that the average speed of displaced vehicle trips that would be 30 miles per hour. Emissions reduced were then converted to pounds and annualized for pounds/year reduced.

SAMPLE CALCULATIONS - 1995 TIP
Project # 950040 - CBD Access On-Street Bikeway

Total # of home-based vehicle trips (HBVT) from within 2-mile buffer	=	998,389			veh/day
Total vehicle trips reduced per day = HBVT / AVO	=	998389 /	1.30	= 767,992	veh/day
Bicycle mode split (assumed to be a % of HBVT reduced from within buffer)	=	767,992	x 0.50%	= 3,840	veh/day
Avg. trip length	=	4.00			miles
Total vehicle miles reduced due to bikeway = total HBVT x avg. trip length	=	3,840	x 4.00	= 15,360	miles

Emission factors based on Harris County avg. non-freeway speed of 30 mph

VOC	=	0.7908	gram/mile
NOx	=	1.4526	gram/mile

Total emission reductions due to bikeway

VOC = [(emission factor x total VMT reduced) x .0022026 gram/lbs] x 260 days/	=	6,955.80			lbs/year
NOx = [(emission factor x total VMT reduced) x .0022026 gram/lbs] x 260 days/	=	12,777.23			lbs/year
VOC + NOx	=	6,955.80	+ 12,777.23	= 19,733.03	lbs/year

DAILY EMISSIONS ESTIMATES FOR TCM SIP COMMITMENTS
MILESTONE YEAR 1996
PARK & RIDE AND TRANSIT CENTER COMMITMENTS

		TCM COMMITMENT	LOCATION	CAPACITY (number of parking spaces	PERCENT UTILIZATION	OCCUPANCY (number of persons)	VMT (Veh*ATL)	VOC RATE @ 34 mph (gm/mile)	VOC EMISSION (tons/day)
1996	HAR	HILLCROFT TR CNTR/HARWIN IMPRVMNTS - PH 1		895	40%	358.00	5605.61	1.30718	0.00808
1996	HAR	MESA TRANSIT CENTER		100	8%	8.40	131.53	1.30718	0.00019
1996	HAR	MISSION BEND P&R - PHASE 1		862	15%	129.30	2024.59	1.30718	0.00292
1996	HAR	MONROE PARK & RIDE		913	38%	346.94	5811.99	1.30718	0.00838
1996	HAR	TIDWELL TRANSIT CENTER		809	7%	56.63	696.98	1.30718	0.00100
1996	HAR	WEST BELLFORT PARK & RIDE		1,200	22%	264.00	4738.46	1.30718	0.00683
1996	MON	WOODLANDS P&R LOT		214	75%	160.50	4746.41	1.38956	0.00727

CALCULATIONS

OCCUPANCY = number of vehicles parked; assume one transit trip per occupied parking space to estimate the number of one-way person t

VMT = daily vehicle trips x ATL (in miles)

% Utilization based on current park and ride use'

where, daily vehicle trips = (one-way person trips / 1.17 Regional AVO) x 2

VOC RATE = MOBILE5a emission factor for Harris County, composite for vehicles other than heavy-duty;
assume all emission control programs scheduled (e.g. I/M) are in place
average operating speed for 1996 = 33.94 mph on freeways, principal arterials, and other arterials

VOC EMISSION CAPACITY x PERECNT UTILIZATION x VMT

Accident Investigation Site (AIS) projects

1999

*Emission benefit savings per mile (VOC) 0.10420 gm/mile
*Emission benefit savings per mile (NOX) -0.04429 gm/mile **Emissions Benefits of A

Project Number	Project Description	Street Name	PEAK ADT	Project Limits		Length (miles)	VOC (tons/day)	NOx (tons/day)
930525	Accident Investigation Sites	IH 45	41,725	SP 261	BW 8	4.21	0.02018	(0.00858)
930529	Accident Investigation Sites	IH 45	47,984	IH 610	SP 261	2.50	0.01378	(0.00586)

2007

*Emission benefit savings per mile (VOC) 0.07739 gm/mile
*Emission benefit savings per mile (NOX) -0.03055 gm/mile **Emissions Benefits of A

Project Number	Project Description	Street Name	PEAK ADT	Project Limits		Length (miles)	VOC (tons/day)	NOx (tons/day)
950199	Accident Investigation Sites	IH 45	31,350	HOUSTON CBD	FM 518 I	23.00	0.06152	(0.02429)
950200	Accident Investigation Sites	IH 10	41,250	WASHINGTON	SH 6	5.00	0.01760	(0.00695)
950201	Accident Investigation Sites	US 59	67,000	GREENBRIAR	W BELLF	12.00	0.06860	(0.02708)

*Emission benifit from increase from 38 mph to 45 mph
**Emission benefit = Emissions benefits per mile x project length x 0.002205/2000

Vanpool Quick Start

Project Number	Project Description	**Ridership	Average Trip Length	AVO	Daily VMT	Ave Speed	VOC Emission Factors (gm/mi) 1996	1999	2007	VOC Total daily emissions (tons/day) 1996	1999	20007
940080	Vanpool Quick Start - 8 Counties (Assist w/ ETR)	3,300	38	1.2	104,500	57	1.08760	0.83964	0.58100	0.12530	0.09674	0.06694

* VMT = (Ridership x Average Trip Length) / AVO

** Ridership = 300 vans x 10 passengers

Emissions = (VMT x VOC Emission Factor) x .002205/2000

where, VMT = Vehicle Miles of Travel

AVO = Average Vehicle Occupancy

URBAN 1996 FINAL EFS

	LDGV	LDGT1	LDGT2	HDGV	LDDV	LDDT	HDDV	MC		
Fwy VMT MIX:	0.6987	0.1710	0.0757	0.0184	0.0022	0.0010	0.0306	0.0024		
non-Fwy VMT MIX	0.7072	0.1732	0.0767	0.0209	0.0022	0.0010	0.0167	0.0021		
SPEED POLLUTANT									COMP EMIS FA (Freeway)	COMP EMIS FA (non-Freeway)
IDLE	26.8136	32.8130	41.7010	56.6637	4.6356	6.4772	15.9939	45.3461	29.1604	29.4074
3 VOC	8.9379	10.9377	13.9003	18.8879	1.5452	2.1591	5.3313	15.1154	9.7201	9.8025
4 VOC	6.5237	8.0617	10.2096	15.5468	1.4670	2.0498	5.0616	13.1339	7.1574	7.2353
5 VOC	5.1883	6.4462	8.1305	13.5391	1.3940	1.9478	4.8097	11.6663	5.7723	5.8022
6 VOC	4.3451	5.4152	6.8010	12.1133	1.3258	1.8525	4.5744	10.5585	4.8699	4.8891
7 VOC	3.7663	4.7022	5.8804	11.0049	1.2621	1.7635	4.3544	9.7080	4.2444	4.2568
8 VOC	3.4019	4.2413	5.2762	10.1997	1.2024	1.6801	4.1487	9.0446	3.8424	3.8510
9 VOC	3.1212	3.8851	4.8100	9.5002	1.1466	1.6022	3.9562	8.5197	3.5298	3.5360
10 VOC	2.8937	3.5966	4.4337	8.8765	1.0944	1.5292	3.7759	8.0990	3.2749	3.2791
11 VOC	2.7048	3.3575	4.1233	8.3177	1.0454	1.4608	3.6070	7.7575	3.0621	3.0649
12 VOC	2.5450	3.1553	3.8621	7.8150	0.9996	1.3966	3.4487	7.4770	2.8811	2.8830
13 VOC	2.4075	2.9816	3.6389	7.3612	0.9565	1.3365	3.3002	7.2440	2.7248	2.7259
14 VOC	2.2875	2.8301	3.4454	6.9505	0.9162	1.2801	3.1609	7.0482	2.5880	2.5885
15 VOC	2.1815	2.6963	3.2755	6.5779	0.8783	1.2272	3.0302	6.8819	2.4668	2.4668
16 VOC	2.0867	2.5768	3.1247	6.2390	0.8427	1.1775	2.9074	6.7389	2.3583	2.3580
17 VOC	2.0013	2.4690	2.9897	5.9302	0.8093	1.1307	2.7921	6.6146	2.2603	2.2598
18 VOC	1.9235	2.3708	2.8675	5.6483	0.7778	1.0868	2.6837	6.5052	2.1710	2.1704
19 VOC	1.8523	2.2807	2.7562	5.3905	0.7483	1.0456	2.5818	6.4078	2.0892	2.0884
20 VOC	1.7830	2.2048	2.6671	5.1580	0.7205	1.0067	2.4859	6.3200	2.0136	2.0127
21 VOC	1.7211	2.1328	2.5778	4.9506	0.6944	0.9702	2.3957	6.2401	1.9444	1.9435
22 VOC	1.6645	2.0665	2.4961	4.7607	0.6698	0.9358	2.3108	6.1666	1.8809	1.8801
23 VOC	1.6124	2.0055	2.4212	4.5867	0.6466	0.9035	2.2309	6.0983	1.8225	1.8217
24 VOC	1.5643	1.9491	2.3520	4.4269	0.6248	0.8730	2.1556	6.0344	1.7685	1.7678
25 VOC	1.5196	1.8968	2.2880	4.2801	0.6042	0.8443	2.0847	5.9741	1.7185	1.7178
26 VOC	1.4781	1.8480	2.2285	4.1451	0.5849	0.8172	2.0179	5.9170	1.6719	1.6713
27 VOC	1.4394	1.8024	2.1730	4.0208	0.5666	0.7917	1.9550	5.8626	1.6284	1.6279
28 VOC	1.4031	1.7596	2.1211	3.9062	0.5494	0.7677	1.8957	5.8109	1.5877	1.5873
29 VOC	1.3690	1.7195	2.0726	3.8005	0.5333	0.7451	1.8398	5.7615	1.5495	1.5493
30 VOC	1.3370	1.6818	2.0269	3.7029	0.5180	0.7238	1.7872	5.7143	1.5137	1.5135
31 VOC	1.3068	1.6463	1.9840	3.6127	0.5036	0.7037	1.7375	5.6695	1.4799	1.4799
32 VOC	1.2783	1.6128	1.9435	3.5294	0.4901	0.6847	1.6908	5.6268	1.4481	1.4481
33 VOC	1.2513	1.5811	1.9053	3.4522	0.4773	0.6669	1.6467	5.5865	1.4180	1.4181
34 VOC	1.2257	1.5512	1.8692	3.3808	0.4653	0.6501	1.6052	5.5484	1.3896	1.3898
35 VOC	1.2014	1.5229	1.8351	3.3147	0.4539	0.6343	1.5662	5.5129	1.3626	1.3629
36 VOC	1.1783	1.4961	1.8028	3.2534	0.4433	0.6194	1.5294	5.4795	1.3371	1.3375
37 VOC	1.1563	1.4707	1.7722	3.1967	0.4333	0.6054	1.4948	5.4488	1.3129	1.3133
38 VOC	1.1354	1.4466	1.7431	3.1441	0.4238	0.5922	1.4623	5.4205	1.2898	1.2904
39 VOC	1.1154	1.4237	1.7155	3.0954	0.4150	0.5798	1.4317	5.3947	1.2679	1.2686
40 VOC	1.0963	1.4020	1.6892	3.0502	0.4067	0.5682	1.4030	5.3714	1.2471	1.2478
41 VOC	1.0780	1.3814	1.6643	3.0084	0.3989	0.5573	1.3761	5.3505	1.2273	1.2280
42 VOC	1.0605	1.3617	1.6405	2.9697	0.3916	0.5471	1.3509	5.3321	1.2083	1.2091
43 VOC	1.0437	1.3430	1.6179	2.9340	0.3847	0.5376	1.3274	5.3159	1.1902	1.1910
44 VOC	1.0276	1.3252	1.5962	2.9010	0.3783	0.5286	1.3054	5.3020	1.1729	1.1738
45 VOC	1.0121	1.3081	1.5755	2.8705	0.3724	0.5203	1.2848	5.2900	1.1564	1.1572
46 VOC	0.9972	1.2917	1.5557	2.8425	0.3669	0.5126	1.2656	5.2798	1.1405	1.1414
47 VOC	0.9828	1.2760	1.5367	2.8168	0.3617	0.5054	1.2481	5.2710	1.1253	1.1261
48 VOC	0.9691	1.2610	1.5185	2.7932	0.3570	0.4988	1.2317	5.2633	1.1108	1.1116
49 VOC	0.9665	1.2583	1.5153	2.7713	0.3526	0.4927	1.2166	5.2633	1.1074	1.1084
50 VOC	0.9642	1.2558	1.5122	2.7515	0.3486	0.4871	1.2028	5.2633	1.1043	1.1054
51 VOC	0.9620	1.2535	1.5093	2.7339	0.3449	0.4820	1.1901	5.2633	1.1014	1.1026
52 VOC	0.9598	1.2512	1.5066	2.7183	0.3416	0.4773	1.1787	5.2633	1.0987	1.1000
53 VOC	0.9578	1.2491	1.5040	2.7046	0.3386	0.4732	1.1684	5.2633	1.0962	1.0975
54 VOC	0.9559	1.2471	1.5016	2.6928	0.3360	0.4694	1.1591	5.2633	1.0938	1.0953
55 VOC	0.9542	1.2452	1.4992	2.6829	0.3336	0.4661	1.1510	5.2633	1.0916	1.0931
56 VOC	0.9831	1.2893	1.5599	2.6748	0.3318	0.4633	1.1439	5.3634	1.1238	1.1258
57 VOC	1.0120	1.3334	1.6207	2.6681	0.3298	0.4608	1.1379	5.4635	1.1561	1.1586
58 VOC	1.0411	1.3777	1.6816	2.6634	0.3284	0.4588	1.1329	5.5637	1.1886	1.1915
59 VOC	1.0703	1.4220	1.7427	2.6602	0.3272	0.4572	1.1299	5.6638	1.2212	1.2245
60 VOC	1.0995	1.4664	1.8037	2.6588	0.3263	0.4560	1.1260	5.7639	1.2540	1.2577
61 VOC	1.1287	1.5109	1.8649	2.6591	0.3258	0.4552	1.1240	5.8640	1.2869	1.2910
62 VOC	1.1581	1.5554	1.9262	2.6610	0.3255	0.4548	1.1230	5.9641	1.3199	1.3244
63 VOC	1.1875	1.6000	1.9875	2.6646	0.3255	0.4548	1.1230	6.0642	1.3530	1.3579
64 VOC	1.2169	1.6447	2.0489	2.6699	0.3258	0.4552	1.1240	6.1643	1.3862	1.3915
65 VOC	1.2464	1.6894	2.1104	2.6770	0.3263	0.4560	1.1260	6.2644	1.4195	1.4252

URBAN 1999 FINAL EFS

	LDGV	LDGT1	LDGT2	HDGV	LDDV	LDDT	HDDV	MC		
Fwy VMT MIX:	0.6987	0.1710	0.0757	0.0184	0.0022	0.0010	0.0306	0.0024		
non-Fwy VMT MI	0.7072	0.1732	0.0767	0.0209	0.0022	0.0010	0.0167	0.0021		
SPEED POLLUTANT									COMP EMIS FA (Freeway)	COMP EMIS FA (non-Freeway)
IDLE	23.6600	28.4469	34.4192	43.6453	3.9547	5.2612	14.4442	44.1617	25.3667	25.5595
3 VOC	7.8867	9.4823	11.4731	14.5484	1.3182	1.7537	4.8147	14.7206	8.4556	8.5198
4 VOC	5.7351	6.9472	8.3659	11.8982	1.2515	1.6650	4.5711	12.8088	6.2225	6.2573
5 VOC	4.5587	5.5440	6.6494	10.3224	1.1893	1.5822	4.3437	11.3928	4.9911	5.0107
6 VOC	3.8221	4.6576	5.5668	9.2136	1.1311	1.5048	4.1312	10.3241	4.2133	4.2241
7 VOC	3.3196	4.0490	4.8242	8.3569	1.0767	1.4324	3.9325	9.5034	3.6779	3.6832
8 VOC	3.0077	3.6611	4.3485	7.7436	1.0258	1.3647	3.7467	8.8634	3.3387	3.3413
9 VOC	2.7680	3.3620	3.9786	7.2120	0.9782	1.3014	3.5728	8.3570	3.0753	3.0766
10 VOC	2.5738	3.1199	3.6816	6.7383	0.9338	1.2421	3.4100	7.9510	2.8614	2.8609
11 VOC	2.4127	2.9192	3.4362	6.3139	0.8919	1.1865	3.2575	7.6216	2.6825	2.6811
12 VOC	2.2764	2.7497	3.2295	5.9322	0.8527	1.1345	3.1145	7.3509	2.5304	2.5284
13 VOC	2.1592	2.6040	3.0525	5.5876	0.8160	1.0856	2.9805	7.1291	2.3991	2.3967
14 VOC	2.0570	2.4770	2.8983	5.2756	0.7816	1.0398	2.8547	6.9373	2.2842	2.2815
15 VOC	1.9668	2.3649	2.7638	4.9925	0.7493	0.9968	2.7366	6.7768	2.1824	2.1795
16 VOC	1.8862	2.2649	2.6439	4.7348	0.7189	0.9564	2.6257	6.6388	2.0914	2.0884
17 VOC	1.8135	2.1747	2.5364	4.4999	0.6904	0.9185	2.5216	6.5189	2.0092	2.0062
18 VOC	1.7475	2.0928	2.4392	4.2854	0.6636	0.8828	2.4237	6.4133	1.9344	1.9314
19 VOC	1.6870	2.0177	2.3507	4.0889	0.6384	0.8493	2.3316	6.3193	1.8658	1.8629
20 VOC	1.6238	1.9473	2.2704	3.9123	0.6147	0.8177	2.2450	6.2347	1.7974	1.7945
21 VOC	1.5649	1.8810	2.1917	3.7554	0.5924	0.7881	2.1636	6.1576	1.7332	1.7304
22 VOC	1.5109	1.8203	2.1198	3.6118	0.5714	0.7601	2.0869	6.0867	1.6745	1.6717
23 VOC	1.4613	1.7646	2.0540	3.4801	0.5516	0.7339	2.0147	6.0208	1.6205	1.6178
24 VOC	1.4156	1.7131	1.9934	3.3592	0.5330	0.7091	1.9467	5.9591	1.5706	1.5680
25 VOC	1.3732	1.6654	1.9375	3.2481	0.5155	0.6858	1.8827	5.9009	1.5244	1.5219
26 VOC	1.3339	1.6211	1.8856	3.1459	0.4990	0.6638	1.8224	5.8458	1.4815	1.4791
27 VOC	1.2972	1.5797	1.8373	3.0517	0.4834	0.6431	1.7656	5.7934	1.4414	1.4392
28 VOC	1.2629	1.5410	1.7923	2.9648	0.4687	0.6236	1.7120	5.7434	1.4040	1.4019
29 VOC	1.2307	1.5048	1.7503	2.8847	0.4549	0.6052	1.6616	5.6958	1.3690	1.3670
30 VOC	1.2004	1.4708	1.7108	2.8107	0.4419	0.5879	1.6140	5.6503	1.3361	1.3342
31 VOC	1.1720	1.4388	1.6738	2.7422	0.4296	0.5716	1.5692	5.6070	1.3051	1.3033
32 VOC	1.1451	1.4086	1.6389	2.6789	0.4181	0.5562	1.5270	5.5659	1.2760	1.2743
33 VOC	1.1197	1.3802	1.6060	2.6203	0.4072	0.5417	1.4872	5.5270	1.2485	1.2469
34 VOC	1.0957	1.3533	1.5750	2.5659	0.3969	0.5280	1.4497	5.4903	1.2225	1.2210
35 VOC	1.0729	1.3279	1.5456	2.5156	0.3873	0.5152	1.4144	5.4559	1.1978	1.1965
36 VOC	1.0513	1.3038	1.5177	2.4690	0.3782	0.5031	1.3812	5.4238	1.1745	1.1732
37 VOC	1.0307	1.2810	1.4913	2.4257	0.3696	0.4917	1.3500	5.3941	1.1524	1.1512
38 VOC	1.0111	1.2593	1.4661	2.3856	0.3616	0.4810	1.3206	5.3668	1.1314	1.1302
39 VOC	0.9924	1.2388	1.4422	2.3483	0.3540	0.4710	1.2930	5.3419	1.1114	1.1103
40 VOC	0.9746	1.2192	1.4194	2.3138	0.3469	0.4615	1.2671	5.3194	1.0923	1.0913
41 VOC	0.9576	1.2006	1.3977	2.2818	0.3403	0.4527	1.2428	5.2993	1.0742	1.0733
42 VOC	0.9412	1.1828	1.3769	2.2522	0.3340	0.4444	1.2200	5.2815	1.0569	1.0560
43 VOC	0.9256	1.1659	1.3571	2.2247	0.3282	0.4366	1.1987	5.2659	1.0403	1.0395
44 VOC	0.9106	1.1497	1.3380	2.1993	0.3228	0.4294	1.1789	5.2525	1.0245	1.0237
45 VOC	0.8962	1.1343	1.3198	2.1759	0.3177	0.4227	1.1603	5.2409	1.0094	1.0086
46 VOC	0.8823	1.1194	1.3023	2.1543	0.3130	0.4164	1.1431	5.2310	0.9948	0.9941
47 VOC	0.8689	1.1051	1.2855	2.1344	0.3086	0.4106	1.1271	5.2226	0.9809	0.9801
48 VOC	0.8561	1.0914	1.2693	2.1161	0.3046	0.4052	1.1124	5.2152	0.9675	0.9668
49 VOC	0.8537	1.0889	1.2663	2.0994	0.3008	0.4002	1.0987	5.2152	0.9644	0.9638
50 VOC	0.8514	1.0865	1.2634	2.0843	0.2974	0.3957	1.0862	5.2152	0.9616	0.9611
51 VOC	0.8493	1.0842	1.2607	2.0707	0.2943	0.3915	1.0748	5.2152	0.9589	0.9585
52 VOC	0.8473	1.0821	1.2582	2.0587	0.2914	0.3877	1.0645	5.2152	0.9564	0.9561
53 VOC	0.8454	1.0801	1.2558	2.0482	0.2889	0.3843	1.0551	5.2152	0.9540	0.9538
54 VOC	0.8436	1.0782	1.2535	2.0391	0.2866	0.3813	1.0468	5.2152	0.9519	0.9517
55 VOC	0.8419	1.0764	1.2513	2.0314	0.2846	0.3786	1.0395	5.2152	0.9498	0.9497
56 VOC	0.8644	1.1074	1.2927	2.0250	0.2829	0.3763	1.0331	5.3118	0.9739	0.9741
57 VOC	0.8869	1.1386	1.3342	2.0199	0.2814	0.3743	1.0277	5.4083	0.9981	0.9986
58 VOC	0.9095	1.1699	1.3757	2.0161	0.2801	0.3727	1.0231	5.5049	1.0224	1.0233
59 VOC	0.9322	1.2012	1.4174	2.0136	0.2791	0.3714	1.0195	5.6015	1.0468	1.0481
60 VOC	0.9550	1.2328	1.4591	2.0123	0.2784	0.3704	1.0169	5.6981	1.0714	1.0729
61 VOC	0.9778	1.2640	1.5009	2.0123	0.2779	0.3697	1.0151	5.7947	1.0961	1.0979
62 VOC	1.0007	1.2956	1.5428	2.0136	0.2777	0.3694	1.0142	5.8913	1.1208	1.1230
63 VOC	1.0237	1.3271	1.5847	2.0161	0.2777	0.3694	1.0142	5.9879	1.1457	1.1481
64 VOC	1.0467	1.3588	1.6268	2.0200	0.2779	0.3697	1.0151	6.0844	1.1707	1.1734
65 VOC	1.0697	1.3905	1.6689	2.0251	0.2784	0.3704	1.0169	6.1810	1.1958	1.1988

