Carbon Monoxide State Implementation Plan

APPENDIX E SUPPLEMENTAL TECHNICAL SUPPORT DOCUMENTATION

Las Vegas Valley Non-attainment Area

Clark County, Nevada

August 2000

Department of Comprehensive Planning

Clark County Board of Commissioners

Appendix E

Supplemental Technical Support Documentation

Section	Title
One	Clean Burning Gasoline (CBG).
Two	Transportation Control Measures (TCM) / Transportation Demand Management (TDM).
Three	Technician Training and Certification.
Four	Alternative Fuel Program (AFP).
Five	Supplemental Urban Airshed Modeling Analysis for the Las Vegas Valley Carbon Monoxide Attainment Demonstration.
Six	Micro-Scale Hot Spot Modeling with CAL3QHC for the Las Vegas Carbon Monoxide State Implementation Plan.
Seven	Inspection / Maintenance Program Performance.
Eight	Contingency Measures Deemed Not Feasible.

APPENDIX E

Section One
Clean Burning Gasoline (CBG)

CLEANER BURNING GASOLINE

The U.S. EPA's Complex Model (with CO added) was used to quantify the benefits of Cleaner Burning Gasoline. Based on discussions with the model's developer, Venkatesh Rao, (OAR/OTAQ) the procedure for estimating the benefits of changing fuel composition parameters using the Complex Model is to conduct two separate model runs between an existing baseline fuel and a target fuel having changed characteristics. Output from the runs are then compared to determine the percentage difference that is anticipated to occur from the changes in the fuel composition. From the modeling that was conducted, the baseline fuel had a CO value of 10,169.33 mg/mi. and the target fuel's value was 9,174.35 mg/mi. The percent difference between these two values is 9.8% and equates to the amount of CO reduction that motor vehicle emissions will be reduced by as a result of using CBG. Applying this reduction factor to the on-road, mobile source portion of the emission inventory, carbon monoxide emissions will be reduced by 31.9 tons per day in 2000.

Copies of the baseline and target fuel Complex Model runs immediately follow. These files comprise the final runs and supercede those contained in the Clark County's Health District technical support documentation related to the adoption of Section 54 of the Air Pollution Control Regulations - Cleaner Burning Gasoline (contained in Appendix D). On April 6, 2000, Venkatesh Rao informed Clark County that the Complex modeling was performed correctly and concurred with the estimated emission reductions. This section concludes with a draft memorandum dated January 14, 2000, from Al Leskys, with the Clark County Health District. The Memorandum is included to provide additional information and justification about the fuel parameters used in the Complex model. The modeling run presented therein is only for illustrative purposes.

Effects of CBG in Future Years

Additional analyses were conducted to determine what the future year effects would be as a result of the CBG program. As newer, Tier II vehicles enter into the local fleet, the benefits of CBG will increase and further reduce CO emissions. Based on Clark County's analysis, the CO reduction attributed to CBG will increase to 13.9% in 2010 and 17.3% in 2020. Additional information regarding the quantification of the future year benefit of CBG can be found in this section of this technical document titled Supplemental Urban Airshed Modeling Analysis for the Las Vegas Valley Carbon Monoxide Attainment Demonstration.

FINAL COMPLEX MODEL FOR VOC, NOx AND TOXICS (CO added): BASE FUEL

	Baseline fuel	Target Fuel	
MTBE (wt% oxygen)	0	0	Area Classb
ETBE (wt% oxygen)	0	0	Phase = 2
Ethanol (wt% oxyg	0	3.5	Season = winter
TAME (wt% oxygen)	0	0	
SULFUR (ppm)	338	100	WARNING
RVP (psi)	8.7	9	
E200 (%)	50	39.1	See Warnings
E300 (%)	83	80	below,
AROMATICS (vol%)	26.4	32	
OLEFINS (vol%)	11.9	8.5	
BENZENE (vol%)	1.64	0.80	

	mg/mi	mg/mi	Percent change
Exhaust VOC	1341.00	1405.55	4.81
Nonexhaust VOC	0.00	0.00	0.00
Total VOC	1341.00	1405.55	4.81
Exhaust benzene	77.6200	54.0965	-30.31
Nonexhaust benzen	0.0000	0.0000	0.00
Acetaldehyde	7.2500	16.3863	126.02
Formaldehyde	15.3400	16.1461	5.25
Butadiene	15.8400	13.4710	-14.96
POM	4.4991	4.7156	4.81
Total exhaust tox	120.5491	104.8155	-13.05
Total toxics	120.5491	104.8155	-13.05
NOx	1540.00	1386.08	-10.00
CO	11600.00	10169.33	-12.33

Warnings and Caveats:

If the current scenario and/or target fuel parameter values require warnings or caveats, such warnings or caveats will appear below :

RVP has been fixed at 8.7 psi

FINAL COMPLEX MODEL FOR VOC, NOx AND TOXICS (CO added): TARGET FUEL

	Baseline fuel	Target Fuel	
MTBE (wt% oxygen)	0	0	Area Classb
ETBE (wt% oxygen)	0	0	Phase = 2
Ethanol (wt% oxyg	0	3.5	Season = winter
TAME (wt% oxygen)	0	0	
SULFUR (ppm)	338	30	WARNING
RVP (psi)	8.7	9	
E200 (%)	50	49.9	See Warnings
E300 (%)	83	91.7	below,
AROMATICS (vol%)	26.4	22	
OLEFINS (vol%)	11.9	4	
BENZENE (vol%)	1.64	0.80	

	mg/mi	mg/mi	Percent change
Exhaust VOC	1341.00	1244.10	-7.23
Nonexhaust VOC	0.00	0.00	0.00
Total VOC	1341.00	1244.10	-7.23
Exhaust benzene	77.6200	45.1625	-41.82
Nonexhaust benzen	0.0000	0.0000	0.00
Acetaldehyde	7.2500	14.7480	103.42
Formaldehyde	15.3400	16.7470	9.17
Butadiene	15.8400	9.5876	-39.47
POM	4.4991	4.1739	-7.23
Total exhaust tox	120.5491	90.4191	-24.99
Total toxics	120.5491	90.4191	-24.99
NOx	1540.00	1304.66	-15.28
CO	11600.00	9174.35	-20.91

Warnings and Caveats:

If the current scenario and/or target fuel parameter values require warnings or caveats, such warnings or caveats will appear below :

RVP has been fixed at 8.7 psi

The exhaust VOC curve has been extrapolated

** The following Memorandum Provides Additional Information on Fuel Parameters **

DRAFT MEMORANDUM

To: Mike Sword, Assistant Director
Ron Smolinski, Project Management Group

From: Al Leskys, Project Management Group

Subject: Carbon Monoxide decrease from change in gasoline composition

Date: January 14, 2000 (revised 1-18-00, revised 1-25-00)

The following baseline and target gasoline compositions were used as the inputs for the EPA complex model:

PARAMETERS	Baseline Fuel	Target Fuel	NOTES
MTBE (wt% oxygen)	0.0	0.0	
ETBE (wt% oxygen)	0.0	0.0	
Ethanol (wt% oxygen)	3.5	3.5	1
TAME (wt% oxygen)	0.0	0.0	
SULFUR (ppm)	100	30	
RVP (psi)	9.00	9.00	
E200 (%)	39.1	49.9	5, 7
E300 (%)	80.0	91.7	6, 7
AROMATICS (vol%)	32.0	22.0	
OLEFINS (vol%)	8.5	4.0	3, 4
BENZENE (vol%)	0.8	0.8	2

CO decrease: 9.6 %

Note 1: When ethanol content for both the baseline and target fuels was changed to 0.0 %, the resulting carbon monoxide percent decrease remained constant (i.e. 9.6%).

Note 2: When the benzene content of the baseline fuel was changed to 2%, the resulting carbon monoxide percent decrease remained constant (i.e. 9.6%).

Note 3: The olefin content of the baseline fuel is inversely proportional to the resulting carbon monoxide percent decrease. For example, when the olefin baseline fuel content is changed from 8.5% to 6%, the carbon monoxide benefit changed from 9.6% to 9.8%.

Note 4: The carbon monoxide benefit is independent of olefin concentration when the olefin content for the baseline fuel is the same as the olefin content of the target fuel.

Note 5: E200 = 39.1% corresponds to T50 = 221 °F, E200 = 49.9% (CARB) corresponds to T50 = 200 °F (CARB).

Note 6: E300 = 80.0% corresponds to T90 = 338 °F, E300 = 91.7% (CARB) corresponds to T90 = 290 °F (CARB).

Note 7: The carbon monoxide benefit is independent of olefin concentration when the olefin content for the baseline fuel is the same as the olefin content of the target fuel.

PARAMETERS	Baseline Fuel	Reference Source for Baseline Fuel
MTBE (wt% oxygen)	0.0	Not applicable.
ETBE (wt% oxygen)	0.0	Not applicable.
Ethanol (wt% oxygen)	3.5	Current Local regulations (Clark County Health District Air Pollution Control) mandate a 3.5 wt% oxygen content in wintertime gasoline.
TAME (wt% oxygen)	0.0	Not applicable.
SULFUR (ppm)	100	Conservative estimate of January 1996 average sulfur content of gasoline published by the American Automobile Manufacturers Association (AAMA). Actual reported concentration was 114 ppm.
RVP (psi)	9.00	Current State regulations (Nevada Division of Agriculture) limit Reid Vapor Pressure to 9.0 psi.
E200 (%)	39.1	1997 Summertime gasoline content as reported by the Nevada Division of Agriculture.
E300 (%)	80.0	1997 Summertime gasoline content as reported by the Nevada Division of Agriculture.
AROMATICS (vol%)	32.0	Conservative estimate of January 1996 average sulfur content of gasoline published by the American Automobile Manufacturers Association (AAMA). Actual reported content was 35%.
OLEFINS (vol%)	8.5	Conservative estimate of 1997 Summertime gasoline content as reported by the Nevada Division of Agriculture. Actual reported range was 5-6%.
BENZENE (vol%)	0.8	CARB specification.

PARAMETERS	Target Fuel	Reference Source for Target Fuel
MTBE (wt% oxygen)	0.0	Not applicable.
ETBE (wt% oxygen)	0.0	Not applicable.
Ethanol (wt% oxygen)	3.5	Current Local regulations (Clark County Health District Air Pollution Control) mandate a 3.5 wt% oxygen content in wintertime gasoline.
TAME (wt% oxygen)	0.0	Not applicable.
SULFUR (ppm)	30	Current Local regulations (Clark County Health District Air Pollution Control) mandate a 30 ppm concentration in gasoline.
RVP (psi)	9.00	Current State regulations (Nevada Division of Agriculture) limit Reid Vapor Pressure to 9.0 psi.
E200 (%)	49.9	CARB specification.
E300 (%)	91.7	CARB specification.
AROMATICS (vol%)	22.0	Current Local regulations (Clark County Health District Air Pollution Control) mandate a 22.0 vol% in gasoline.
OLEFINS (vol%)	4.0	CARB specification.
BENZENE (vol%)	0.8	CARB specification.

Notes

- Called Arturo (486-4690, NV Agricultural Department) on Friday (1-14-00)

Arturo (through John Connoly) provided T50 and T90 boiling property averages for the first week of January 2000. These numbers were:

T50 = 97.8 °C = 208 °F, which corresponds to E200 = 46.0%
T90 = 174.5 °C = 346 °F, which corresponds to E300 = 79.4%

- Called Steve Smith ((602)728-6998, TOSCO) on Friday (1-14-00) and Monday (1-18-00)

Steve told me there were essentially two ways to come up with baseline fuel parameters:

1. Contact each of the refineries supplying gasoline to Clark County (TOSCO, Chevron, ARCO, Mobil, Equaline (ie. Texaco and Shell), Exxon and Ultramar Diamond Shamrock). Contact should be through a formal request… a uniform letter that would state the reason for the information request and also state that the response is voluntary. It was my impression that these refineries were hesitant to send any information not mandated by regulation to a government agency.

2. Contacted WESPA and ask them to get the information from the refineries. This method of inquiry would take longer.

Steve called around 3 pm 1-18-00, he told me that he had talked to Mike Engam from Chevron. Hoe told me that he was going to try to get the information I need by accessing published data collected by Gasoline survey organizations. He asked me to wait a couple days before sending the letter of request to the refineries.

- Spoke to MHN, he gave me a copy of petition #2-99 which listed AAMA source information.

CLARK COUNTY HEALTH DISTRICT
P.O. BOX 3902 • 625 SHADOW LANE • LAS VEGAS, NEVADA 89127 • 702-383-1276 • FAX 702-383-1443

MEMORANDUM

DISTRICT BOARD OF HEALTH

Donald S. Kwalick, M.D., Chief Health Officer

Mike Sword, Assistant Director, Air Quality Division
Michael H. Naylor, Director, Air Quality Division

Annual Report On Wintertime Cleaner Burning and Oxygenated Gasoline

DT: March 13, 2000

Introduction

This memo discusses the observations of the older oxy program, correlations and impacts of the new wintertime cleaner burning gasoline and this most recent Carbon Monoxide season.

Carbon Monoxide season for the Las Vegas Valley starts in November of each year and ends in March of the subsequent year. In May of 1999, the Board approved Regulations for a wintertime cleaner burning gasoline (CBG) which became effective November 1, 1999. This regulation expands upon the oxygenate requirement which has been in the Regulations for several years.

Wintertime Cleaner Burning Gasoline

The wintertime cleaner burning gasoline regulates two components of gasoline: sulfur and aromatic hydrocarbon content. The combined CO reduction benefit is approximately 10 percent.

Nearly all gasoline delivered to the Las Vegas Valley is refined in Southern California. Compliance inspections for the cleaner burning gasoline rules primarily targets the refiners and the shippers (or importers). The District has contracted with California Air Resources Board (CARB) to sample and track the wintertime cleaner burning gasoline shipments at the refinery level. CARB has had a monitoring and tracking program in place for many years to insure compliance with their own state fuel requirements. This CARB arrangement has been in place for six months and has worked well for Clark County. The results indicate the refineries are complying with the new cleaner burning gasoline regulations.

CO Measurements

The attached chart is a graphical presentation of the number of CO exceedance days for each calendar year since 1981. Examination of the chart identifies that significant reductions occurred in calendar years 1990 and 1999. The latter reduction appears to forecast zero exceedance days. This result was the hope of the new wintertime cleaner burning gasoline.

Oxygen Delivery Issues

The Board should also be aware that there have been logistical issues related to the delivery of ethanol at the terminal. The majority of these difficulties had to do with scheduling through the railroad company. The Air Pollution Control Hearing Board passed a resolution (see attached) endorsing support for improvements of the railroad delivery efforts. This resolution was sponsored by Mr. Jack Greco. In addition, Mr. Greco met with Senator Richard Bryan who is on the Senate Transportation Committee which oversees railroad activities. This communication resulted in a meeting with senior railroad managers. The railroad commitment to prioritize the ethanol deliveries to the terminal and to expand the local railroad capacity by constructing an off-load track dedicated to ethanol tanker cars. Additionally, to resolve short-term supply issues, effective telephone communications were established between the railroad and the ethanol recipients.

Legal Issues

The District was sued by Western States Petroleum Association (WSPA) in Fall 1997 related to a de facto ethanol mandate. In early 1999, EPA approved the regulation as an amendment to the County's State Implementation. Mobil Oil and Chevron filed an appeal in Federal court objecting to EPA's approval. The District argued that the dispute must now be filed at the Federal level and we asked the court to dismiss the District from the suit. The court took no action on the request and the court has been monitoring the ongoing dispute between EPA and Mobil/Chevron.

Anticipated Program and Regulatory Changes

Proposed regulations which will come before the Board of Health related to oxygenated gasoline include things such as removing the requirement for the oxygenated gasoline label at the pumps. This is an old, even outdated requirement stemming back to the times when a facility could use either ethanol or MTBE to oxygenate the fuel. The labels advise the purchaser of which oxygenate they were purchasing. At this point in time, our requirements can only be met by ethanol. Also, impacts of oxygenate on gasoline engines are better understood. The potential for damage to the engine is well-documented to be immeasurable or negligible.

In addition, staff anticipates shortening the time period for the wintertime oxygenate requirement from October 1 to November 1 of each year. This change would put Las Vegas on the same supply schedule as Maricopa County. This will hopefully minimize "boutique" fuel issues and delivery issues. The month of October is not considered to be a month at risk related to potential CO exceedances.

MAS/ck

attachment

CLARK COUNTY HEALTH DISTRICT

AIR QUALITY DIVISION

Phone Number: (702) 383-1276
P.O. Box 3902
Las Vegas, NV 89127

Fax (702) 383-1443
625 Shadow Lane
Las Vegas, NV 89106

May 18, 2000

Mr. Russel Roberts
Assistant Planning Manager
Clark County Department of Comprehensive Planning
Environmental Division
500 S. Grand Central Pkwy
Las Vegas, NV 89155-1745

Re: Final Report - Wintertime CBG Program

Dear Mr. Roberts,

The Wintertime Cleaner Burning Gasoline (CBG) program for the period 1999/2000 ended as of 3-31-00. This report will offer a summation of the five months progress and events.

Key Points :

- CBG Program Started Nov 1, 1999, effective through March 31, 2000; and each year thereafter.
- Five Refiners opted to produce CBG - Tosco, Ultramar, Mobil, Chevron, & ARCO.
- Approximately 51.6 million gallons of CBG were produced per month for the 5 month season.
- All fuel was produced to the "Flat Standard" (Max Sulfur @ 40 PPM by weight & and max. Aromatic Content @ 25% by volume).

  There were no exceedances of the fuel specifications.

Section 54 of the District Board of Health of Clark County Air Pollution Control Regulations entitled "Cleaner Burning Gasoline (CBG): Wintertime Program" was adopted by the Board on 4-22-99. Soon thereafter, a registration program was initiated to educate and make all affected entities aware of the new program. An introductory letter and registration form was sent to all entities that could be identified as potential refiners, brokers, wholesalers, transports, consumers and retailers of CBG. By October of 1999, 30 days before the starting date of the CBG program, 99% of the identified prospects were registered with the AQD. The remaining entities were personally visited, and entered the fold prior to inception of the program. All told, 653 registrations are logged in the data base.

The registrant list is roughly categorized as follows (some entities provide multiple services that cross the definitions):

1. (5) Refiners/Producers
2. (6) Blender/Broker/Wholesalers
3. (16) Hauler/Carrier/Transports
4. (56) Consumers
5. (562) Retailers

Pursuant to the requirements of Section 54, each of the refiners (after a couple of hiccups in the first month) provided their monthly summation report on-time and with complete data.

Quality control (Testing and Enforcement) of CBG was accomplished through two avenues.

First - To check fuel at the source, an agreement was made with the California Air Resources Board in August of 1999 to have them sample and test CBG at the refineries in Southern California, the sole source for Las Vegas gasoline. In late August, a rough draft proposal was presented to CCHD by CARB. In early 2000, the Board of Health accepted the proposal, and the contract was signed and returned. However, due to legal concerns at the CARB, the final draft contract has to this date, still not been finalized. In spite of the legal wrangling, CARB inspectors sampled and tested CBG in October 1999, and February and March of 2000. No discrepancies were found in the fuel parameters.

Secondly - To check fuel at the final destination (Clark County), an agreement was made in August, 1999 with the State of Nevada Department of Business and Industry, Division of Agriculture. They agreed to check Sulfur and Aromatic content of CBG fuel along with their normal testing. They would notify CCHD, AQD in the event that any fuel sampled exhibited non-compliant CBG characteristics. Here again, no discrepancies were found in the fuel parameters.

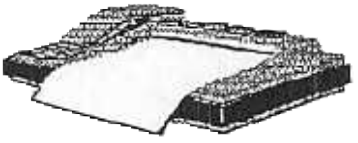
In summation, the program went very well, with relatively few bumps. The refineries (most notably, TOSCO) and the vast majority of wholesalers, transports, and retailers were readily supportive of the program and the air quality issues involved. The testing contract with CARB should be ironed out by the next season, with some revisions, but will still meet the needs of CCHD. Continued support from the division of Agriculture is anticipated. The only confusion throughout the length of the program was the coincident applicability of Section 53, the "Oxygenated Gasoline Program". A considerable amount of confusion exists with the regulated community regarding the geographic area of applicability, and the effective time periods of the two programs.