URBAN 2007 FINAL EFS

	LDGV	LDGT1	LDGT2	HDGV	LDDV	LDDT	HDDV	MC		
Fwy VMT MIX:	0.69870	0.17102	0.07567	0.01840	0.00221	0.00096	0.03062	0.00242		
non-Fwy VMT MIX:	0.70721	0.17315	0.07667	0.02091	0.00224	0.00097	0.01671	0.00214		
SPEED POLLUTANT									COMP EMIS FA (Freeway)	COMP EMIS FAC (non-Freeway)
IDLE	16.07234	19.55098	24.19558	27.21537	3.08800	4.29691	13.35525	42.68619	17.4282	17.5015
3 VOC	5.35745	6.51699	8.06519	9.07179	1.02933	1.43230	4.45175	14.22873	5.8094	5.8338
4 VOC	3.93547	4.80210	5.93494	7.54081	0.97726	1.35984	4.22651	12.36586	4.3216	4.3280
5 VOC	3.15832	3.85561	4.75878	6.59985	0.92863	1.29217	4.01620	10.98613	3.5005	3.4980
6 VOC	2.67190	3.25898	4.01716	5.91964	0.88320	1.22995	3.81972	9.94472	2.9813	2.9739
7 VOC	2.33996	2.84965	3.50825	5.38323	0.84073	1.16986	3.63605	9.14507	2.6233	2.6132
8 VOC	2.12712	2.58246	3.17464	4.98402	0.80101	1.11459	3.46425	8.52140	2.3893	2.3781
9 VOC	1.96389	2.37689	2.91802	4.63569	0.76383	1.06286	3.30348	8.02799	2.2081	2.1962
10 VOC	1.83265	2.21137	2.71162	4.32486	0.72903	1.01443	3.15295	7.63243	2.0610	2.0469
11 VOC	1.72465	2.07497	2.54174	4.04618	0.69642	0.96905	3.01192	7.31137	1.9390	1.9259
12 VOC	1.63410	1.96041	2.39924	3.79543	0.66585	0.92652	2.87973	7.04769	1.8360	1.8240
13 VOC	1.55697	1.86266	2.27781	3.56913	0.63719	0.88664	2.75577	6.82863	1.7476	1.7358
14 VOC	1.49038	1.77810	2.17292	3.36438	0.61030	0.84922	2.63947	6.64459	1.6708	1.6593
15 VOC	1.43222	1.70411	2.08128	3.17869	0.58506	0.81410	2.53030	6.48820	1.6034	1.5922
16 VOC	1.38091	1.63870	2.00040	3.00997	0.56135	0.78111	2.42778	6.35377	1.5435	1.5328
17 VOC	1.33524	1.58036	1.92838	2.85636	0.53908	0.75013	2.33146	6.23689	1.4901	1.4798
18 VOC	1.29428	1.52791	1.86375	2.71627	0.51815	0.72100	2.24064	6.13403	1.4419	1.4320
19 VOC	1.25728	1.48041	1.80533	2.58829	0.49847	0.69362	2.15583	6.04247	1.3983	1.3888
20 VOC	1.21072	1.42667	1.73862	2.47234	0.47996	0.66786	2.07578	5.95999	1.3487	1.3374
21 VOC	1.16275	1.37479	1.67338	2.36792	0.46255	0.64363	2.00046	5.88488	1.2949	1.2858
22 VOC	1.11907	1.32755	1.61400	2.27233	0.44619	0.62082	1.92957	5.81576	1.2476	1.2388
23 VOC	1.07910	1.28433	1.55969	2.18472	0.43072	0.59935	1.86283	5.75155	1.2043	1.1958
24 VOC	1.04240	1.24465	1.50984	2.10433	0.41619	0.57913	1.79998	5.69143	1.1645	1.1562
25 VOC	1.00856	1.20807	1.46389	2.03049	0.40251	0.56008	1.74079	5.63476	1.1278	1.1197
26 VOC	0.97726	1.17423	1.42142	1.96258	0.38961	0.54214	1.68502	5.58106	1.0938	1.0860
27 VOC	0.94821	1.14283	1.38201	1.90008	0.37746	0.52523	1.63248	5.52999	1.0622	1.0546
28 VOC	0.92118	1.11361	1.34536	1.84250	0.36601	0.50930	1.58298	5.48131	1.0328	1.0255
29 VOC	0.89595	1.08635	1.31117	1.78940	0.35522	0.49429	1.53630	5.43486	1.0054	0.9982
30 VOC	0.87235	1.06084	1.27920	1.74040	0.34506	0.48014	1.49233	5.39056	0.9797	0.9728
31 VOC	0.85021	1.03692	1.24923	1.69515	0.33548	0.46681	1.45089	5.34838	0.9557	0.9489
32 VOC	0.82940	1.01444	1.22107	1.65334	0.32645	0.45425	1.41185	5.30830	0.9330	0.926
33 VOC	0.80981	0.99327	1.19457	1.61468	0.31794	0.44241	1.37506	5.27037	0.9118	0.9054
34 VOC	0.79131	0.97330	1.16957	1.57892	0.30993	0.43126	1.34041	5.23461	0.8917	0.8855
35 VOC	0.77382	0.95441	1.14594	1.54582	0.30239	0.42077	1.30779	5.20108	0.8728	0.8668
36 VOC	0.75726	0.93652	1.12358	1.51519	0.29529	0.41089	1.27708	5.16983	0.8548	0.8490
37 VOC	0.74154	0.91955	1.10237	1.48683	0.28861	0.40159	1.24820	5.14088	0.8378	0.8321
38 VOC	0.72661	0.90343	1.08223	1.46057	0.28233	0.39285	1.22103	5.11428	0.8217	0.8162
39 VOC	0.71239	0.88809	1.06308	1.43627	0.27643	0.38464	1.19552	5.09003	0.8064	0.8010
40 VOC	0.69885	0.87347	1.04484	1.41378	0.27089	0.37694	1.17156	5.06811	0.7918	0.7865
41 VOC	0.68592	0.85952	1.02744	1.39299	0.26569	0.36971	1.14910	5.04854	0.7780	0.7728
42 VOC	0.67357	0.84619	1.01083	1.37377	0.26083	0.36294	1.12806	5.03121	0.7647	0.7597
43 VOC	0.66175	0.83344	0.99495	1.35602	0.25628	0.35661	1.10838	5.01602	0.7521	0.7471
44 VOC	0.65044	0.82123	0.97974	1.33966	0.25203	0.35070	1.09000	5.00289	0.7401	0.7351
45 VOC	0.63958	0.80953	0.96517	1.32461	0.24807	0.34518	1.07287	4.99162	0.7285	0.7237
46 VOC	0.62916	0.79829	0.95120	1.31078	0.24439	0.34006	1.05694	4.98201	0.7175	0.7127
47 VOC	0.61915	0.78749	0.93778	1.29811	0.24097	0.33531	1.04216	4.97376	0.7069	0.7022
48 VOC	0.60952	0.77711	0.92486	1.28651	0.23781	0.33091	1.02850	4.96656	0.6968	0.6921
49 VOC	0.60807	0.77555	0.92295	1.27572	0.23490	0.32686	1.01590	4.96656	0.6948	0.6902
50 VOC	0.60670	0.77407	0.92114	1.26603	0.23223	0.32314	1.00435	4.96656	0.6929	0.6884
51 VOC	0.60542	0.77268	0.91944	1.25739	0.22979	0.31974	0.99380	4.96656	0.6911	0.6868
52 VOC	0.60420	0.77137	0.91783	1.24975	0.22757	0.31666	0.98422	4.96656	0.6895	0.6853
53 VOC	0.60305	0.77013	0.91632	1.24309	0.22558	0.31389	0.97560	4.96656	0.6880	0.6838
54 VOC	0.60196	0.76896	0.91488	1.23735	0.22380	0.31141	0.96791	4.96656	0.6865	0.6825
55 VOC	0.60093	0.76784	0.91352	1.23253	0.22223	0.30923	0.96111	4.96656	0.6852	0.6812
56 VOC	0.61607	0.78440	0.93369	1.22960	0.22086	0.30733	0.95521	5.06067	0.7001	0.6964
57 VOC	0.63126	0.80101	0.95433	1.22553	0.21970	0.30571	0.95018	5.15479	0.7152	0.7116
58 VOC	0.64650	0.81767	0.97483	1.22392	0.21874	0.30437	0.94601	5.24890	0.7303	0.7269
59 VOC	0.66178	0.83438	0.99539	1.22196	0.21797	0.30330	0.94269	5.34302	0.7455	0.7423
60 VOC	0.67710	0.85113	1.01600	1.22143	0.21739	0.30250	0.94020	5.43713	0.7607	0.7578
61 VOC	0.69246	0.86793	1.03666	1.22175	0.21701	0.30197	0.93855	5.53125	0.7761	0.
62 VOC	0.70785	0.88476	1.05736	1.22292	0.21682	0.30170	0.93772	5.62536	0.7915	0.
63 VOC	0.72328	0.90162	1.07811	1.22494	0.21682	0.30170	0.93772	5.71948	0.8070	0.8046
64 VOC	0.73874	0.91852	1.09891	1.22783	0.21701	0.30197	0.93855	5.81359	0.8226	0.8203
65 VOC	0.75423	0.93546	1.11974	1.23160	0.21739	0.30250	0.94020	5.90771	0.8382	0.8361

1996 HARRIS FINAL EFS

	LDGV	LDGT1	LDGT2	HDGV	LDDV	LDDT	HDDV	MC		
Fwy VMT MIX:	0.69870	0.17102	0.07567	0.01940	0.00221	0.00096	0.03062	0.00242		
non-Fwy VMT MIX	0.70721	0.17315	0.07667	0.02091	0.00224	0.00097	0.01671	0.00214		
SPEED POLLUTANT									COMP EMIS FA (Freeway)	COMP EMIS FA (non-Freeway)
IDLE	25.3910	30.1338	41.1559	47.7130	4.8297	6.5891	15.5467	44.9446	27.4382	27.7007
3 VOC	8.4637	10.0446	13.7186	15.9043	1.6099	2.1964	5.1822	14.9815	9.1527	9.2336
4 VOC	6.2401	7.4878	10.1717	13.1338	1.5285	2.0852	4.9200	13.0204	6.8394	6.8796
5 VOC	4.9909	6.0241	8.1338	11.4564	1.4524	1.9815	4.6752	11.5678	5.5199	5.5439
6 VOC	4.1936	5.0777	6.8132	10.2595	1.3813	1.8845	4.4465	10.4715	4.6691	4.6835
7 VOC	3.6417	4.4173	5.8907	9.3253	1.3149	1.7939	4.2327	9.6296	4.0749	4.0830
8 VOC	3.2864	3.9832	5.2745	8.6480	1.2528	1.7092	4.0327	8.9730	3.6852	3.6901
9 VOC	3.0117	3.6466	4.7980	8.0549	1.1947	1.6298	3.8455	8.4536	3.3816	3.3842
10 VOC	2.7888	3.3737	4.4139	7.5273	1.1402	1.5556	3.6703	8.0372	3.1339	3.1348
11 VOC	2.6036	3.1473	4.0973	7.0540	1.0892	1.4860	3.5061	7.6992	2.9270	2.9258
12 VOC	2.4466	2.9557	3.8314	6.6278	1.0414	1.4208	3.3523	7.4216	2.7511	2.7500
13 VOC	2.3114	2.7909	3.6044	6.2426	0.9966	1.3596	3.2080	7.1910	2.5990	2.5973
14 VOC	2.1933	2.6469	3.4079	5.8936	0.9545	1.3022	3.0728	6.9972	2.4658	2.4637
15 VOC	2.0887	2.5196	3.2365	5.5766	0.9150	1.2484	2.9455	6.8326	2.3477	2.3452
16 VOC	1.9952	2.4056	3.0829	5.2880	0.8780	1.1978	2.8262	6.6910	2.2419	2.2391
17 VOC	1.9108	2.3024	2.9455	5.0247	0.8431	1.1503	2.7140	6.5680	2.1461	2.1433
18 VOC	1.8339	2.2082	2.8216	4.7840	0.8104	1.1056	2.6087	6.4597	2.0589	2.0559
19 VOC	1.7632	2.1214	2.7086	4.5638	0.7796	1.0636	2.5096	6.3633	1.9787	1.9757
20 VOC	1.6957	2.0487	2.6183	4.3655	0.7507	1.0241	2.4164	6.2765	1.9054	1.9025
21 VOC	1.6361	1.9812	2.5303	4.1501	0.7234	0.9870	2.3287	6.1974	1.8394	1.8365
22 VOC	1.5816	1.9190	2.4496	4.0295	0.6978	0.9520	2.2462	6.1246	1.7788	1.7760
23 VOC	1.5315	1.8617	2.3754	3.8822	0.6737	0.9191	2.1685	6.0570	1.7230	1.7203
24 VOC	1.4851	1.8084	2.3068	3.7469	0.6509	0.8881	2.0953	5.9937	1.6714	1.6688
25 VOC	1.4421	1.7588	2.2432	3.6225	0.6295	0.8589	2.0264	5.9341	1.6234	1.6210
26 VOC	1.4021	1.7124	2.1838	3.5082	0.6094	0.8313	1.9615	5.8776	1.5788	1.5764
27 VOC	1.3648	1.6690	2.1284	3.4029	0.5904	0.8054	1.9003	5.8238	1.5370	1.5348
28 VOC	1.3298	1.6282	2.0766	3.3056	0.5725	0.7810	1.8427	5.7725	1.4980	1.4959
29 VOC	1.2970	1.5898	2.0278	3.2159	0.5556	0.7580	1.7884	5.7236	1.4613	1.4593
30 VOC	1.2661	1.5537	1.9820	3.1330	0.5397	0.7363	1.7372	5.6770	1.4268	1.4250
31 VOC	1.2369	1.5196	1.9389	3.0564	0.5247	0.7158	1.6890	5.6326	1.3943	1.3926
32 VOC	1.2094	1.4874	1.8983	2.9855	0.5106	0.6966	1.6435	5.5904	1.3636	1.3620
33 VOC	1.1833	1.4570	1.8599	2.9199	0.4973	0.6784	1.6007	5.5505	1.3346	1.3332
34 VOC	1.1586	1.4283	1.8236	2.8591	0.4847	0.6613	1.5604	5.5126	1.3072	1.3059
35 VOC	1.1351	1.4011	1.7894	2.8028	0.4729	0.6452	1.5224	5.4775	1.2812	1.2800
36 VOC	1.1127	1.3754	1.7570	2.7505	0.4618	0.6301	1.4866	5.4446	1.2566	1.2554
37 VOC	1.0914	1.3511	1.7263	2.7021	0.4514	0.6158	1.4530	5.4141	1.2332	1.2321
38 VOC	1.0711	1.3282	1.6973	2.6572	0.4416	0.6024	1.4214	5.3861	1.2110	1.2100
39 VOC	1.0517	1.3064	1.6698	2.6155	0.4323	0.5898	1.3917	5.3606	1.1898	1.1889
40 VOC	1.0331	1.2858	1.6437	2.5768	0.4237	0.5780	1.3638	5.3375	1.1697	1.1689
41 VOC	1.0154	1.2662	1.6190	2.5410	0.4156	0.5669	1.3377	5.3169	1.1505	1.1498
42 VOC	0.9983	1.2477	1.5958	2.5078	0.4079	0.5566	1.3132	5.2987	1.1322	1.1316
43 VOC	0.9819	1.2301	1.5733	2.4770	0.4008	0.5468	1.2903	5.2827	1.1148	1.1141
44 VOC	0.9662	1.2133	1.5521	2.4486	0.3942	0.5378	1.2689	5.2689	1.0981	1.0975
45 VOC	0.9511	1.1974	1.5319	2.4223	0.3880	0.5293	1.2489	5.2570	1.0821	1.0815
46 VOC	0.9365	1.1821	1.5126	2.3981	0.3822	0.5215	1.2304	5.2469	1.0668	1.0662
47 VOC	0.9224	1.1674	1.4942	2.3758	0.3769	0.5142	1.2132	5.2382	1.0521	1.0515
48 VOC	0.9090	1.1535	1.4765	2.3554	0.3719	0.5074	1.1973	5.2306	1.0381	1.0375
49 VOC	0.9070	1.1514	1.4737	2.3370	0.3674	0.5012	1.1826	5.2306	1.0353	1.0349
50 VOC	0.9061	1.1494	1.4711	2.3205	0.3632	0.4955	1.1691	5.2306	1.0327	1.0324
51 VOC	0.9033	1.1476	1.4686	2.3057	0.3594	0.4903	1.1569	5.2306	1.0303	1.0301
52 VOC	0.9016	1.1458	1.4662	2.2927	0.3559	0.4856	1.1457	5.2306	1.0280	1.0280
53 VOC	0.9000	1.1441	1.4640	2.2812	0.3528	0.4813	1.1357	5.2306	1.0259	1.0260
54 VOC	0.8985	1.1425	1.4619	2.2714	0.3500	0.4775	1.1267	5.2306	1.0240	1.0241
55 VOC	0.8971	1.1410	1.4599	2.2630	0.3476	0.4742	1.1188	5.2306	1.0222	1.0224
56 VOC	0.9266	1.1842	1.5231	2.2562	0.3454	0.4713	1.1120	5.3297	1.0548	1.0555
57 VOC	0.9561	1.2274	1.5863	2.2508	0.3436	0.4688	1.1061	5.4288	1.0876	1.0887
58 VOC	0.9857	1.2706	1.6497	2.2468	0.3421	0.4667	1.1012	5.5279	1.1205	1.1220
59 VOC	1.0154	1.3140	1.7131	2.2443	0.3409	0.4651	1.0974	5.6269	1.1535	1.1555
60 VOC	1.0451	1.3573	1.7767	2.2431	0.3400	0.4639	1.0945	5.7260	1.1866	1.1890
61 VOC	1.0749	1.4008	1.8403	2.2434	0.3394	0.4631	1.0926	5.8251	1.2199	1.2227
62 VOC	1.1047	1.4443	1.9039	2.2451	0.3391	0.4626	1.0916	5.9242	1.2532	1.2564
63 VOC	1.1346	1.4878	1.9677	2.2482	0.3391	0.4626	1.0916	6.0233	1.2866	1.2902
64 VOC	1.1645	1.5314	2.0314	2.2528	0.3394	0.4631	1.0926	6.1223	1.3202	1.3241
65 VOC	1.1944	1.5750	2.0953	2.2588	0.3400	0.4639	1.0945	6.2214	1.3538	1.3581