CC: Mr. Clete Kus, CCDCP
Ms. Roxanne Johnson, USEPA
Mr. Ken Bigos, USEPA
Mr Larry Biland. USEPA
Ms. Colleen Cripps, NDEP

California Environmental Protection Agency

Air Resources Board

Fax



Pages to Follow: 3

Facsimile Message
State of California
Air Resources Board
Compliance Division
2020 L Street
Sacramento, California 95814

Please Deliver ASAP to: RON SMOLINSKI

From: HERMAN LAU
916-327-1518

Comments: Clark County CBG test results test log
The Nevada Gasoline is labeled "OS" for out of State (i.e. out of California)

Any problems in receiving this message should be reported to:

Contact Person:

Fax: (916) 445-5745
Voice: (916) _____ - _____

State of California
Air Resources Board
Test Results Log

s = screen

Page 1

Date	Sample Number	Type	Grd	Brand/ Supplier	Address City/ Zip	Sampled By	Grab RVP psi	s/GC Oxy %W	s/GC Benz %V	s/GC TAro %V	s/GC Olfn %V	s/DA T50 degF	s/DA T90 degF	s Pb g/G	ASTM S ppm	s Mn ppm	s P g/G	s/SHC ArHC %VorW	s/SHC PAH %W
3/6/00	9583	RP	R	Mobil	3700 W. 190th St, Torrance 90504	HLA													
	9584	RP	P	"	"														
05	9585	05 RP	R	"	"			0.0 / 0.0	0.62 / 0.67	21.1 / 21.9	10.9 /	198 /	345 /		26				
05	9586	05 RP	P	"	"			0.0 /	0.45 / 0.46	21.8 / 26.2	6.2 /	200 /	363 /		20				
	9587	RP	R	Chevron	2402 E. Anaheim Wilmington 90744														
	1010																		
	1042																		
	1013																		
	4024																		

Type: service station ; 03=out of state
others: use Refinery Data Sheet "Fuel Source"

* = within R

2/08

State of California
Air Resources Board
Test Results Log

s = screen

Page 5

~~MD Testing~~/A=Ante's

Date	Sample Number	Type	Grd	Brand/ Supplier	Address City/ Zip	Sampled By	RVP psi	Oxy %W	Benz %V	Arom %V	Olefn %V	T50 degF	T90 degF	Pb g/G	S ppm	Mn g/G	P g/G	ArHC %Vol	PAH %W
3/7/00	6835	RP	D	Chevron	324 W. El Segundo Blvd El Segundo	Stover													
"	6836	RP	D	"	"	"													
"	6837	OS	R	"	"	"		0.0	0.14 0.28	17.7 10.3	7.5	184	316		28				
"	6838	RP	M	"	"	"													
"	6839	RP	P	"	"	"													
"	6840	RP	R	"	"	"													
"	6841	RP	R	"	"	"													
"	6842	SS	R	Thrifty	4200 Crenshaw Blvd Los Angeles 90008	"													
"	6843	SS	M	"	"	"													
"	6844	SS	P	"	"	"													

* = MDAL + R

2/00

State of California
Air Resources Board
Test Results Log

s = screen

MD=Xerxy/A=Antek

Date	Sample Number	Type	Grd	Brand/ Supplier	Address City/ Zip	Sampled By	RVP psi	Oxy %W	Benz %V	TArc %V	Olfn %V	T50 degF	T90 degF	Pb g/G	S ppm	Mn ppm	P g/G	ArHC %VorW	FAM %W
3-7-00	1011	RP	D	Arco	Carson R. Fwy	Vette													
	1012	RP	D																
	1013	RP	R																
	1014	OS	Mid CBG					0.0	0.69 0.90	34.3 22.3	12.1	301	336		40				
	1015	RP	R																
	1016	RP	R																
	1017	RP	R																
	1018	RP	R	"	"														
	1019	TP	R	Ultramar/ Equilon	Carson Terminal														
	1020	OS	Mid Sub Oct.					10.0	0.48 0.61	38.7 25.4	5.3	185	341		18				
	1021	TP	P																
	1022	TP	R																
	1023	TP	R																
	1024	TP	R	"	"														
	1025	TP	P	Equilon	"														
	1026	TP	R	"	"														

Type: SS=service station; CS=out of state
All others: see Refinery Data Sheet "Fuel Source"

* = within R

2/00

California Environmental Protection Agency

Air Resources Board

Fax

Pages to Follow: 1

Facsimile Message
State of California
Air Resources Board
Compliance Division
2020 L Street
Sacramento, California 95814

Please Deliver ASAP to: Ron Smolinski

From: Herman LAU
916-327-1518 or
e-mail: hlau@arb.ca.gov

Comments: I Received the complete lab results yesterday. I'm faxing the log sheet which has all the test data with the sample numbers the suppliers, etc. If you want me to fax or send you the field sheets I can do that too; it's about 10 pages, some of which are spec sheets that you probably already have copies of. Any question call me at 916-327-1518 or e-mail me such as reproducibilities, lab sheets, etc

Any problems in receiving this message should be reported to:

Contact Person:

Fax. (916) 445-5745
Voice. (916) ____ -

State of California
Air Resources Board
Test Results Log

s = screen

Page 5

Date	Sample Number	Grd	Brand/ Supplier	Address City/ Zip	Sampled By	Grab RVP psi	s/GC Oxy %W	s/GC Benz %V	s/GC TAro %V	s/GC Olfn %V	s/DA T50 degF	s/DA T90 degF	s Pb g/G	ANTEK ASTM S ppm	s Mn ppm	s P g/G	s/SFC ArHC %VorW	s/SFC PAH %W
2/24/00	OS 9577	R	Tosco	2650 W. Lomita Blvd Torrance, 90505	HHH			1.10	29.0					31				
1	OS 9578	P	Mobil	3700 W. 190th St. Torrance 90504				0.41	26.6					22				
	OS 9579	R	Chevron	324 W. El Segundo Blvd El Segundo 90245				0.52	18.7					37				
1	OS 9580	R	Arco	1801 Sepulveda Carson 90746				0.90	22.6					46				
↓	9581	D	Glencore	GATX Berth 118 Wilmington										8			5.44	0.46
2/25/00	OS 9582	R	Ultramar Equilon	20945 S. Wilmington Carson 90746	↓			0.60	25.2					17				

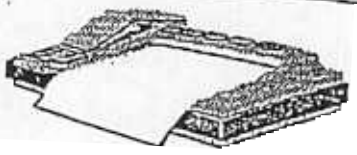
1.4 Ref do total aromatics

5/97

California Environmental Protection Agency

Air Resources Board

Fax



Pages to Follow: 7

Facsimile Message
State of California
Air Resources Board
Compliance Division
2020 L Street
Sacramento, California 95814

Please Deliver ASAP to: RON SMOLINSKI

From: HERMAN HALL 916-327-1518

Comments: No Refinery producing Nevada CBG were sampled in November. Let me know if these faxed don't come out well and I can send you hardcopies.

Any problems in receiving this message should be reported to:

Contact Person: Herman Hall

State of California
AIR RESOURCES BOARD
Refinery and Bulk Terminal Motor Fuel Sampling Data

Company name Chevron ☒ Ref. ☐ Term. Location El Segundo

Company contact Lani Marshall Escort Mark Ruda / Steve Patterson

Phone (310) 615 - 3315 Date 9/21/99 CARB inspector Vebl

Sample Number	Grade	Tank I.D. Number	Batch Number	Gauge	Barrels in Tank	Time	Sample Location	Sample Type	Sampler's Name
1862	D	993	A-39	33 19/4		1200	3	R	Vebl
1863	Nevada R	993	416	34 18¾			3	R	
1864	M	995	418	24 11			3	R	
1865	R	185	419	46 18			3	R	
1866	R	183	420	46 6½			3	R	
1867	P	181	415	26 19			3	R	
				/					
				/					
				/					

Compliance option for GASOLINE:

- ☐ Specification -- Flat
- ☐ Specification -- DAL: Obtain copy of DAL FAX for each batch.
- ☒ ~~Predictive Model -- Flat: Obtain copy of PM specifications or FAX for each batch.~~
- ☐ Predictive Model -- DAL: Obtain copy of PM specifications and DAL FAX for each batch.
- ☐ Small refiner exemption.
- ☐ Alternative formulation number: ~~ALAD 23 G 714 021~~

Compliance option for DIESEL:

- ☐ 10% aromatics (or 20% for small refiners)
- ☐ Specification -- DAL: Obtain copy of DAL FAX.
- ☐ Alternative formulation number: ALAD 23 G714 021

Obtain company lab results:
Cetane #: 498
Nitrogen: .00315
Additive: _____ (If applicable)

Comments: Sample #1863 in Las Vegas, gas - certificate of analysis is attached → looks like non CBG

Sample Location
1. EXT gauge platform
2. EXT roof platform
3. EXT roof roof
4. EXT tap tank
5. INT gauge Roof
6. INT roof roof
7. INT tap tank
8. FIX roof roof
9. FIX tap tank
10. PIPELINE tap
11. PUMP tap
12. CARGO dome
OTHER: (specify)

Sample Type
A. All levels
R. Running
U. Upper
M. Middle
L. Lower
TC Tap, cooling coil
T. Tap, no cooling coil
O. Other: (specify)

CHEVRON USA - EL SEGUNDO REFINERY 17-SEP-1999 03:18:39
FINAL REGULAR (CONV.LAS VEGAS) ~~TANK 993~~ PAGE 1

CARB # 1863

DATE SAMPLED	9/16/99 16:46	SAMPLE NUMBER	541913
BATCH NUMBER	416	TANK NUMBER	993
REMARKS			

TANK RELEASED BY:	L.M.A-M	@3:15AM
GRAVITY,API,D1298		
541912 FINAL UPPER	61.2	
541913 FINAL MIDDLE	61.2	
541914 FINAL LOWER	61.1	
COLOR,VISUAL,MOTOR GAS		
541912 FINAL UPPER	STD	
541913 FINAL MIDDLE	STD	
541914 FINAL LOWER	STD	
APPEARANCE/CONDITION		
541912 FINAL UPPER	PASS	
541913 FINAL MIDDLE	PASS	
541914 FINAL LOWER	PASS	
DISTILLATION,D86,EVAP,F		
10%,F	140	
50%,F	217	
90%,F	311	
END PT,F	376	
RESIDUE%	0.5	
VOLUME@ 200 DEG F,(MLS)	40.7	
VOLUME@ 300 DEG F,(MLS)	86.9	
DRIVEABILITY INDEX	1172	
DOCTOR TEST, SM 145-7	NEG	
VAPOR/LIQUID (ACTUAL),F	151	
VAPOR PRESSURE,EPA,PSI	7.7	
RATING@122F,3HR	1A	
AROMATICS(FIA),V%,D1319	21.49	
OLEFINS (FIA),V%,D1319	6.63	
SATURATES(FIA),V%,D1319	71.89	
RESEARCH OCTANE NO,F-1	91.1	
MOTOR OCTANE NO,F-2	83.7	
ANTIKNOCK INDEX (R+M/2)	87.4	
WASHED EX GUM,MG/100ML	0.4	
INDUCTION OF MOGAS,HRS	+4	
WASHED ACC GUM,MG/100ML	1.2	
PH, MOTOR GASOLINE	6.82	
SULFUR BY ANTEK,PPM	20	
D3606 BZ, VOL%	0.485	
TOTAL OXYGEN, WT%	0.00	
MTBE, WT%	0.000	
TAME, WT%	0.000	
OXYGEN IN MTBE, WT%	0.000	
OXYGEN IN TAME, WT%	0.000	

Quality Control Representative 9/16/99 Date 3:15 Time

Gasoline

B&S ✓

RSC ✓

CAA ✓

Mktg(PL) ✓

CARB ✓

TOTAL AND AROMATICS ASTM D5580 METHOD							
9/21/99 LVL							
SAMPLE		Benzene Vol %	Benzene Min %	Benzene R		Total Vol %	Total Min %
1858		0.71	0.61	0.09		17.86	16.46
1860		0.40	0.35	0.05		13.77	12.37
1861		0.70	0.61	0.09		17.83	16.43
9410L		0.34	0.30	0.04		15.16	13.76
9410U		0.32	0.28	0.04		13.69	12.29
9407		0.38	0.34	0.05		17.10	15.70
9408		0.59	0.51	0.08		27.55	26.15
9409		0.32	0.29	0.04		14.01	12.61
9420		0.10	0.09	0.01		8.90	7.50
9421		0.55	0.48	0.07		24.98	23.58
9422		0.55	0.48	0.07		24.78	23.38
9423		0.54	0.47	0.07		24.88	23.48
1863		0.46	0.41	0.06		23.45	22.05
1864		0.36	0.32	0.04		14.74	13.34
1865		0.32	0.28	0.04		26.94	25.54
1866		0.28	0.24	0.03		27.05	25.65
1867		0.42	0.37	0.05		27.27	25.87
1868		0.73	0.63	0.10		23.22	21.82
1869		0.70	0.61	0.09		22.41	21.01
1870		0.44	0.38	0.06		15.91	14.51
1871		0.45	0.39	0.06		16.42	15.02

JGS 9/21/99

SULFUR ANALYSIS BY U.V. FLUORESCENCE
MLD 123
METHOD D 5453-93

SAMPLE	CONC. PPM
1863	20.74
1864	18.93
1865	11.34
1866	9.31
1867	13.12
1868	12.48
1869	10.89
1870	18.69
1871	20.65
1862 D	220.16
9420	18.49
9421	15.23
9422	14.82
9423	15.09

State of California
AIR RESOURCES BOARD
Refinery and Bulk Terminal Motor Fuel Sampling Data

Company name ARCO ☑ Ref. ☐ Term. Address 1801 Sepulveda Blvd City Carson, CA
Company contact Travis Palomares Escort Mike Estrada Zip 90749
Phone (310) 816-4520 Date 10/27/99 CARB inspector LAU

Sample Number	Grade	Tank I.D. Number	Fuel Source	Batch Number	Gauge	Barrels in Tank	Time	Sample Location	Sample Type	Sampler's Name
9475	Sub octane	42			37 1/4		11:00	1	R	H LAU
					/					
					/					
					/					
					/					
					/					
					/					
					/					
					/					
					/					

>43 bbls

Compliance option for GASOLINE:
- ☑ Specification -- Flat Nevada CBG, needs ethanol Sulfur: 40 ppm ☑ with 10% ethanol blend
- ☐ Specification -- DAL: Obtain copy of DAL FAX for each batch.
- ☐ Predictive Model -- Flat: Obtain copy of PM specifications or FAX for each batch.
- ☐ Predictive Model -- DAL: Obtain copy of PM specifications and DAL FAX for each batch.
- ☐ Small refiner exemption.
- ☐ Alternative formulation number: _____ Boen

Compliance option for DIESEL:
- ☐ 10% aromatics (or 20% for small refiners)
- ☐ Specification -- DAL: Obtain copy of DAL FAX.
- ☐ Alternative formulation number: _____ also obtain company test results

25 vol% with 10% ethanol blend

Cetane #: Nitrogen: Additive: _____ (If applicable)

Permit-required confined space -- reclassified to non-permit-required space. [8 CCR 5157 (C)(7)]
A permit-required confined space may be reclassified as a non-permit-required confined space for as long as the atmospheric hazard remains eliminated provided the following:
The permit space poses no actual or potential atmospheric hazard.
All hazards in the space are eliminated without entry into the space.
Forced air ventilation is not required to control/eliminate any atmospheric hazard.
If hazards arise in the space declassified to non-permit-required, employees shall immediately exit the space.

I certify that all hazards in the permit space have been eliminated. (Sign) _____

Tank Number	Time	LEL %	OXY %	H_2S ppm	CO ppm

Fuel Source
- RP Refinery production tanks
- RD Refinery downstream storage
- IS IMPORT shore tank
- IV IMPORT marine vessel
- IR IMPORT railcar
- TP Terminal production tanks
- TD Terminal downstream storage
- TC Terminal cargo tank truck

Sample Location
1. EXTERNAL gauge platform
2. EXTERNAL roof platform
3. EXTERNAL roof roof
4. EXTERNAL tap tank
5. INTERNAL gauge Roof
6. INTERNAL roof roof
7. INTERNAL tap tank
8. FIX roof roof
9. FIX tap tank
10. PIPELINE tap
11. PUMP tap
12. CARGO dome
OTHER: (specify)

Sample Type
- A. All levels
- R. Running
- U. Upper
- M. Middle
- L. Lower
- TC Tap, cooling coil
- T. Tap, no cooling coil
- O. Other: (specify)

State of California
AIR RESOURCES BOARD
Refinery and Bulk Terminal Motor Fuel Sampling Data

Company name Chevron ☑ Ref. ☐ Term. Address 324 W. El Segundo Blvd City El Segundo

Company contact Mark Dada Escort Chia Zip 90245

Phone (310) 615 - 5171 Date 10/27/99 CARB inspector LAn

Sample Number	Grade	Tank I.D. Number	Fuel Source	Batch Number	Gauge	Barrels in Tank	Time	Sample Location	Sample Type	Sampler's Name
9476	Sub octane	992			30 4/8		13:00	2	R	HLAn
9477	11	993			42 7/8		13:30	2	R	HLAn
					/					
					/					
					/					
					/					
					/					
					/					
			Gas Headley 310-615-5171		/					

Compliance option for GASOLINE:
- ☑ Specification – Flat Nevada CBG, needs ethanol
- ☐ Specification – DAL: Obtain copy of DAL FAX for each batch.
- ☐ Predictive Model – Flat: Obtain copy of PM specifications or FAX for each batch.
- ☐ Predictive Model – DAL: Obtain copy of PM specifications and DAL FAX for each batch.
- ☐ Small refiner exemption.
- ☐ Alternative formulation number: _____

Compliance option for DIESEL:
- ☐ 10% aromatics (or 20% for small refiners)
- ☐ Specification – DAL: Obtain copy of DAL FAX.
- ☐ Alternative formulation number: _____ also obtain company test results:

Cetane #: _____ Nitrogen: _____ Additive: _____ (If applicable)

Permit-required confined space -- reclassified to non-permit-required space. [8 CCR 5157 (C)(7)]
A permit-required confined space may be reclassified as a non-permit-required confined space for as long as the atmospheric hazard remains eliminated provided the following:
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All hazards in the space are eliminated without entry into the space.
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If hazards arise in the space declassified to non-permit-required, employees shall immediately exit the space.

I certify that all hazards in the permit space have been eliminated. (Sign) _____

Tank Number	Time	LEL %	OXY %	H_2S ppm	CO ppm

Fuel Source
- RP Refinery production tanks
- RD Refinery downstream storage
- IS IMPORT shore tank
- IV IMPORT marine vessel
- IR IMPORT railcar
- TP Terminal production tanks
- TD Terminal downstream storage
- TC Terminal cargo tank truck

Sample Location
1. EXTERNAL gauge platform
2. EXTERNAL roof platform
3. EXTERNAL roof roof
4. EXTERNAL tap tank
5. INTERNAL gauge Roof
6. INTERNAL roof roof
7. INTERNAL tap tank
8. FIX roof roof
9. FIX tap tank
10. PIPELINE tap
11. PUMP tap
12. CARGO dome
- OTHER: (specify)

Sample Type
- A. All levels
- R. Running
- U. Upper
- M. Middle
- L. Lower
- TC Tap, cooling coil
- T. Tap, no cooling coil
- O. Other: (specify)

LABORATORY ANALYSIS REPORT
FUEL ANALYSIS AND METHODS EVALUATION SECTION
CALIFORNIA AIR RESOURCES BOARD

Project ID: CD102799 **Contact:** Fred Schmidt

Submitted by: Herman Lau **Submitted:** 10/27/99 **Affiliation:** CD

ANALYTICAL LABORATORY	Fuel Analysis & Methods Evaluation Section (FAME) Monitoring and Laboratory Division, CARB										
METHOD	ASTM 4815-94, GC/FID		ASTM D5580, GC/FID		ASTM D5191	ASTM D86 Automatic			ASTM 5453 ANTEK	ASTM 6293 Reformulyzer	ASTM D4052
Analysis Date	NR		10/28/99		NR	NR			10/28/99	NR	NR
Analyst			LL						JS		
Sample I.D.	*MTBE (wt %)*	*Total Oxygen (mass%)*	*Benzene (vol %)*	*Total Aromatics (vol %)*	*RVP psi*	*T10 (deg F)*	*T50 (deg F)*	*T90 (deg F)*	*Sulfur (ppm)*	*Olefins (vol %)*	*Specific Gravity*
9475			0.70	23.0					32		
9476			0.56	24.5					21		
9477			0.56	24.1					24		

Approved by: SHM for SHM **NR:** not requested **Date:** 10/29/99

APPENDIX E

Section Two
Transportation Control Measures (TCM) / Transportation Demand Management (TDM)

VOLUNTARY TCM/TDM PROGRAM: CAT MATCH

Background

The 1990 CAAA requires that consideration be given to the implementation of TCMs for the purposes of reducing motor vehicle emissions and offsetting growth in vehicle miles traveled (VMT). As a serious CO nonattainment area, the Las Vegas Valley is required to evaluate and implement (if practical) those TCMs referenced in Section 187(b)(2) referencing Section 182(d)(1)(A) and (B) with the focus of reducing carbon monoxide emissions. Section 108(f) of the CAAA also require that plans evaluate and implement such measures as necessary to demonstrate attainment of the CO standard, in combination with other measures.

The CAAA sections referenced above allow the Las Vegas Valley and other serious CO nonattainment areas to be exempt from the stated requirements if certain conditions are met. These sections contain language that is interpreted to mean that the SIP needs only to contain those TCMs that are necessary to demonstrate attainment. This section of the document contains the rational for the selected TCMs, benefits and criteria for their selection.

In developing this plan, a Carbon Monoxide Transportation Control Measure Analysis was conducted by Lima and Associates. A copy of this document is contained in Appendix B. The intent of this study was to identify those transportation control measures that showed the greatest potential in reducing carbon monoxide emissions in the Valley. Based on this study s findings, the following measures are being considered for implementation as voluntary control measures: employer based commuter incentive programs, telecommuting and area wide ridesharing programs.

According to EPAs policy on Voluntary Mobile Source Emission Reduction Programs (VMEPs), reflected in a memorandum dated October 24, 1997, from Richard D. Wilson, Voluntary mobile source measures have the potential to contribute, in a cost-effective manner, emission reductions needed for progress toward attainment and maintenance of the NAAQS. Furthermore this guidance states, EPA believes that SIP credit is appropriate for voluntary mobile source measures where we have confidence that the measures can achieve emission reductions. Under this policy, credit for VMEPs are limited to 3% of the total projected future year emissions reductions required to attain the NAAQS.

Program Scenario

The VMEP control measures, consisting of employer based commuter incentive programs, telecommuting and an area wide ridesharing program, are being recommended for implementation by this plan. The Transportation Demand Management Division of the Clark County Regional Transportation Commission will be responsible for implementing, managing and monitoring this program.

Through adoption of the TIP (FY 1998-2000), the implementation of TDM strategy is prioritized. Funding in the amount of $911,000 for these programs have been derived from Congestion Mitigation Air Quality (CMAQ) funds. On June 10, 1999, the Regional Transportation Commission of Clark County adopted Resolution No. 177 which establish guidelines for administering the CAT MATCH commuter services program including the commuter incentive program, Club Ride. Portions of the CAT MATCH program became operational in July, 1999.

Up Front Credit

The voluntary TCM/TDM programs considered for implementation are estimated to achieve 0.3 tons per day of emission reductions by the year 2000 at an estimated cost of $42,446 per ton of CO reduced of the life of the program. The reduction attributed to this measure is 0.3 tons per day or 0.08 percent of the amount necessary to attain the NAAQS in 2000. This value does not exceed the 3% maximum credit allowed to be claimed by VMEPs. As participation increases in the CAT MATCH program it is estimated that the resulting emission benefit in 2010 and 2020 will be 1.8 and 2.3 tons per day, respectively. CAT MATCH is anticipated to have cumulative effect of reducing 21.5 tons of CO over the life of the program. Additional information on the quantification of these benefits are presented in the section titled Emission Effects, below.

Program Elements

CAT MATCH. The RTC has recently developed an energetic and creative approach to reducing work-related travel through the provision of incentives to both employers and employees to travel to work in ways other than single occupant vehicles (SOVs). The program is based on an intensive public/private partnership with local businesses. RTC staff is currently working directly with 20 local employers representing a significant proportion of Clark County employees. The 20 employers include numerous large casinos and several government agencies. Benefits to employers include a reduced need for maintaining employee parking spaces and increased morale through participation in programs involving more flexible work hours along with decreased stress associated with commuting on heavily congested freeways. Employers are also educated about Federal tax benefits available from their employees who commute by transit and van pool.