HARRIS 1999 FINAL EFS

	LDGV	LDGT1	LDGT2	HDGV	LDDV	LDDT	HDDV	MC		
wy VMT MIX:	0.6987	0.1710	0.0757	0.0184	0.0022	0.0010	0.0306	0.0024		
on-Fwy VMT MI	0.7072	0.1732	0.0767	0.0209	0.0022	0.0010	0.0167	0.0021		
SPEED POLLUTANT									COMP EMIS FA (Freeway)	COMP EMIS FA (non-Freeway
IDLE	19.5752	23.1360	28.5369	35.0617	4.2024	5.5539	14.1580	43.7406	20.9924	21.1158
3 VOC	6.5251	7.7120	9.5123	11.6872	1.4008	1.8513	4.7193	14.5802	6.9975	7.0386
4 VOC	4.7741	5.6787	6.9650	9.6208	1.3299	1.7576	4.4906	12.6899	5.1835	5.2015
5 VOC	3.8098	4.5451	5.5479	8.3761	1.2638	1.6702	4.2576	11.2899	4.1752	4.1816
6 VOC	3.2029	3.8255	4.6496	7.4922	1.2019	1.5885	4.0493	10.2331	3.5347	3.5344
7 VOC	2.7871	3.3295	4.0310	6.8050	1.1441	1.5121	3.8546	9.4217	3.0918	3.0875
8 VOC	2.5291	3.0135	3.6321	6.3105	1.0901	1.4407	3.6725	8.7688	2.8109	2.8048
9 VOC	2.3303	2.7693	3.3243	5.8808	1.0395	1.3738	3.5020	8.2881	2.5924	2.5853
10 VOC	2.1687	2.5708	3.0750	5.4972	0.9921	1.3112	3.3425	7.8868	2.4136	2.4058
11 VOC	2.0341	2.4056	2.8685	5.1529	0.9477	1.2525	3.1929	7.5610	2.2638	2.2556
12 VOC	1.9197	2.2654	2.6940	4.8426	0.9061	1.1976	3.0528	7.2934	2.1360	2.1275
13 VOC	1.8210	2.1444	2.5441	4.5621	0.8671	1.1460	2.9214	7.0711	2.0251	2.0166
14 VOC	1.7345	2.0384	2.4135	4.3077	0.8305	1.0977	2.7981	6.8844	1.9276	1.9191
15 VOC	1.6578	1.9444	2.2984	4.0765	0.7962	1.0523	2.6824	6.7257	1.8409	1.8325
16 VOC	1.5889	1.8601	2.1957	3.8658	0.7639	1.0096	2.5737	6.5893	1.7630	1.7548
17 VOC	1.5266	1.7837	2.1034	3.6733	0.7336	0.9696	2.4716	6.4707	1.6923	1.6843
18 VOC	1.4697	1.7138	2.0195	3.4972	0.7051	0.9319	2.3756	6.3663	1.6277	1.6199
19 VOC	1.4173	1.6495	1.9429	3.3357	0.6784	0.8965	2.2854	6.2734	1.5683	1.5607
20 VOC	1.3635	1.5913	1.8774	3.1911	0.6532	0.8632	2.2005	6.1897	1.5102	1.5028
21 VOC	1.3145	1.5380	1.8138	3.0640	0.6295	0.8319	2.1207	6.1135	1.4570	1.4498
22 VOC	1.2697	1.4892	1.7557	2.9476	0.6072	0.8024	2.0455	6.0433	1.4083	1.4013
23 VOC	1.2285	1.4442	1.7024	2.8408	0.5862	0.7747	1.9748	5.9782	1.3634	1.3566
24 VOC	1.1904	1.4025	1.6534	2.7427	0.5664	0.7485	1.9082	5.9172	1.3219	1.3154
25 VOC	1.1551	1.3641	1.6080	2.6524	0.5478	0.7239	1.8454	5.8597	1.2834	1.2771
26 VOC	1.1222	1.3282	1.5658	2.5693	0.5302	0.7007	1.7863	5.8052	1.2476	1.2415
27 VOC	1.0915	1.2946	1.5266	2.4927	0.5137	0.6789	1.7306	5.7534	1.2141	1.2083
28 VOC	1.0628	1.2632	1.4900	2.4221	0.4981	0.6583	1.6781	5.7040	1.1828	1.1772
29 VOC	1.0358	1.2338	1.4557	2.3568	0.4834	0.6389	1.6286	5.6568	1.1535	1.1481
30 VOC	1.0104	1.2061	1.4235	2.2965	0.4696	0.6206	1.5820	5.6119	1.1259	1.1207
31 VOC	0.9865	1.1800	1.3932	2.2407	0.4565	0.6034	1.5381	5.5691	1.0999	1.0949
32 VOC	0.9639	1.1554	1.3647	2.1890	0.4443	0.5871	1.4967	5.5284	1.0754	1.0705
33 VOC	0.9425	1.1321	1.3378	2.1411	0.4327	0.5718	1.4577	5.4899	1.0522	1.0475
34 VOC	0.9222	1.1101	1.3123	2.0967	0.4218	0.5574	1.4210	5.4536	1.0302	1.0258
35 VOC	0.9029	1.0892	1.2882	2.0555	0.4115	0.5439	1.3864	5.4196	1.0095	1.0051
36 VOC	0.8846	1.0695	1.2653	2.0173	0.4019	0.5311	1.3538	5.3879	0.9897	0.9855
37 VOC	0.8671	1.0507	1.2435	1.9818	0.3928	0.5191	1.3232	5.3585	0.9710	0.9669
38 VOC	0.8505	1.0329	1.2228	1.9488	0.3842	0.5078	1.2944	5.3315	0.9531	0.9492
39 VOC	0.8345	1.0159	1.2031	1.9182	0.3762	0.4972	1.2674	5.3069	0.9361	0.9323
40 VOC	0.8193	0.9998	1.1843	1.8898	0.3688	0.4872	1.2420	5.2847	0.9199	0.9162
41 VOC	0.8047	0.9844	1.1663	1.8634	0.3616	0.4779	1.2182	5.2648	0.9044	0.9008
42 VOC	0.7907	0.9697	1.1492	1.8389	0.3550	0.4691	1.1959	5.2472	0.8897	0.8861
43 VOC	0.7773	0.9556	1.1327	1.8161	0.3488	0.4609	1.1750	5.2318	0.8755	0.8720
44 VOC	0.7644	0.9421	1.1169	1.7951	0.3430	0.4533	1.1555	5.2185	0.8619	0.8586
45 VOC	0.7519	0.9293	1.1018	1.7756	0.3376	0.4462	1.1374	5.2071	0.8489	0.8456
46 VOC	0.7399	0.9169	1.0872	1.7576	0.3326	0.4395	1.1205	5.1973	0.8364	0.8331
47 VOC	0.7283	0.9049	1.0732	1.7409	0.3279	0.4334	1.1048	5.1889	0.8244	0.8212
48 VOC	0.7172	0.8935	1.0597	1.7257	0.3236	0.4277	1.0903	5.1816	0.8129	0.8097
49 VOC	0.7154	0.8915	1.0574	1.7123	0.3197	0.4225	1.0770	5.1816	0.8104	0.8074
50 VOC	0.7136	0.8897	1.0551	1.7003	0.3160	0.4177	1.0647	5.1816	0.8081	0.8052
51 VOC	0.7119	0.8879	1.0530	1.6895	0.3127	0.4133	1.0535	5.1816	0.8059	0.8031
52 VOC	0.7103	0.8863	1.0510	1.6799	0.3097	0.4093	1.0434	5.1816	0.8039	0.8011
53 VOC	0.7088	0.8847	1.0491	1.6716	0.3070	0.4057	1.0342	5.1816	0.8020	0.7993
54 VOC	0.7074	0.8832	1.0473	1.6644	0.3046	0.4025	1.0261	5.1816	0.8002	0.7976
55 VOC	0.7061	0.8818	1.0456	1.6582	0.3024	0.3997	1.0189	5.1816	0.7986	0.7960
56 VOC	0.7251	0.9077	1.0824	1.6532	0.3006	0.3972	1.0126	5.2771	0.8190	0.8168
57 VOC	0.7443	0.9337	1.1192	1.6492	0.2990	0.3951	1.0073	5.3726	0.8396	0.8377
58 VOC	0.7635	0.9597	1.1562	1.6462	0.2977	0.3934	1.0029	5.4681	0.8603	0.8587
59 VOC	0.7828	0.9858	1.1932	1.6443	0.2966	0.3920	0.9993	5.5636	0.8811	0.8798
60 VOC	0.8021	1.0119	1.2302	1.6434	0.2958	0.3910	0.9967	5.6591	0.9021	0.9010
61 VOC	0.8214	1.0381	1.2673	1.6435	0.2953	0.3903	0.9950	5.7546	0.9230	0.9222
62 VOC	0.8409	1.0644	1.3045	1.6446	0.2951	0.3900	0.9941	5.8501	0.9441	0.9435
63 VOC	0.8603	1.0907	1.3418	1.6468	0.2951	0.3900	0.9941	5.9456	0.9653	0.9649
64 VOC	0.8798	1.1170	1.3791	1.6500	0.2953	0.3903	0.9950	6.0411	0.9866	0.9864
65 VOC	0.8993	1.1434	1.4164	1.6543	0.2958	0.3910	0.9967	6.1366	1.0079	1.0080

	LDGV	LDGT1	LDGT2	HDGV	LDDV	LDDT	HDDV	MC		
Fwy VMT MIX:	0.69870	0.17102	0.07567	0.01840	0.00221	0.00096	0.03062	0.00242		
n-Fwy VMT MI	0.70721	0.17315	0.07667	0.02091	0.00224	0.00097	0.01671	0.00214		
SPEED POLLUTANT									COMP EMIS FA (Freeway)	COMP EMIS FAC (non-Freeway)
IDLE	13.02477	15.23695	19.10169	21.32189	0.00000	4.29327	13.33570	42.27684	14.0568	14.0774
3 VOC	4.34159	5.07898	6.36723	7.10730	0.00000	1.43109	4.44523	14.09228	4.6863	4.6925
4 VOC	3.20159	3.74973	4.69160	5.99636	0.97348	1.35868	4.22033	12.25039	3.5059	3.4988
5 VOC	2.57541	3.01385	3.76424	5.28873	0.92504	1.29108	4.01033	10.88620	2.8494	2.8360
6 VOC	2.18206	2.54895	3.17852	4.76390	0.87979	1.22791	3.81413	9.85651	2.4325	2.4158
7 VOC	1.91290	2.22947	2.77606	4.34272	0.83748	1.16887	3.63073	9.06586	2.1439	2.1256
8 VOC	1.74025	2.02187	2.51375	4.02168	0.79791	1.11364	3.45918	8.44922	1.9551	1.9364
9 VOC	1.60766	1.86188	2.31168	3.73995	0.76088	1.06196	3.29865	7.96136	1.8084	1.7897
10 VOC	1.50086	1.73270	2.14870	3.48783	0.72621	1.01357	3.14833	7.57026	1.6890	1.6705
11 VOC	1.41278	1.62593	2.01414	3.26126	0.69373	0.96823	3.00751	7.25281	1.5897	1.5715
12 VOC	1.33877	1.53596	1.90089	3.05700	0.66328	0.92574	2.87551	6.99210	1.5055	1.4878
13 VOC	1.27556	1.45892	1.80404	2.87236	0.63473	0.88589	2.75174	6.77551	1.4330	1.4158
14 VOC	1.22085	1.39204	1.72007	2.70505	0.60794	0.84850	2.63560	6.59354	1.3698	1.3532
15 VOC	1.17294	1.33328	1.64641	2.55312	0.58280	0.81341	2.52659	6.43891	1.3141	1.2981
16 VOC	1.13065	1.28112	1.58113	2.41490	0.55919	0.78045	2.42423	6.30600	1.2646	1.2491
17 VOC	1.09271	1.23440	1.52274	2.28892	0.53700	0.74949	2.32805	6.19042	1.2201	1.2052
18 VOC	1.05865	1.19220	1.47010	2.17388	0.51615	0.72039	2.23766	6.08973	1.1799	1.1656
19 VOC	1.02779	1.15383	1.42230	2.06868	0.49655	0.69303	2.15268	5.99819	1.1433	1.1295
20 VOC	0.99950	1.11140	1.36939	1.97357	0.47811	0.66730	2.07274	5.91664	1.1009	1.0875
21 VOC	0.95038	1.07110	1.31824	1.88930	0.46076	0.64308	1.99753	5.84238	1.0586	1.0457
22 VOC	0.91474	1.03438	1.27164	1.81022	0.44443	0.62029	1.92675	5.77404	1.0201	1.0075
23 VOC	0.88210	1.00076	1.22899	1.73863	0.42906	0.59884	1.86011	5.71058	0.9848	0.9725
24 VOC	0.85211	0.96937	1.18991	1.67291	0.41459	0.57864	1.79735	5.65111	0.9522	0.9404
25 VOC	0.82444	0.94136	1.15367	1.61253	0.40095	0.55961	1.73824	5.59508	0.9222	0.9107
26 VOC	0.79882	0.91498	1.12023	1.55699	0.38811	0.54168	1.68255	5.54199	0.8943	0.8832
27 VOC	0.77503	0.89047	1.08918	1.50584	0.37600	0.52479	1.63009	5.49149	0.8685	0.8576
28 VOC	0.75287	0.86764	1.06027	1.45871	0.36460	0.50887	1.58064	5.44335	0.8444	0.8338
29 VOC	0.73218	0.84632	1.03328	1.41523	0.35385	0.49387	1.53405	5.39743	0.8218	0.8116
30 VOC	0.71280	0.82635	1.00801	1.37510	0.34372	0.47973	1.49015	5.35363	0.8007	0.7908
31 VOC	0.69460	0.80761	0.98430	1.33802	0.33418	0.46641	1.44877	5.31192	0.7809	0.7713
32 VOC	0.67748	0.78998	0.96200	1.30374	0.32519	0.45386	1.40978	5.27229	0.7623	0.7529
33 VOC	0.66135	0.77336	0.94099	1.27204	0.31671	0.44204	1.37305	5.23479	0.7446	0.7356
34 VOC	0.64610	0.75765	0.92114	1.24270	0.30873	0.43090	1.33845	5.19943	0.7282	0.7193
35 VOC	0.63167	0.74279	0.90237	1.21553	0.30122	0.42041	1.30588	5.16628	0.7126	0.7039
36 VOC	0.61799	0.72869	0.88458	1.19037	0.29415	0.41054	1.27521	5.13538	0.6978	0.6893
37 VOC	0.60500	0.71531	0.86769	1.16707	0.28749	0.40125	1.24637	5.10676	0.6837	0.6754
38 VOC	0.59264	0.70258	0.85163	1.14549	0.28124	0.39252	1.21925	5.08045	0.6704	0.6623
39 VOC	0.58086	0.69045	0.83634	1.12550	0.27536	0.38432	1.19377	5.05648	0.6577	0.6498
40 VOC	0.56963	0.67887	0.82175	1.10699	0.26984	0.37662	1.16985	5.03481	0.6456	0.6378
41 VOC	0.55889	0.66781	0.80783	1.08986	0.26467	0.36940	1.14742	5.01546	0.6341	0.6265
42 VOC	0.54862	0.65724	0.79451	1.07402	0.25982	0.36263	1.12641	4.99833	0.6231	0.6156
43 VOC	0.53879	0.64710	0.78176	1.05938	0.25529	0.35631	1.10676	4.98330	0.6125	0.6052
44 VOC	0.52935	0.63739	0.76954	1.04587	0.25106	0.35040	1.08841	4.97032	0.6025	0.5953
45 VOC	0.52030	0.62806	0.75781	1.03343	0.24711	0.34489	1.07130	4.95918	0.5930	0.5858
46 VOC	0.51159	0.61909	0.74655	1.02199	0.24344	0.33977	1.05539	4.94967	0.5838	0.5767
47 VOC	0.50322	0.61046	0.73572	1.01149	0.24004	0.33502	1.04064	4.94152	0.5750	0.5680
48 VOC	0.49518	0.60218	0.72532	1.00191	0.23689	0.33063	1.02699	4.93440	0.5665	0.5596
49 VOC	0.49405	0.60097	0.72380	0.99338	0.23399	0.32658	1.01442	4.93440	0.5649	0.5581
50 VOC	0.49297	0.59984	0.72238	0.98574	0.23133	0.32286	1.00288	4.93440	0.5633	0.5566
51 VOC	0.49196	0.59876	0.72103	0.97893	0.22890	0.31947	0.99234	4.93440	0.5618	0.5553
52 VOC	0.49100	0.59775	0.71977	0.97294	0.22669	0.31640	0.98278	4.93440	0.5605	0.5541
53 VOC	0.49009	0.59679	0.71857	0.96773	0.22471	0.31362	0.97417	4.93440	0.5592	0.5529
54 VOC	0.48924	0.59588	0.71743	0.96328	0.22293	0.31115	0.96649	4.93440	0.5581	0.5518
55 VOC	0.48842	0.59502	0.71635	0.95956	0.22137	0.30897	0.95971	4.93440	0.5570	0.5508
56 VOC	0.50073	0.60776	0.73227	0.95656	0.22001	0.30707	0.95381	5.02746	0.5690	0.5630
57 VOC	0.51306	0.62053	0.74823	0.95426	0.21885	0.30545	0.94879	5.12051	0.5810	0.5752
58 VOC	0.52544	0.63335	0.76425	0.95265	0.21789	0.30411	0.94463	5.21357	0.5931	0.5875
59 VOC	0.53785	0.64620	0.78031	0.95173	0.21713	0.30304	0.94131	5.30662	0.6053	0.5999
60 VOC	0.55029	0.65909	0.79641	0.95150	0.21655	0.30224	0.93882	5.39967	0.6176	0.6123
61 VOC	0.56276	0.67201	0.81255	0.95195	0.21617	0.30171	0.93717	5.49273	0.6299	0.6247
62 VOC	0.57526	0.68495	0.82873	0.95309	0.21598	0.30145	0.93635	5.58578	0.6423	0.6373
63 VOC	0.58778	0.69793	0.84494	0.95493	0.21598	0.30145	0.93635	5.67884	0.6547	0.6499
64 VOC	0.60033	0.71093	0.86119	0.95747	0.21617	0.30171	0.93717	5.77190	0.6672	0.6625
65 VOC	0.61290	0.72395	0.87746	0.96073	0.21655	0.30224	0.93882	5.86495	0.6798	0.6752

El Paso TCMs

Transportation Control Measure Commitments
El Paso Area Ozone Nonattainment Area

1993 Rate-of-Progress State Implementation Plan
Texas Natural Resource Conservation Commission

	CURRENT TCM CATEGORIES	PROJECT SIZE	ESTIMATED EMISSIONS REDUCTION (lb/day)	
1	Transit Terminals (Park-and-Ride Lots)	1 terminal	4	
2	Traffic Surveillance System	1 project	670	
3	CNG Fueling Facility -Public Transportation	1 facility	18	
			691	lbs/day
			0.35*	tons/day

*indicates number has been rounded for consistency

tcm-ep
6-12-96

EL PASO
METROPOLITAN PLANNING ORGANIZATION

February 28, 1996

nsportation Advisory Board

y Francis, Chairman
or, City of El Paso

elio Sanchez, V. Chemn.
nty Commissioner

e Aguirre
or, City of Sunland Park, Mexico

V. Franco
yor, Town of Anthony

Haggerty
e Representative

celio Lozoya
yor, City of Socorro

uck Mattox
unty Judge, y of El Paso

ary M. May, P.E.
strict Engineer, TxDOT

ncy McDonald
ate Representative

uf Moreno
ate Representative

rena E. Murphy
rector, Mass Transit

nacio "Nacho" Padilla
ty Representative

seph C. Pickett
ate Representative

eggy Rosson
tate Senator

Albert Serna
tate Representative

Raymond Telles
ity Representative

Ricardo Dominguez
Transportation Planning Coordinator

Mr. Al Giles, Manager
Transportation Planning Section
Texas Natural Resource Conservation Commission
12100 Park 35 Circle, Bldg. E., MC - 164
P.O. Box 13087
Austin, TX 78711-3087

Mr. Giles:

The Transportation Advisory Board approved changing the Transportation Control Measures (TCMs) for the El Paso Metropolitan Planning Organization on January 26, 1996. The newly adopted TCMs for El Paso are the Northeast Transit Terminal; the IH-10/US 54 Traffic Surveillance System; and the CNG Fueling Facility. These new TCMs replace the previously approved list which contained 10 categories and listed 15 TCM projects. Attached is a copy of the TAB resolution approving the new TCMs.

I would like to thank you and your staff in assisting the MPO through this process. Please keep us informed as you submit these TCMs to the Environmental Protection Agency for their approval.

Sincerely,

Mayor Larry Francis
Chairman
Transportation Advisory Board

LF/RD/lg

Two Civic Center Plaza . El Paso, Texas 79901-1196 (915) 541-4017 Fax (915) 541-4028

RESOLUTIONS

TRANSPORTATION ADVISORY BOARD FOR THE
EL PASO URBAN TRANSPORTATION STUDY

MEETING - JANUARY 26, 1996

Item 3 The Transportation Advisory Board (TAB) for the El Paso Urban Transportation Study (EPUTS) approved the minutes for the December 8, 1995 meeting.