The program includes the following nine major components:

1. Provision of outreach through presentation display and tabletop display systems to provide information about the benefits of commute alternatives at business expos and transportation fairs throughout the region;

2. Club Ride which provides incentives, including monthly prize drawings, to

employees who use commute alternatives at least four times per month. Their use of commute alternatives is tracked by swiping a Club Ride credit card through veriphones being installed by participating employers. The card is swiped after each instance of using alternative commute options, and random checks are conducted to ensure honest use of the cards;

3. Preferential parking for carpoolers and vanpoolers, which includes free "Club Ride Reserved Parking" signs provided to participating employers;

4. Emergency Ride Home for Club Ride members needing rides home in an emergency when they do not have access to a car as a result of program participation;

5. Marketing and advertising on billboards, TV/Radio stations, and newsletters for professional, home owner and community associations;

6. Monthly special events for special community outreach on events such as "Bike-to-Work" day, or Try Transit Day;

7. Travel Assistance Information: provision of transit schedules to public on the Internet and at kiosks at key public locations. Users may enter their location and destination and receive schedule, fare and directions, or simply view known routes and status;

8. Flexifare transit passes use magnetic card reading technology, which tracks and records each trip taken on the bus. The passes are good for one year and employers that subsidize their employees' transit expenses are only charged for transit trips actually taken (in contrast to purchasing a standard pass for a preset amount and good for only a month). It also allows employers to take advantage of federal tax incentives that are available and gives employees a means to pre-tax dollars for their transit expenses each month;

9. Partnership with a vanpool leasing company.

Activity Effects

Since the start of this CAT MATCH program in July, 1999, the program seems to be gaining ground quickly. Estimates of participation are modest for the year 2000, with a projected participation rate of 2,500 employees. Participation is expected to grow to 25,000 participants by the year 2020. For Fiscal Year 2000-2001, current estimates of emission effectiveness are based on the following assumptions:

1. 2,500 participants on an average day
2. 1,800 single occupant vehicle reduction
3. Two trips per day reduced (one to, and one from work) at an average trip

distance of 7.5 miles (Average trip length obtained from the *RTC's 1996 Household Travel Survey*).

It will be difficult to assess the effectiveness of the program until actual data is collected from the participating employers and employees. However, the estimates of participation appear quite reasonable given the extent of outreach, the clear benefits to employers and employees for participating in the program, and the very real frustration of commute traffic in the Las Vegas Valley. As part of the monitoring and reporting requirement for VMEP's, The RTC will collect this data and utilize Ride Pro software for monitoring and reporting purposes. Annual reports will be provided to the EPA comparing the actual effect of this program to the predicted effect.

Emission Effects

For FY 2000-01, the RTC is projecting that there will be 2500 employees participating in commute alternatives and enrolled in Club Ride. The estimated number of SOVs reduced by those 2500 participants is 1800. With each of those SOVs traveling the total average valley wide trip distance of 7.5 miles each way, the amount of VMT reduced for those round trips 27,000 miles. An emission factor reflective of a systems average speed that has also been adjusted for the effects of clean burning gasoline and off-cycle emissions is then applied to estimated VMT reduction to quantify the emission reduction benefit of this program. The table below provides information on the emission factors utilized to estimate the anticipated effects of this voluntary control measure.

Carbon Monoxide Emission Factors for Quantifying the Benefits of Cat Match

		2000	2010	2020
System Average Speed		33.5	31.9	33.5
MOBILE5 Factor	LDGV	10.25	7.82	8.49
	LDGT1	11.42	9.32	10.17
	LDGT2	18.31	15.78	16.98
CBG Adjustment	LDGV	9.25	6.63	6.84
	LDGT1	10.30	7.80	8.14
	LDGT2	16.52	14.23	15.32
Combined Factor LDGV,LDGT1,2*		**9.91**	**7.33**	**7.63**

* Combined emission factor is a weighted average based on VMT.

The methodology used to quantify the emission reduction is based on the following formula:

Single Occupant Vehicle Reduction X Valley Wide Trip Distance X 2 Trips per Day X Emission Factor = Emission Reduction

Utilizing this formula, the following benefits for this voluntary measure have been

quantified and are presented in the table below.

Estimated Emission Reductions from Cat Match

Year	Projected Participants	SOV Reduction	Average Trip Distance	Trips/Day	Daily VMT Reduction	Emission Factor (g/mi)	Emission Reduction (tons/day)
2000	2,500	1,800	7.5	2	27,000	9.91	**0.295**
2010	20,000	15,000	7.5	2	225,000	7.33	**1.818**
2020	25,000	18,500	7.5	2	277,500	7.63	**2.33**

The CMAQ funds being used for TDM projects will play an integral role in achieving those VMT and CO reductions. The 10 TDM projects with comprise the CAT MATCH Program along with the funding allocation are presented in the chart below.

CAT MATCH Funding Allocation

Project Description	**Project Cost**	**Percent of Total**
TDM Promotional Materials	1,500.00	0.16%
Club Ride Commuter Incentive	250,500.00	27.50%
Club Ride Survey Incentive	5,775.00	0.63%
Club Ride TC Incentive	7,360.00	0.81%
Growth potential	36,365.00	3.99%
Preferential Parking Signage	30,000.00	3.29%
Emergency Ride Home Program	100,000.00	10.98%
TDM Marketing & Advertising Program	200,000.00	21.95%
Monthly Special Events	61,000.00	6.70%
Training Aids	2,000.00	0.22%
Travel Assistance Kiosks	200,000.00	21.95%
Flex-Fare transit Pass	15,000.00	1.65%
Vanpool Component	1,500.00	0.16%
Totals	$ 911,000.00	100.00%

Commitment for Evaluation, Reporting and Credit Shortfall

As indicated earlier, the RTC is responsible for monitoring CAT MATCH program activities. Monthly reports are provided to the RTC's governing board and are developed using Ride Pro software. A sample copy of the monthly report immediately follows at the conclusion of this is section. Data collection on participation in program activities will occur through the use of Club Ride cards and verifones (installed at work sites) and Flexifare transit passes. These cards and passes use magnetic card reading technology to that will track participation in the program. Oversight will occur through employers TDM Coordinators and staff from RTC's Transportation Demand Management Division. Clark County will continue to work with RTC on program activities and assist with monitoring and reporting requirements.

As part of the of the evaluation and reporting commitment requirements, RTC and the Clark County commit to submitting annual reports to the EPA. This evaluation will include a comparison of the predicted effect of the program to the actual observed levels. This evaluation will be prepared using Ride Pro, a database program developed specifically for rideshare programs. The format of this annual report will be similar to monthly reports mentioned earlier.

The RTC and Clark County, through the adoption of resolutions, commit to remedy any SIP credit shortfall in a timely manner, if this voluntary measure does not achieve projected emission reductions. A copy of the resolution adopted by the Regional Transportation Commission is contained in Appendix D, Regulations and Policies.

Technical Support Documentation

Information on the CAT MATCH Program has been presented in the beginning of this document under the headings of Program Scenario and Program Elements. The methodology for estimating the emission reductions from the CAT MATCH Program are detailed under the sections labeled Activity Levels and Emission Effects. Data collection efforts have been discussed under Program Elements and Commitment for Evaluation and Reporting.

As this is a voluntary program, it is difficult to ascertain with any degree of certainty, any programmatic uncertainty. The assumptions used to quantify the estimated effectiveness of the program are considered as being conservative. The first annual report will determine if program goals have been attained along provide additional insight about programmatic uncertainty. As Clark County and the RTC has committed to rectifying and SIP credit shortfall in a timely manner, combined with the fact that the assumptions are conservative, concerns about "uncertainties" should be belayed.

CAT MATCH Commuter Services Report

September 1999

by Justin Schor, Manager
Transportation Demand Management Division
Regional Transportation Commission

Background Information

The CAT MATCH Commuter Services Report is comprised of several smaller reports generated by the RidePro software which are called, "Rideshare Activity Summary", "CSR Data Entry Report", "Commuter Mode Use Summary By Company", and "Rideshare Match Activity Summary". These reports detail the activities recorded in the RidePro software for the CAT MATCH system during the period of **September 1, 1999 to September 30, 1999**. The pages that follow explain the information generated in each of the aforementioned reports.

"Rideshare Activity Summary" Report

Part I. Commuter File Transactions

The Commuter File Transactions section indicates that for the month of September 1999, **21** new commuters were added to the CAT MATCH database. There was an average of slightly less than one new CAT MATCH registrant per day. This brings the Total Commuters on file to **155**.

Presently the Total Numbers of Carpool, Vanpool, and Bike Program Participants in this section do not have any information because that information can best be gathered from a different source. CAT MATCH tracks commute alternative participation by looking at the number of registrants who are enrolled in Club Ride and swiping their Club Ride Cards. As more businesses enroll in Club Ride and their employees begin to participate in it, CAT MATCH will be generating reports that track actual participation levels in all commute modes.

September was the second fully operational month for CAT MATCH Commuter Services system. The general public is still learning what CAT MATCH Commuter Services is and what services it has to offer. We anticipate that as knowledge of the CAT MATCH program increases in the months to come, so will participation in the program.

Part II. Carpool Transactions

This section helps determine how effective CAT MATCH was at making successful match reports for the month of **September**. Out of **27** matches attempted, **11** were successful, meaning that more than **40%** of the people inquiring with CAT MATCH about carpool alternatives, received carpool partner matches.

Of the commuters matched, most live fairly close to each other and are an average of **1.5** miles from each other. Similarly, they work very close to one another, within **three-tenths (3/10)** of a mile of each other. These short distances allow for more convenient pick up and drop off and increase the likelihood that commuters will carpool together.

These commuters also work very similar work hours. The average difference in start time was **24.9** minutes and in end time was **10.8** minutes. With such small differences in their work schedules it is more likely that commuters will be able to coordinate a common time for their carpools to arrive to and depart from work.

The commuters who were successfully matched were given names of people who have been in the CAT MATCH database for an average of **81.4** days. This is a relatively new database with a fairly high level of accuracy in the quality of the contact information. As the average age of the matching commuter records begins to approach 180 days (6

months), CAT MATCH will begin to follow up with registrants to update the database to include more up to date information.

On average, each registrant received, **4.3** carpool matches per report, which means that the opportunity for each registrant to find at least one person to carpool with is fairly high.

Part III. Vanpool/Public Transit/Park & Ride/Telecenter/Bike Transactions

This section indicates that in **September** approximately **one-fifth** of reports attempted (6 Successful Reports out of **27** Reports Attempted) offered registrants information about CAT Routes that were geographically convenient to their commute. At the present time, RidePro has a very simple transit matching function that provides the bus route that will take a commuter from home to work if it is direct. The upgraded version of RidePro, which will include TransitPro, offers registrants more detailed information about the combination of CAT bus routes that are best for their commute. TransitPro will consider when commuters need to arrive to work, where they live, and where their worksite is in determining which CAT routes are nearest and provide them with the fastest commute. TransitPro should be an operational function of CAT MATCH reports by the first of the year.

The other modes do not show successful reports because they are not being offered to CAT MATCH registrants at this time. There are presently no vanpools or telecenters operational in the Las Vegas valley. In the months to come vanpools will begin to form at various employers throughout the Valley and can be included in the matches commuters receive. The one Park & Ride in the northwest section of the Valley serves a very small percentage of the Valley's commuters and is therefor not included in the match options at this time. As the Club Ride Merchant-based Neighborhood Park & Ride Program develops there will be more successful reports for Park & Rides. Instead of matching commuters to viable bike routes, CAT MATCH sends them a copy of the "Share the Road" Bike Map. This allows commuters to decide for themselves which are the safest routes for them to take based on their level of bicycling experience.

Part IV. Estimated Program Benefits

Ridepro makes some conservative projections about the VMT and air quality benefits that will result from the number of registrants new to CAT MATCH this month. It conservatively assumes that 20%of the successful match reports result in a rideshare arrangement. Based on this conservative estimate, we can assume the commuters who registered in **September** will yield an annual reduction in VMT of **22,150** miles, which equates to a **0.34** ton reduction in carbon monoxide (CO), **0.04** ton reduction in volatile organic compounds (VOC), and **0.05** tons of nitrogen oxides (NOx). Also based on this conservative estimate, we can assume that the demand will be reduced for **8** parking spaces, conservatively valued at $1,000 each. This means that employers throughout the valley will save over **$8,000** this year on parking construction costs.

CSR Data Entry Report

Current Mode Split Statistics

This report helps us determine whether CAT MATCH registrants enrolled by phone or registration form. In **September** approximately **75%** of CAT MATCH registrants were entered into the system by RTC Customer Service Representatives responding to phone calls while the remaining **25%** were entered by TDM staff who received CAT MATCH Registration Forms. This ratio may change in future months as more commuters register at their worksite using the CAT MATCH Registration Forms.

Commuter Mode Use Summary By Company Report

This report helps determine employer demographics are amongst the names currently in our database.

Employer Statistics

Of the **285** companies we have in our database, **46** have employees who are active registrants in our database. Those **46** employers are comprised of come of the valley s largest companies employing thousands of employees, to some of the smallest employing a handful of workers. (See Commuter Mode Use Summary By Company for a more detailed employer listing) Most of the companies on this list are not companies who we have solicited in the CAT MATCH program. This is good for two reasons. One is that it means that these employers are new companies that we can solicit partnership in the Club Ride program to further offer benefits to their employees, as well as give us a better count on the number of commuters actually participating in commute alternatives. What is also promising about this employer list, is that once the employers we are working with begin to promote CAT MATCH internally to their employees, we anticipate that the participation levels will rise tremendously. We expect to see this trend occur in **November, December, and January** as the employers we are working with begin to distribute the CAT MATCH Commuter Information Forms to all of their employees. The form provides them with the opportunity to register with CAT MATCH.

Rideshare Match Activity Summary Report

The Rideshare Match Activity Summary indicates that the Regional Transportation Commission has the most registrants in the CAT MATCH database with 102, followed by Clark County Government Center with 21, and the remainder are spread amongst the 29 other companies with employees in our database.

441 ***CAT MATCH* Commuter Services Report** **September 1999**

Regional Transportation Commission Rideshare Activity Summary

Report Period 09/01/1999 through 09/30/1999 - All Rideshare

PART I. COMMUTER FILE TRANSACTIONS

A. Records Added:	18	H.Total Commuters On-File:	141
B. Records Chang	16	I.Total Carpools:	1
C. Records Delet	0	J.Total Carpool Participants:	2
D. Total Trans	34	K.Total Vanpools:	0
E. Net Gain or	18	L.Total Vanpool Participants:	0
F. Marketing Contacts:	2	M.Total Bike Program	0nts:
G. Companies On-File:	348	N.Avg. Home-Work D	7.2

PART II. CARPOOL TRANSACTIONS

A. Number of matches attempted.....	27
B. Number of successful match reports.....	11
1. Average Quality of List.....	0.0
2. Average difference in distance at origin (mi.)....	1.5
3. Average difference in distance at destination (mi.)	0.3
4. Average difference in start time (min.).....	24.9
5. Average difference in end time (min.).....	10.8
6. Average age of matching commuter record (days)....	81.4
7. Average number of matches per carpool report.....	4.3
8. Average distance origin-to-destination (mi.).....	7.0

PART III. VANPOOL/PUBLIC TRANSIT/PARK-N-RIDE/TELECENTER/BIKE TRANSACTIONS

MODE	REPORTS ATTEMPTED	REPORTS SUCCESSFUL	AVERAGE DISTANCE ORIGIN TO DESTINATION
Vanpool	27	0	0.0
Transit	27	6	5.3
Park-n-Ride	25	0	0.0
Telecenter	2	0	0.0
Bike	2	0	0.0
TOTAL	83	6	N/A

PART IV. ESTIMATED PROGRAM BENEFITS

Assuming 20% of the successful match reports result in a rideshare benefits to our service region performed by our agency during the 09/30/1999 are:

Reduction in vehicle miles of travel.	22150
Reduction in commuting cost.....	$5316
Reduction in required parking spaces.	8
Reduction in carbon monoxide (tons)	0.34
Reduction in volatile organic comp	0.04
Reduction in oxides of nitrogen (tons).....	0.05

APPENDIX E

Section Three
Technician Training and Certification

INSPECTOR TRAINING AND CERTIFICATION

The State's Motor Vehicle Inspection/Maintenance (I/M) Program requires that inspectors be licensed. The training and certification procedures were established to comply with 40 CFR 51.367. The requirements for a certified inspector in Nevada's I/M program are verified training, including a course approved by the Department of Motor Vehicles and Public Safety (DMV & PS), a written and practical testing program and a separate certification process. In general terms inspector training will cover: purpose and goals of enhanced I/M, emission control devices, configuration and inspection, test procedures and rationale. The I/M program also consists of training and licensing of class 2 inspectors that conforms to the requirements set forth in 40 CFR 51.369. Under this requirement, certification and licensing is required in order to perform work or service on a vehicle's emission components. Additional information about these requirements are delineated in NAC 445B.485 through 445B.5084 as well as the State of Nevada's *State Implementation Plan for an Enhanced Program for the Inspection and Maintenance of Motor Vehicles for Las Vegas Valley and Boulder City, Nevada* (March 1996).

The DMV & PS is the agency responsible for implementing and monitoring the State's Motor Vehicle I/M Program, including the Inspector Training and Certification programs. As specified in NRS 445B.765 and 445B.810, it is also the responsibility of DMV to prepare annual reports on the program and submit them to the U.S. EPA in July of each year to comply with the provisions of 40 CFR 51.366. Additional information on the Inspection Maintenance Program can be found in the Inspection Maintenance State Implementation Plan that is referenced above.

The carbon monoxide emission reduction benefit from this control measure was derived from the Mobile5b model. This was accomplished by setting the I/M control flag record equal to 6 (IMFLAG = 6) and including a value of 2 in the third position of the corresponding input record (See Figure 1 for a sample copy of the Mobile5 input file). In doing so, the model calculates the benefits of Technician Training and Certification. A second model run was made keeping the inputs identical with the exception of not signifying, or including, the benefits attributed to technician training. The resulting emission factors from these two runs were then input into DTIM2 where VMT was applied in two separate runs. The results of these runs were then compared to determine the resulting benefit. The result of this analysis indicates that technician training and certification will reduce carbon monoxide emissions by 10.4 tons per day or 2.95%. Annualizing this amount, technician training will reduce carbon monoxide emissions by 3,796 tons per year in 2000 (10.4 X 365 = 3,796).

Figure 1: Sample MOBILE5b Input File to Estimate Benefits of Technician Training

```
5       PROMPT
  Las Vegas 2001 run; LV I/M with TTC begins on 3rd reg,incl HDGV
1       TAMFLG
1       SPDFLG
3       VMFLAG - Use Las Vegas VMT mix
3       MYMRFG
1       NEWFLG
6       IMFLAG - I/M program with TTC
1       ALHFLG
2       ATPFLG - Anti-Tampering program
2       RLFLAG - Las Vegas Vapor Recovery Program
2       LOCFLG - LAP record will appear once, in one-time data section.
1       TEMFLG - Mobile 5 will calculate the ambient temperature
4       OUTFMT - 80 Column Descriptive Format
2       PRTFLG - print exhaust CO results
1       IDLFLG -   No idle emission outputs
4       NMHFLG - Total organic gasses (TOG)
3       HCFLAG - Detailed component HC printed
.735.123.067.012.019.007.027.010                    Local VMT Mix
.043 .090 .083 .077 .077 .072 .066 .045 .042 .044     LDGV
.046 .060 .053 .045 .031 .019 .018 .019 .014 .009
.009 .008 .006 .006 .018
.027 .099 .089 .080 .104 .075 .059 .037 .037 .035     LDGT1
.035 .048 .042 .032 .024 .017 .020 .018 .019 .012
.014 .010 .007 .010 .050
.008 .042 .046 .033 .054 .043 .036 .029 .030 .043     LDGT2
.036 .082 .080 .070 .059 .041 .045 .050 .042 .027
.029 .027 .022 .008 .018
.013 .045 .041 .030 .045 .040 .036 .025 .022 .020     HDGV
.035 .079 .073 .065 .049 .039 .044 .054 .040 .028
.030 .027 .017 .083 .020
.043 .090 .083 .077 .077 .072 .066 .045 .042 .044     LDDV
.046 .060 .053 .045 .031 .019 .018 .019 .014 .009
.009 .008 .006 .006 .018
.027 .099 .089 .080 .104 .075 .059 .037 .037 .035     LDDT
.035 .048 .042 .032 .024 .017 .020 .018 .019 .012
.014 .010 .007 .010 .050
.040 .144 .084 .073 .095 .098 .076 .048 .046 .033     HDDV
.038 .035 .032 .016 .013 .014 .020 .016 .019 .012
.012 .008 .006 .004 .018
.024 .056 .059 .074 .112 .098 .079 .096 .134 .098     MC
.091 .079 .000 .000 .000 .000 .000 .000 .000 .000
.000 .000 .000 .000 .000
1 1 2 1
83 20 68 99 01 01 096 2 1 2222 2222 220. 1.20 999.     2-speed test 68, incl HDGV
TECH12.D                                            I/M data file
IMDATA4.D                                           I/M data file
83 81 99 2222 21 096. 22212112                      Anti-Tampering
92 3 095 095                                        RLFLAG refueling emission
            C  36.  64. 13.5 09.0 95 2 1 1          Local Area Parameter record
.000 1.00 .000 .035 1                               Ether Alcohol oxyEther oxy
4 02 19.6 50.0 20.6 27.3 20.6 01                    Scenario description record
01 11
```

Technician Training and Certification Cost Effectiveness

The following is provided to delineate the methodology, variables and assumptions used to quantify the cost effectiveness of the Technician Training and Certification program that is part of Nevada's Motor Vehicle Inspection/Maintenance Program. The program allows for two types of inspectors Class I and Class II. Class I certification will only allow the inspector to conduct an emission test. Repairs of emission related components can only be conducted by a Class II inspector. Training and testing for these two inspector types varies. The DMV & PS provided information regarding the program requirements and data necessary to prepare this analysis.