Item 4 The TAB for the EPUTS approved the 1996 Schedule of Meetings.

Item 6 The TAB for the EPUTS approved the revised list of Transportation Control Measures (TCMs) and moved that the list be transmitted to the Texas Natural Resource Conservation Commission (TNRCC).

Item 7 The TAB for the EPUTS approved Sun Metro's 1996 ADA Paratransit Plan.

Item 8 The TAB for the EPUTS tabled the reprogramming of planning funds for the Fabens port-of-entry and amending the FY1996 Unified Work Program for one (1) month; and appointed Senator Peggy Rosson and State Representative Pat Haggerty to evaluate the use of transportation planning funds for feasibility studies for road projects.

Item 9 The TAB for the EPUTS approved the amendments to the FY1996 UWP to include New Mexico and the Federal Highway Administration (FHWA) Planning Funds programmed for the City of Sunland Park, New Mexico.

Item 12 The TAB for the EPUTS denied the inclusion of Ft. Bliss to the TAB as a voting member and moved to add Ft. Bliss to the TAB Work Committee List.

Item 13 The TAB for the EPUTS approved that the following projects be submitted to the Texas Transportation Commission for funding:

a) Approval to construct main lanes and structures from Zaragoza Road interchange to IH-10 at an estimated cost of $23.4 million.

b) Approval to construct two (2) additional lanes from Tom Mays Park to the IH-10 Interchange at an estimated cost of $3.9 million.

c) Approval to conduct a feasibility study of a new highway to bypass the congested portions of IH-10 from NM 404 interchange with IH-10 to Loop 375.

Mayor Larry Francis, Chairman
Transportation Advisory Board

January 26, 1996
Date

APPROVED AS TO FORM:

David Caylor

City Attorney

NORTHEAST TRANSIT TERMINAL EL PASO, TEXAS 1996 FORECAST YEAR

19 Feb 96 - Revised emission rates: Tier I, the Motorist's Choice program, and the RVP (7.0) control strategies

TCM
$425,000 City of El Paso Funds

ASSUMPTIONS:

51 cars have been removed as a result of new bus service made available through the Transit Terminal.

Distance of Transit Terminal to CBD is 12.6 miles one way.

No new buses are operating as a result of the Terminal (thus there are no additional bus emissions).

Vehicles replaced would have used freeway for a portion of the trip, resulting in an average speed of 35 MPH.

EMISSION CALCULATIONS:

1. CALCULATE DAILY VMT OF VEHICLES REMOVED

NO. OF AUTOS * (DAILY TRIP LENGTH * 2) = DAILY VMT SAVED

51	25.2 MI	1,285.20

2. CALCULATE DAILY VEHICLE EMISSIONS SAVED

	DAILY VMT SAVED	* 35 MPH COMPOSITE E.R.	= EMISSIONS SAVED (DAILY)	(ANNUAL)
VOC	1,285.20	1.45603 G/MI	1.8739 KG	487.20 KG
CO	1,285.20	10.95908 G/MI	14.0846 KG	3,662.00 KG
NOX	1,285.20	2.19715 G/MI	2.8238 KG	734.18 KG

COST/ BENEFIT ANALYSIS:

1. CALCULATE ANNUAL PROJECT COSTS

PROJECT COST / USEFUL LIFE = ANNUAL COST

$425,000	20 YRS	$21,250

2. CALCUALTE COST PER KG REMOVED

ANNUAL COST / EMISSION BENEFIT = COST PER KG REMOVED

VOC	$21,250	487.20 KG	$43.62
CO	$21,250	3,662.00 KG	$5.80
NOX	$21,250	734.18 KG	$28.94

Data Sources:

1987 El Paso Travel Demand Model Calibration & Validation
(Avg. Freeway Speed)

MOBILE 5.0 (1996 Emission Rates for Tier I, the Motorist's Choice program and reduced RVP 7.0 control strategies).

Sun Metro (No. of Autos Removed. Useful Life of Project)

FREEWAY SURVEILLANCE PROJECT: IH-10 & US 54 — 1996 FORECAST YEAR
EL PASO, TEXAS

19 Feb 98 - Revised emission rates: Tier I, the Motorist's Choice program, and the RVP (7.0) control strategies

TCM
1993 TIP Project $7,876,540 CMAQ

ASSUMPTIONS:

Project consists of incident detection and response, which has an effectiveness rate of 50%.
VMT count on freeways in 1987 was 3,791,368. This figure is being increased by 10% to account for additional traffic to 1996 (4,170,527 total).
Incident response will be operational daily between 7:00 AM and 6:00 PM.
65% of daily VMT occurs during hours of operation of surveillance.
Traffic speed during incidents is 5 MPH.
Avg. freeway speed (free flow) is 34 MPH (CBD Fringe area type).

EMISSION CALCULATIONS:

1. CALCULATE VMT DURING HOURS OF OPERATION
   DAILY FREEWAY VMT * PCT DURING OPERATING HOURS = AFFECTED VMT
   4,170,527 — 65.00% — 2,710,843
2. CALCULATE VMT SUBJECT TO INCIDENTS
   AFFECTED DAILY FREEWAY VMT * NONRECURRING PCT = INCIDENT VMT
   2,710,843 — 4.90% — 132,831.3
3. CALCULATE VMT WHICH WILL FLOW FREELY AS A RESULT OF THE PROJECT
   INCIDENT VMT * EFFECTIVENESS RATE = INCIDENT VMT IMPROVED BY PROJECT
   132,831.3 — 50.00% — 66,415.6
4. CALCULATE EMISSIONS OF INCIDENT TRAFFIC NOT FLOWING AT FREE SPEED
   INCIDENT VMT * 5 MPH E.R. = EMISSIONS OF INCIDENT TRAFFIC

VOC	66,415.6	6.0600 G/MI	402.479 KG
CO	66,415.6	56.7102 G/MI	3,766.444 KG
NOX	66,415.6	2.7244 G/MI	180.943 KG

5. CALCUALTE EMISSIONS OF FREE FLOWING TRAFFIC
   INCIDENT VMT * 34 MPH E.R. = EMISSIONS OF FREE FLOWING TRAFFIC

VOC	66,415.6	1.4867 G/MI	98.740 KG
CO	66,415.6	11.2339 G/MI	746.107 KG
NOX	66,415.6	2.1878 G/MI	145.304 KG

6. CALCULATE EMISSION BENEFIT OF PROJECT
   INCIDENT EMISSIONS - FREE FLOW EMISSIONS = DAILY EMISSION BENEFIT

VOC	402.479 KG	98.740 KG	303.739 KG
CO	3,766.444 KG	746.107 KG	3,020.338 KG
NOX	180.943 KG	145.304 KG	35.639 KG

7. CONVERT TO ANNUAL BENEFIT
   DAILY EMISSION BENEFIT * WORK DAYS = ANNUAL BENEFIT

VOC	303.739 KG	260	78,972 KG
CO	3,020.338 KG	260	785,288 KG
NOX	35.639 KG	260	9,266 KG

COST/ BENEFIT ANALYSIS:

1. CALCULATE ANNUAL PROJECT COST
   PROJECT COST / USE LIFE OF EQUIPMENT = ANNUAL COST
   $7,876,540 — 5 YRS — $1,575,308
2. CALCULATE ANNUAL COST PER KILOGRAM REMOVED
   ANNUAL COST / ANNUAL SAVINGS = COST PER KG REMOVED

VOC	$1,576,308	78,972 KG	$19.95
CO	$1,575,308	785,288 KG	$2.01
NOX	$1,575,308	9,266 KG	$170.01

Data Sources:

- Congestion Management Air Quality Analysis Methodology, TxDOT, 1993 (Methodology, Useful Life of Project)
- Jeffrey A. Lindley, Urban Freeway Congestion: Quantification of the Problem and Effectiveness of Potential Solutions, 1987 (Nonrecurring %)
- 1987 El Paso Travel Demand Model Calibration & Validation (1987 Freeway VMT, Freeway Speed)
- MOBILE 5.0 (1996 Emission Rate for Tier I, Motorist's Choice program and RVP 7.0 control strategies)
- TxDOT (Project Description)

CNG FUELING FACILITY EL PASO, TEXAS 1996 FORECAST YEAR

19 Feb 96 - Revised emission rates: Tier I, the Motorist's Choice program, and the RVP (7.0) control strategies

TCM
1993 TIP Project $1,400,000 CMAQ
1995 TIP Project $ 501,000 FTA Sec. 9
Total Cost $2,651,000 (Including Non-TIP Funds)

ASSUMPTIONS:

Project will allow the 215 alternatively fueled vehicles in the Sun Metro fleet to refuel at their own facility, saving the 28-mile round trip to the present facility.

Emission rate used is for 1996 Heavy Duty Diesel Vehicle from the revised emission rates for the Motorist's Choice and reduced RVP (7.0) control strategies.

Alternative fuel credit is calculated at a 25% reduction from HDDV emission rates. This is to account for the fact that alternative fuel buses have a lower emission rate than HDDV's. EPA has not developed an emission rate for alternative fuel vehicles.

Buses will travel at 30 MPH, the average network speed, due to the fact that they do not carry passengers to and from the fueling facility.

EMISSION CALCULATIONS:

1. CALCULATE DAILY VMT SAVINGS

# BUSES *	DAILY MILES SAVED =	DAILY VMT SAVINGS
215	28	6,020

2. CALCULATE DAILY EMISSION BENEFITS

	DAILY VMT SAVINGS *	30 MPH E.R. *	ALTERNATIVE FUEL CREDIT =	DAILY EMISSION BENEF
VOC	6,020	1.8012 G/MI	0.75	8.1324 KG
CO	6,020	8.0305 G/MI	0.75	36.2578 KG
NOX	6,020	12.7801 G/MI	0.75	57.7021 KG

3. CALCULATE ANNUAL EMISSION BENEFITS

	DAILY EMISSION BENEFIT *	WORK DAYS =	ANNUAL EMISSION BENEFIT
VOC	8.1324 KG	260	2,114.42 KG
CO	36.2578 KG	260	9,427.03 KG
NOX	57.7021 KG	260	15,002.54 KG

COST/ BENEFIT ANALYSIS:

1. CALCULATE ANNUAL PROJECT COSTS

PROJECT COST /	USEFUL LIFE =	ANNUAL COST
$2,651,000	20 YRS	$132,550

2. CALCULATE ANNUAL COST PER KILOGRAM REMOVED

	ANNUAL COST /	ANNUAL SAVINGS =	COST PER KG REMOVED
VOC	$132,550	2,114.42 KG	$62.69
CO	$132,550	9,427.03 KG	$14.06
NOX	$132,550	15,002.54 KG	$8.84

Data Sources:

1987 El Paso Travel Demand Model Calibration & Validation
(Weighted Avg. Network Speed)
MOBILE 5.0 (Revised Emission Rate for 1996 Heavy Duty Diesel Vehicle, Motorist's Choice and RVP 7.0 control strategies)
TxDOT (Project Description)
Sun Metro (Project Cost)

El Paso 1996 Summer Time Period 1 VOC Emission Rates (grams/mile)

Speed	LDGV	LDGT1	LDGT2	HDGV	LDDV	LDDT	HDDV	MC
3	8.83396	10.87212	17.25403	18.97498	1.70093	2.40350	5.69445	14.08075
4	6.56119	8.14838	12.89870	15.73942	1.61487	2.28189	5.40634	11.87424
5	5.26154	6.55954	10.30422	13.72514	1.53451	2.16835	5.13732	10.24000
6	4.42183	5.51946	8.58303	12.25611	1.45944	2.06226	4.88599	9.00649
7	3.83562	4.78766	7.36386	11.09095	1.38927	1.96310	4.65104	8.05933
8	3.44960	4.29479	6.52854	10.21811	1.32363	1.87035	4.43129	7.32061
9	3.15011	3.91051	5.88086	9.45463	1.26220	1.78355	4.22564	6.73618
10	2.90685	3.59804	5.36028	8.77206	1.20468	1.70227	4.03308	6.26766
11	2.70456	3.33805	4.93311	8.15911	1.15080	1.62613	3.85269	5.88737
12	2.53302	3.11742	4.57619	7.60674	1.10029	1.55477	3.68360	5.57504
13	2.38511	2.92697	4.27307	7.10748	1.05293	1.48784	3.52504	5.31559
14	2.25571	2.76008	4.01185	6.65509	1.00849	1.42505	3.37627	5.09759
15	2.14108	2.61185	3.78367	6.24422	0.96678	1.36611	3.23662	4.91235
16	2.03841	2.47861	3.58189	5.87029	0.92761	1.31076	3.10549	4.75313
17	1.94555	2.35756	3.40140	5.52931	0.89081	1.25876	2.98229	4.61468
18	1.86081	2.24652	3.23826	5.21782	0.85622	1.20988	2.86650	4.49285
19	1.78289	2.14377	3.08940	4.93276	0.82371	1.16393	2.75763	4.38439
20	1.70931	2.06045	2.96643	4.67599	0.79312	1.12071	2.65523	4.28670
21	1.64528	1.98767	2.85445	4.44740	0.76434	1.08005	2.55888	4.19773
22	1.58662	1.92079	2.75165	4.23811	0.73725	1.04178	2.46821	4.11586
23	1.53262	1.85903	2.65671	4.04625	0.71175	1.00574	2.38284	4.03982
24	1.48270	1.80174	2.56859	3.87016	0.68774	0.97181	2.30245	3.96861
25	1.43637	1.74838	2.48645	3.70838	0.66512	0.93985	2.22673	3.90148
26	1.39322	1.69855	2.40961	3.55958	0.64382	0.90974	2.15539	3.83788
27	1.35290	1.65188	2.33753	3.42259	0.62374	0.88138	2.08818	3.77738
28	1.31513	1.60808	2.26977	3.29635	0.60482	0.85464	2.02484	3.71972
29	1.27965	1.56692	2.20600	3.17992	0.58699	0.82945	1.96516	3.66471
30	1.24624	1.52819	2.14593	3.07244	0.57019	0.80571	1.90891	3.61223
31	1.21473	1.49172	2.08930	2.97317	0.55436	0.78334	1.85590	3.56227
32	1.18495	1.45736	2.03595	2.88141	0.53944	0.76226	1.80596	3.51480
33	1.15675	1.42498	1.98568	2.79654	0.52539	0.74240	1.75890	3.46987
34	1.13002	1.39446	1.93837	2.71801	0.51215	0.72369	1.71459	3.42751
35	1.10463	1.36570	1.89386	2.64531	0.49968	0.70608	1.67286	3.38780
36	1.08050	1.33859	1.85205	2.57799	0.48795	0.68950	1.63358	3.35078
37	1.05752	1.31304	1.81279	2.51565	0.47691	0.67390	1.59662	3.31650
38	1.03562	1.28897	1.77600	2.45791	0.46654	0.65924	1.56188	3.28498
39	1.01472	1.26629	1.74154	2.40444	0.45679	0.64546	1.52924	3.25626
40	0.99475	1.24492	1.70930	2.35495	0.44763	0.63253	1.49860	3.23030
41	0.97565	1.22477	1.67916	2.30914	0.43905	0.62040	1.46987	3.20712
42	0.95736	1.20577	1.65099	2.26679	0.43101	0.60904	1.44295	3.18660
43	0.93981	1.18783	1.62465	2.22767	0.42349	0.59841	1.41778	3.16860
44	0.92297	1.17087	1.60003	2.19158	0.41647	0.58849	1.39427	3.15305
45	0.90677	1.15479	1.57694	2.15833	0.40992	0.57924	1.37236	3.13970
46	0.89117	1.13950	1.55522	2.12777	0.40384	0.57064	1.35198	3.12831
47	0.87611	1.12491	1.53469	2.09975	0.39819	0.56266	1.33308	3.11855
48	0.86181	1.11098	1.51516	2.07414	0.39297	0.55529	1.31560	3.11002
49	0.86013	1.10916	1.51204	2.05088	0.38816	0.54849	1.29949	3.11002
50	0.85855	1.10743	1.50910	2.03001	0.38374	0.54225	1.28471	3.11002
51	0.85705	1.10580	1.50633	2.01142	0.37971	0.53655	1.27121	3.11002
52	0.85564	1.10425	1.50371	1.99502	0.37605	0.53138	1.25897	3.11002
53	0.85429	1.10279	1.50124	1.98072	0.37276	0.52673	1.24794	3.11002
54	0.85302	1.10140	1.49889	1.96846	0.36982	0.52257	1.23809	3.11002
55	0.85181	1.10008	1.49667	1.95818	0.36722	0.51891	1.22941	3.11002
56	0.88412	1.14976	1.57771	1.94983	0.36497	0.51572	1.22186	3.21876
57	0.91649	1.19951	1.65885	1.94338	0.36305	0.51300	1.21542	3.32751
58	0.94890	1.24931	1.74010	1.93879	0.36145	0.51075	1.21009	3.43626
59	0.98137	1.29916	1.82144	1.93604	0.36018	0.50896	1.20583	3.54500
60	1.01388	1.34907	1.90286	1.93514	0.35923	0.50761	1.20265	3.65375
61	1.04644	1.39902	1.98437	1.93607	0.35860	0.50672	1.20054	3.76249
62	1.07903	1.44901	2.06595	1.93885	0.35829	0.50628	1.19948	3.87124
63	1.11166	1.49905	2.14761	1.94350	0.35829	0.50628	1.19949	3.97999
64	1.14433	1.54912	2.22932	1.95004	0.35860	0.50672	1.20054	4.08873
65	1.17703	1.59923	2.31111	1.95851	0.35923	0.50762	1.20265	4.19748

El Paso 1996 Summer Time Period 1 CO Emission Rates (grams/mile)

Speed	LDGV	LDGT1	LDGT2	HDGV	LDDV	LDDT	HDDV	MC
3	80.25406	104.58652	152.83388	220.77815	5.47653	6.30152	39.29140	151.73120
4	61.65607	80.40222	117.73409	201.71559	5.04724	5.80757	36.21147	121.00894
5	50.37383	65.50882	95.35751	184.70470	4.66008	5.36208	33.43378	98.83479
6	42.80699	55.44574	79.93062	169.50104	4.31045	4.95978	30.92531	82.47202
7	37.38841	48.22224	68.73784	155.89125	3.99431	4.59603	28.65723	70.15134
8	33.32358	42.80768	60.30998	143.69005	3.70811	4.26670	26.60384	60.70078
9	30.16589	38.61310	53.77774	132.73552	3.44868	3.96820	24.74258	53.32710
10	27.64500	35.27727	48.59351	122.88617	3.21325	3.69730	23.05347	47.48166
11	25.58757	32.56647	44.39626	114.01831	2.99934	3.45117	21.51880	42.77821
12	23.87746	30.32292	40.93875	106.02335	2.80477	3.22729	20.12288	38.93959
13	22.43398	28.43643	38.04681	98.80612	2.62760	3.02343	18.85179	35.76381
14	21.19931	26.82773	35.59464	92.28282	2.46611	2.83761	17.69316	33.10138
15	20.13098	25.43854	33.48936	86.38026	2.31876	2.66806	16.63597	30.84027
16	19.19717	24.22502	31.66118	81.03313	2.18418	2.51321	15.67048	28.89548
17	18.37354	23.15375	30.05698	76.18459	2.06116	2.37166	14.78789	27.20186
18	17.64116	22.19891	28.63560	71.78380	1.94862	2.24216	13.98044	25.70915
19	16.98518	21.34026	27.36504	67.78615	1.84557	2.12360	13.24113	24.37828
20	16.30759	20.61172	26.31552	64.15222	1.75116	2.01496	12.56379	23.17882
21	15.60573	19.80771	25.23198	60.84676	1.66461	1.91537	11.94280	22.08694
22	14.96627	19.06993	24.24194	57.83868	1.58521	1.82401	11.37319	21.08421
23	14.38095	18.38934	23.33221	55.10042	1.51236	1.74018	10.85047	20.15614
24	13.84298	17.75871	22.49208	52.60744	1.44548	1.66323	10.37064	19.29160
25	13.34669	17.17224	21.71300	50.33789	1.38407	1.59257	9.93008	18.48221
26	12.88733	16.62524	20.98792	48.27232	1.32769	1.52770	9.52556	17.72137
27	12.46095	16.11397	20.31136	46.39343	1.27592	1.46813	9.15416	17.00435
28	12.06415	15.63536	19.67863	44.68587	1.22841	1.41346	8.81327	16.32745
29	11.69405	15.18684	19.08607	43.13599	1.18482	1.36330	8.50053	15.68822
30	11.34818	14.76630	18.53055	41.73155	1.14486	1.31732	8.21382	15.08482
31	11.02439	14.37197	18.00948	40.46173	1.10826	1.27521	7.95124	14.51574
32	10.72082	14.00224	17.52063	39.31697	1.07479	1.23669	7.71108	13.97998
33	10.43580	13.65573	17.06215	38.28876	1.04422	1.20152	7.49180	13.47710
34	10.16790	13.33121	16.63231	37.36957	1.01637	1.16948	7.29199	13.00607
35	9.91581	13.02751	16.22966	36.55275	0.99107	1.14037	7.11046	12.56670
36	9.67837	12.74353	15.85278	35.83253	0.96816	1.11401	6.94608	12.15797
37	9.45453	12.47827	15.50043	35.20387	0.94750	1.09023	6.79786	11.77971
38	9.24333	12.23076	15.17133	34.66241	0.92897	1.06891	6.66491	11.43075
39	9.04390	12.00002	14.86428	34.20445	0.91246	1.04992	6.54648	11.11031
40	8.85543	11.78513	14.57815	33.82690	0.89788	1.03314	6.44186	10.81738
41	8.67719	11.58515	14.31176	33.52716	0.88514	1.01848	6.35046	10.55078
42	8.50845	11.39910	14.06381	33.30325	0.87417	1.00586	6.27176	10.30883
43	8.34858	11.22602	13.83313	33.15376	0.86491	0.99520	6.20532	10.09004
44	8.19693	11.06486	13.61837	33.07759	0.85731	0.98646	6.15077	9.89221
45	8.05288	10.91447	13.41819	33.07430	0.85132	0.97957	6.10781	9.71330
46	7.91581	10.77354	13.23100	33.14381	0.84691	0.97449	6.07619	9.55071
47	7.78509	10.64065	13.05510	33.28664	0.84406	0.97122	6.05574	9.40125
48	7.66010	10.51419	12.88873	33.50371	0.84276	0.96971	6.04636	9.26177
49	7.66010	10.51419	12.88873	33.79648	0.84298	0.96997	6.04800	9.26177
50	7.66010	10.51419	12.88873	34.16689	0.84475	0.97200	6.06065	9.26177
51	7.66010	10.51419	12.88873	34.61739	0.84806	0.97581	6.08439	9.26177
52	7.66010	10.51419	12.88873	35.15115	0.85293	0.98142	6.11936	9.26177
53	7.66010	10.51419	12.88873	35.77167	0.85939	0.98886	6.16574	9.26177
54	7.66010	10.51419	12.88873	36.48338	0.86748	0.99816	6.22378	9.26177
55	7.66010	10.51419	12.88873	37.29112	0.87725	1.00940	6.29382	9.26177
56	8.76728	12.33221	15.36797	38.20081	0.88873	1.02261	6.37624	11.49227
57	9.87447	14.15022	17.84715	39.21877	0.90201	1.03789	6.47150	13.72278
58	10.98166	15.96822	20.32639	40.35258	0.91716	1.05532	6.58015	15.95328
59	12.08884	17.78621	22.80563	41.61066	0.93425	1.07499	6.70281	18.18378
60	13.19603	19.60423	25.28488	43.00241	0.95340	1.09702	6.84020	20.41428
61	14.30322	21.42221	27.76410	44.53859	0.97472	1.12155	6.99313	22.64476
62	15.41040	23.24020	30.24333	46.23126	0.99832	1.14871	7.16249	24.87524
63	16.51756	25.05824	32.72260	48.09395	1.02436	1.17867	7.34931	27.10576
64	17.62473	26.87625	35.20178	50.14194	1.05300	1.21162	7.55476	29.33624
65	18.73192	28.69424	37.68105	52.39203	1.08440	1.24776	7.78009	31.56676