Class I inspectors

	Fees	Personal Time
DMV Course and License Fees	$ 25	5 hrs
Training on Emission Principles	$100	12 hrs
		17 hrs @ $20

$125 + $340 = $465

==========

$465 Two year certification and training cost

$232.50 One year certification and training cost

X 650 Number of Class I inspectors in Las Vegas

$ 151,125 Annual Class I certification and training cost

==========

Class II inspectors

	Fees	Personal Time
DMV Course and License Fees	$ 25	8 hrs
Advanced Emissions Training	$550	20 hrs
		28 hrs @ $30

$575 + $840 = $1,415

==========

$1,415 Two year certification and training cost

$707.50 One year certification and training cost

X 400 Number of Class II inspectors in Las Vegas

$ 283,000 Annual Class II certification and training cost

==========

$ 151,125 Annual Class I certification and training cost
$ 283,000 Annual Class II certification and training cost

$434,125 Annual Cost / 3,796 tons per year = $114.36 per ton of CO reduced

APPENDIX E

Section Four
Alternative Fuel Program (AFP)

ALTERNATIVE FUEL VEHICLE PROGRAM

This section contains information pertaining to the quantification of the emission reduction benefits attributed to the State's Alternative Fuel Program for governmental fleets. Three spreadsheets below contain information on the cost effectiveness, assumptions, methodology and data used to calculate the benefit of this control measure. Also included in this section is information provided by the Division of Environmental Protection Division describing the administration of this program. Last, a copy of amendments to NRS486A which were adopted by the State Environmental Commission on April 20, 2000, that serve to strengthen this program are also provided.

Table 1

CO Emission Factors for the Different Classes & Types of Vehicles

(Default values are based on test data for the Phoenix Metropolitan area by Arizona DEQ, VEI Section)

	1996 Models (*)	2005 Models
	(gr/mile)	(gr/mile)
Average miles vehicle is driven = 35 miles/day		
Average miles bus is driven = 50.5 miles/day		
Average light duty gasoline vehicle CO emissions	12.23	10.95
Average light duty gasoline truck CO emissions	14.29	13.35
Average gasoline bus emissions	31.14	12.91
Average light duty gasoline vehicle compressed natural gas emissions (*)	2.94	1.22
Average light duty gasoline truck compressed natural gas emissions (*)	3.43	1.43
Average bus diesel or cng emissions (*)	7.47	3.11

(*) Compressed natural gas reduced carbon monoxide by an estimated 76% in 1996

Table 2

CO Emissions Reductions from Government Vehicular Fleets

(1)	(2)	(3)	(4)	(5)	(6)
Year	Growth Factors	In Use Federal, State, & Local AF Vehicles	Carbon Monoxide Reduction due to AFV (gr/day)	**Total CO Reduction (metric ton/day)**	**Total CO Reduction (short ton/day)**
Dec-97		497	172,797	0.173	0.190
Dec-98		587	204,088	0.204	0.225
Dec-99		784	272,581	0.273	0.300
Dec-00	1.380	1,082	376,161	0.376	0.415
Dec-05		2,285	849,966	0.850	0.937
Dec-10	1.280	2,925	1,087,957	1.088	1.199
Dec-20	1.220	3,568	1,327,307	1.327	1.463
Dec-30	1.393	4,970	1,848,806	1.849	2.038

(*) 59% light duty gas vehicle and 41% light duty gas truck

Column	Column Explanation
(1)	Analysis Year
(2)	Growth rate applied to vehicle population
(3)	Total state and local governments fleet
(4)	Carbon monoxide emission reduction due to alternative fuel use. Assuming that an average vehicle is driven 35 miles per day
	and using the emission factors provided in TABLE 1 one can estimate the carbon monoxide emission benefit
	using the following formula for the years before 2005:
	CO (gr/day) = [35 * (col 3) * (0.59 * 12.23 + 0.41 * 14.29)] - [35 * (col3) * (0.59 * 2.94 + 0.41 * 3.43)]
	And for the year 2005 (after Tier II kicks in) and thereafter the following formual:
	CO (gr/day) = [35 * (col 3) * (0.59 * 10.95 + 0.41 * 13.35)] - [35 * (col3) * (0.59 * 1.22 + 0.41 * 1.43)]
(5)	Total carbon monoxide reductions due to alternative fuel use in all above fleets in metric tons per day = (col 4) / 1,000,000
(6)	Total carbon monoxide reductions due to alternative fuel use in all above fleets in short tons per day = (col 5) * (1.102311)

Table 3

Emissions Benefit - Cost / Benefit Analyses

Year	Growth Factors	In Use State & Local AF Vehicles	Assumed additional cost for alternative Fuel Vehicle	Additional Cost of Fleet	Normalized Additional Cost per day for all Vehicles (*)	Total CO Reduction (ton/day)	Cost Effectiveness ($$$/ton)
1997		497	$5,000	$2,485,000	$20,425	0.190	$107,230
1998		587	$5,000	$2,935,000	$24,123	0.225	$107,230
1999		784	$5,000	$3,920,000	$32,219	0.300	$107,230
2000	1.380	1,082	$4,000	$4,327,680	$35,570	0.415	$85,784
2005		2,285	$4,000	$9,140,000	$75,123	0.937	$80,180
2010	1.280	2,925	$3,000	$8,774,400	$72,118	1.199	$60,135
2020	1.220	3,568	$2,000	$7,136,512	$58,656	1.463	$40,090
2030	1.393	4,970	$1,000	$4,970,224	$40,851	2.038	$20,045

(*) Assuming that an alternative fuel vehicle useful life is 3 years

PETER G. MORROS, Director
ALLEN BIAGGI, *Administrator*
[redacted] 687-4670
[redacted] 687-4678
Administration
Water Pollution Control
Facsimile 687-5856
Mining Regulation and Reclamation
Facsimile 684-5259

STATE OF NEVADA
KENNY C. GUINN
Governor

Waste Management
Corrective Actions
Federal Facilities
Air Quality
Water Quality Planning
Facsimile 687-6396

DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES
DIVISION OF ENVIRONMENTAL PROTECTION
333 W. Nye Lane, Room 138
Carson City, Nevada 89706-0851

CK

March 6, 2000

Roxanne Johnson
Mobile Sources Section
Air & Toxics Division, USEPA
75 Hawthorne Street
San Francisco CA 94105

Dear Ms. Johnson:

We spoke last week about Nevada's alternative fuel vehicle (AFV) in fleets program, and I faxed you the statute, regulations and proposed regulatory changes pertaining to the program. This letter provides additional information describing NDEP's administration of the program and program performance in Clark County. I have been intentionally concise, so if you need more information in any area, please let me know.

Enclosed:

- Table 1 summarizing Clark County fleets' acquisitions over program, through FY 98-99.
- Table 2 comparing NAC 486A and EPACT overlap.
- List of administrative directives; variance policy; enforcement actions in Clark County; and Clark County compliance record to date.
- NAC 486A Fuel Use Tracking Form.
- Proposed amendments to AFV program (revised since last week).
- Proposed OBD regulation (different NAC, but relevant to Clark County AQIP).
- Hard copies of Nevada Revised Statute 486A and Nevada Administrative Code 486A.

From the acquisition summary table you will see that about 700 CNG vehicles were added to Clark County in compliance with the state AFV program, so far. There are currently 27 fleets in the state program in Clark County; 15 of these are also regulated under EPACT (Table 2). Fleets that fall under EPACT, but not the state program, include federal fleets and fuel provider fleets: I estimate an additional 200-300 CNG vehicles in fleets belonging to SW Gas Corp., Sierra Pacific Power Resources Co., Nellis AFB and the GSA. Another large, but voluntary, fleet of AFVs in Clark County is the Yellow Checker Star Cab Co. with about 575 propane vehicles.

Regarding fuel use, the NAC requires fleets to keep month-by month records of alternative and conventional fuel use. A copy of the Fuel Tracking Form is enclosed for your review. If use of the alternative fuel drops below 80% in the bi-fueled vehicles, I will do an audit. I also, randomly request actual fuel invoices for individual AFVs. When necessary in the past, NDEP has issued enforceable compliance plans, based on discussions with the fleet in violation, to bring fleets into compliance with fuel use requirements. There was some driver resistance early in the program, however, currently essentially all of the fleets are using the alternative fuels as required.

The performance of Clark County fleets is described in another enclosure, *NAC 486A, AFVs in Fleets Program.* We have had over a 90% compliance rate for the program, with written plans to bring that up to 100% by the end of this fiscal year. If you have any questions or would like more information, please let me know. You may phone me at (775) 687-4670 ext 3076 or e-mail to amalone@NDEP.Carson-City.nv.us.

Sincerely,

Adele King Malone, ES III
Mobile Sources Branch

encl (8)

cc, with enclosures:
Jolaine Johnson, NDEP
Colleen Cripps, NDEP
Jim Smitherman, NDEP
Russell Roberts, CCCP
Clete Kus, CCCP

TABLE 1

NAC 486A, ALTERNATIVE FUELED VEHICLES IN FLEETS[1]
CLARK COUNTY FLEET ACQUISITIONS SUMMARY

Program Year (AFV % requirement)	Total Acquisitions	AFV percentage	CNG	% of total acq	Propane	% of total acq	Diesel	% of total acq	RFG	% of total acq
Credits prior to program start			42 CNG conversions for City of Las Vegas							
SFY 94-95 (10%)	596	56%	163	27%	0	--	173	29%	0	--
SFY 95-96 (15%)	624	36%	107	17%	0	--	115	18%	0	--
SFY 96-97 (25%)	613	24%	80	14%	1	<1%	69	11%	0	--
SFY 97-98 (50%)	810	48%	94	12%	1	<1%	292	36%	3	<1%
SFY 98-99 (75%)	591	80%	183	31%	14	2%	203	34%	64	11%
SUMMARY	3234	49%	627+42	19%	16	<1%	852	26%	67	2%

[1]The state program applies to state and local government fleets with 10 or more vehicles. The program includes on-road vehicles ≤26,000 lbs GVWR, plus busses. This tabulation may be low, since it does not include AFVs already in a fleet when the state program began.

TABLE 2, OVERLAP OF NAC 486A FLEETS AND EPACT FLEETS

Clark County Fleets Regulated Under NAC 486A

STATE OF NEVADA FLEETS: ALSO REGULATED UNDER EPACT	CNG+ propane acquired for compliance
1. Department of Agriculture	0
2. Community College of Southern Nevada, UCCSN	1
3. Child & Family Services Division, Dept of Human Resources	0
4. Compliance & Enforcement Division, Dept of Motor Vehicles & Public Safety	3
5. Department of Transportation	38
6. Desert Research Institute, UCCSN	0
7. Department of Prisons (may be exempt from EPACT)	0
8. Desert Regional Center, Dept of Human Resources	0
9. Employment Security Division, Dept of Employment, Training & Rehab	3
10. Division of Forestry, Dept of Conservation and Natural Resources	0
11. Division of Industrial Relations, Dept of Business & Industry	3
12. Motor Pool Division, Dept of Administration	34
13. Division of State Parks, Dept of Conservation and Natural Resources	0
14. University of Nevada at Las Vegas, UCCSN	14
15. Division of Wildlife, Dept of Conservation and Natural Resources	2

LOCAL GOVERNMENT FLEETS: NOT UNDER EPACT	CNG+ propane acquired for compliance
1. City of Boulder City	0
2. City of Las Vegas (42 CNGs acquired prior to program)	122+42
3. Clark County Health District	0
4. Clark County Sanitation District	34
5. Clark County School District	0
6. Clark County Government	180
7. Henderson	20
8. Las Vegas Convention & Visitors' Authority	2
9. Las Vegas Housing Authority	3
10. Las Vegas Regional Transportation Commission	77
11. Las Vegas Valley Water District	32
12. North Las Vegas	69

NAC 486A, ALTERNATIVE FUELED VEHICLES IN FLEETS PROGRAM

Program Changes Through Administrative Directives

9-25-95: A-55 designated as an alternative fuel under NAC 486A.

3-23-99: Fiscal Year 99-00 compliance rate held over at FY 98-99 rate, 75%.

10-11-99: B20 (blend of 20% biodiesel with 80% diesel #2) designated as an alternative fuel under NAC 486A.

Clark County Exemptions Based on Vehicle or Infrastructure Availability

The state regulations give NDEP the authority (NAC 486A.200) to exempt a fleet from program requirements, for not more than one year at a time, based on vehicle or fuel (un)availability. To request an exemption for any other reason, including economic hardship, a fleet would have to request a public hearing in front of the State Environmental Commission; this has not happened yet. Exemption requests to NDEP must contain a thorough documentation (vehicle by vehicle) of the fleet's efforts to obtain AFVs in place the gasoline version. Only two exemption requests have been granted in five years .

- 6-14-99: City of Las Vegas fleet exempted from FY 97-98 acquisition requirements, based on unavailability of AFVs. The city placed a large order for AFVs with a manufacturer (GM) that subsequently went on strike for six months. At the end of the strike the manufacturer canceled AFV orders.

  8-16-99: Clark County Government fleet granted exemption for 15 vehicles in FY 97-98, reducing compliance rate from required 50% rate to 37%. This exemption was based on the closure of the only CNG conversion business in Las Vegas, after USEPA tightened aftermarket conversion component requirements. The County actually negotiated a new contract with the mechanic who had been doing conversions with the shop that discontinued. However, the three trial conversions that were subsequently done had mechanical difficulties. Thus, to avoid safety problems NDEP granted an exemption for the outstanding requirements.

- 75% AFV Compliance Rate for FY 98-99 Held Over for FY 99-00. This administrative directive, noted above, was granted program-wide after a review of the problems fleets were encountering with vehicle availability in FY 98-99. The types/models of AFVs offered by manufacturers did not fit fleet needs; delivery of AFVs was taking 12-18 months and frequently were canceled; provisions of USEPA Memo 1A Addendum (9/97) tightening conversion kit requirements made the conversion option exceedingly limited.

Variance Policy

In administering NAC 486A, NDEP has chosen to allow fleets that come up with a shortfall of required AFVs at the end of a fiscal year to submit a plan for coming back into compliance during the immediately following fiscal year. We adopted this policy as a way to work with fleets that have shown good faith efforts, rather than to pursue an enforcement and fines option. The policy serves program goals by acquiring the required number of AFVs, although on a delayed schedule.

Compliance Record for Clark County Fleets

As of this date, all Clark County fleets are in compliance for every completed program year, with the following exceptions:

City of Las Vegas owes 7 AFVs; plan to acquire extra CNGs in FY 00 to make up shortfall.

- Clark County Health District and School District given variance to use Cleaner Burning Gasoline 11/99 through 3/00 in place of RFG; plan to arrange for RFG delivery beginning 4/00 and thereafter which will comply with state and county regulations.

- DMV&PS, Clark County fleet, owes 2 AFVs; plan to acquire 2 extra CNGs in FY 00.

FUEL USE TRACKING FORM, by month*

NOTE: **Dedicated and bi-fueled vehicles are listed separately.**

FLEET NAME: _____

STATE OF NEVADA
DIVISION OF ENVIRONMENTAL PROTECTION
BUREAU OF AIR QUALITY
ALTERNATIVE FUELED VEHICLES IN FLEETS PROGRAM

1999		**DIESEL**	**CNG** (in equivalent gallons)	**LPG** (propane)	**RFG** (reformulated gasoline)	**Other alternative fuel:**
July	# of dedicated veh.					
	gal. of fuel used					
	# of bi-fuel vehicles					
	gal. of alt fuel					
	gal. of gasoline					
August	# of dedicated veh.					
	gal. of fuel used					
	# of bi-fuel vehicles					
	gal. of alt fuel					
	gal. of gasoline					
September	# of dedicated veh.					
	gal. of fuel used					
	# of bi-fuel vehicles					
	gal. of alt fuel					
	gal. of gasoline					

*Records are to be kept at the fleet facility and available for inspection not later than 30 days after the previous month's end. Records should be saved for a period of two years. (NAC 486A.180)

PROPOSED AMENDMENTS
AFFECTED SECTIONS ONLY

NEVADA ADMINISTRATIVE CODE
CHAPTER 486A

FLEETS: USE OF ALTERNATIVE FUELS

Matter in italics is new; matter in brackets [ ] is material to be omitted.

Section 1. Chapter 486A of NAC is hereby amended by adding thereto the following definition.

486A . . . "Ultra low-emission vehicle" defined. *"Ultra low-emission vehicle" (ULEV) means any motor vehicle conforming to the applicable federal ULEV exhaust emission certification standard established by the U.S. Environmental Protection Agency, Office of Mobile Sources.*

Section 2. NAC 486A.140 is hereby amended to read as follows:

486A.140 Designation of fuel as alternative fuel: Request for designation; requirements for designation; notice of intent to designate. (NRS 445B.210, 486A.150)

1. The administrator of the division of environmental protection of the department may designate a fuel as an alternative fuel. A person who wishes to have a fuel designated as an alternative fuel must submit to the administrator a written request which includes evidence that the fuel complies with the requirements set forth in subsection 2.

2. A fuel designated as an alternative fuel by the administrator must:

(a) When used to operate a motor vehicle:

(1) Reduce the emissions of one or more regulated pollutants to a level below the level of emissions generated when the fuel for which the designated fuel serves as an alternative is used to operate a motor vehicle;

(2) Generate emissions which are within the limits established pursuant to NAC 445B.596 for all regulated pollutants; and

(3) Generate emissions which are measurable using testing procedures approved by the division; and

(b) Be capable of being safely transported in bulk, handled during fueling and used to operate motor vehicles which are converted or manufactured to use the fuel.

3. *The administrator may not designate a fuel as an alternative fuel if such designation would adversely impact any control measure or contingency measure contained in an Air Quality Implementation Plan prepared pursuant to NRS 445B.500.*

4. Not less than 30 days before a fuel is designated as an alternative fuel pursuant to subsection 1, the administrator shall provide a notice of intent to designate the fuel as an alternative fuel to each person who has requested that his name be placed on a mailing list maintained by the division for the purpose of providing that notice. The administrator shall

cause the notice to be published at least once in newspapers of general circulation throughout the state.

(Added to NAC by Environmental Comm'n, eff. 11-9-95; A 10-29-97)

Section 3. NAC 486A.160 is hereby amended to read as follows:

486A.160 Acquisition of or conversion of vehicles to alternative fuel vehicles. (NRS 445B.210, 486A.150)

1. The operator of a fleet including, but not limited to, the operator of a fleet with buses and heavy-duty trucks, must obtain alternative fuel vehicles *or vehicles that are certified to federal United States Environmental Protection Agency ULEV, or more stringent, standards* in the following percentages of vehicles acquired or replaced, in compliance with the following schedule:

Fiscal year 1995	10 percent
Fiscal year 1996	15 percent
Fiscal year 1997	25 percent
Fiscal year 1998	50 percent
Fiscal year 1999	75 percent
Fiscal year 2000 and each year thereafter	90 percent

2. If the number of vehicles purchased, leased or otherwise acquired by the operator of a fleet in any 1 year when multiplied by the percentage specified in subsection 1 contains a fraction, the number of vehicles required to be **[clean]** alternative fuel vehicles *or vehicles that are certified to federal United States Environmental Protection Agency ULEV, or more stringent, standards* must be rounded off to the nearest whole number.

3. The operator of a fleet may meet the requirements of this section by converting existing or newly acquired vehicles to alternative fuel vehicles.

(Added to NAC by Environmental Comm'n, eff. 11-23-92; A 10-29-97)

Section 4. NAC 486A.180 is hereby amended to read as follows:

486A.180 Use of alternative fuel; records of fuel used; reporting requirements. (NRS 445B.210, 486A.150)

1. *Alternative fueled* **[The]** vehicles acquired in compliance with NAC 486A.160 must be operated solely on an alternative fuel except when operating in an area where the appropriate alternative fuel is unavailable. *This requirement does not apply to hybrid electric vehicles.*

2. The operator of a fleet shall compile records of all fuel used *by alternative fueled vehicles* on a monthly basis. The records must be:

(a) Available for inspection not later than 30 days after the end of the month for which the records were compiled; and

(b) Maintained for a period of 2 years after the end of the month for which the records were compiled.

3. Not later than 30 days after the end of each fiscal year, the operator of a fleet shall file a written report with the director which specified for that immediately preceding fiscal year:

(a) The number of vehicles purchased, *leased or otherwise acquired*;

(b) The number of vehicles purchased, *leased or otherwise acquired* that are alternative fuel vehicles *or vehicles that are certified to federal United States Environmental Protection Agency ULEV, or more stringent, standards;*

(c) The number of existing vehicles that were converted to alternative fuel vehicles; and

(d) For each vehicle included in paragraph (a), (b) or (c);

(1) The vehicle identification number;

(2) The make, model and year of manufacture; and

(3) The type of fuel used by the vehicle.

(Added to NAC by Environmental Comm'n, eff. 11-23-92; A 10-29-97)

Section 5. NAC 486A.200 is hereby amended to read as follows:

486A.200 Exemptions from provisions. (NRS 445B.210, 486A.150)

1. *Except as otherwise provided in subsection 3, t*[T]he director may exempt the operator of a fleet from any provision of this chapter if the director determines that:

(a) Alternative fuel vehicles *or vehicles that are certified to federal United States Environmental Protection Agency ULEV, or more stringent, standards* meeting the requirements of this chapter are not available for purchase, lease or acquisition by other means; or

(b) A commercial facility which sells alternative fuel is not available in the area in which the fleet is operated, and providing a facility to dispense alternative fuel would be economically impracticable for the operator of the fleet.

2. An exemption granted by the director pursuant to subsection 1 must be for an initial period of not more than 12 months and may be renewed for additional periods of not more than 12 months.

3. The director may not exempt the operator of a fleet from any provision of this chapter if such exemption would adversely impact any control measure or contingency measure contained in an Air Quality Implementation Plan prepared pursuant to NRS 445B.500.

(Added to NAC by Environmental Comm'n, eff. 11-23-92; A 10-29-97)

PROPOSED AMENDMENTS
to
NEVADA ADMINISTRATIVE CODE
CHAPTER 445B.400-774,
EMISSIONS FROM ENGINES

Matter in italics is new; matter in brackets [ ] is material to be omitted.

Section 1. Chapter 445B.400-774 of NAC is hereby amended by adding thereto the following definition.

445B . . . "Certified on-board diagnostic system" defined. *"Certified on-board diagnostic system" means a computer system housed within the vehicle and certified by the United States Environmental Protection Agency to be fully capable of monitoring all of the sensors and actuators in the vehicle's drive train to determine whether they are working as intended.*

Section 2. Chapter 445B.400-774 of NAC is hereby amended by adding thereto the following new section.