El Paso 1996 Summer Time Period 1 NOx Emission Rates (grams/mile)

Speed	LDGV	LDGT1	LDGT2	HDGV	LDDV	LDDT	HDDV	MC
3	2.28906	2.53085	2.88385	4.56874	2.82175	3.24855	25.92682	0.90848
4	2.10597	2.33072	2.69233	4.61601	2.70291	3.11173	24.83485	0.86895
5	1.99484	2.20973	2.57807	4.66329	2.59275	2.98491	23.82268	0.83614
6	1.91991	2.12881	2.50287	4.71057	2.49061	2.86732	22.88422	0.80955
7	1.86581	2.07117	2.45032	4.75785	2.39590	2.75828	22.01398	0.78867
8	1.82486	2.02833	2.41214	4.80513	2.30806	2.65716	21.20694	0.77302
9	1.79279	1.99559	2.38372	4.85240	2.22661	2.56338	20.45851	0.76215
10	1.76700	1.97007	2.36225	4.89968	2.15107	2.47643	19.76454	0.75560
11	1.74584	1.94993	2.34591	4.94696	2.08106	2.39582	19.12123	0.75296
12	1.72822	1.93390	2.33349	4.99424	2.01619	2.32114	18.52516	0.75382
13	1.71334	1.92111	2.32411	5.04151	1.95611	2.25197	17.97314	0.75778
14	1.70067	1.91089	2.31714	5.08879	1.90052	2.18798	17.46240	0.76449
15	1.68977	1.90275	2.31208	5.13607	1.84913	2.12882	16.99025	0.77357
16	1.68035	1.89632	2.30857	5.18335	1.80170	2.07420	16.55437	0.78471
17	1.67214	1.89128	2.30632	5.23062	1.75797	2.02386	16.15257	0.79758
18	1.66498	1.88741	2.30510	5.27790	1.71774	1.97755	15.78295	0.81189
19	1.65869	1.88449	2.30471	5.32518	1.68081	1.93504	15.44368	0.82735
20	1.65969	1.88592	2.30885	5.37246	1.64702	1.89613	15.13319	0.84370
21	1.66904	1.90108	2.32655	5.41973	1.61620	1.86065	14.85002	0.86071
22	1.67765	1.91526	2.34315	5.46701	1.58821	1.82843	14.59283	0.87813
23	1.68563	1.92856	2.35875	5.51429	1.56292	1.79932	14.36050	0.89577
24	1.69306	1.94106	2.37344	5.56157	1.54022	1.77318	14.15193	0.91344
25	1.70000	1.95282	2.38731	5.60884	1.52001	1.74991	13.96620	0.93095
26	1.70652	1.96389	2.40041	5.65612	1.50220	1.72940	13.80252	0.94817
27	1.71266	1.97433	2.41281	5.70340	1.48670	1.71156	13.66012	0.96495
28	1.71846	1.98416	2.42455	5.75068	1.47345	1.69631	13.53840	0.98118
29	1.72396	1.99343	2.43569	5.79796	1.46240	1.68359	13.43685	0.99675
30	1.72919	2.00218	2.44627	5.84523	1.45349	1.67333	13.35500	1.01159
31	1.73418	2.01043	2.45634	5.89251	1.44669	1.66550	13.29250	1.02563
32	1.73896	2.01821	2.46594	5.93979	1.44197	1.66006	13.24912	1.03883
33	1.74354	2.02555	2.47512	5.98707	1.43930	1.65700	13.22463	1.05116
34	1.74797	2.03249	2.48392	6.03434	1.43868	1.65628	13.21894	1.06261
35	1.75224	2.03905	2.49238	6.08162	1.44011	1.65793	13.23204	1.07320
36	1.75639	2.04526	2.50056	6.12890	1.44358	1.66193	13.26396	1.08294
37	1.76044	2.05117	2.50850	6.17617	1.44912	1.66830	13.31487	1.09189
38	1.76440	2.05680	2.51627	6.22346	1.45675	1.67708	13.38495	1.10010
39	1.76829	2.06220	2.52390	6.27073	1.46650	1.68831	13.47451	1.10767
40	1.77214	2.06740	2.53147	6.31801	1.47841	1.70202	13.58398	1.11468
41	1.77597	2.07244	2.53903	6.36529	1.49254	1.71829	13.71376	1.12126
42	1.77978	2.07737	2.54664	6.41257	1.50894	1.73717	13.86448	1.12755
43	1.78361	2.08224	2.55438	6.45984	1.52769	1.75875	14.03678	1.13369
44	1.78747	2.08710	2.56231	6.50712	1.54887	1.78314	14.23139	1.13986
45	1.79139	2.09199	2.57050	6.55440	1.57258	1.81043	14.44922	1.14625
46	1.79539	2.09698	2.57905	6.60168	1.59892	1.84076	14.69122	1.15307
47	1.79949	2.10213	2.58802	6.64895	1.62801	1.87425	14.95851	1.16054
48	1.80371	2.10749	2.59750	6.69623	1.65998	1.91106	15.25230	1.16892
49	1.87248	2.19239	2.70733	6.74351	1.69499	1.95136	15.57397	1.20698
50	1.94126	2.27729	2.81716	6.79079	1.73320	1.99535	15.92501	1.24504
51	2.01003	2.36219	2.92699	6.83806	1.77478	2.04322	16.30707	1.28311
52	2.07880	2.44709	3.03682	6.88535	1.81995	2.09522	16.72209	1.32117
53	2.14757	2.53199	3.14665	6.93262	1.86891	2.15159	17.17198	1.35923
54	2.21635	2.61689	3.25648	6.97989	1.92193	2.21262	17.65904	1.39730
55	2.28512	2.70179	3.36631	7.02717	1.97925	2.27862	18.18578	1.43536
56	2.35389	2.78669	3.47614	7.07445	2.04118	2.34991	18.75478	1.47342
57	2.42266	2.87159	3.58597	7.12173	2.10804	2.42688	19.36909	1.51148
58	2.49144	2.95649	3.69580	7.16900	2.18018	2.50994	20.03194	1.54955
59	2.56021	3.04139	3.80563	7.21629	2.25800	2.59952	20.74693	1.58761
60	2.62898	3.12629	3.91547	7.26356	2.34191	2.69613	21.51799	1.62567
61	2.69775	3.21119	4.02529	7.31084	2.43240	2.80031	22.34937	1.66373
62	2.76653	3.29609	4.13512	7.35812	2.52997	2.91263	23.24586	1.70180
63	2.83530	3.38099	4.24495	7.40540	2.63520	3.03378	24.21272	1.73986
64	2.90407	3.46588	4.35478	7.45267	2.74870	3.16445	25.25560	1.77792
65	2.97284	3.55078	4.46461	7.49995	2.87117	3.30544	26.38083	1.81598

El Paso 1996 Summer Time Period 2 VOC Emission Rates (grams/mile)

Speed	LDGV	LDGT1	LDGT2	HDGV	LDDV	LDDT	HDDV	MC
3	12.06977	13.63200	21.74982	28.34518	1.70093	2.40350	5.69445	16.10608
4	8.68892	9.90307	15.61056	22.07945	1.61487	2.28189	5.40634	13.92576
5	6.82932	7.82218	12.17145	18.58501	1.53451	2.16835	5.13732	12.31090
6	5.66002	6.50042	9.98121	16.25957	1.45944	2.06226	4.88599	11.09202
7	4.85990	5.59047	8.47299	14.54057	1.38927	1.96310	4.65104	10.15610
8	4.37924	5.01417	7.51426	13.40806	1.32363	1.87035	4.43129	9.42614
9	4.00659	4.57034	6.77930	12.44286	1.26220	1.78355	4.22564	8.84865
10	3.69978	4.21146	6.18981	11.58771	1.20468	1.70227	4.03308	8.38568
11	3.44096	3.91467	5.70710	10.82457	1.15080	1.62613	3.85269	8.00991
12	3.21813	3.66445	5.30465	10.13971	1.10029	1.55477	3.68360	7.70128
13	3.02296	3.44992	4.96373	9.52230	1.05293	1.48784	3.52504	7.44490
14	2.84947	3.26324	4.67076	8.96360	1.00849	1.42505	3.37627	7.22949
15	2.69327	3.09861	4.41570	8.45629	0.96678	1.36611	3.23662	7.04644
16	2.55107	2.95170	4.19099	7.99432	0.92761	1.31076	3.10549	6.88912
17	2.42035	2.81918	3.99083	7.57251	0.89081	1.25876	2.98229	6.75231
18	2.29914	2.69846	3.81075	7.18638	0.85622	1.20988	2.86650	6.63192
19	2.18591	2.58753	3.64723	6.83211	0.82371	1.16393	2.75763	6.52475
20	2.08692	2.49537	3.51073	6.51728	0.79312	1.12071	2.65523	6.42822
21	2.01171	2.40998	3.38186	6.24443	0.76434	1.08005	2.55888	6.34031
22	1.94259	2.33137	3.26361	5.99457	0.73725	1.04178	2.46821	6.25941
23	1.87876	2.25865	3.15447	5.76543	0.71175	1.00574	2.38284	6.18427
24	1.81956	2.19106	3.05324	5.55500	0.68774	0.97181	2.30245	6.11390
25	1.76443	2.12801	2.95894	5.36149	0.66512	0.93985	2.22673	6.04757
26	1.71291	2.06901	2.87079	5.18332	0.64382	0.90974	2.15539	5.98472
27	1.66461	2.01365	2.78816	5.01909	0.62374	0.88138	2.08818	5.92495
28	1.61919	1.96162	2.71053	4.86753	0.60482	0.85464	2.02484	5.86796
29	1.57638	1.91264	2.63748	4.72752	0.58699	0.82945	1.96516	5.81360
30	1.53594	1.86648	2.56866	4.59805	0.57019	0.80571	1.90891	5.76175
31	1.49764	1.82295	2.50379	4.47821	0.55436	0.78334	1.85590	5.71238
32	1.46131	1.78188	2.44262	4.36720	0.53944	0.76226	1.80596	5.66547
33	1.42679	1.74311	2.38494	4.26430	0.52539	0.74240	1.75890	5.62108
34	1.39394	1.70653	2.33057	4.16882	0.51215	0.72369	1.71459	5.57922
35	1.36262	1.67200	2.27935	4.08019	0.49968	0.70608	1.67286	5.53998
36	1.33272	1.63942	2.23111	3.99787	0.48795	0.68950	1.63358	5.50341
37	1.30415	1.60867	2.18571	3.92139	0.47691	0.67390	1.59662	5.46953
38	1.27680	1.57967	2.14302	3.85030	0.46654	0.65924	1.56188	5.43838
39	1.25060	1.55229	2.10290	3.78421	0.45679	0.64546	1.52924	5.41000
40	1.22546	1.52646	2.06522	3.72278	0.44763	0.63253	1.49860	5.38436
41	1.20131	1.50208	2.02983	3.66568	0.43905	0.62040	1.46987	5.36144
42	1.17808	1.47905	1.99661	3.61262	0.43101	0.60904	1.44295	5.34116
43	1.15571	1.45727	1.96538	3.56333	0.42349	0.59841	1.41778	5.32338
44	1.13414	1.43664	1.93603	3.51759	0.41647	0.58849	1.39427	5.30801
45	1.11330	1.41705	1.90837	3.47518	0.40992	0.57924	1.37236	5.29483
46	1.09313	1.39839	1.88221	3.43591	0.40384	0.57064	1.35198	5.28357
47	1.07359	1.38053	1.85739	3.39962	0.39819	0.56266	1.33308	5.27393
48	1.05506	1.36346	1.83360	3.36599	0.39297	0.55529	1.31560	5.26550
49	1.05147	1.35949	1.82648	3.33406	0.38816	0.54849	1.29949	5.26550
50	1.04808	1.35575	1.81977	3.30513	0.38374	0.54225	1.28471	5.26550
51	1.04488	1.35222	1.81344	3.27908	0.37971	0.53655	1.27121	5.26550
52	1.04186	1.34888	1.80748	3.25576	0.37605	0.53138	1.25897	5.26550
53	1.03900	1.34573	1.80184	3.23506	0.37276	0.52673	1.24794	5.26550
54	1.03630	1.34274	1.79651	3.21689	0.36982	0.52257	1.23809	5.26550
55	1.03373	1.33991	1.79146	3.20117	0.36722	0.51891	1.22941	5.26550
56	1.06702	1.39331	1.87425	3.18781	0.36497	0.51572	1.22186	5.37295
57	1.10043	1.44684	1.95729	3.17677	0.36305	0.51300	1.21542	5.48041
58	1.13396	1.50050	2.04056	3.16800	0.36145	0.51075	1.21009	5.58786
59	1.16759	1.55427	2.12404	3.16147	0.36018	0.50896	1.20583	5.69532
60	1.20132	1.60816	2.20772	3.15714	0.35923	0.50761	1.20265	5.80278
61	1.23515	1.66215	2.29159	3.15502	0.35860	0.50672	1.20054	5.91023
62	1.26906	1.71624	2.37563	3.15510	0.35829	0.50628	1.19948	6.01769
63	1.30306	1.77042	2.45984	3.15739	0.35829	0.50628	1.19949	6.12514
64	1.33713	1.82468	2.54420	3.16191	0.35860	0.50672	1.20054	6.23260
65	1.37128	1.87903	2.62871	3.16871	0.35923	0.50762	1.20265	6.34006

El Paso 1996 Summer Time Period 2 CO Emission Rates (grams/mile)

Speed	LDGV	LDGT1	LDGT2	HDGV	LDDV	LDDT	HDDV	MC
3	90.22404	121.80792	181.69545	298.34668	5.47653	6.30152	39.29140	194.96100
4	69.21217	93.67691	139.79395	272.58716	5.04724	5.80757	36.21147	155.48564
5	56.42767	76.22096	113.01599	249.59996	4.66008	5.36208	33.43378	126.99384
6	47.84012	64.38353	94.53484	229.05470	4.31045	4.95978	30.92531	105.96919
7	41.68715	55.87686	81.12215	210.66315	3.99431	4.59603	28.65723	90.13820
8	37.07167	49.50343	71.02435	194.17514	3.70811	4.26670	26.60384	77.99509
9	33.48785	44.57314	63.20108	179.37173	3.44868	3.96820	24.74258	68.52055
10	30.62868	40.66002	56.99573	166.06186	3.21325	3.69730	23.05347	61.00967
11	28.29697	37.48717	51.97479	154.07834	2.99934	3.45117	21.51880	54.96617
12	26.36038	34.86700	47.84129	143.27434	2.80477	3.22729	20.12288	50.03391
13	24.72690	32.66820	44.38594	133.52138	2.62760	3.02343	18.85179	45.95329
14	23.33054	30.79610	41.45737	124.70615	2.46611	2.83761	17.69316	42.53229
15	22.12279	29.18103	38.94403	116.72975	2.31876	2.66806	16.63597	39.62697
16	21.06731	27.77061	36.76199	109.50389	2.18418	2.51321	15.67048	37.12807
17	20.13632	26.52484	34.84746	102.95181	2.06116	2.37166	14.78789	34.95193
18	19.30826	25.41292	33.15103	97.00484	1.94862	2.24216	13.98044	33.03395
19	18.56615	24.41081	31.63423	91.60263	1.84557	2.12360	13.24113	31.32391
20	17.81216	23.57417	30.40742	86.69196	1.75116	2.01496	12.56379	29.78271
21	17.04295	22.66379	29.15475	82.22511	1.66461	1.91537	11.94280	28.37976
22	16.34142	21.82503	28.00937	78.16019	1.58521	1.82401	11.37319	27.09132
23	15.69856	21.04784	26.95601	74.45984	1.51236	1.74018	10.85047	25.89883
24	15.10700	20.32445	25.98233	71.09096	1.44548	1.66323	10.37064	24.78796
25	14.56060	19.64876	25.07857	68.02397	1.38407	1.59257	9.93008	23.74796
26	14.05429	19.01596	24.23676	65.23268	1.32769	1.52770	9.52556	22.77036
27	13.58382	18.42230	23.45058	62.69368	1.27592	1.46813	9.15416	21.84903
28	13.14559	17.86484	22.71486	60.38609	1.22841	1.41346	8.81327	20.97928
29	12.73655	17.34113	22.02545	58.29173	1.18482	1.36330	8.50053	20.15794
30	12.35408	16.84927	21.37889	56.39381	1.14486	1.31732	8.21382	19.38261
31	11.99594	16.38770	20.77229	54.67786	1.10826	1.27521	7.95124	18.65141
32	11.66015	15.95490	20.20325	53.13092	1.07479	1.23669	7.71108	17.96301
33	11.34497	15.54968	19.66969	51.74142	1.04422	1.20152	7.49180	17.31686
34	11.04889	15.17087	19.16974	50.49930	1.01637	1.16948	7.29199	16.71162
35	10.77051	14.81739	18.70178	49.39548	0.99107	1.14037	7.11046	16.14708
36	10.50860	14.48813	18.26419	48.42216	0.96816	1.11401	6.94608	15.62190
37	10.26205	14.18208	17.85562	47.57266	0.94750	1.09023	6.79786	15.13588
38	10.02982	13.89821	17.47467	46.84102	0.92897	1.06891	6.66491	14.68750
39	9.81095	13.63544	17.11984	46.22212	0.91246	1.04992	6.54648	14.27576
40	9.60457	13.39271	16.78993	45.71187	0.89788	1.03314	6.44186	13.89937
41	9.40986	13.16893	16.48352	45.30685	0.88514	1.01848	6.35046	13.55681
42	9.22600	12.96286	16.19904	45.00427	0.87417	1.00586	6.27176	13.24592
43	9.05227	12.77328	15.93515	44.80226	0.86491	0.99520	6.20532	12.96480
44	8.88790	12.59878	15.69016	44.69933	0.85731	0.98646	6.15077	12.71060
45	8.73217	12.43779	15.46246	44.69490	0.85132	0.97957	6.10781	12.48072
46	8.58430	12.28843	15.25010	44.78879	0.84691	0.97449	6.07619	12.27180
47	8.44352	12.14866	15.05096	44.98181	0.84406	0.97122	6.05574	12.07976
48	8.30901	12.01607	14.86286	45.27515	0.84276	0.96971	6.04636	11.90055
49	8.30901	12.01607	14.86286	45.67081	0.84298	0.96997	6.04800	11.90055
50	8.30901	12.01607	14.86286	46.17131	0.84475	0.97200	6.06065	11.90055
51	8.30901	12.01607	14.86286	46.78014	0.84806	0.97581	6.08439	11.90055
52	8.30901	12.01607	14.86286	47.50139	0.85293	0.98142	6.11936	11.90055
53	8.30901	12.01607	14.86286	48.33992	0.85939	0.98886	6.16574	11.90055
54	8.30901	12.01607	14.86286	49.30173	0.86748	0.99816	6.22378	11.90055
55	8.30901	12.01607	14.86286	50.39334	0.87725	1.00940	6.29382	11.90055
56	9.57024	14.19943	17.82407	51.62253	0.88873	1.02261	6.37624	14.76654
57	10.83147	16.38277	20.78528	52.99820	0.90201	1.03789	6.47150	17.63254
58	12.09271	18.56610	23.74657	54.53041	0.91716	1.05532	6.58015	20.49852
59	13.35394	20.74945	26.70786	56.23045	0.93425	1.07499	6.70281	23.36450
60	14.61518	22.93282	29.66910	58.11118	0.95340	1.09702	6.84020	26.23047
61	15.87639	25.11613	32.63036	60.18713	0.97472	1.12155	6.99313	29.09648
62	17.13763	27.29947	35.59160	62.47452	0.99832	1.14871	7.16249	31.96246
63	18.39883	29.48286	38.55290	64.99168	1.02436	1.17867	7.34931	34.82846
64	19.66005	31.66621	41.51411	67.75917	1.05300	1.21162	7.55476	37.69446
65	20.92128	33.84956	44.47539	70.79982	1.08440	1.24776	7.78009	40.56042

El Paso 1996 Summer Time Period 2 NOx Emission Rates (grams/mile)

Speed	LDGV	LDGT1	LDGT2	HDGV	LDDV	LDDT	HDDV	MC
3	2.27325	2.49529	2.73451	4.33415	2.82175	3.24855	25.92682	0.80643
4	2.08811	2.29500	2.54392	4.37900	2.70291	3.11173	24.83485	0.77133
5	1.97609	2.17411	2.43015	4.42385	2.59275	2.98491	23.82268	0.74221
6	1.90079	2.09334	2.35511	4.46870	2.49061	2.86732	22.88422	0.71861
7	1.84662	2.03582	2.30247	4.51355	2.39590	2.75828	22.01398	0.70007
8	1.80574	1.99306	2.26400	4.55840	2.30806	2.65716	21.20694	0.68618
9	1.77380	1.96033	2.23512	4.60325	2.22661	2.56338	20.45851	0.67653
10	1.74820	1.93476	2.21303	4.64810	2.15107	2.47643	19.76454	0.67072
11	1.72723	1.91449	2.19596	4.69295	2.08106	2.39582	19.12123	0.66838
12	1.70980	1.89828	2.18269	4.73780	2.01619	2.32114	18.52516	0.66914
13	1.69511	1.88524	2.17236	4.78265	1.95611	2.25197	17.97314	0.67266
14	1.68260	1.87472	2.16437	4.82750	1.90052	2.18798	17.46240	0.67861
15	1.67185	1.86624	2.15823	4.87235	1.84913	2.12882	16.99025	0.68667
16	1.66255	1.85943	2.15360	4.91720	1.80170	2.07420	16.55437	0.69656
17	1.65445	1.85398	2.15018	4.96205	1.75797	2.02386	16.15257	0.70799
18	1.64737	1.84967	2.14777	5.00690	1.71774	1.97755	15.78295	0.72069
19	1.64114	1.84628	2.14616	5.05175	1.68081	1.93504	15.44368	0.73441
20	1.64230	1.84703	2.14874	5.09660	1.64702	1.89613	15.13319	0.74893
21	1.65192	1.86157	2.16484	5.14145	1.61620	1.86065	14.85002	0.76402
22	1.66076	1.87513	2.17987	5.18630	1.58821	1.82843	14.59283	0.77949
23	1.66893	1.88781	2.19395	5.23115	1.56292	1.79932	14.36050	0.79514
24	1.67651	1.89970	2.20717	5.27600	1.54022	1.77318	14.15193	0.81082
25	1.68357	1.91087	2.21960	5.32085	1.52001	1.74991	13.96620	0.82637
26	1.69017	1.92136	2.23131	5.36570	1.50220	1.72940	13.80252	0.84166
27	1.69637	1.93123	2.24237	5.41055	1.48670	1.71156	13.66012	0.85655
28	1.70220	1.94051	2.25281	5.45540	1.47345	1.69631	13.53840	0.87096
29	1.70770	1.94925	2.26270	5.50025	1.46240	1.68359	13.43685	0.88478
30	1.71290	1.95748	2.27206	5.54510	1.45349	1.67333	13.35500	0.89795
31	1.71784	1.96523	2.28095	5.58995	1.44669	1.66550	13.29250	0.91042
32	1.72255	1.97253	2.28941	5.63480	1.44197	1.66006	13.24912	0.92213
33	1.72704	1.97941	2.29747	5.67965	1.43930	1.65700	13.22463	0.93308
34	1.73134	1.98589	2.30518	5.72450	1.43868	1.65628	13.21894	0.94325
35	1.73547	1.99202	2.31258	5.76935	1.44011	1.65793	13.23204	0.95264
36	1.73945	1.99781	2.31971	5.81420	1.44358	1.66193	13.26396	0.96129
37	1.74329	2.00330	2.32660	5.85905	1.44912	1.66830	13.31487	0.96923
38	1.74703	2.00852	2.33332	5.90390	1.45675	1.67708	13.38495	0.97652
39	1.75067	2.01351	2.33989	5.94875	1.46650	1.68831	13.47451	0.98324
40	1.75424	2.01830	2.34638	5.99360	1.47841	1.70202	13.58398	0.98946
41	1.75775	2.02293	2.35282	6.03845	1.49254	1.71829	13.71376	0.99531
42	1.76121	2.02744	2.35928	6.08330	1.50894	1.73717	13.86448	1.00088
43	1.76466	2.03187	2.36581	6.12815	1.52769	1.75875	14.03678	1.00634
44	1.76811	2.03626	2.37246	6.17300	1.54887	1.78314	14.23139	1.01181
45	1.77157	2.04067	2.37930	6.21785	1.57258	1.81043	14.44922	1.01749
46	1.77507	2.04514	2.38638	6.26270	1.59892	1.84076	14.69122	1.02354
47	1.77862	2.04972	2.39378	6.30755	1.62801	1.87425	14.95851	1.03018
48	1.78225	2.05446	2.40156	6.35240	1.65998	1.91106	15.25230	1.03761
49	1.84972	2.13709	2.50243	6.39725	1.69499	1.95136	15.57397	1.07140
50	1.91719	2.21972	2.60329	6.44210	1.73320	1.99535	15.92501	1.10518
51	1.98467	2.30235	2.70416	6.48695	1.77478	2.04322	16.30707	1.13897
52	2.05214	2.38498	2.80502	6.53180	1.81995	2.09522	16.72209	1.17276
53	2.11961	2.46760	2.90589	6.57665	1.86891	2.15159	17.17198	1.20654
54	2.18709	2.55023	3.00676	6.62150	1.92193	2.21262	17.65904	1.24033
55	2.25456	2.63286	3.10763	6.66635	1.97925	2.27862	18.18578	1.27412
56	2.32203	2.71549	3.20849	6.71120	2.04118	2.34991	18.75478	1.30790
57	2.38951	2.79812	3.30936	6.75605	2.10804	2.42688	19.36909	1.34169
58	2.45698	2.88075	3.41022	6.80090	2.18018	2.50994	20.03194	1.37548
59	2.52446	2.96338	3.51109	6.84575	2.25800	2.59952	20.74693	1.40926
60	2.59193	3.04601	3.61195	6.89060	2.34191	2.69613	21.51799	1.44305
61	2.65940	3.12864	3.71282	6.93545	2.43240	2.80031	22.34937	1.47684
62	2.72688	3.21127	3.81369	6.98030	2.52997	2.91263	23.24586	1.51062
63	2.79435	3.29389	3.91456	7.02516	2.63520	3.03378	24.21272	1.54441
64	2.86182	3.37652	4.01542	7.07000	2.74870	3.16445	25.25560	1.57820
65	2.92930	3.45915	4.11629	7.11485	2.87117	3.30544	26.38083	1.61199

El Paso 1996 Summer Time Period 3 VOC Emission Rates (grams/mile)

Speed	LDGV	LDGT1	LDGT2	HDGV	LDDV	LDDT	HDDV	MC
3	12.46333	14.01375	22.38278	29.56750	1.70093	2.40350	5.69445	16.32204
4	8.94098	10.14341	15.99168	22.88744	1.61487	2.28189	5.40634	14.14295
5	7.01128	7.99346	12.43309	19.19292	1.53451	2.16835	5.13732	12.52901
6	5.80145	6.63226	10.17639	16.75316	1.45944	2.06226	4.88599	11.31081
7	4.97539	5.69740	8.62714	14.96112	1.38927	1.96310	4.65104	10.37542
8	4.48336	5.10985	7.65112	13.79525	1.32363	1.87035	4.43129	9.64588
9	4.10211	4.65806	6.90394	12.80449	1.26220	1.78355	4.22564	9.06871
10	3.78802	4.29300	6.30483	11.92773	1.20468	1.70227	4.03308	8.60601
11	3.52285	3.99130	5.81437	11.14600	1.15080	1.62613	3.85269	8.23045
12	3.29439	3.73715	5.40558	10.44488	1.10029	1.55477	3.68360	7.92200
13	3.09413	3.51943	5.05940	9.81311	1.05293	1.48784	3.52504	7.66576
14	2.91599	3.33014	4.76203	9.24156	1.00849	1.42505	3.37627	7.45047
15	2.75548	3.16336	4.50324	8.72274	0.96678	1.36611	3.23662	7.26753
16	2.60924	3.01467	4.27536	8.25034	0.92761	1.31076	3.10549	7.11029
17	2.47471	2.88065	4.07248	7.81903	0.89081	1.25876	2.98229	6.97356
18	2.34988	2.75869	3.89006	7.42421	0.85622	1.20988	2.86650	6.85324
19	2.23318	2.64672	3.72453	7.06192	0.82371	1.16393	2.75763	6.74613
20	2.13159	2.55335	3.58609	6.74022	0.79312	1.12071	2.65523	6.64965
21	2.05498	2.46612	3.45475	6.46182	0.76434	1.08005	2.55888	6.56179
22	1.98457	2.38581	3.33422	6.20688	0.73725	1.04178	2.46821	6.48094
23	1.91953	2.31149	3.22298	5.97307	0.71175	1.00574	2.38284	6.40584
24	1.85919	2.24239	3.11980	5.75834	0.68774	0.97181	2.30245	6.33551
25	1.80299	2.17790	3.02369	5.56087	0.66512	0.93985	2.22673	6.26922
26	1.75045	2.11754	2.93385	5.37904	0.64382	0.90974	2.15539	6.20641
27	1.70119	2.06089	2.84963	5.21142	0.62374	0.88138	2.08818	6.14667
28	1.65486	2.00763	2.77050	5.05671	0.60482	0.85464	2.02484	6.08972
29	1.61118	1.95747	2.69604	4.91377	0.58699	0.82945	1.96516	6.03539
30	1.56991	1.91019	2.62589	4.78157	0.57019	0.80571	1.90891	5.98357
31	1.53081	1.86559	2.55974	4.65918	0.55436	0.78334	1.85590	5.93422
32	1.49372	1.82349	2.49737	4.54579	0.53944	0.76226	1.80596	5.88734
33	1.45846	1.78374	2.43854	4.44064	0.52539	0.74240	1.75890	5.84297
34	1.42490	1.74622	2.38307	4.34308	0.51215	0.72369	1.71459	5.80114
35	1.39290	1.71079	2.33079	4.25248	0.49968	0.70608	1.67286	5.76192
36	1.36235	1.67734	2.28154	4.16831	0.48795	0.68950	1.63358	5.72536
37	1.33314	1.64577	2.23517	4.09008	0.47691	0.67390	1.59662	5.69150
38	1.30518	1.61596	2.19154	4.01735	0.46654	0.65924	1.56188	5.66038
39	1.27837	1.58783	2.15052	3.94972	0.45679	0.64546	1.52924	5.63201
40	1.25265	1.56127	2.11196	3.88682	0.44763	0.63253	1.49860	5.60638
41	1.22794	1.53619	2.07574	3.82833	0.43905	0.62040	1.46987	5.58348
42	1.20416	1.51248	2.04169	3.77396	0.43101	0.60904	1.44295	5.56322
43	1.18126	1.49005	2.00968	3.72344	0.42349	0.59841	1.41778	5.54544
44	1.15916	1.46880	1.97956	3.67652	0.41647	0.58849	1.39427	5.53008
45	1.13782	1.44860	1.95115	3.63299	0.40992	0.57924	1.37236	5.51690
46	1.11716	1.42935	1.92427	3.59267	0.40384	0.57064	1.35198	5.50566
47	1.09713	1.41092	1.89873	3.55536	0.39819	0.56266	1.33308	5.49602
48	1.07813	1.39330	1.87426	3.52076	0.39297	0.55529	1.31560	5.48759
49	1.07427	1.38904	1.86657	3.48765	0.38816	0.54849	1.29949	5.48759
50	1.07063	1.38501	1.85933	3.45764	0.38374	0.54225	1.28471	5.48759
51	1.06720	1.38122	1.85251	3.43057	0.37971	0.53655	1.27121	5.48759
52	1.06395	1.37763	1.84608	3.40631	0.37605	0.53138	1.25897	5.48759
53	1.06089	1.37424	1.84000	3.38475	0.37276	0.52673	1.24794	5.48759
54	1.05798	1.37103	1.83425	3.36577	0.36982	0.52257	1.23809	5.48759
55	1.05523	1.36799	1.82880	3.34930	0.36722	0.51891	1.22941	5.48759
56	1.08863	1.42185	1.91183	3.33526	0.36497	0.51572	1.22186	5.59498
57	1.12216	1.47586	1.99512	3.32358	0.36305	0.51300	1.21542	5.70238
58	1.15581	1.53000	2.07866	3.31423	0.36145	0.51075	1.21009	5.80978
59	1.18958	1.58427	2.16243	3.30716	0.36018	0.50896	1.20583	5.91717
60	1.22345	1.63866	2.24642	3.30235	0.35923	0.50761	1.20265	6.02457
61	1.25743	1.69316	2.33061	3.29979	0.35860	0.50672	1.20054	6.13196
62	1.29150	1.74776	2.41498	3.29948	0.35829	0.50628	1.19948	6.23935
63	1.32565	1.80246	2.49954	3.30142	0.35829	0.50628	1.19949	6.34675
64	1.35989	1.85726	2.58426	3.30564	0.35860	0.50672	1.20054	6.45415
65	1.39421	1.91214	2.66913	3.31217	0.35923	0.50762	1.20265	6.56154

El Paso 1996 Summer Time Period 3 CO Emission Rates (grams/mile)

Speed	LDGV	LDGT1	LDGT2	HDGV	LDDV	LDDT	HDDV	MC
3	91.69049	124.39040	185.82924	307.90991	5.47653	6.30152	39.29140	200.46814
4	70.32265	95.66312	142.94728	281.32422	5.04724	5.80757	36.21147	159.87773
5	57.31749	77.82272	115.53938	257.60010	4.66008	5.36208	33.43378	130.58105
6	48.58032	65.71991	96.62259	236.39667	4.31045	4.95978	30.92531	108.96252
7	42.31981	57.02161	82.89362	217.41563	3.99431	4.59603	28.65723	92.68436
8	37.62372	50.50500	72.55792	200.39912	3.70811	4.26670	26.60384	80.19824
9	33.97748	45.46478	64.55054	185.12128	3.44868	3.96820	24.74258	70.45609
10	31.06874	41.46530	58.19939	171.38474	3.21325	3.69730	23.05347	62.73303
11	28.69681	38.22321	53.06067	159.01711	2.99934	3.45117	21.51880	56.51884
12	26.72699	35.54652	48.83040	147.86676	2.80477	3.22729	20.12288	51.44722
13	25.06560	33.30081	45.29420	137.80121	2.62760	3.02343	18.85179	47.25133
14	23.64546	31.38907	42.29723	128.70341	2.46611	2.83761	17.69316	43.73373
15	22.41724	29.73999	39.72520	120.47134	2.31876	2.66806	16.63597	40.74634
16	21.34384	28.29988	37.49226	113.01384	2.18418	2.51321	15.67048	38.17683
17	20.39705	27.02782	35.53308	106.25177	2.06116	2.37166	14.78789	35.93921
18	19.55490	25.89223	33.79703	100.11418	1.94862	2.24216	13.98044	33.96707
19	18.80011	24.86852	32.24481	94.53882	1.84557	2.12360	13.24113	32.20871
20	18.03494	24.01598	30.99313	89.47070	1.75116	2.01496	12.56379	30.62398
21	17.25584	23.09009	29.71684	84.86069	1.66461	1.91537	11.94280	29.18140
22	16.54520	22.23662	28.54977	80.66550	1.58521	1.82401	11.37319	27.85660
23	15.89389	21.44537	27.47643	76.84654	1.51236	1.74018	10.85047	26.63040
24	15.29448	20.70850	26.48418	73.36966	1.44548	1.66323	10.37064	25.48816
25	14.74074	20.01987	25.56310	70.20438	1.38407	1.59257	9.93008	24.41876
26	14.22756	19.37462	24.70506	67.32359	1.32769	1.52770	9.52556	23.41356
27	13.75064	18.76901	23.90373	64.70326	1.27592	1.46813	9.15416	22.46622
28	13.30635	18.20010	23.15375	62.32170	1.22841	1.41346	8.81327	21.57191
29	12.89162	17.66553	22.45094	60.16017	1.18482	1.36330	8.50053	20.72734
30	12.50381	17.16335	21.79179	58.20146	1.14486	1.31732	8.21382	19.93011
31	12.14065	16.69202	21.17337	56.43047	1.10826	1.27521	7.95124	19.17825
32	11.80016	16.25009	20.59326	54.83394	1.07479	1.23669	7.71108	18.47041
33	11.48058	15.83637	20.04933	53.39993	1.04422	1.20152	7.49180	17.80602
34	11.18038	15.44970	19.53966	52.11798	1.01637	1.16948	7.29199	17.18369
35	10.89816	15.08901	19.06265	50.97876	0.99107	1.14037	7.11046	16.60318
36	10.63268	14.75318	18.61664	49.97429	0.96816	1.11401	6.94608	16.06317
37	10.38280	14.44121	18.20026	49.09752	0.94750	1.09023	6.79786	15.56342
38	10.14748	14.15206	17.81206	48.34242	0.92897	1.06891	6.66491	15.10238
39	9.92576	13.88463	17.45056	47.70366	0.91246	1.04992	6.54648	14.67901
40	9.71675	13.63784	17.11452	47.17709	0.89788	1.03314	6.44186	14.29199
41	9.51961	13.41057	16.80246	46.75911	0.88514	1.01848	6.35046	13.93975
42	9.33352	13.20156	16.51282	46.44687	0.87417	1.00586	6.27176	13.62008
43	9.15773	13.00953	16.24420	46.23833	0.86491	0.99520	6.20532	13.33102
44	8.99148	12.83305	15.99490	46.13206	0.85731	0.98646	6.15077	13.06964
45	8.83401	12.67047	15.76326	46.12755	0.85132	0.97957	6.10781	12.83327
46	8.68453	12.51983	15.54727	46.22444	0.84691	0.97449	6.07619	12.61845
47	8.54223	12.37900	15.34476	46.42366	0.84406	0.97122	6.05574	12.42098
48	8.40629	12.24546	15.15350	46.72639	0.84276	0.96971	6.04636	12.23671
49	8.40629	12.24546	15.15350	47.13469	0.84298	0.96997	6.04800	12.23671
50	8.40629	12.24546	15.15350	47.65125	0.84475	0.97200	6.06065	12.23671
51	8.40629	12.24546	15.15350	48.27959	0.84806	0.97581	6.08439	12.23671
52	8.40629	12.24546	15.15350	49.02397	0.85293	0.98142	6.11936	12.23671
53	8.40629	12.24546	15.15350	49.88939	0.85939	0.98886	6.16574	12.23671
54	8.40629	12.24546	15.15350	50.88203	0.86748	0.99816	6.22378	12.23671
55	8.40629	12.24546	15.15350	52.00861	0.87725	1.00940	6.29382	12.23671
56	9.69050	14.48416	18.18506	53.27725	0.88873	1.02261	6.37624	15.18365
57	10.97471	16.72282	21.21663	54.69699	0.90201	1.03789	6.47150	18.13062
58	12.25892	18.96150	24.24826	56.27826	0.91716	1.05532	6.58015	21.07753
59	13.54313	21.20020	27.27988	58.03282	0.93425	1.07499	6.70281	24.02448
60	14.82734	23.43890	30.31149	59.97388	0.95340	1.09702	6.84020	26.97145
61	16.11151	25.67758	33.34311	62.11633	0.97472	1.12155	6.99313	29.91838
62	17.39574	27.91624	36.37471	64.47705	0.99832	1.14871	7.16249	32.86530
63	18.67992	30.15497	39.40636	67.07486	1.02436	1.17867	7.34931	35.81226
64	19.96411	32.39366	42.43791	69.93109	1.05300	1.21162	7.55476	38.75920
65	21.24832	34.63237	45.46956	73.06918	1.08440	1.24776	7.78009	41.70616