445B.5795 Inspection of vehicle: On-board diagnostic (OBD) checks required.

1. Any 1996 and newer model year motor vehicle which is equipped with a certified on-board diagnostic system and subject to inspection in accordance with the provisions of chapter 445B of NRS, as a condition of compliance with the inspection, must undergo an OBD system inspection beginning January 1, 2001.

2. The department shall develop test procedures and certify equipment to be used for the OBD system inspection.

ADOPTED 4/20/00

~~PROPOSED~~ REGULATION OF THE

STATE ENVIRONMENTAL COMMISSION

LCB File No. R031-00

April 12, 2000

EXPLANATION – Matter in *italics* is new; matter in brackets **[~~omitted material~~]** is material to be omitted.

AUTHORITY: §§1-9 and 11, NRS 445B.210 and 486A.150; §10, 445B.210, 486A.150 and 486A.180.

Section 1. Chapter 486A of NAC is hereby amended by adding thereto the provisions set forth as sections 2 to 5, inclusive, of the regulation.

Sec. 2. ***"Certified vehicle" means a motor vehicle that complies with:***

1. The standards for the control of emissions from an ultra low-emission vehicle set forth in 40 C.F.R. § 88.104-94 or 40 C.F.R. § 88.105-94; or

2. Any other standards for the control of emissions from a motor vehicle adopted by the United States Environmental Protection Agency which are more stringent than the standards for the control of emissions from an ultra low-emission vehicle set forth in 40 C.F.R. § 88.104-94 or 40 C.F.R. § 88.105-94.

Sec. 3. ***"Contingency measure" means a measure that:***

1. Is included in the state implementation plan; and

2. Takes effect in the manner prescribed in 42 U.S.C. § 7502(c)(9).

Sec. 4. *"Control measure" means a measure that is included in the state implementation plan to attain and maintain the national primary and secondary ambient air quality standards set forth in 40 C.F.R. Part 50.*

Sec. 5. *"State implementation plan" means the plan adopted by the State of Nevada pursuant to 42 U.S.C. § 7410 and 42 U.S.C. § 7502.*

Sec. 6. NAC 486A.140 is hereby amended to read as follows:

486A.140 1. ~~[The]~~ *Except as otherwise provided in subsection 4, the* administrator of the division of environmental protection of the department may designate a fuel as an alternative fuel. A person who wishes to have a fuel designated as an alternative fuel must submit to the administrator a written request which includes evidence that the fuel complies with the requirements set forth in subsection 2.

2. A fuel designated as an alternative fuel by the administrator must:

(a) ~~[When]~~ *If* used to operate a motor vehicle:

(1) Reduce the emissions of one or more regulated pollutants to a level below the level of emissions generated ~~[when]~~ *if* the fuel for which the designated fuel serves as an alternative is used to operate a motor vehicle;

(2) Generate emissions which are within the limits established pursuant to NAC 445B.596 for all regulated pollutants; and

(3) Generate emissions which are measurable using testing procedures approved by the division; and

(b) Be capable of being safely transported in bulk, handled during fueling and used to operate motor vehicles which are converted or manufactured to use the fuel.

3. Not less than 30 days before a fuel is designated as an alternative fuel pursuant to subsection 1, the administrator shall provide a notice of intent to designate the fuel as an alternative fuel to each person who has requested that his name be placed on a mailing list maintained by the division for the purpose of providing that notice. The administrator shall cause the notice to be published at least once in newspapers of general circulation throughout ~~[the]~~ ***this*** state.

4. The administrator shall not designate a fuel as an alternative fuel if he determines that such a designation would have a significant adverse effect on a control measure or contingency measure.

Sec. 7. NAC 486A.160 is hereby amended to read as follows:

486A.160 The operator of a fleet, including, but not limited to, the operator of a fleet with buses and heavy-duty trucks, must obtain alternative fuel vehicles ***or certified vehicles*** in the following percentages of vehicles acquired or replaced, in compliance with the following schedule:

Fiscal year 1995	10 percent
Fiscal year 1996	15 percent
Fiscal year 1997	25 percent
Fiscal year 1998	50 percent
Fiscal year 1999	75 percent
Fiscal year 2000 and each year thereafter	90 percent

2. If the number of vehicles purchased, leased or otherwise acquired by the operator of a fleet in any 1 year when multiplied by the percentage specified in subsection 1 contains a fraction, the number of vehicles required to be alternative fuel vehicles ***or certified vehicles*** must be rounded off to the nearest whole number.

3. The operator of a fleet may meet the requirements of this section by converting existing or newly acquired vehicles to alternative fuel vehicles.

Sec. 8. NAC 486A.180 is hereby amended to read as follows:

486A.180 ~~[The vehicles]~~ ***An alternative fuel vehicle*** acquired in compliance with NAC 486A.160 must be operated solely on an alternative fuel except when operating in an area where the appropriate alternative fuel is unavailable. ***The provisions of this subsection do not apply to a hybrid electric vehicle as defined in 40 C.F.R. § 86.1702-99.***

2. The operator of a fleet shall compile records of all fuel used ***to operate alternative fuel vehicles*** on a monthly basis. The records must be:

(a) Available for inspection not later than 30 days after the end of the month for which the records were compiled; and

(b) Maintained for a period of 2 years after the end of the month for which the records were compiled.

3. Not later than 30 days after the end of each fiscal year, the operator of a fleet shall file a written report with the director which specifies for that immediately preceding fiscal year:

(a) The number of vehicles purchased ~~[;]~~ ***, leased or otherwise acquired;***

(b) The number of vehicles purchased ***, leased or otherwise acquired*** that are alternative fuel vehicles ~~[;]~~ ***or certified vehicles;***

(c) The number of existing vehicles that were converted to alternative fuel vehicles; and

(d) For each vehicle included in paragraph (a), (b) or (c):

(1) The vehicle identification number;

(2) The make, model and year of manufacture; and

(3) The type of fuel used by the vehicle.

Sec. 9. NAC 486A.200 is hereby amended to read as follows:

486A.200 1. ~~[The]~~ ***Except as otherwise provided in subsection 3, the*** director may exempt the operator of a fleet from ***the requirements of*** any provision of this chapter if the director determines that:

(a) Alternative fuel vehicles ***or certified vehicles*** meeting the requirements of this chapter are not available for purchase, lease or acquisition by other means; or

(b) A commercial facility which sells alternative fuel is not available in the area in which the fleet is operated, and providing a facility to dispense alternative fuel would be economically impracticable for the operator of the fleet.

2. An exemption granted by the director pursuant to subsection 1 must be for an initial period of not more than 12 months and may be renewed for additional periods of not more than 12 months.

3. The director shall not exempt the operator of a fleet from the requirements of any provision of this chapter if he determines that such an exemption would have a significant adverse effect on a control measure or contingency measure.

Sec. 10. NAC 486A.230 is hereby amended to read as follows:

486A.230 1 The amount of the fine imposed for any violation ***of the provisions of chapter 486A of NRS or this chapter*** must be submitted not later than 10 days after ~~[service of]~~ the notice ***required by NAC 486A.210 is served*** upon the violator.

2. Payment of the fine imposed ~~[must]~~ *:*

(a) Must be made to the Bureau of Air Quality, ~~[123]~~ *333* West Nye Lane, ***Room 138,*** Carson City, Nevada ~~[89710. Payment may]~~ *89706-0851; and*

(b) May be made by cashier's check, certified check, money order, personal check or cash

Sec. 11. NAC 486A.250 is hereby amended to read as follows:

486A.250 1. Any person who requests a hearing before the commission concerning a final decision of the department pursuant to chapter 486A of NRS may do so by filing a request, within 10 days after notice of the action of the department, on form 3 ~~[*]~~ with the State Environmental Commission, 333 West Nye Lane, ~~[Capitol Complex,]~~ ***Room 138,*** Carson City, Nevada ~~[89710.]~~ *89706-0851. A copy of the form may be obtained from the commission.*

2. The provisions of NAC 445B.875 to 445B.899, inclusive, apply to a hearing of the commission requested pursuant to subsection

~~[*(See adopting agency for form.)]~~

APPENDIX E

Section Five
Supplemental Urban Airshed Modeling Analysis for the Las Vegas Valley Carbon Monoxide Attainment Demonstration

Supplemental Urban Airshed Modeling Analysis for The Las Vegas Valley Carbon Monoxide Attainment Demonstration

By

Clark County Department of Comprehensive Planning
500 S. Grand Central Parkway
PO Box 551741
Las Vegas, NV 89155-1741

May 31, 2000

1. Background

The Las Vegas Valley (LVV) is currently classified as a serious nonattainment area for the 8-hour carbon monoxide (CO) National Ambient Air Quality Standard (NAAQS) by the U.S. Environmental Protection Agency (EPA) based on monitored air quality data. The 1990 Clean Air Act Amendments (CAAA) mandate that nonattainment areas submit State Implementation Plans (SIPs) and adopt emission control measures to attain the NAAQS by the designated attainment date. The CAAA also requires that an attainment demonstration be performed as part of the SIP submittal using EPA approved air quality models. The Clark County Department of Comprehensive Planning (CCDCP) is responsible for SIP development and attainment demonstration modeling for the Las Vegas Valley. According to the EPA's recommendation, the attainment demonstration for CO NAAQS (9.0 ppm) should include both area-wide modeling using the Urban Airshed Model (UAM) and hot spot modeling with CAL3QHC, a roadway intersection model. Since 1992, CCDCP has applied the use of both models in developing their CO SIPs.

The most current CO SIP for LVV was submitted to EPA in September 1999, and was designed to demonstrate attainment of the NAAQS in December 2000 while maintaining the CO standard twenty years beyond the attainment date. In order to support the SIP development, CCDCP conducted a two-phased Urban Airshed Modeling effort between 1996 through 1999, including an intensive field study during the 1995/96 winter season. The modeling project was completed in the Summer of 1999 with attainment demonstrated using December 8-9, 1996, as the design episode. Details on the UAM modeling analysis for this project are documented in a report titled, *The Las Vegas Valley Carbon Monoxide Urban Airshed Model Update Project – Phase II: Modeling to Demonstrate Attainment of the Carbon Monoxide Standard* (Emery et al., 1999), hereinafter referred to as Phase II modeling (contained in Appendix C, Section 4). However, it was later found that the credit taken for the transportation control measures/travel demand management (TCM/TDM) program exceeds the 3% amount allowed by EPA for a voluntary measure. In addition, it was also necessary to correct the stringency and compliance input parameters in the MOBILE model. As a result of the reduction in benefit of the voluntary control measure, CCDCP had to reassess the selection of control measures, including their estimated benefits, and remodel the new effects in the attainment and future years.

The purpose of this supplemental UAM modeling analysis is to ensure that the revised primary control measures would sufficiently reduce on-road mobile emissions to achieve the CO NAAQS by the designated attainment date in December 2000, and to maintain the NAAQS in the future years out to 2020. The results of this UAM analysis also provided the area-wide background concentrations for future year hot spot modeling analysis which is addressed separately in Appendix E, Section 6.

2. Technical Approach for the Modeling Analysis

During the Phase II modeling project, CCDCP had conducted a number of in-house parallel modeling studies using the meteorology and air quality data compiled by ENVIRON which was the basis for the modeling contained in the September 1999 CO SIP submittal. These parallel studies conducted by the CCDCP included evaluations of the impacts of EPA's Tier 2 Analysis Tool (T2AT) and NONROAD models on the CO SIP in the Las Vegas Valley.

This supplemental UAM modeling analysis was performed using the same modeling domain, meteorology and air quality input files as used in Phase II modeling. With the exception of the on-road motor vehicle source, CO emission inventories from other sources such as stationary area, point and non-road source remained unchanged from Phase II modeling inventories. The models used in this analysis included: Mobile5b, CO Complex model, Direct Travel Impact Model (DTIM2), Emission Preprocessors System (EPS2) and UAM. They are exactly the same combination of models used in the Phase II modeling. The on-road motor vehicle emission inventories for the supplemental modeling have been revised to reflect the changes in primary control measures, and the corrections of the parameters in the Mobile5b input files for the basic Inspection and Maintenance program (I/M), and anti-tampering program. The revised basic control parameters for the Mobile5b runs are listed as follows:

- Inspection and maintenance program:

  Start date: 1983
  Stringency (failure rate): 20 %
  Model years covered: 1968 to 3 years older than evaluation year
  Waiver rates: 1 % for pre- and post-1981 model years
  Compliance: 96 %
  Program Type: computerized test and repair
  Frequency: annual
  Vehicle Types: light and heave duty gas vehicles and trucks
  Test Type: 2-speed idle
  Cutpoints: default

- Anti-tampering program:

  Start date: 1983
  Model years covered: 1981 to 3 years older than evaluation year
  Vehicle Types: light and heave duty gas vehicles and trucks
  Program Type: test and repair
  Frequency: annual
  Compliance: 96 %

In order to generate the revised on-road emission inventories, Mobile5b and then DTIM2 modeling have been performed to reflect these changes. The DTIM2 is a program that

reads link-specific traffic volumes and assigns emission rates by vehicle type to generate a gridded hourly mobile source inventory. Estimates of network link-specific traffic volumes and vehicle speed were derived from the Clark County Regional Transportation Commission's (RTC's) transportation model (TRANPLAN) output and are the same as used in the Phase II modeling. Once gridded on-road mobile source emissions were generated, they were then merged with stationary and non-road mobile sources using EPS2 pre-processor to generate the total gridded emission inventories for the UAM simulations. Additional information pertaining to the processing of this data can be found in the Phase II document contained in Appendix C.

3. Primary Control Measures

Clark County has proposed and evaluated four primary control measures to reduce CO emissions for the revised CO SIP . The four control measures target the on-road mobile source emissions and include: Vehicle Inspection Maintenance Program Technical Training and Certification, Wintertime Cleaner Burning Gasoline (CBG), Alternative Fuel Vehicle Program for Government Fleets, and Transportation Control Measures/Travel Demand Management (TCM/TDM). These same control measures were incorporated into the future year air quality modeling inventories for the episode of December 8-9, 1996, to demonstrate attainment of CO NAAQS by the designated attainment date and beyond. Each control measure was added consecutively to the future year inventories in the same order as presented above. The methodologies and procedures used to develop the controlled emission inventories for the future years are described below.

Technician Training and Certification

The estimate of benefits from the technician training and certification program can be derived directly from Mobile5b and then processed through DTIM2 model. The I/M parameters for the Mobile5b inputs were set appropriately to include the control measure and both models were run hour-by-hour for a 24-hour period for each future year. By comparing the base case Mobile5b/DTIM2 outputs, the CO benefits of the technician training control measure were estimated to be 2.95 % in 2000, 3.90 % in 2010, and 4.10 % in 2020.

Cleaner Burning Gasoline (CBG)

The CBG program adopted by Clark County affects the CO emissions from cars (LDGV) and light duty trucks (LDGT1 and LDGT2) by reducing the level of sulfur and aromatic contents in gasoline. The emission reduction due to the CBG program was derived from EPA's CO Complex model. The EPA Complex model is a spreadsheet model which users can input a baseline fuel and a target fuel specifications and therefore calculate the fleet average emission reduction of the target fuel relative to the baseline fuel. The Complex model was developed using the data from 1990 model year vehicles, which are Tier 0 standard vehicles. For Tier 1 vehicles, we assume the same emission reductions as Tier 0 vehicles.

To estimate the benefit of the Clark County wintertime CBG program for Tier 0 and Tier 1 cars and light duty trucks, the Complex model was run twice, once for Clark County baseline fuel, and once for CBG fuel. The CO emission reduction in percent for the CBG program estimated from the Complex model along with the specifications for the baseline and CBG fuels are summarized in Table 1. The first run with the Clark County baseline fuel specification yields a CO emission of 10169.33 mg/mile, while the second run with the Clark County CBG fuel specification yields a CO emission of 9174.35 mg/mile. By comparing the two Complex model runs, a CO emission reduction of 9.8 % for the CBG program relative to the baseline fuel can be calculated ((10169.33 - 9174.35) / 10169.33 x 100% = 9.8 %).

Table 1: CO emission reduction for CBG and Clark County Baseline and CBG fuel specifications

	Baseline	CBG
Fuel Parameters		
Ethanol	3.5 %	3.5 %
Sulfur	100 ppm	30 ppm
RVP	9 psi	9 psi
E200	39.1	49.9
E300	80.0	91.7
Aromatics	32 %	22 %
Olefins	8.5 %	4.0 %
CO Emissions (mg/mile)	10169.33	9174.35
CO Reduction (%)		9.8 %

Beginning with model year 2001, all light duty cars and trucks in LDGV and LDGT1 (up to 6000 lbs gross vehicle weight) classes will have to meet the National Lower Emission Vehicle (NLEV) standard. New data recently collected on the impacts of fuel sulfur on LEV emissions indicates that the LEV vehicles are more sensitive to fuel sulfur content than predicted by the CO Complex model. As mentioned earlier, the CO Complex model was developed with 1990 model year cars and trucks (Tier 0), thus the above mentioned emission reduction of 9.8 % is not an appropriate estimate for NLEV vehicles as it significantly underestimates the predicted benefit.

For the 2001 and later model year light duty cars and trucks, the CO emission reductions due to the CBG program were calculated in two steps in order to adjust the LEV sulfur effect. First, the fuel sulfur effect of the CBG for NLEVs was calculated based on two sulfur test programs that were conducted to assess the impact of fuel sulfur on LEV emissions. One test was performed by the Coordinating Research Council (CRC), which

is made up of selected automotive and oil companies, and the other was performed by the American Automobile Manufacturers Association (AAMA) and the Association of International Automobile Manufacturers (AIAM). The two test results were compiled and used by EPA for developing the Tier 2 Analysis Tool (T2AT model) as part of its Tier 2 Study (EPA, 1998). The detailed information about T2AT model can be found in *Methodology for Modifying Mobile5b in the Tier 2 Study* (Koupal and Rykowski, 1998). Table 2 summarizes the effects of increasing fuel sulfur content from 40 ppm to 150 and 330 ppm, based on the two sulfur tests and used by EPA during the Tier 2 Study. To determine the sulfur effects of the Clark County CBG program on NLEV vehicles, the same test data were used and linearly extrapolated to estimate CO reductions due to the sulfur content decreasing from 100 ppm to 30 ppm. The linear extrapolation results in the CO reductions of 14 % for LDGV, and 15 % for LDGT1. The LEV sulfur corrections were not applied to LDGT2 since these vehicles are not held to LEV standards.

Table 2: Average NLEV CO Emission Increase (percent) due to the increase of sulfur content from 40 ppm

	150 ppm	330 ppm
LDGV	25.0	46.9
LDGT1	27.0	47.6

The second step is to estimate the effect of all other fuel characteristics (including aromatics, olefins, etc.) other than sulfur content of the CBG using the Complex model. In this instance, the Complex model is run leaving the sulfur level at the baseline fuel level (100 ppm) but changing the other fuel characteristics to reflect CBG specifications. By comparing baseline runs, the total non-sulfur effect of the CBG was a 6.9 % CO reduction. Table 3 shows the NLEV emission reductions for sulfur component, non-sulfur components, and combined effects of the CBG program for NLEVs. As indicated in the table, the total CO reductions related to NLEVs using CBG are 19.93 % for LDGV and 20.87 % for LDGT1.

Table 3: CO Emission Reductions (percent) of CBG Program for NLEV Vehicles

	Effect of Sulfur Component	Effect of Non-Sulfur Component	Total CO Reduction
NLEV LDGV	14.00	6.90	19.93
NLEV LDGT1	15.00	6.90	20.87

Since the effects that CBG will have varies by vehicle class and will also be different for newer vehicles meeting the NLEV standards, it was necessary to estimate the percentage of the total fleet that would be considered NLEV in each of the future years. Using model year distribution output from the Mobile5b model, the fraction of emissions contributed by NLEV vehicles in each vehicle class was calculated and this fraction was used to apply the projected reductions resulting from the CBG. Table 4 shows the NLEV fraction in each year and the benefit from implementing CBG on each vehicle class affected by the program. Using these percent emission reduction estimates in the table, a control factor for each vehicle class was calculated and these factors were then applied to the Mobile5b output files for the technician training and certification run. This new set of adjusted Mobile5b output files were then processed through the DTIM2 system to generate a new gridded mobile emission inventory for the Clark County CBG program.

Table 4: Projected benefit in on-road mobile CO emissions from CBG program

Vehicle Class	2000		2010		2020	
	% NLEV	%Reduction	% NLEV	%Reduction	%NLEV	%Reduction
LDGV	0.0	9.8	53.84	15.26	95.17	19.44
LDGT1	0.0	9.8	58.57	16.28	92.16	20.00
LDGT2	0.0	9.8	0.00	9.8	0.00	9.8

Alternative Fuels Program for Government Fleets

This control measure reduces CO emissions as a result of vehicles operating on clean alternative fuels. Table 5 summarizes the number of vehicles and CO emission reductions of the alternative fuels program for government fleets for each projection year. A detailed description of the methodology used to calculate the CO reduction benefit from this program can be found in Appendix E, Section 4. Additional information about this measure can also be found in a report prepared by Lima & Associates for Clark County (Lima & Associates, 1998) which is located in Appendix B, Section 1. As shown in Table 5, the alternative fuel program in Las Vegas will provide CO emission reductions of 0.415 tons per day in 2000, 1.121 tons per day in 2010, and 1.368 tons per day in 2020. Because it was assumed that the benefit is based on the entire on-road mobile emission inventory, the CO benefit estimated in tons per day was then converted to a reduction factor relative to the emission total after the technical training and CBG programs were applied. The reduction factor for each modeled year was applied as an across-the-board adjustment factor to the hourly gridded on-road mobile emissions before input into UAM model.

Table 5: CO Emissions Reductions from Government Vehicular Fleets

(1)	(2)	(3)	(4)	(5)	(6)
Year	Growth Factors	In Use State & Local AF Vehicles	Carbon Monoxide Reduction due to AFV (gr/day)	**Total CO Reduction (metric ton/day)**	**Total CO Reduction (short ton/day)**
Dec-97		497	172,797	0.173	0.190
Dec-98		587	204,088	0.204	0.225
Dec-99		784	272,581	0.273	0.300
Dec-00	1.380	1,082	376,161	0.376	0.415
Dec-05		2,285	794,448	0.794	0.876
Dec-10	1.280	2,925	1,016,893	1.017	1.121
Dec-20	1.220	3,568	1,240,609	1.241	1.368
Dec-30	1.393	4,970	1,728,045	1.728	1.905

(*) 59% light duty gas vehicle and 41% light duty gas truck

Column	Column Explanation
(1)	Analysis Year
(2)	Growth rate applied to vehicle population
(3)	Total state and local governments fleet
(4)	Carbon monoxide emission reduction due to alternative fuel use. Assuming that an average vehicle is driven 35 miles/day and using the emission factors provided in the Lima & Associates report one can estimate the carbon monoxide emission benefit from fleets using the following formula: CO (gr/day) = [35 * (col 3) * (0.59 * 12.23 + 0.41 * 14.29)] - [35 * (col3) * (0.59 * 2.94 + 0.41*3.43)]
(5)	Total carbon monoxide reductions due to alternative fuel use in all above fleets in metric tons per day = (col 4) / 1,000,000
(6)	Total carbon monoxide reductions due to alternative fuel use in all above fleets in short tons per day = (col 5) * (1.102311)

Transportation Control Measures/Travel Demand Management (TCM/TDM)

The benefit of the voluntary TCM/TDM package has been significantly reduced from the amount indicated in the 1999 CO SIP submittal that claimed more credit than the 3% maximum allowed by EPA for voluntary control measure. CCDCP has re-calculated the benefit from this control measure based on updated participation projection information provided by RTC. Table 6 summarizes the CO emission reduction from the TCM/TDM program as well as the information used to derive the emission benefit. Additional information can be found in Appendix E, Section 2. As the table indicates, the RTC projects that there will be 2500 employees participating in commute alternatives and enrolled in the commuter incentive program in 2000. The estimated number of single occupancy vehicles (SOVs) reduced by these participants would be 1800. With each of those SOVs traveling the total average valley wide trip distance of 7.5 miles each way, the amount of VMT reduced for those round trips is 27,000 miles. As the number of participants will increase in future years, VMT will continue to reduce in 2010 and 2020. The emission factor used to calculate the benefit of the control measure is a combined factor for light duty gasoline cars and trucks. The emission factors for these vehicle classes were derived from the Mobile5b model and then adjusted for the CBG program.

As shown in the table, this control measure will provide CO emission reductions of 0.296, 1.818 and 2.334 tons per day in 2000, 2010 and 2020, respectively. These values reflect percentage reductions that are much lower than the 3% maximum credit allowed to be taken by EPA. This emission reduction was then applied in the form of an across-the-board control factor to hourly gridded on-road mobile emissions for each year.

Table 6: CO emission reductions and information for the TCM/TDM program

	2000	2010	2020
Projected Participants	2500	20,000	25,000
SOV Reduction	1800	15,000	18,500
Daily VMT Reduction (miles)	27,000	225,000	277,500
CO Emission Factors (grams/mile)	9.91	7.33	7.63
CO Emission Reduction (tons/day)	0.295	1.818	2.334

4. Summary of the Emission Inventory

Table 7 presents the domain wide emission totals in tons per day for the 1996 base case and all future year base and consecutive control strategy cases, as well as the emission reductions from the four control strategies in tons per day and corresponding percentages. The area and point source emission inventories, developed based on the 1990 base year inventories and local growth factors, are presented in Table 8 for reference. As shown in Table 7, the four control measures will provided a 43.1 tons per day (12.2 %) CO emission reduction for 2000, while the estimated emission reduction increases to 72.6 tons per day (18.1 %) and 124.1 tons per day (21.3 %) in 2010 and 2020, respectively. The increases in the emission reductions for the out years 2010 and 2020 are primarily attributed to the use of wintertime cleaner burning gasoline which will produce larger CO benefits as the percentage of NLEV vehicles increases in the fleet.

Figure 1 displays the domain wide, on-road mobile emission totals for base case and combined primary control case for each modeled year. The figure shows significant decreases in emission from 1996 to 2000 even for the base case (no additional control scenario). This emission decrease is clearly due to the existing controls that have been implemented along with fleet turnover. The figure also shows a significant increase trend after 2000 for both base and control case. The predicted emission increase trend is due to the flatter emission rates estimated by Mobile5b and a huge growth in the roadway network and VMT estimates (see Figure 2) in Las Vegas Valley. However, a sensitivity study (CCDCP, 1999) conducted by CCDCP with EPA's T2AT model along with the same VMT estimates indicated a downward emission trend in the outer years from 2000 to 2020. It is thought that Mobile5b dramatically overestimated the on-road mobile source emissions in the outer years due to the fact that Mobile5b assumes much higher vehicle deterioration rates. It is also important to mention that the domain wide emission trend is not applicable to the problematic CO area (Eastern Charleston area), because the growth in roadway network will mostly occur at the periphery of the modeling domain.

Table 7: On-Road Mobile Source CO Emission Totals (tons/day) and Control Strategies										
	1996	2000			2010			2020		
Control Measures	**Emission Total (TPD)**	**CO Benefits Percent**	**CO Benefit (TPD)**	**Emission Total (TPD)**	**CO Benefits Percent**	**CO Benefit (TPD)**	**Emission Total (TPD)**	**CO Benefits Percent**	**CO Benefits (TPD)**	**Emission Total (TPD)**
Base Case	405.40			353.23			402.06			581.58
Technician Training		2.95%	10.421	342.81	3.9%	15.708	386.35	4.1%	23.892	557.69
CBG		9.80% (LDGV,LDGT1 and LDGT2)	31.924	310.89	15.3% (LDGV) 16.3% (LDGT1) 9.8 % (LDGT2)	53.963	332.39	19.4% (LDGV) 20.0% (LDGT1) 9.8% (LDGT2)	96.545	461.14
Alternative Fuels		0.12%	0.415	310.47	0.28%	1.121	331.26	0.24%	1.368	459.78
TCM/TDM		0.08%	0.295	310.18	0.45%	1.818	329.45	0.40%	2.334	457.44
Combined Controls		12.2%	43.1		18.1%	72.6		21.3%	124.1	

On-Road mobile emissions have been adjusted for the month of December (adjustment factor is 1.021)

Table 8: Point and area source emission totals (Tons/day) on December 9

	1996	2000	2010	2020
Point source	23.2	23.2	23.2	23.2
Area source	10.2	14.3	17.9	22.4

5. UAM Model Results

Two UAM model runs for the years 2000, 2010, and 2020 have been performed by CCDCP for this study, one for base case and another for the combined primary control case. This section discusses the model results and the effectiveness of the combined primary control measures.

Future Year Base Case (no additional controls) Model Results

Table 9 summarizes the base case and the control case UAM simulation results for the Las Vegas Valley based on the December 8-9, 1996, episode. The results are presented as domain-wide maximum 8-hour average CO concentrations. The UAM results for the base case and the primary control case are also displayed in Figure 3. Note that a scaling factor of 1.14 was used for all years in the Phase II modeling in order to correct the under prediction problem associated with the Mobile5b model. The same scaling factor is used for all the UAM results in this study as well in order to maintain consistency in the modeling analysis. The 1996 base case serves as the starting point for this supplemental UAM modeling analysis. Additional information on the previous Phase II modeling can be found in Appendix C.

There are significant reductions between the 1996 base case and 2000 base case with respect to the maximum 8-hour CO concentrations. The base case CO reductions in 2000 are mainly attributed to existing local controls and federal motor vehicle emission control requirements. However, existing controls and federal motor vehicle requirements are not sufficient to achieve attainment of CO NAAQS in 2000. The predicted year 2000 maximum 8-hour CO was 9.1 ppm. These results indicate that additional local controls are necessary for attainment of CO NAAQS in 2000. This result is consistent with the Phase II UAM modeling result.

The predicted base case CO concentrations show slight decreases from 2000 to 2010, and also indicate substantial increases from 2010 to 2020. The base case maximum 8-hour CO concentrations were predicted to be just below 9.0 ppm in 2010. However, CO levels are projected to increase above the NAAQS again before 2015 (see Figure 3) due to the substantial growth in mobile source emissions as predicted by Mobile5b and TRANPLAN models. By the year 2020, the maximum 8-hour CO concentration was predicted to be 10.5 ppm without any additional local controls.

Table 9: UAM 8-hour domain-wide maximum CO (ppm) for the episode of December 8-9, 1996

Runs	Controls	1996	2000	2010	2020
Base Case	No additional Controls	11.2	9.1	8.7	10.5
Primary Control Case	Technician Training CBG Alternative Fuels TCM/TDM		8.1	7.2	8.5

Figure 4 displays the spatial distributions of the UAM predicted maximum 8-hour CO concentrations for the episode of December 8-9, 1996, with no additional control scenario for the years 2000, 2010 and 2020. The location of the elevated CO concentrations above 9 ppm (red colored area) were predicted in the central areas of the Las Vegas Valley including the Eastern/ Charleston area for the years 2000 and 2020, with a larger red colored area in 2020. Figure 4 also shows that there will be significant CO increases in the outer areas of the Valley, indicating the emission growth in these areas. The East Charleston area is situated within a topographic depression where valley air often converges during stagnation episodes such as the episode of December 8-9, 1996 as plotted in Figure 5.

Future Year Primary Control Case Model Results

Table 9 and Figure 3 also indicate that the primary control scenario would result in significant CO reductions in the Las Vegas Valley. The CO benefit from the primary control measures becomes larger and larger in the outer years as NLEVs begin to phase-in starting with model year 2001 and with the effect of fleet turn over. With the adoption of the primary controls, the UAM predicted maximum 8-hour CO concentrations would be below 9.0 ppm for 2000 and beyond. Figure 6 displays the spatial distributions of UAM predicted maximum 8-hour CO concentrations for the primary control case. The modeling results indicate that the primary control measures will provide sufficient emission reductions to reach attainment of CO NAAQS in 2000, and the Valley will continue to remain in attainment of the NAAQS until 2020.

It is also noted from Figure 3 that the predicted CO concentrations will begin to increase after 2010. The increase trend in CO concentrations after 2010 may be associated with the uncertainties of the Mobile5b model. As mentioned earlier, a separate sensitivity modeling analysis using the T2AT model in conjunction with the UAM predicted a

decreasing trend in CO emissions. Another uncertainty that may cause the increasing trend in CO concentrations may be attributed to VMT estimates derived from the TRANPLAN model as recent traffic counts collected by Nevada Department of Transportation (NDOT) actually indicate a declining trend in traffic volumes at the East Charleston area.

6. Conclusions

The supplemental modeling analysis performed by CCDCP shows that there will be a significant reduction in the maximum 8-hour CO concentrations between 1996 to 2000 in the Las Vegas Valley. The modeling results indicate that additional local controls are necessary for attainment of the CO NAAQS in the year 2000 as well as in the outer year 2020. Most importantly, the UAM predicted that the primary control measures would provide sufficient emission reductions to attain the CO NAAQS in 2000 and remain in attainment out through 2020.

It is realized that there may be uncertainties existing in the Mobile5b, such as inaccurate vehicle deterioration rates. Also, the emission reductions from Tier 2 standard and OBD II cannot be accurately estimated with the Mobile5b and, therefore, their effects have not been included in this modeling analysis. As mentioned earlier, the preliminary T2AT/UAM analysis performed by CCDCP suggested that the motor vehicle emissions and CO concentrations in the Las Vegas Valley should show a continuous decreasing trend from 2000 to 2020 instead of the increasing trend after 2010, as currently predicted by the Mobile5b/UAM modeling system. The preliminary T2AT modeling results clearly indicated that Mobile5b under-predicts baseline year (1996) mobile source emissions and over-predicts the future year (2010 and 2020) emissions. This result may also imply that the Mobile5b would artificially make attainment of the CO standard more difficult, especially in 2020. Future modeling efforts should include the use of more accurate motor vehicle emission estimates in air quality analysis once the new EPA mobile emission model, Mobile6, becomes available.

7. References

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Koupal, J., and R. Rykowski, 1998. Methodology for Modifying MOBILE5b in the Tier 2 Study. Office of Mobile Sources, U.S. Environmental Protection Agency, April 1998, EPA420-R-98-004

Figure 1: On-Road CO Emission Totals, Las Vegas

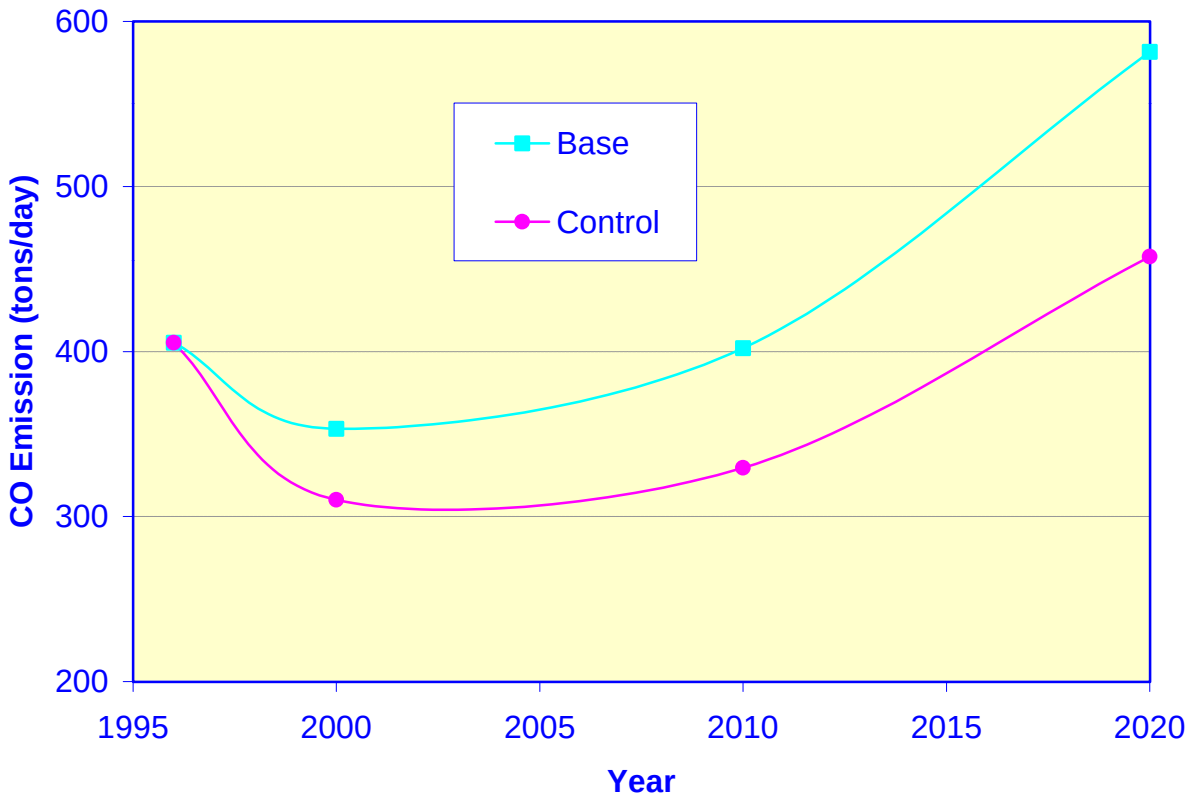


Figure 2: Daily Total VMT for Las Vegas Valley

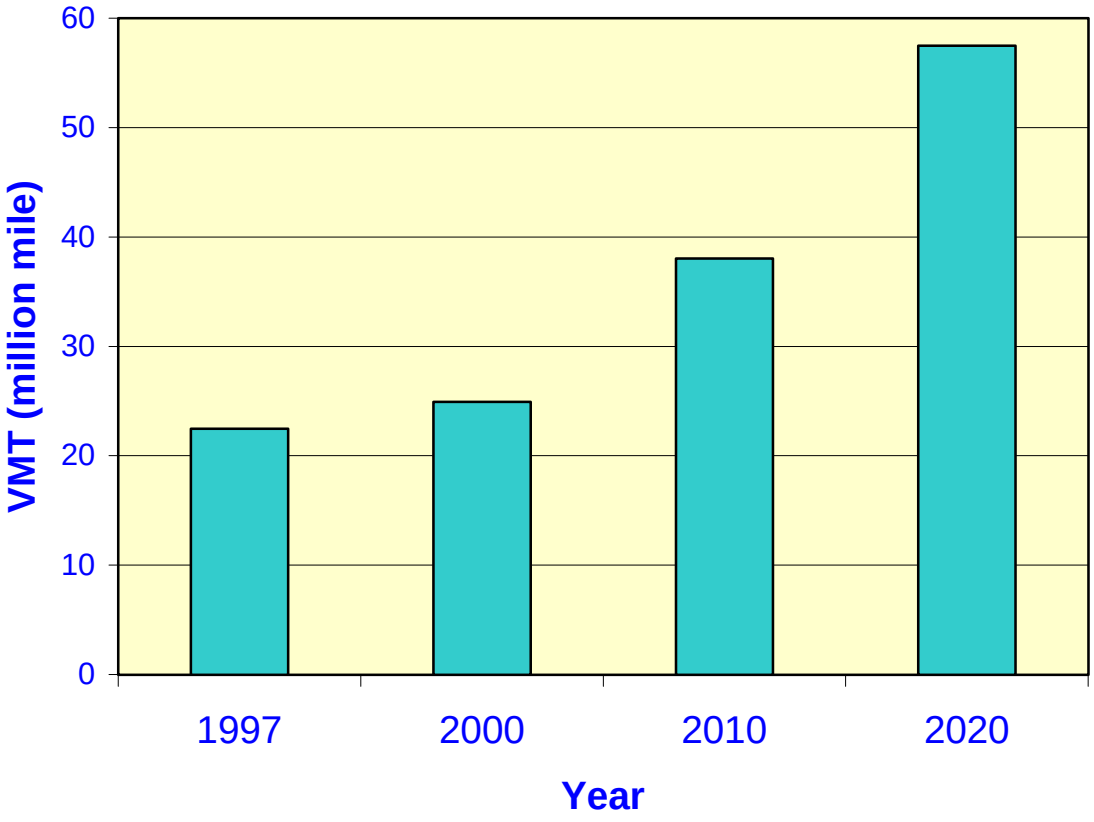


Figure 3: UAM 8-hour Max. CO (ppm)
Dec 8-9, 1996 Episode, Las Vegas

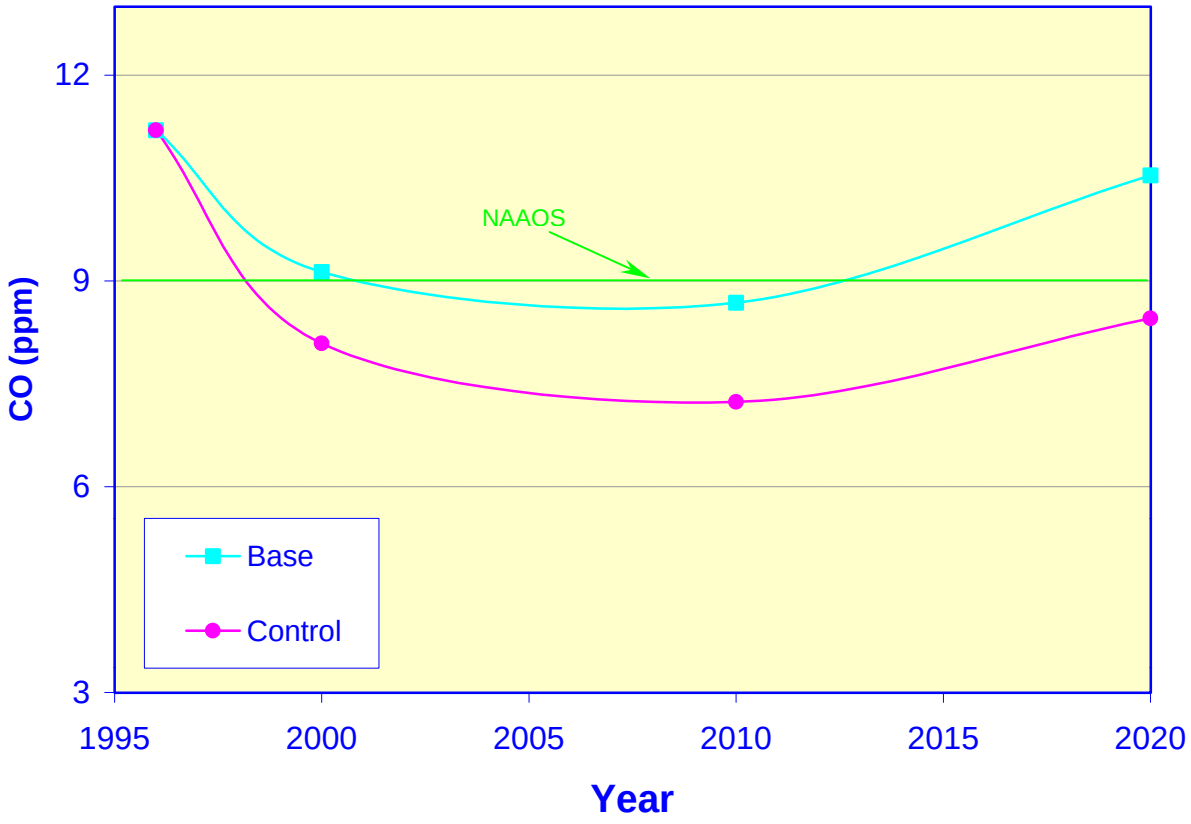


Figure 4: UAM (layer 1) 8-hour Max CO Concentrations, Las Vegas
December 8-9, 1996 Episode

Base Case (no controls)