El Paso 1996 Summer Time Period 3 NOx Emission Rates (grams/mile)

Speed	LDGV	LDGT1	LDGT2	HDGV	LDDV	LDDT	HDDV	MC
3	2.27258	2.49291	2.72293	4.31553	2.82175	3.24855	25.92682	0.79750
4	2.08722	2.29256	2.53236	4.36019	2.70291	3.11173	24.83485	0.76280
5	1.97510	2.17165	2.41859	4.40484	2.59275	2.98491	23.82268	0.73400
6	1.89976	2.09087	2.34354	4.44950	2.49061	2.86732	22.88422	0.71065
7	1.84556	2.03334	2.29088	4.49416	2.39590	2.75828	22.01398	0.69232
8	1.80467	1.99058	2.25237	4.53882	2.30806	2.65716	21.20694	0.67859
9	1.77274	1.95784	2.22343	4.58348	2.22661	2.56338	20.45851	0.66904
10	1.74714	1.93225	2.20129	4.62813	2.15107	2.47643	19.76454	0.66330
11	1.72619	1.91197	2.18415	4.67279	2.08106	2.39582	19.12123	0.66098
12	1.70876	1.89573	2.17080	4.71745	2.01619	2.32114	18.52516	0.66173
13	1.69408	1.88267	2.16039	4.76210	1.95611	2.25197	17.97314	0.66521
14	1.68158	1.87212	2.15231	4.80676	1.90052	2.18798	17.46240	0.67110
15	1.67084	1.86361	2.14608	4.85142	1.84913	2.12882	16.99025	0.67907
16	1.66155	1.85676	2.14135	4.89608	1.80170	2.07420	16.55437	0.68885
17	1.65345	1.85127	2.13783	4.94074	1.75797	2.02386	16.15257	0.70015
18	1.64637	1.84691	2.13531	4.98539	1.71774	1.97755	15.78295	0.71271
19	1.64014	1.84349	2.13360	5.03005	1.68081	1.93504	15.44368	0.72628
20	1.64132	1.84418	2.13605	5.07471	1.64702	1.89613	15.13319	0.74064
21	1.65096	1.85866	2.15202	5.11936	1.61620	1.86065	14.85002	0.75556
22	1.65981	1.87217	2.16692	5.16402	1.58821	1.82843	14.59283	0.77086
23	1.66800	1.88480	2.18088	5.20868	1.56292	1.79932	14.36050	0.78634
24	1.67559	1.89664	2.19398	5.25333	1.54022	1.77318	14.15193	0.80185
25	1.68266	1.90775	2.20630	5.29799	1.52001	1.74991	13.96620	0.81723
26	1.68928	1.91820	2.21790	5.34265	1.50220	1.72940	13.80252	0.83234
27	1.69548	1.92802	2.22884	5.38731	1.48670	1.71156	13.66012	0.84707
28	1.70131	1.93726	2.23918	5.43196	1.47345	1.69631	13.53840	0.86131
29	1.70681	1.94595	2.24896	5.47662	1.46240	1.68359	13.43685	0.87498
30	1.71201	1.95414	2.25823	5.52128	1.45349	1.67333	13.35500	0.88801
31	1.71695	1.96185	2.26703	5.56594	1.44669	1.66550	13.29250	0.90034
32	1.72165	1.96911	2.27539	5.61059	1.44197	1.66006	13.24912	0.91193
33	1.72613	1.97595	2.28336	5.65526	1.43930	1.65700	13.22463	0.92275
34	1.73042	1.98240	2.29099	5.69991	1.43868	1.65628	13.21894	0.93280
35	1.73454	1.98848	2.29830	5.74457	1.44011	1.65793	13.23204	0.94210
36	1.73850	1.99424	2.30534	5.78922	1.44358	1.66193	13.26396	0.95065
37	1.74234	1.99970	2.31215	5.83388	1.44912	1.66830	13.31487	0.95850
38	1.74606	2.00489	2.31878	5.87854	1.45675	1.67708	13.38495	0.96571
39	1.74968	2.00984	2.32527	5.92319	1.46650	1.68831	13.47451	0.97236
40	1.75322	2.01460	2.33166	5.96786	1.47841	1.70202	13.58398	0.97851
41	1.75671	2.01919	2.33802	6.01251	1.49254	1.71829	13.71376	0.98429
42	1.76015	2.02367	2.34439	6.05717	1.50894	1.73717	13.86448	0.98980
43	1.76357	2.02806	2.35081	6.10183	1.52769	1.75875	14.03678	0.99520
44	1.76698	2.03242	2.35736	6.14648	1.54887	1.78314	14.23139	1.00061
45	1.77040	2.03678	2.36409	6.19114	1.57258	1.81043	14.44922	1.00622
46	1.77386	2.04121	2.37106	6.23580	1.59892	1.84076	14.69122	1.01221
47	1.77737	2.04574	2.37833	6.28046	1.62801	1.87425	14.95851	1.01877
48	1.78096	2.05044	2.38597	6.32512	1.65998	1.91106	15.25230	1.02612
49	1.84834	2.13289	2.48612	6.36977	1.69499	1.95136	15.57397	1.05954
50	1.91573	2.21535	2.58628	6.41443	1.73320	1.99535	15.92501	1.09295
51	1.98311	2.29781	2.68643	6.45909	1.77478	2.04322	16.30707	1.12636
52	2.05050	2.38027	2.78658	6.50375	1.81995	2.09522	16.72209	1.15977
53	2.11788	2.46273	2.88673	6.54840	1.86891	2.15159	17.17198	1.19319
54	2.18527	2.54518	2.98688	6.59306	1.92193	2.21262	17.65904	1.22660
55	2.25266	2.62764	3.08704	6.63772	1.97925	2.27862	18.18578	1.26001
56	2.32004	2.71010	3.18719	6.68237	2.04118	2.34991	18.75478	1.29343
57	2.38743	2.79256	3.28734	6.72703	2.10804	2.42688	19.36909	1.32684
58	2.45482	2.87502	3.38749	6.77169	2.18018	2.50994	20.03194	1.36025
59	2.52220	2.95747	3.48764	6.81635	2.25800	2.59952	20.74693	1.39367
60	2.58959	3.03993	3.58779	6.86100	2.34191	2.69613	21.51799	1.42708
61	2.65697	3.12239	3.68794	6.90566	2.43240	2.80031	22.34937	1.46049
62	2.72436	3.20485	3.78810	6.95032	2.52997	2.91263	23.24586	1.49390
63	2.79175	3.28731	3.88825	6.99498	2.63520	3.03378	24.21272	1.52732
64	2.85913	3.36976	3.98840	7.03963	2.74870	3.16445	25.25560	1.56073
65	2.92652	3.45222	4.08855	7.08429	2.87117	3.30544	26.38083	1.59414

El Paso 1996 Summer Time Period 4 VOC Emission Rates (grams/mile)

Speed	LDGV	LDGT1	LDGT2	HDGV	LDDV	LDDT	HDDV	MC
3	8.67584	10.67306	16.99229	18.26395	1.70093	2.40350	5.69445	13.79853
4	6.45758	8.01445	12.73782	15.20585	1.61487	2.28189	5.40634	11.57688
5	5.18465	6.45836	10.18999	13.27880	1.53451	2.16835	5.13732	9.93142
6	4.36025	5.43747	8.49414	11.86059	1.45944	2.06226	4.88599	8.68944
7	3.78375	4.71805	7.29027	10.72848	1.38927	1.96310	4.65104	7.73578
8	3.40064	4.22981	6.45943	9.87112	1.32363	1.87035	4.43129	6.99200
9	3.10334	3.84922	5.81509	9.11969	1.26220	1.78355	4.22564	6.40356
10	2.86215	3.54016	5.29761	8.44747	1.20468	1.70227	4.03308	5.93182
11	2.66185	3.28337	4.87338	7.84354	1.15080	1.62613	3.85269	5.54892
12	2.49222	3.06580	4.51928	7.29914	1.10029	1.55477	3.68360	5.23445
13	2.34617	2.87828	4.21890	6.80702	1.05293	1.48784	3.52504	4.97321
14	2.21859	2.71424	3.96032	6.36104	1.00849	1.42505	3.37627	4.75372
15	2.10575	2.56879	3.73473	5.95601	0.96678	1.36611	3.23662	4.56721
16	2.00484	2.43828	3.53548	5.58741	0.92761	1.31076	3.10549	4.40690
17	1.91371	2.31991	3.35747	5.25134	0.89081	1.25876	2.98229	4.26750
18	1.83069	2.21152	3.19678	4.94438	0.85622	1.20988	2.86650	4.14483
19	1.75448	2.11140	3.05031	4.66353	0.82371	1.16393	2.75763	4.03563
20	1.68199	2.02974	2.92882	4.41031	0.79312	1.12071	2.65523	3.93726
21	1.61822	1.95725	2.81712	4.18448	0.76434	1.08005	2.55888	3.84769
22	1.55983	1.89066	2.71457	3.97771	0.73725	1.04178	2.46821	3.76525
23	1.50610	1.82918	2.61989	3.78819	0.71175	1.00574	2.38284	3.68869
24	1.45646	1.77217	2.53200	3.61425	0.68774	0.97181	2.30245	3.61699
25	1.41040	1.71910	2.45007	3.45447	0.66512	0.93985	2.22673	3.54940
26	1.36753	1.66954	2.37344	3.30752	0.64382	0.90974	2.15539	3.48536
27	1.32750	1.62315	2.30156	3.17226	0.62374	0.88138	2.08818	3.42445
28	1.29001	1.57963	2.23400	3.04763	0.60482	0.85464	2.02484	3.36639
29	1.25482	1.53873	2.17041	2.93270	0.58699	0.82945	1.96516	3.31100
30	1.22170	1.50027	2.11051	2.82664	0.57019	0.80571	1.90891	3.25817
31	1.19048	1.46407	2.05406	2.72869	0.55436	0.78334	1.85590	3.20786
32	1.16098	1.42997	2.00088	2.63817	0.53944	0.76226	1.80596	3.16006
33	1.13307	1.39784	1.95079	2.55447	0.52539	0.74240	1.75890	3.11483
34	1.10663	1.36756	1.90364	2.47704	0.51215	0.72369	1.71459	3.07218
35	1.08153	1.33904	1.85931	2.40538	0.49968	0.70608	1.67286	3.03220
36	1.05769	1.31217	1.81767	2.33906	0.48795	0.68950	1.63358	2.99493
37	1.03500	1.28684	1.77859	2.27765	0.47691	0.67390	1.59662	2.96040
38	1.01339	1.26299	1.74197	2.22080	0.46654	0.65924	1.56188	2.92867
39	0.99277	1.24052	1.70769	2.16817	0.45679	0.64546	1.52924	2.89975
40	0.97309	1.21936	1.67563	2.11948	0.44763	0.63253	1.49860	2.87362
41	0.95428	1.19941	1.64568	2.07444	0.43905	0.62040	1.46987	2.85027
42	0.93628	1.18060	1.61770	2.03281	0.43101	0.60904	1.44295	2.82961
43	0.91902	1.16285	1.59156	1.99438	0.42349	0.59841	1.41778	2.81149
44	0.90246	1.14608	1.56712	1.95895	0.41647	0.58849	1.39427	2.79583
45	0.88655	1.13018	1.54423	1.92634	0.40992	0.57924	1.37236	2.78239
46	0.87123	1.11508	1.52270	1.89639	0.40384	0.57064	1.35198	2.77093
47	0.85646	1.10065	1.50237	1.86895	0.39819	0.56266	1.33308	2.76110
48	0.84242	1.08690	1.48304	1.84389	0.39297	0.55529	1.31560	2.75251
49	0.84088	1.08522	1.48018	1.82116	0.38816	0.54849	1.29949	2.75251
50	0.83943	1.08363	1.47748	1.80078	0.38374	0.54225	1.28471	2.75251
51	0.83805	1.08213	1.47493	1.78264	0.37971	0.53655	1.27121	2.75251
52	0.83675	1.08071	1.47252	1.76666	0.37605	0.53138	1.25897	2.75251
53	0.83552	1.07937	1.47024	1.75275	0.37276	0.52673	1.24794	2.75251
54	0.83434	1.07809	1.46809	1.74085	0.36982	0.52257	1.23809	2.75251
55	0.83323	1.07688	1.46604	1.73090	0.36722	0.51891	1.22941	2.75251
56	0.86578	1.12671	1.54758	1.72286	0.36497	0.51572	1.22186	2.86200
57	0.89838	1.17661	1.62920	1.71668	0.36305	0.51300	1.21542	2.97149
58	0.93102	1.22655	1.71092	1.71235	0.36145	0.51075	1.21009	3.08099
59	0.96371	1.27654	1.79273	1.70984	0.36018	0.50896	1.20583	3.19048
60	0.99644	1.32658	1.87461	1.70914	0.35923	0.50761	1.20265	3.29997
61	1.02921	1.37667	1.95657	1.71026	0.35860	0.50672	1.20054	3.40946
62	1.06202	1.42679	2.03860	1.71320	0.35829	0.50628	1.19948	3.51895
63	1.09486	1.47695	2.12069	1.71799	0.35829	0.50628	1.19949	3.62845
64	1.12774	1.52715	2.20285	1.72465	0.35860	0.50672	1.20054	3.73794
65	1.16065	1.57738	2.28506	1.73323	0.35923	0.50762	1.20265	3.84743

El Paso 1996 Summer Time Period 4 CO Emission Rates (grams/mile)

Speed	LDGV	LDGT1	LDGT2	HDGV	LDDV	LDDT	HDDV	MC
3	80.65579	104.56339	152.15903	213.57257	5.47653	6.30152	39.29140	148.98367
4	61.97491	80.38554	117.22864	195.13213	5.04724	5.80757	36.21147	118.81773
5	50.64709	65.50940	94.97159	178.67644	4.66008	5.36208	33.43378	97.04509
6	43.05136	55.46240	79.63086	163.96895	4.31045	4.95978	30.92531	80.97862
7	37.61256	48.25154	68.50154	150.80339	3.99431	4.59603	28.65723	68.88106
8	33.53258	42.84630	60.12141	139.00038	3.70811	4.26670	26.60384	59.60162
9	30.36296	38.65829	53.62564	128.40340	3.44868	3.96820	24.74258	52.36145
10	27.83232	35.32700	48.46991	118.87550	3.21325	3.69730	23.05347	46.62186
11	25.76674	32.61923	44.29517	110.29709	2.99934	3.45117	21.51880	42.00357
12	24.04967	30.37764	40.85585	102.56300	2.80477	3.22729	20.12288	38.23447
13	22.60020	28.49239	37.97879	95.58136	2.62760	3.02343	18.85179	35.11623
14	21.36028	26.88448	35.53902	89.27097	2.46611	2.83761	17.69316	32.50198
15	20.28737	25.49576	33.44414	83.56104	2.31876	2.66806	16.63597	30.28180
16	19.34953	24.28261	31.62500	78.38841	2.18418	2.51321	15.67048	28.37225
17	18.52231	23.21173	30.02866	73.69812	2.06116	2.37166	14.78789	26.70929
18	17.78677	22.25731	28.61421	69.44096	1.94862	2.24216	13.98044	25.24362
19	17.12801	21.39923	27.34988	65.57379	1.84557	2.12360	13.24113	23.93684
20	16.44588	20.66895	26.30255	62.05847	1.75116	2.01496	12.56379	22.75911
21	15.73782	19.86110	25.21902	58.86089	1.66461	1.91537	11.94280	21.68701
22	15.09279	19.12012	24.22917	55.95099	1.58521	1.82401	11.37319	20.70242
23	14.50244	18.43689	23.31969	53.30212	1.51236	1.74018	10.85047	19.79115
24	13.95991	17.80408	22.47993	50.89046	1.44548	1.66323	10.37064	18.94226
25	13.45948	17.21585	21.70131	48.69499	1.38407	1.59257	9.93008	18.14752
26	12.99636	16.66747	20.97676	46.69681	1.32769	1.52770	9.52556	17.40047
27	12.56652	16.15509	20.30081	44.87929	1.27592	1.46813	9.15416	16.69643
28	12.16655	15.67561	19.66872	43.22743	1.22841	1.41346	8.81327	16.03180
29	11.79353	15.22639	19.07681	41.72815	1.18482	1.36330	8.50053	15.40414
30	11.44494	14.80527	18.52193	40.36954	1.14486	1.31732	8.21382	14.81166
31	11.11863	14.41042	18.00146	39.14116	1.10826	1.27521	7.95124	14.25289
32	10.81268	14.04022	17.51318	38.03377	1.07479	1.23669	7.71108	13.72684
33	10.52543	13.69324	17.05524	37.03912	1.04422	1.20152	7.49180	13.23306
34	10.25541	13.36820	16.62587	36.14995	1.01637	1.16948	7.29199	12.77056
35	10.00131	13.06392	16.22359	35.35979	0.99107	1.14037	7.11046	12.33914
36	9.76194	12.77929	15.84700	34.66302	0.96816	1.11401	6.94608	11.93781
37	9.53624	12.51329	15.49483	34.05492	0.94750	1.09023	6.79786	11.56641
38	9.32325	12.26493	15.16583	33.53114	0.92897	1.06891	6.66491	11.22377
39	9.12208	12.03322	14.85878	33.08809	0.91246	1.04992	6.54648	10.90913
40	8.93193	11.81724	14.57254	32.72282	0.89788	1.03314	6.44186	10.62151
41	8.75205	11.61605	14.30594	32.43292	0.88514	1.01848	6.35046	10.35973
42	8.58171	11.42870	14.05768	32.21632	0.87417	1.00586	6.27176	10.12216
43	8.42027	11.25420	13.82663	32.07170	0.86491	0.99520	6.20532	9.90733
44	8.26709	11.09153	13.61140	31.99800	0.85731	0.98646	6.15077	9.71308
45	8.12154	10.93956	13.41069	31.99483	0.85132	0.97957	6.10781	9.53741
46	7.98301	10.79700	13.22293	32.06203	0.84691	0.97449	6.07619	9.37776
47	7.85087	10.66248	13.04642	32.20026	0.84406	0.97122	6.05574	9.23101
48	7.72451	10.53443	12.87944	32.41025	0.84276	0.96971	6.04636	9.09406
49	7.72451	10.53443	12.87944	32.69345	0.84298	0.96997	6.04800	9.09406
50	7.72451	10.53443	12.87944	33.05174	0.84475	0.97200	6.06065	9.09406
51	7.72451	10.53443	12.87944	33.48756	0.84806	0.97581	6.08439	9.09406
52	7.72451	10.53443	12.87944	34.00386	0.85293	0.98142	6.11936	9.09406
53	7.72451	10.53443	12.87944	34.60416	0.85939	0.98886	6.16574	9.09406
54	7.72451	10.53443	12.87944	35.29266	0.86748	0.99816	6.22378	9.09406
55	7.72451	10.53443	12.87944	36.07408	0.87725	1.00940	6.29382	9.09406
56	8.83485	12.34459	15.34493	36.95399	0.88873	1.02261	6.37624	11.28417
57	9.94519	14.15476	17.81039	37.93877	0.90201	1.03789	6.47150	13.47429
58	11.05552	15.96492	20.27585	39.03557	0.91716	1.05532	6.58015	15.66440
59	12.16586	17.77505	22.74136	40.25256	0.93425	1.07499	6.70281	17.85451
60	13.27619	19.58519	25.20682	41.59891	0.95340	1.09702	6.84020	20.04460
61	14.38653	21.39534	27.67232	43.08499	0.97472	1.12155	6.99313	22.23473
62	15.49685	23.20552	30.13782	44.72241	0.99832	1.14871	7.16249	24.42482
63	16.60718	25.01570	32.60329	46.52432	1.02436	1.17867	7.34931	26.61493
64	17.71750	26.82585	35.06880	48.50540	1.05300	1.21162	7.55476	28.80501
65	18.82782	28.63602	37.53424	50.68207	1.08440	1.24776	7.78009	30.99513

El Paso 1996 Summer Time Period 4 NOx Emission Rates (grams/mile)