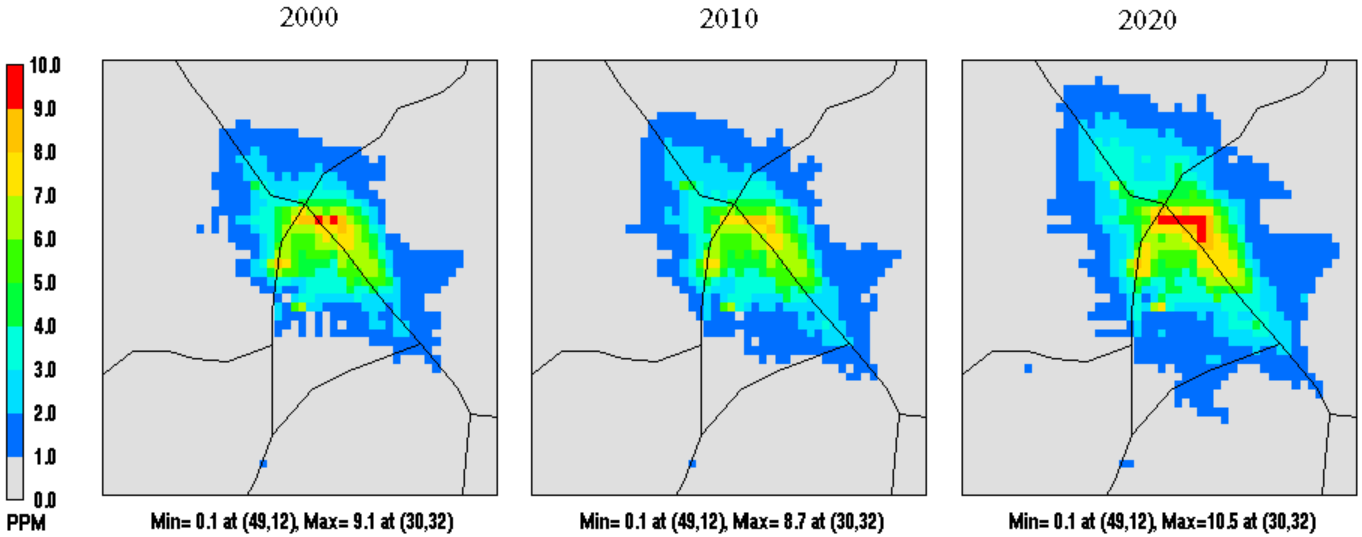
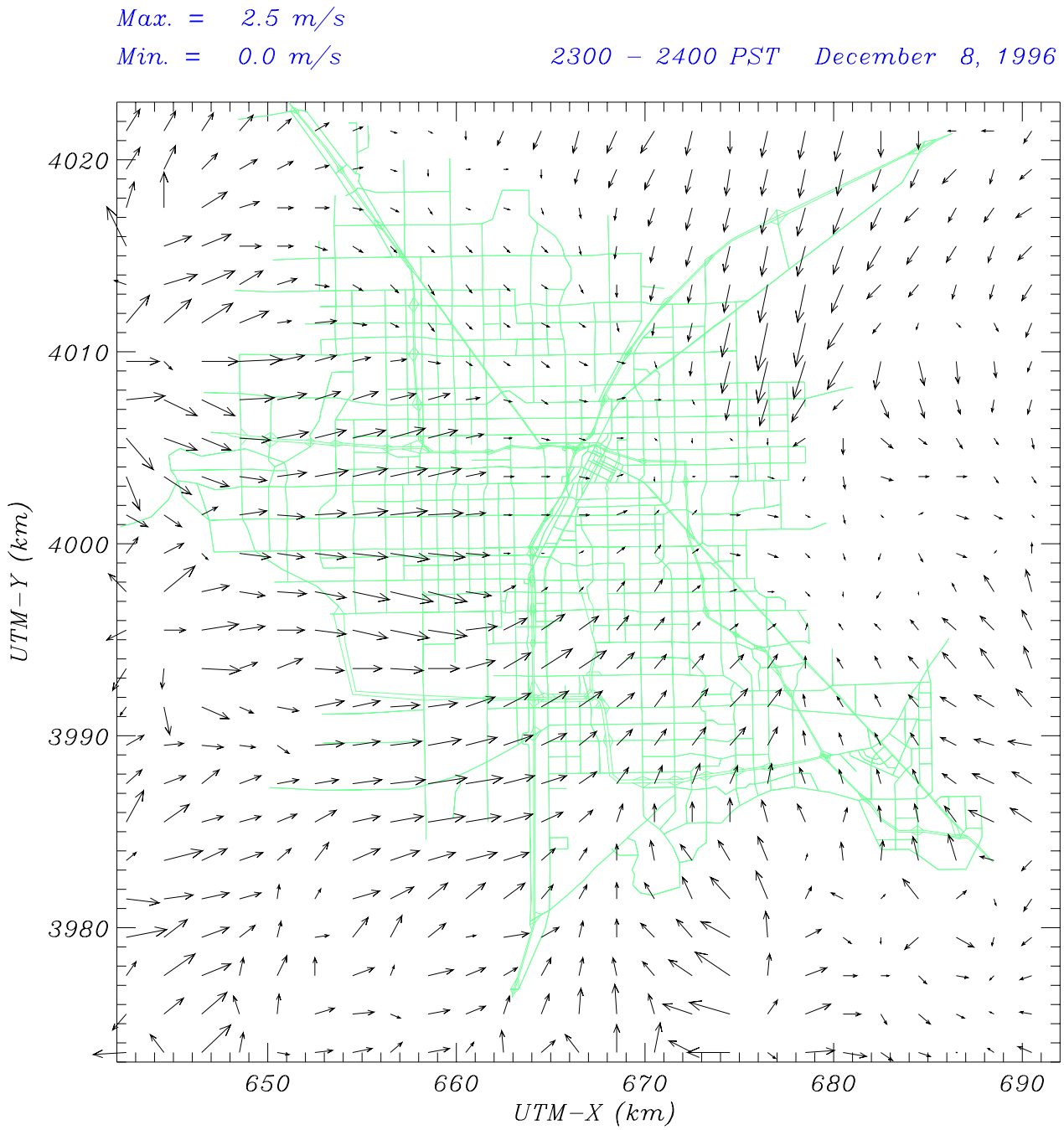


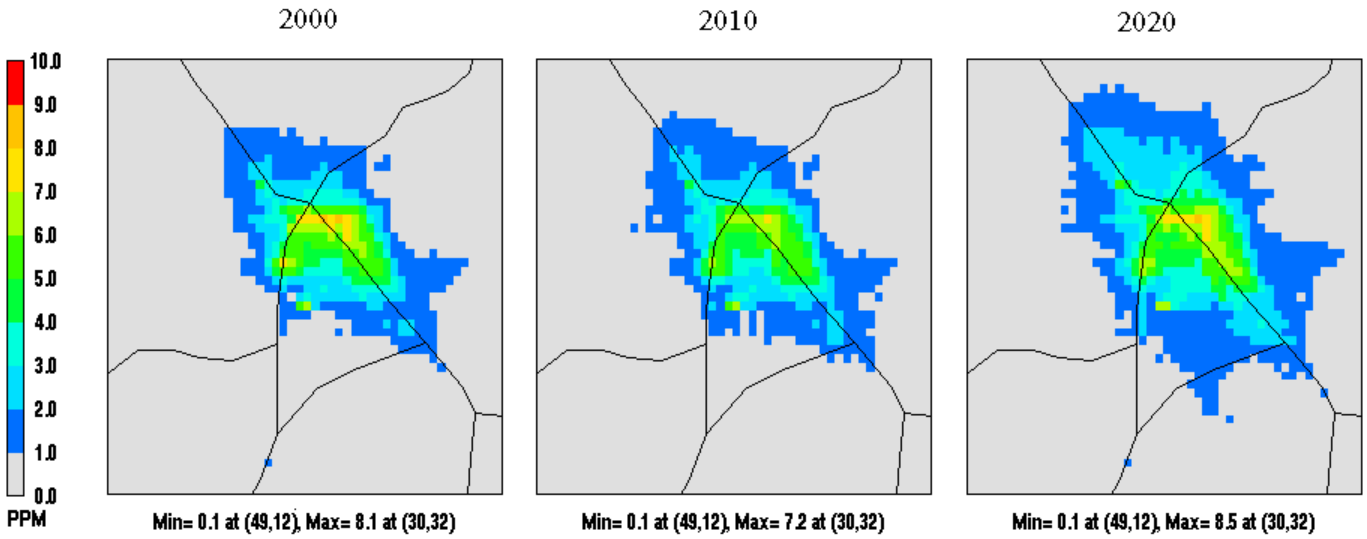
Figure 5: Wind Field for Las Vegas UAM Layer 1



Clark County Department of Comprehensive Planning

Figure 6: UAM (layer 1) 8-hour Max CO Concentrations, Las Vegas
December 8-9, 1996 Episode

Primary Control Case



APPENDIX E

Section Six
Micro-Scale Hot Spot Modeling with CAL3QHC for the Las Vegas Carbon Monoxide State Implementation Plan

DRAFT

Microscale Hot Spot Modeling With CAL3QHC For Las Vegas CO SIP

by

Clark County Department of Comprehensive Planning
500 S. Grand Central Parkway
PO Box 551741
Las Vegas, NV 89155-1741

May 16, 2000

Introduction

Clark County Department of Comprehensive Planning (CCDCP) has conducted microscale hot spot modeling analysis with the CAL3QHC model as part of the Las Vegas Valley year 2000 attainment demonstration of the National Ambient Air Quality Standards (NAAQS) for carbon monoxide (CO). The attainment demonstration is a major component of the CO State Implementation Plan (SIP) for the Las Vegas Valley nonattainment area. The microscale hot spot modeling is also conducted to demonstrate the maintenance of the CO standard in the out years of 2010 and 2020, and therefore to establish the mobile source emissions budgets for the transportation conformity determinations in the future. CAL3QHC is a microcomputer based model used to predict CO or inert pollutant concentrations from motor vehicles at roadway intersections, and is the model recommended by the U.S. EPA for CO attainment demonstration.

CO hot spot modeling for three intersections at the "five points" region of Las Vegas has been completed for the episode of December 8-9, 1996 following the modeling protocol and EPA modeling guidelines (EPA, 1992). The "five points" intersections were chosen for the hot spot analysis due to the high-volume of traffic in the area and the high CO concentrations observed in the nearby monitors (Sunrise Acres and Marnel Field) during this episode. The three intersections included in the mircoscale hot spot analysis are:

1) East Charleston and Eastern
2) East Charleston and Fremont
3) Eastern and Fremont

Methodology for Using CAL3QHC

The EPA guidelines recommend the use of combined highest 8-hour running average CO concentrations from the roadway intersection modeling with CAL3QHC (Version 2) and the area-wide models, such as Urban Airshed Model (UAM), for attainment demonstration of CO NAAQS. The UAM modeling analyses for the Las Vegas Valley were conducted by ENVIRON International Corporation and CCDCP. The descriptions of the UAM modeling can be found in *The Las Vegas Valley Carbon Monoxide Urban Airshed Model Update Project – Phase II: Modeling to Demonstrate Attainment of the Carbon Monoxide Standard* (Emery et al., 1999), and in *Supplemental Urban Airshed Model Analysis for the Las Vegas Valley Carbon Monoxide attainment demonstration* (CCDCP, 2000). The combined highest 8-hour running average concentration was calculated by the following method:

1) Modeling hourly CO concentrations over the episode period using the CAL3QHC microscale model;

2) Combining 1-hour average microscale CO concentrations with 1-hour average background or neighborhood CO concentrations generated from the UAM in the four grid cells immediately surrounding the roadway intersection;

3) Calculating an 8-hour running average of CO concentrations over the highest continual eight hours.

The input data regarding the intersection geometrics, dimensions, and average signal cycle and times are the same as used in the 1992 CO attainment demonstration modeling generated by BRW (BRW, 1992). Cross-section and link coordinate/receptor diagrams for the three modeled intersections are included in **Attachment A**. Hourly wind speeds and directions from the UAM grid cell where the intersections are located were also used in the CAL3QHC model. Hourly wind speeds and directions at the "five points" intersections are shown in **Table 1**. CAL3QHC user's guide (EPA, 1995) suggests that the wind speed should be at least 1 meter/second (m/s) as CAL3QHC has not been validated for wind speeds below 1 m/s. Therefore, the default wind speed of 1 m/s was used for the intersection modeling due to the calm wind conditions for the episode. Since the intersections were located in the urban area, the stability class D, as suggested in the EPA guideline, was used for the intersection modeling. Hourly idle and running vehicle emission rates were calculated using MOBILE5b, the same as was used for the UAM modeling. Note that the "off-cycle" emissions were incorporated in the MOBILE5b by ENVIRON for the UAM emission processing. The samples of the CAL3QHC input files at the three intersections for 2000 are included in **Attachment B.**

Table 1 : UAM Hourly Wind Speeds and Directions
December 8 - 9, 1996

Hour	Wind Speed (m/s)	Wind Direction (Degrees)
15 - 16	0.63	130
16 - 17	0.50	180
17 - 18	0.38	170
18 - 19	0.22	250
19 - 20	0.23	240
20 - 21	0.13	270
21 - 22	0.14	180
22 - 23	0.26	250
23 - 24	0.12	270
0 - 1	0.18	240
1 - 2	0.19	270
2 - 3	0.30	250
3 - 4	0.25	240
4 - 5	0.33	240
5 - 6	0.18	240
6 - 7	0.20	220
7 - 8	0.17	270
8 - 9	0.23	80
9 - 10	0.39	100
10 - 11	0.31	180

Hourly turn movement traffic volumes for the three modeled intersections were provided by Regional Transportation Commission (RTC). Those turn movement volumes were derived from RTC's transportation model for 2000, 2010, and 2020. The RTC model results were also adjusted based on Nevada Department of Transportation (NDOT) traffic counts at the three intersections. According to RTC (**Attachment E**), the travel demand, in some cases, at these intersections exhibits a decline trend in recent years. Hourly turn movement volumes for the three modeled intersections are presented in **Attachment C**.

Primary Control Scenario

The primary control scenario includes the following control measures:

1) I/M Technician Training
2) Wintertime Cleaner Burning Gasoline (CBG)
3) Alternative Fuels Program for Government Fleets
4) Transportation Control Measures/Traffic Demand Management (TCM/TDM)

With the exception of I/M Technical Training, MOBILE5b cannot directly estimate the benefits of the control measures listed above such as CBG, alternative fuels, and TCM/TDM. Therefore, the emission rates were calculated first with MOBILE5b without the benefits of these controls, and then were adjusted with control factors to account for the benefits of these controls. The control factors are based on those used for UAM modeling. Hourly temperatures utilized for the episode were consistent with the UAM emission processing. The running and idle vehicle emission rates along with hourly temperatures and vehicle speeds used as inputs to CAL3QHC are shown in **Table 2**.

Table 2: Hourly Emission Rates, Temperatures and Vehicle Speeds at the modeled intersections December 8 - 9, 1996 Episode

			2000		2010		2020	
Hour	**Air Tempe-rature (F)**	**Vehicle Speed (MPH)**	**Running Emission Rate (g/mile)**	**Idle Emission Rate (g/hr)**	**Running Emission Rate (g/mile)**	**Idle Emission Rate (g/hr)**	**Running Emission Rate (g/mile)**	**Idle Emission Rates (g/hr)**
15 - 16	66	30	8.0	151	6.4	113	6.0	106
16 - 17	62	30	8.5	161	6.8	120	6.3	113
17 - 18	58	30	8.9	169	7.1	126	6.6	118
18 - 19	55	30	9.3	177	7.4	131	6.9	124
19 - 20	53	30	9.9	188	7.8	138	7.3	130
20 - 21	51	30	9.9	188	7.8	139	7.3	131
21 - 22	50	30	9.7	184	7.7	138	7.3	129
22 - 23	48	30	9.7	184	7.8	139	7.3	131
23 - 24	47	30	9.7	184	7.9	140	7.4	131
0 - 1	45	30	9.8	184	7.9	141	7.4	132
1 - 2	44	30	10.0	189	8.1	144	7.6	135
2 - 3	44	30	9.8	185	8.0	142	7.5	134
3 - 4	43	30	10.0	189	8.1	144	7.6	136
4 - 5	42	30	9.7	183	8.0	142	7.5	134
5 - 6	42	30	9.8	184	8.0	143	7.5	134
6 - 7	42	30	9.8	184	8.0	143	7.5	134
7 - 8	44	30	9.8	184	8.0	142	7.5	133
8 - 9	49	30	9.4	178	7.6	135	7.1	127
9 - 10	51	30	9.9	189	7.9	140	7.4	131
10 - 11	55	30	9.7	185	7.6	136	7.2	128

Modeling Results

To remain consistent with the UAM analyses, UAM concentrations were scaled by a factor of 1.14 for all years before being added to the CAL3QHC results (see Emery et al., 1999). **Table 3** summarizes the maximums of area-wide and mircoscale CO concentrations predicted from UAM and CAL3QHC for the primary control scenario. Both 1-hour and 8-hour average CAL3QHC + UAM concentrations by intersection are presented in **Attachment D**.

The combined results in **Table 3** show that the highest predicted 8-hour CO concentration is 8.3 ppm at the Eastern and Charleston intersection in year 2000. According to EPA's guidance, the combined results from the roadway intersection modeling and the area-wide modeling should show no predicted 8-hour maximum concentrations greater than 9.0 ppm in order to demonstrate attainment of the CO NAAQS. Therefore, we believe that the primary controls will result in sufficient emission reductions to reach attainment of the CO NAAQS in the Las Vegas Valley in December 2000. The combined model results also show that CO levels at the three modeled intersections would maintain the CO standard with the adoption of the proposed primary controls in the out years of 2010 and 2020.

Table 3: Maximum 8-Hour CO Concentrations at Five Point Intersections
December 8 - 9, 1996 Episode

Intersections	2000		2010		2020	
	Maximum UAM +CAL3Q (ppm)	Maximum UAM (ppm)	Maximum UAM +CAL3Q (ppm)	Maximum UAM (ppm	Maximum UAM +CAL3Q (ppm)	Maximum UAM (ppm)
Charleston/Eastern	8.3	5.9	7.3	5.2	7.6	5.7
Charleston/Fremont	6.7	5.9	5.9	5.2	6.4	5.7
Eastern/Fremont	7.6	5.9	6.6	5.2	7.4	5.7

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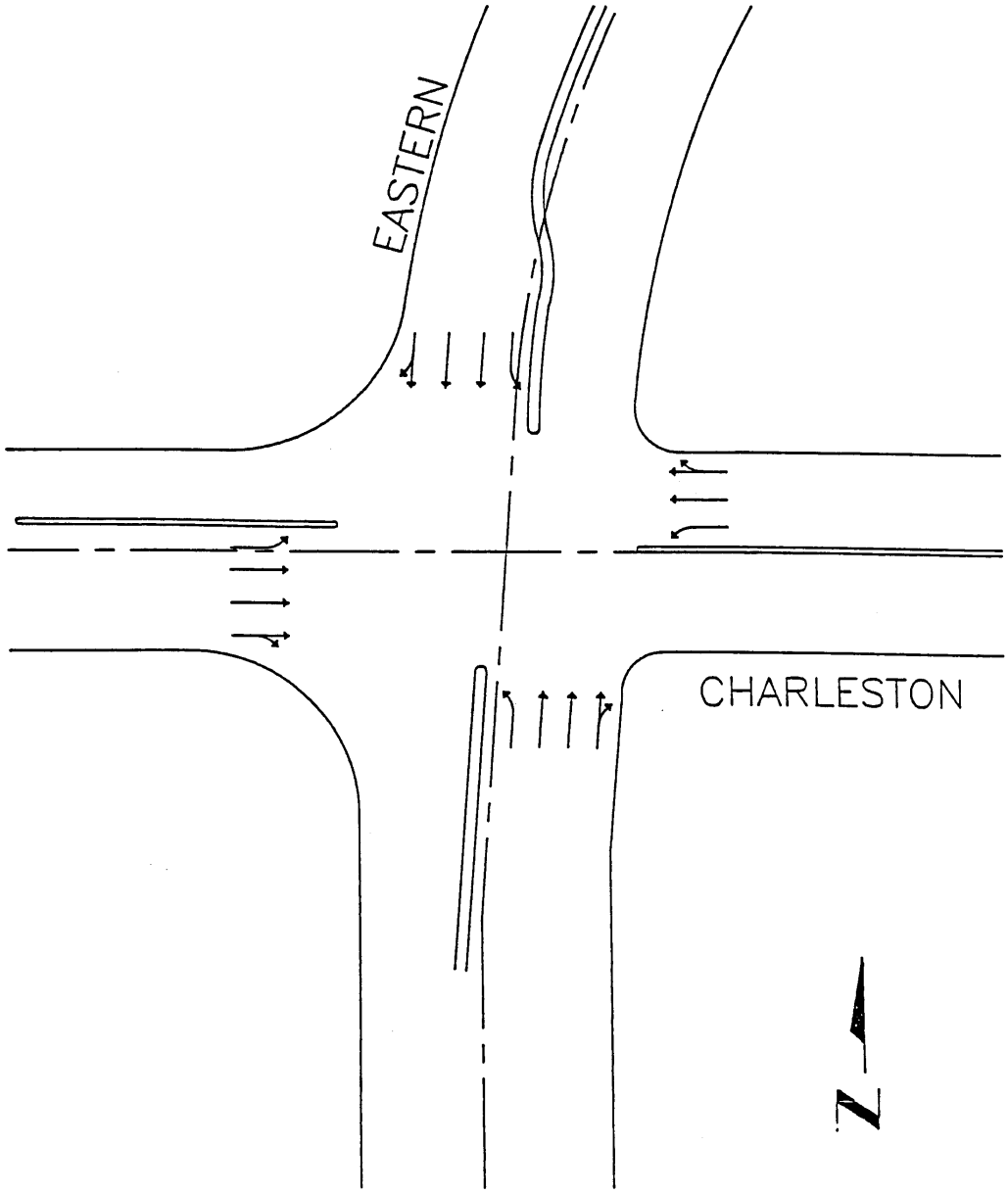
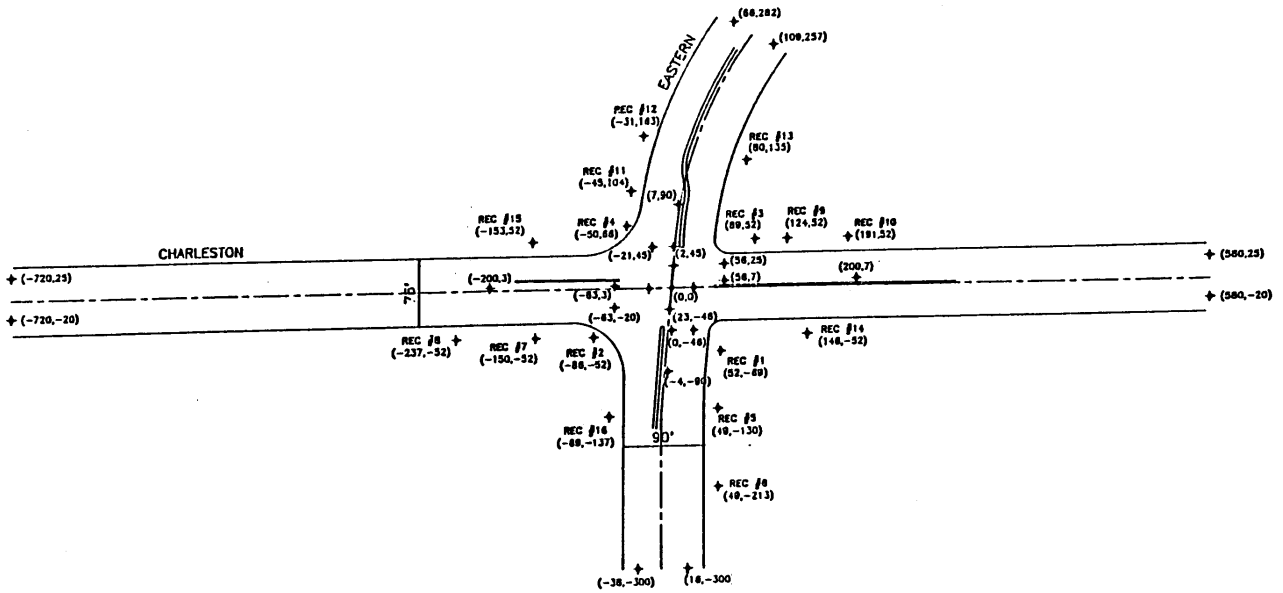
Attachment A