Speed	LDGV	LDGT1	LDGT2	HDGV	LDDV	LDDT	HDDV	MC
3	2.33566	2.57133	2.93892	4.47339	2.82175	3.24855	25.92682	0.92604
4	2.14913	2.36822	2.74452	4.51968	2.70291	3.11173	24.83485	0.88574
5	2.03588	2.24542	2.62854	4.56598	2.59275	2.98491	23.82268	0.85230
6	1.95949	2.16328	2.55221	4.61226	2.49061	2.86732	22.88422	0.82520
7	1.90432	2.10475	2.49887	4.65856	2.39590	2.75828	22.01398	0.80391
8	1.86255	2.06125	2.46013	4.70485	2.30806	2.65716	21.20694	0.78796
9	1.82981	2.02800	2.43131	4.75114	2.22661	2.56338	20.45851	0.77688
10	1.80349	2.00208	2.40955	4.79743	2.15107	2.47643	19.76454	0.77021
11	1.78188	1.98162	2.39302	4.84372	2.08106	2.39582	19.12123	0.76751
12	1.76388	1.96534	2.38047	4.89001	2.01619	2.32114	18.52516	0.76839
13	1.74868	1.95234	2.37100	4.93630	1.95611	2.25197	17.97314	0.77243
14	1.73572	1.94196	2.36399	4.98259	1.90052	2.18798	17.46240	0.77926
15	1.72458	1.93370	2.35892	5.02889	1.84913	2.12882	16.99025	0.78853
16	1.71494	1.92717	2.35544	5.07518	1.80170	2.07420	16.55437	0.79988
17	1.70655	1.92205	2.35324	5.12147	1.75797	2.02386	16.15257	0.81300
18	1.69922	1.91812	2.35208	5.16776	1.71774	1.97755	15.78295	0.82758
19	1.69278	1.91516	2.35176	5.21405	1.68081	1.93504	15.44368	0.84334
20	1.69383	1.91655	2.35600	5.26034	1.64702	1.89613	15.13319	0.86001
21	1.70334	1.93181	2.37393	5.30663	1.61620	1.86065	14.85002	0.87734
22	1.71211	1.94609	2.39076	5.35292	1.58821	1.82843	14.59283	0.89511
23	1.72024	1.95949	2.40658	5.39921	1.56292	1.79932	14.36050	0.91309
24	1.72781	1.97208	2.42149	5.44550	1.54022	1.77318	14.15193	0.93109
25	1.73489	1.98393	2.43556	5.49179	1.52001	1.74991	13.96620	0.94895
26	1.74153	1.99509	2.44887	5.53808	1.50220	1.72940	13.80252	0.96650
27	1.74779	2.00562	2.46146	5.58438	1.48670	1.71156	13.66012	0.98360
28	1.75370	2.01554	2.47340	5.63067	1.47345	1.69631	13.53840	1.00014
29	1.75932	2.02490	2.48473	5.67696	1.46240	1.68359	13.43685	1.01601
30	1.76466	2.03372	2.49549	5.72325	1.45349	1.67333	13.35500	1.03114
31	1.76975	2.04205	2.50574	5.76954	1.44669	1.66550	13.29250	1.04546
32	1.77464	2.04990	2.51551	5.81583	1.44197	1.66006	13.24912	1.05891
33	1.77933	2.05732	2.52485	5.86212	1.43930	1.65700	13.22463	1.07148
34	1.78385	2.06432	2.53381	5.90841	1.43868	1.65628	13.21894	1.08315
35	1.78823	2.07095	2.54244	5.95471	1.44011	1.65793	13.23204	1.09394
36	1.79248	2.07724	2.55078	6.00100	1.44358	1.66193	13.26396	1.10388
37	1.79663	2.08321	2.55888	6.04728	1.44912	1.66830	13.31487	1.11300
38	1.80069	2.08891	2.56680	6.09358	1.45675	1.67708	13.38495	1.12137
39	1.80469	2.09437	2.57460	6.13987	1.46650	1.68831	13.47451	1.12908
40	1.80865	2.09963	2.58234	6.18616	1.47841	1.70202	13.58398	1.13623
41	1.81258	2.10474	2.59007	6.23245	1.49254	1.71829	13.71376	1.14294
42	1.81651	2.10975	2.59787	6.27874	1.50894	1.73717	13.86448	1.14934
43	1.82045	2.11469	2.60579	6.32503	1.52769	1.75875	14.03678	1.15560
44	1.82443	2.11962	2.61392	6.37133	1.54887	1.78314	14.23139	1.16189
45	1.82848	2.12459	2.62233	6.41761	1.57258	1.81043	14.44922	1.16841
46	1.83260	2.12967	2.63110	6.46391	1.59892	1.84076	14.69122	1.17536
47	1.83684	2.13491	2.64032	6.51020	1.62801	1.87425	14.95851	1.18298
48	1.84120	2.14037	2.65007	6.55649	1.65998	1.91106	15.25230	1.19151
49	1.91135	2.22655	2.76213	6.60278	1.69499	1.95136	15.57397	1.23031
50	1.98150	2.31274	2.87418	6.64907	1.73320	1.99535	15.92501	1.26911
51	2.05165	2.39893	2.98624	6.69536	1.77478	2.04322	16.30707	1.30791
52	2.12180	2.48512	3.09829	6.74165	1.81995	2.09522	16.72209	1.34671
53	2.19195	2.57131	3.21035	6.78794	1.86891	2.15159	17.17198	1.38551
54	2.26210	2.65750	3.32240	6.83423	1.92193	2.21262	17.65904	1.42430
55	2.33224	2.74369	3.43446	6.88053	1.97925	2.27862	18.18578	1.46310
56	2.40240	2.82988	3.54651	6.92681	2.04118	2.34991	18.75478	1.50190
57	2.47254	2.91607	3.65857	6.97311	2.10804	2.42688	19.36909	1.54070
58	2.54270	3.00226	3.77062	7.01940	2.18018	2.50994	20.03194	1.57950
59	2.61284	3.08846	3.88268	7.06569	2.25800	2.59952	20.74693	1.61830
60	2.68299	3.17464	3.99473	7.11198	2.34191	2.69613	21.51799	1.65709
61	2.75314	3.26083	4.10679	7.15827	2.43240	2.80031	22.34937	1.69589
62	2.82329	3.34702	4.21884	7.20456	2.52997	2.91263	23.24586	1.73469
63	2.89344	3.43321	4.33090	7.25086	2.63520	3.03378	24.21272	1.77349
64	2.96359	3.51940	4.44295	7.29714	2.74870	3.16445	25.25560	1.81229
65	3.03374	3.60559	4.55501	7.34344	2.87117	3.30544	26.38083	1.85109

Dallas/Fort Worth TCMs

Transportation Control Measure Commitments
Dallas/Fort Worth Ozone Nonattainment Area

1993 Rate-of-Progress State Implementation Plan
Texas Natural Resource Conservation Commission

	CURRENT TCM CATEGORIES	PROJECT SIZE	ESTIMATED EMISSIONS REDUCTION (lb/day)	
1	Intersection Improvement Projects	336 locations	1,756	
2	Signal Improvement Projects	1,350 locations	6,180	
3	High Occupancy Vehicle (HOV) Lanes	33 miles	935	
4	Alternative Fuel Vehicles	3,332 vehicles	287	
5	Corridor Management Projects	4 corridors	394	
6	Park-and-Ride Lots	2 locations	30	
7	Pedestrian/Bicycle Facilities	16 miles	8	
8	Commuter Rail	9.6 miles	9	
9	Light Rail	7.9 miles	140	
10	Arterial Street Widenings	763 lane miles	4,137	
			13,876	lbs/day
			6.94	tons/day

tcm-d
5-21-96

North Central Texas Council Of Governments

February 24, 1994

John Hall, Chairman
Texas Natural Resource Conservation Commission
P.O. Box 13087
Austin, Texas 78711-3087

Dear Chairman Hall:

I am pleased to transmit to you the enclosed resolution adopted by the North Central Texas Council of Governments regarding the proposed Phase II controls for the State Implementation Plan. Pursuant to the State public hearing held in Irving on January 27, 1994, the original deadline for written comments was extended to February 25, 1994.

This resolution reflects the desires of our Executive Board which has been ably supported by our Air Quality Advisory Committee (a technical advisory group), and our Air Quality Policy Subcommittee (an elected officials policy group). These two committees have held intensive and repeated meetings in the last two months to review and prioritize specific options for the State Air Quality Plan. We have appreciated the opportunity to provide input from the public sector leadership of this region to the Commission on the many difficult regulatory and policy choices. We intend to continue working with your staff in the coming months to further explore and refine our options for contingency measures.

I want to add our collective appreciation of Beverly Hartsock and her staff. They have worked tirelessly and diligently to explain and research the complex details of the State Implementation Plan and the available options.

Sincerely,

Mike Eastland
Executive Director

xc: Anthony Grigsby
Beverly Hartsock
Cyril Durrenberger
Alan Henderson

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RESOLUTION ENDORSING CONTROL MEASURES IN THE STATE IMPLEMENTATION PLAN FOR OZONE

WHEREAS, the North Central Texas Council of Governments (NCTCOG) recognizes the challenges faced by the DFW 4-county ozone nonattainment area in implementing the necessary controls to reduce air emissions under Clean Air Act requirements; and

WHEREAS, the State of Texas ("Texas Natural Resource Conservation Commission") is seeking the input of the NCTCOG on the preferred controls to be implemented in Phase II of the State Implementation Plan (Rate-of-Progress Plan), to be submitted by Texas to EPA by May 15, 1994; and

WHEREAS, the Air Quality Advisory Committee and its Air Quality Policy Subcommittee have conducted intensive review and discussion of the implications of the proposed Phase II controls and indicated their preference of these options; and

WHEREAS, additional contingency measures must be identified at this time as part of the State Implementation Plan and are subject to potential activation at a later date; and

WHEREAS, the cost and policy impact of the potential contingency measure require further intensive review in the coming months to determine and differentiate their impact on businesses versus that to motorists.

NOW, THEREFORE, BE IT HEREBY RESOLVED:

SECTION 1 That the North Central Texas Council of Governments (NCTCOG) endorses the Texas Natural Resource Conservation Commission's (TNRCC) proposed Phase II options for the State Implementation Plan, as listed on the document (Attachment 1-February 17, 1994 SIP), which represent the consensus of the Air Quality Advisory Committee and the Air Quality Policy Subcommittee.

SECTION 2 That the NCTCOG intends to continue the working partnership with the TNRCC in the coming months to further review and evaluate the contingency measures and to assist in selection of the preferred control measures, if need be.

SECTION 3 That the NCTCOG supports a partnership with the TNRCC to inform the utmost number of elected officials, businesses and citizens of our clean air goals and involve them in the necessary initiatives to achieve them.

SECTION 4 That this resolution shall be in effect immediately upon its adoption.

David Doyle, President
North Central Texas Council of Governments
Mayor, City of DeSoto

I hereby certify that this resolution was adopted by the Executive Board of the North Central Texas Council of Governments on February 24, 1994.

Jewel Woods, Secretary-Treasurer
North Central Texas Council of Governments
Councilmember, City of Fort Worth

APPENDIX J

EMISSION CALCULATION METHODOLOGY FOR TRANSPORTATION CONTROL MEASURES

EMISSIONS CALCULATIONS

BASIC EMISSION EQUATION:

Emissions = EF * VMT

Where: EF = Emission factor as a function of speed (grams per vehicle mile)

VMT = Vehicle miles of travel

	BENEFIT CRITERIA	
Project	Lower Emission Factor	Decreased VMT
Roadway Widening	X	
Transit Improvements[1]		X
Intersection Improvements	X	
Signal Timing/Progression	X	
HOV Lanes	X	X
Motorist Assistance/Incident Detection and Response	X	
Park and Ride Lots		X
Travel Demand Incentives		X
Bikeways		X

[1]Includes Alternative Fuel Vehicle Purchases.

AIR QUALITY/ENERGY CONSERVATION RATING
TRANSIT IMPROVEMENTS[1]

I. Calculate Daily VMT Reduction

$$VMT = \frac{\text{Average Daily Ridership}}{\text{Average Auto Occupancy}} * \text{Average Trip Length}$$

II. Calculate Daily HC Emissions

$$E_D = EF * VMT$$

Where: E_D = Daily emissions

EF = Emission factor (grams per mile) based on average speed of surrounding roadways (see Figure 1)

III. Determine Annual HC Emissions (E_A)

$$E_A = E_D * 260 \text{ weekdays/year}$$

IV. Determine Cost Per Pounds of HC Reductions

$$\text{Cost/Pound} = \frac{(\text{Annual Project Cost})\ (C_1)}{E_A}$$

Where: C_1 = 454 grams/pound

VI. Apply score from Table 1

[1]Includes capital and operating assistance for both public transit and elderly and disabled transit. Capital assistance can include new or replacement vehicles which are assumed to be alternative fueled. Also includes travel demand incentive projects.

AIR QUALITY/ENERGY CONSERVATION RATING
HOV LANES

I. Calculate Existing Daily Hydrocarbon (HC) Emissions

$$E_B = EF_B * VOL_B * \text{Distance}$$

Where: E_B = Emissions before improvement (grams)

EF_B = Emission factor (grams per mile) based on existing mainlane average speed (see Figure 1)

VOL_B = HOV Volume[1] * $\frac{\text{Auto Occupancy of HOV}}{\text{Auto Occupancy of Mixed Flow}}$

II. Determine Average Speed after Improvement

Increased Capacity–Improved Level of Service–Higher Speed

III. Calculate Daily HC Emissions After Improvement

$$E_A = EF_A * VOL_A * \text{Distance}$$

Where: E_A = Emissions after improvement (grams)

EF_A = Emission factor (grams per mile) based on new average HOV speed (see Figure 1)

VOL_A = HOV volume

IV. Find Annual HC Emission Reductions (E_R)

$$E_R = (E_B - E_A) * 260 \text{ weekdays/year}$$

V. Determine Cost per Pound of HC Reductions

$$\text{Cost/Pound} = \frac{\text{Annual Project Cost } (C_1)}{E_R}$$

Where: C_1 = 454 grams/pound

VI. Apply Score from Table 1

[1]Air quality benefits are assumed to be from HOV traffic only.

AIR QUALITY/ENERGY CONSERVATION RATING
PARK-AND-RIDE LOTS

I. Calculate Daily VMT Reduction

$$VMT = PS * UF * D$$

Where: PS = Number of parking spaces in lot

UF = Utilization factor

D = Distance from CBD

II. Calculate Daily HC Emission Reductions (E_{RD}) in grams

$$E_{RD} = EF * VMT$$

Where: EF = Emission factor (grams per mile) based on average freeway speed (see Figure 1)

III. Find Annual Emission Reductions (E_{RA})

$$E_{RA} = E_{RD} * 260 \text{ weekdays/year}$$

IV. Determine Cost per Pound of HC Reductions

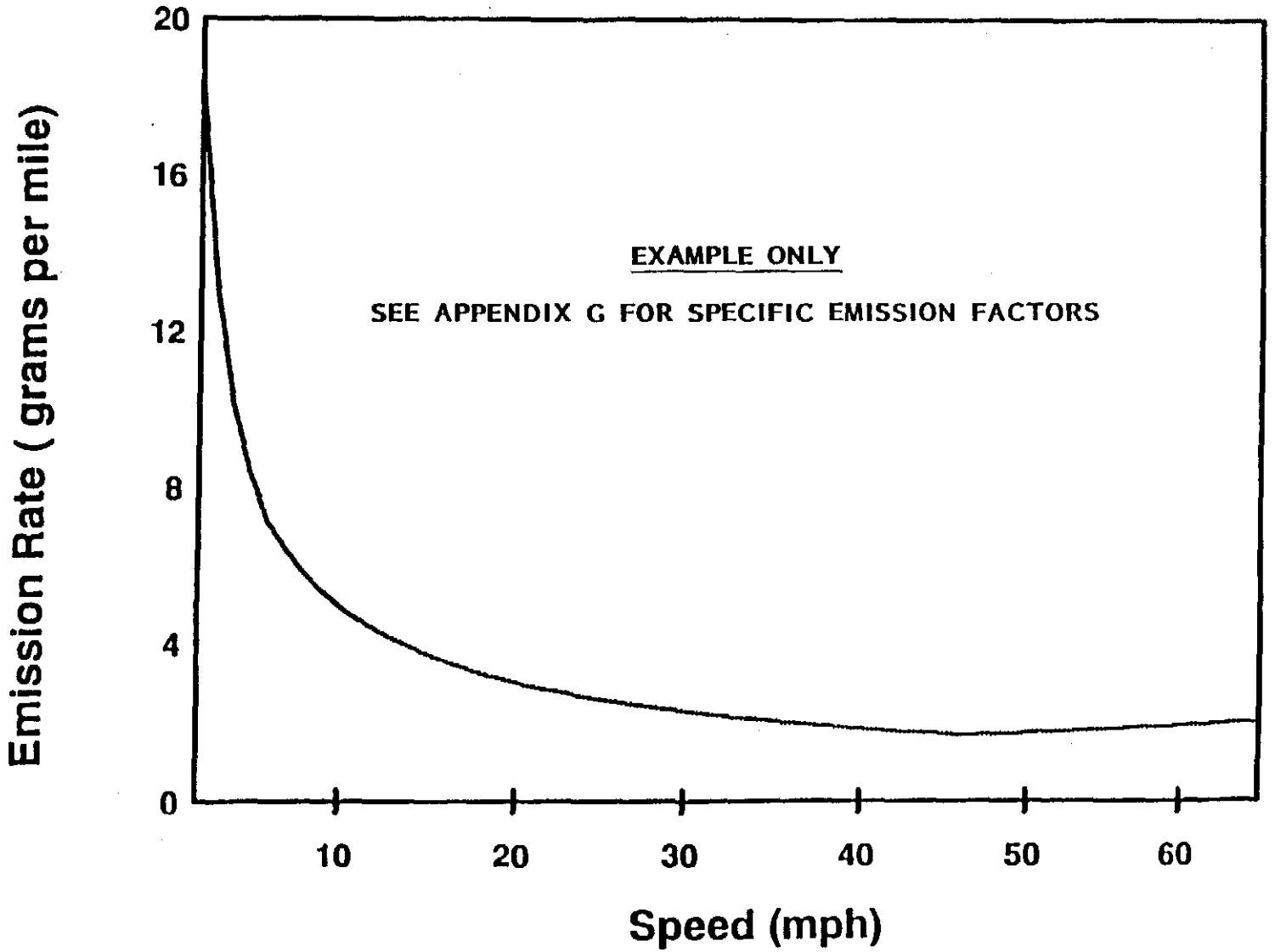
$$\text{Cost/Pound} = \frac{\text{Annual Project Cost } (C_1)}{E_{RA}}$$

Where: C_1 = 454 grams/pound

V. Apply Score from Table 1

FIGURE 1

HYDROCARBON EMISSION RATES



1996 CONTROL STRATEGY EMISSION INVENTORY ADJUSTMENT
TEXAS MOTORIST CHOICE I/M PROGRAM (100% BAR90)
MOBILE5A_H COMPOSITE EMISSION FACTORS (grams/mile)
DALLAS/TARRANT COUNTY: JULY 1996
(ADJUSTED FOR COMMUTE VMT)

SPEED	VOC	CO	NOx	SPEED	VOC	CO	NOx
1	9.11	69.05	3.31	34	1.38	9.05	2.27
2	9.11	69.05	3.31	35	1.36	8.82	2.28
3	9.11	69.05	3.31	36	1.33	8.60	2.28
4	6.68	54.43	3.10	37	1.31	8.41	2.29
5	5.36	45.25	2.96	38	1.29	8.22	2.30
6	4.52	38.92	2.85	39	1.27	8.05	2.31
7	3.95	34.28	2.77	40	1.24	7.89	2.32
8	3.59	30.72	2.69	41	1.23	7.74	2.33
9	3.31	27.89	2.63	42	1.21	7.60	2.34
10	3.08	25.61	2.57	43	1.19	7.47	2.35
11	2.89	23.72	2.53	44	1.18	7.35	2.37
12	2.73	22.13	2.48	45	1.16	7.25	2.38
13	2.60	20.77	2.45	46	1.15	7.15	2.40
14	2.47	19.60	2.41	47	1.13	7.06	2.42
15	2.36	18.57	2.38	48	1.12	6.98	2.44
16	2.27	17.67	2.35	49	1.12	6.98	2.51
17	2.19	16.87	2.32	50	1.11	7.00	2.58
18	2.11	16.16	2.31	51	1.11	7.01	2.66
19	2.04	15.51	2.28	52	1.10	7.02	2.73
20	1.97	14.88	2.27	53	1.10	7.04	2.81
21	1.91	14.21	2.27	54	1.09	7.07	2.89
22	1.85	13.60	2.26	55	1.10	7.09	2.97
23	1.79	13.05	2.26	56	1.12	8.02	3.05
24	1.74	12.54	2.26	57	1.14	8.95	3.14
25	1.70	12.07	2.25	58	1.17	9.89	3.23
26	1.65	11.63	2.26	59	1.19	10.83	3.33
27	1.61	11.22	2.26	60	1.22	11.78	3.42
28	1.57	10.84	2.26	61	1.25	12.73	3.52
29	1.53	10.49	2.26	62	1.27	13.68	3.62
30	1.50	10.16	2.26	63	1.30	14.64	3.72
31	1.47	9.85	2.26	64	1.33	15.61	3.83
32	1.44	9.57	2.26	65	1.35	16.58	3.94
33	1.41	9.30	2.27				

Source: North Central Texas Council of Governments - Transportation Department