Cross-section and link coordinate/receptor diagrams for the three modeled intersections



CHARLESTON/EASTERN
LANE CONFIGURATION
BRW !NC. 4-28-92 BFR
SCALE: 1"=50'



CHARLESTON/EASTERN
RECEPTOR LOCATIONS
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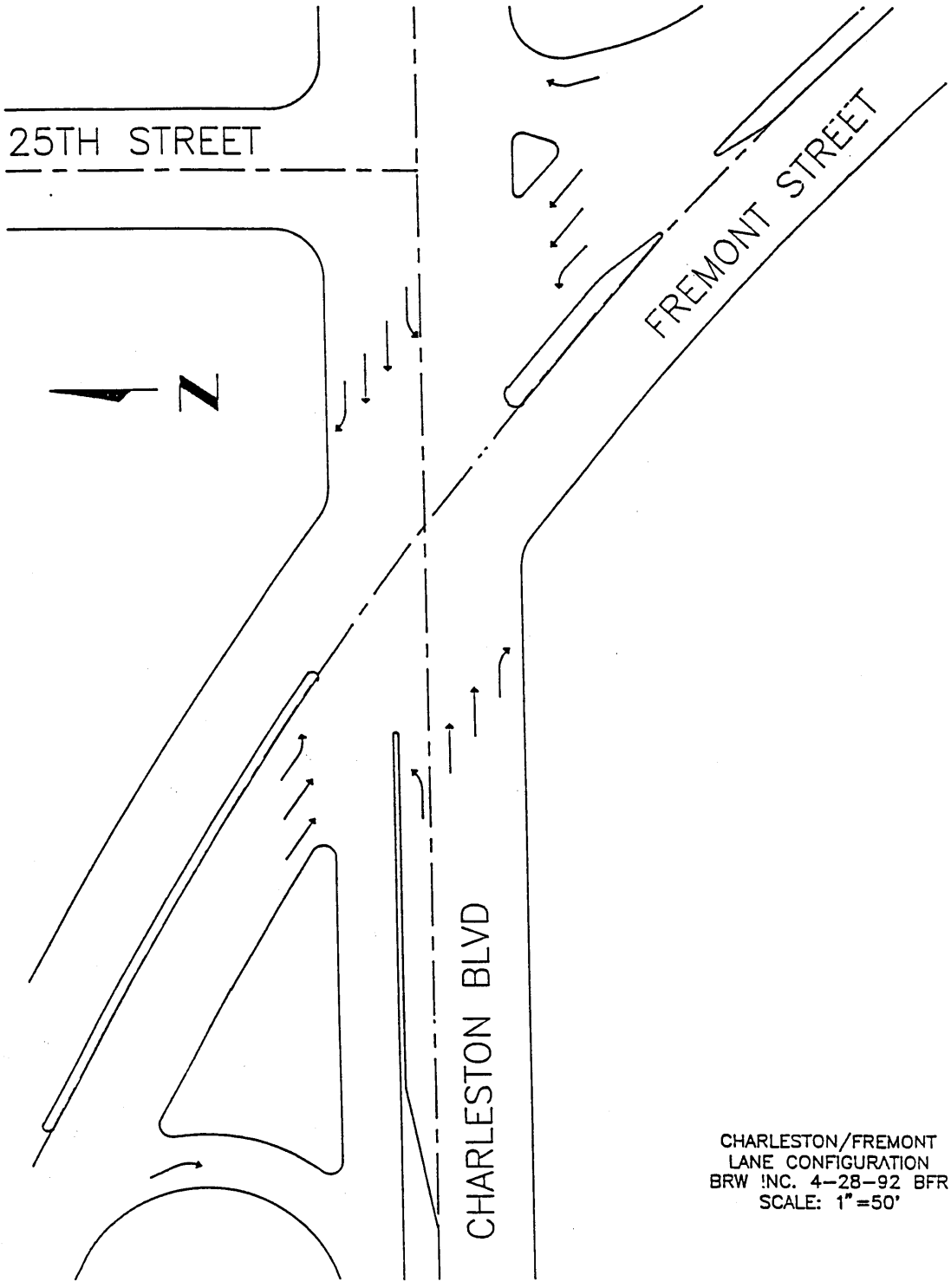

CHARLESTON/FREMONT
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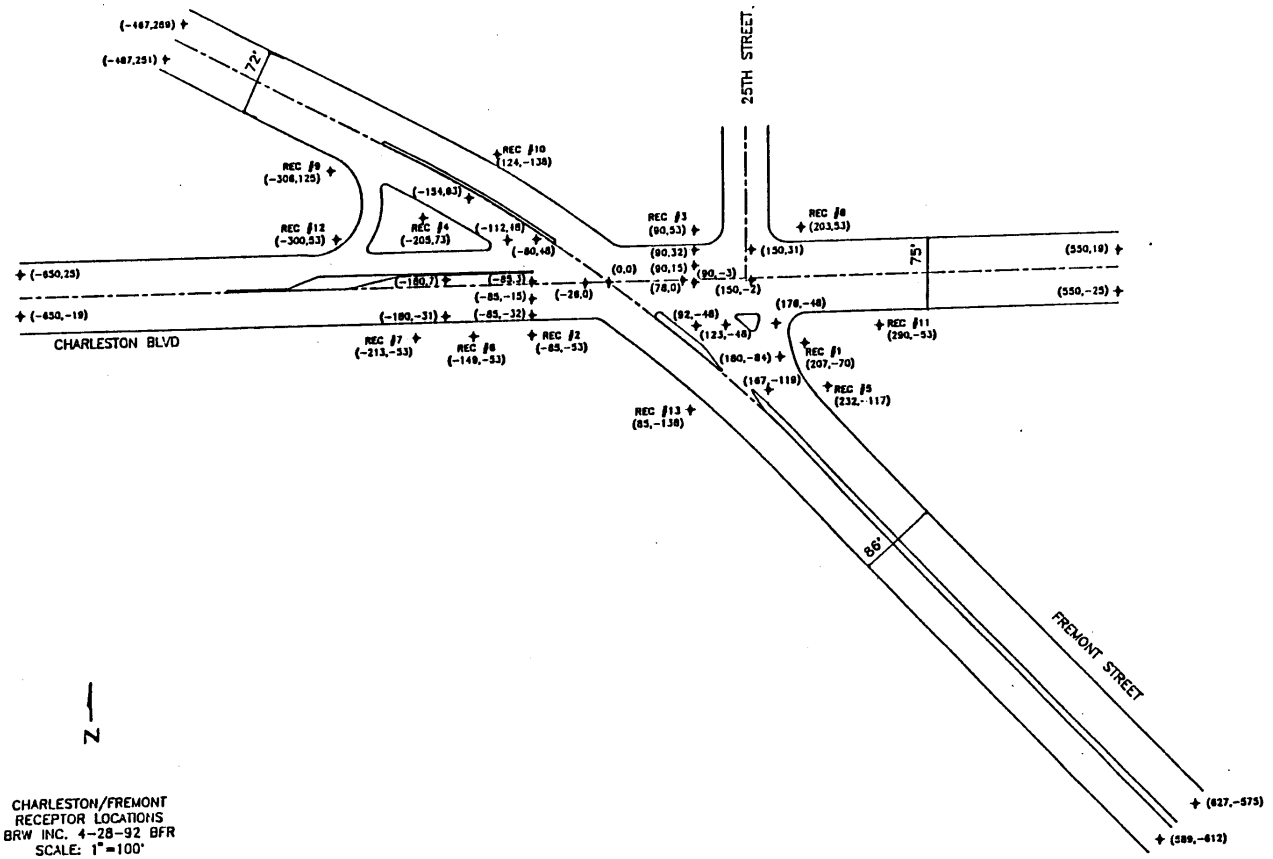

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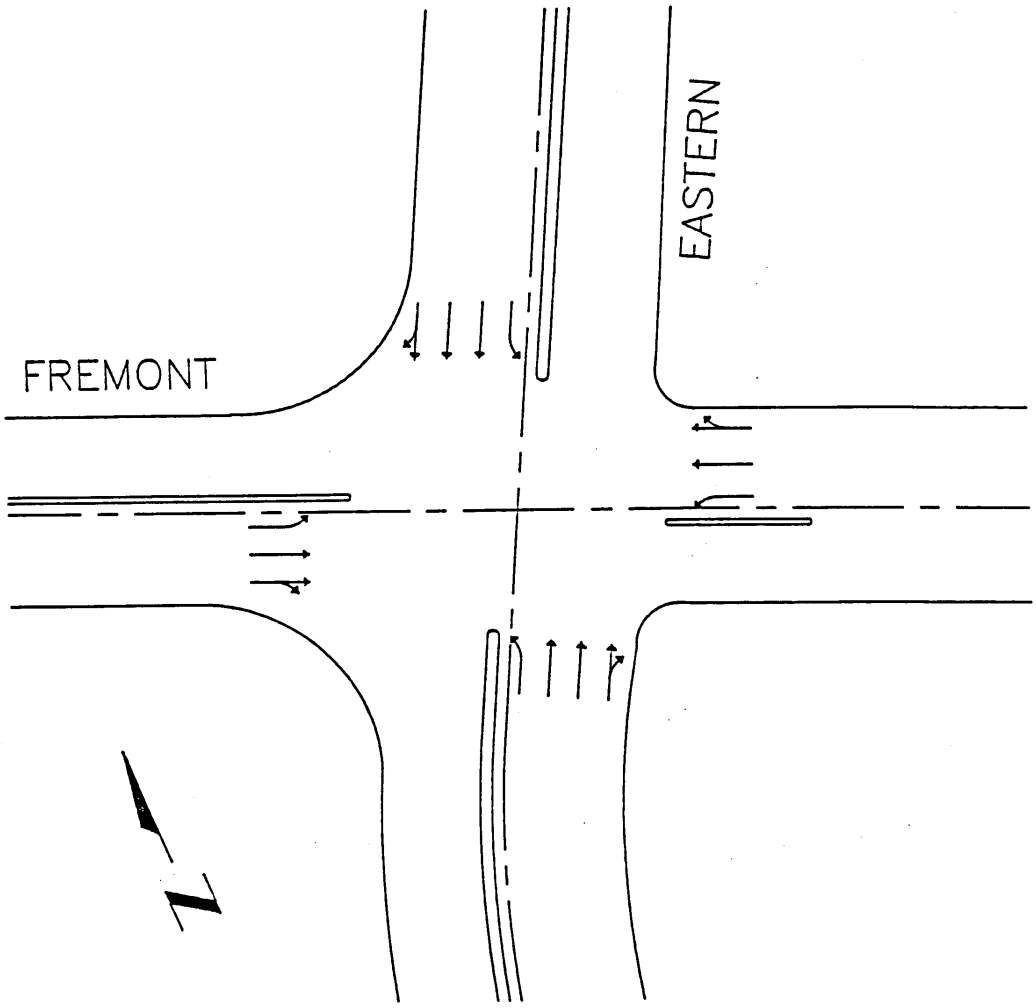
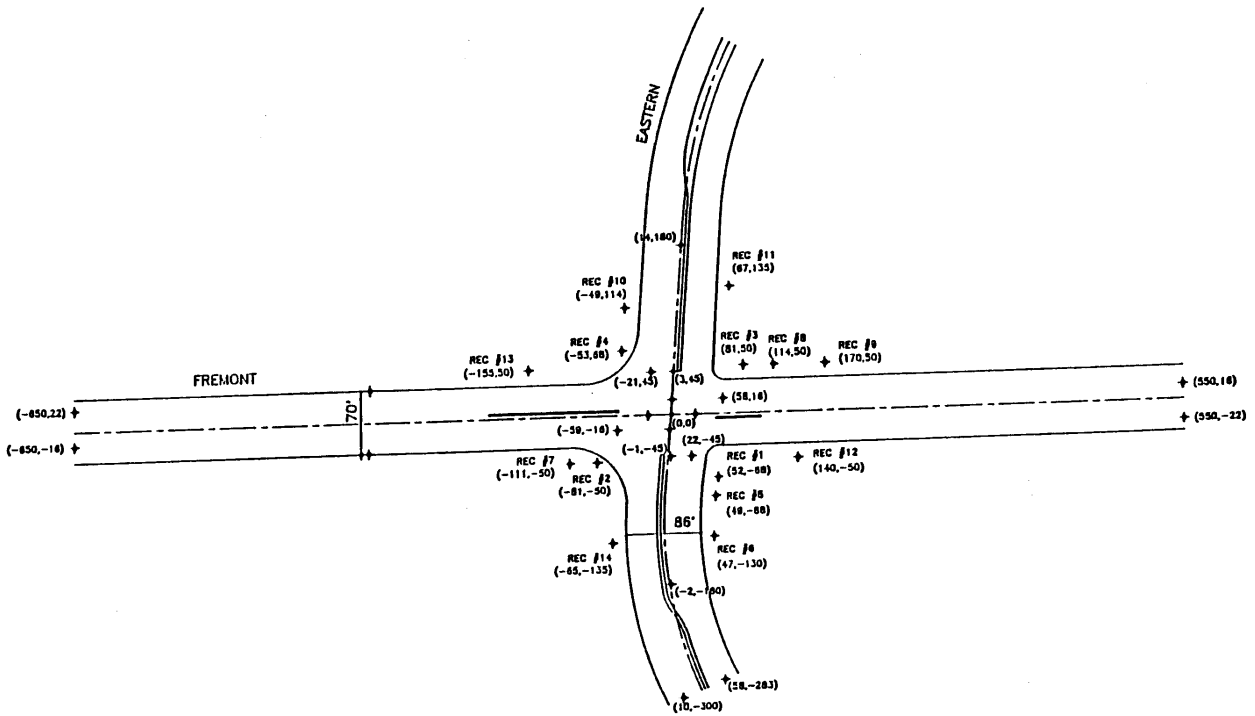


FREMONT/EASTERN
LANE CONFIGURATION
BRW INC. 4-28-92 BFR
SCALE: 1"=50'

FREMONT/EASTERN
RECEPTOR LOCATIONS
BRW INC. 4-28-92 BFR
SCALE: 1"=100'



Attachment B

Samples of CAL3QHC input files
At Five-Point Intersections

December 8 - 9, 1996 Episode

```
'CHARLESTON/EASTERN INT. (HOUR 16)  '       60.  175.   0. 0.  16    0.3048 1 1
'REC 1 (SE CORNER)    '        47.      -69.      6.0
'REC 2 (SW CORNER)    '       -86.      -52.      6.0
'REC 3 (NE CORNER)    '        89.       47.      6.0
'REC 4 (NW CORNER)    '       -50.       68.      6.0
'REC 5 (NB MID Q)     '        44.     -130.      6.0
'REC 6 (NB END Q)     '        44.     -213.      6.0
'REC 7 (EB MID Q)     '      -150.      -47.      6.0
'REC 8 (EB END Q)     '      -237.      -47.      6.0
'REC 9 (WB MID Q)     '       124.       47.      6.0
'REC 10 (WB END Q)    '       191.       47.      6.0
'REC 11 (SB MID Q)    '       -40.      104.      6.0
'REC 12 (SB END Q)    '       -26.      163.      6.0
'REC 13 (NB DEP)      '        75.      135.      6.0
'REC 14 (EB DEP)      '       146.      -47.      6.0
'REC 15 (WB DEP)      '      -153.       47.      6.0
'REC 16 (SB DEP)      '       -64.     -137.      6.0
'CHARLESTON/EASTERN INT. (HOUR 16)  '      16  1  1  'C'
  1
'EASTERN NB APPR      '  'AG'    16.  -300.    23.     0. 1289.   8.0  0. 54.
  2
'EASTERN NB QUEUE     '  'AG'    23.   -46.    16.  -300.    0.  34.0   3
       132        83       2.0 1168  151. 1800 2 0
  2
'EASTERN NB Q. LEFT   '  'AG'     0.   -46.    -4.   -90.    0.  11.0   1
       132       121       2.0  123  151. 1800 2 0
  1
'EASTERN NB DEP       '  'AG'    23.     0.   109.   257. 1180.   8.0  0. 54.
  1
'EASTERN SB APPR      '  'AG'    66.   282.   -23.     0. 1001.   8.0  0. 54.
  2
'EASTERN SB QUEUE     '  'AG'   -21.    45.    66.   282.    0.  34.0   3
       132        83       2.0  971  151. 1800 2 0
  2
'EASTERN SB LEFT      '  'AG'     2.    45.     7.    90.    0.  11.0   1
       132       121       2.0   30  151. 1800 2 0
  1
'EASTERN SB DEP       '  'AG'   -23.     0.   -38.  -300. 1162.   8.0  0. 54.
  1
'CHARSTN EB APPR      '  'AG'  -720.   -20.     0.   -20. 1028.   8.0  0. 54.
  2
'CHARSTN EB QUEUE     '  'AG'   -63.   -20.  -720.   -20.    0.  34.0   3
       132        84       2.0  884  151. 1800 2 0
  2
'CHARSTN EB Q. LEFT   '  'AG'   -63.     3.  -200.     3.    0.  11.0   1
       132       112       2.0  144  151. 1800 2 0
  1
'CHARSTN EB DEP       '  'AG'     0.   -20.   580.   -20.  900.   8.0  0. 54.
  1
'CHARSTN WB APPR      '  'AG'   580.    25.     0.    25. 1080.   8.0  0. 55.
  2
'CHARSTN WB QUEUE     '  'AG'    56.    25.   580.    25.    0.  24.0   2
       132        81       2.0  896  151. 1800 2 0
  2
'CHARSTN WB Q. LEFT   '  'AG'    56.     7.   200.     7.    0.  11.0   1
       132       115       2.0  183  151. 1800 2 0
  1
'CHARSTN WB DEP       '  'AG'     0.    25.  -720.    25. 1161.   8.0  0. 44.
 1.0  130  4  1000. 0.0  'N' 0 0 0
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'CHARLESTON/FREMONT INT. (HOUR 16)  '       60.  175.   0. 0.  13    0.3048 1 1
'REC 1 (SE CORNER)   '       207.      -70.      6.0
'REC 2 (SW CORNER)   '       -85.      -48.      6.0
'REC 3 (NE CORNER)   '        90.       48.      6.0
'REC 4 (NW CORNER)   '      -205.       76.      6.0
'REC 5 (NB END Q)    '       228.     -117.      6.0
'REC 6 (EB MID Q)    '      -149.      -48.      6.0
'REC 7 (EB END Q)    '      -213.      -48.      6.0
'REC 8 (WB END Q)    '       203.       48.      6.0
'REC 9 (SB END Q)    '      -306.      125.      6.0
'REC 10 (NB DEP)     '       124.     -136.      6.0
'REC 11 (EB DEP)     '       290.      -48.      6.0
'REC 12 (WB DEP)     '      -300.      -53.      6.0
'REC 13 (SB DEP)     '        88.     -138.      6.0
'CHARLESTON/FREMONT INT. (HOUR 16)  '      18  1  1  'C'
  1
'FREMONT NB APPR     '  'AG'   627.  -575.    78.     0.  808.   8.0  0. 63.
  2
'FREMONT NB QUEUE    '  'AG'   123.   -48.   627.  -575.    0.  32.0   3
       67        48       2.0  644  151. 1800 2 0
  2
'FREMONT NB Q. LEFT  '  'AG'    92.   -48.   167.  -119.    0.  11.0   1
       67        48       2.0  163  151. 1800 2 0
  2
'FREMONT NB Q. RGHT  '  'AG'   176.   -48.   180.   -84.    0.  11.0   1
       67        41       2.0   17  151. 1800 2 0
  1
'FREMONT NB DEP      '  'AG'    78.     0.  -467.   289.  709.   8.0  0. 52.
  1
'FREMONT SB APPR     '  'AG'  -487.   251.   -26.     0.  790.   8.0  0. 55.
  2
'FREMONT SB QUEUE    '  'AG'  -112.    48.  -487.   251.    0.  24.0   2
       67        52       2.0  605  151. 1800 2 0
  2
'FREMONT SB LEFT     '  'AG'   -80.    48.  -154.    93.    0.  11.0   1
       67        52       2.0  185  151. 1800 2 0
  1
'FREMONT SB DEP      '  'AG'   -26.     0.   589.  -612. 1085.   8.0  0. 55.
  1
'CHARSTN EB APPR     '  'AG'  -650.   -19.     0.   -19.  951.   8.0  0. 58.
  2
'CHARSTN EB QUEUE    '  'AG'   -85.   -15.  -650.   -15.    0.  24.0   2
       67        45       2.0  945  151. 1800 2 0
  2
'CHARSTN EB Q. RGHT  '  'AG'   -85.   -31.  -180.   -31.    0.  11.0   1
       67        26       2.0    5  151. 1800 2 0
  1
'CHARSTN EB DEP      '  'AG'     0.   -19.   550.   -25.  857.   8.0  0. 44.
  1
'CHARSTN WB APPR     '  'AG'   550.    19.     0.    19. 1071.   8.0  0. 58.
  2
'CHARSTN WB QUEUE    '  'AG'    90.    15.   550.    19.    0.  24.0   2
       67        38       2.0  846  151. 1800 2 0
  2
'CHARSTN WB Q. LEFT  '  'AG'    90.    -3.   150.    -3.    0.  12.0   1
       67        60       2.0  161  151. 1800 2 0
  2
'CHARSTN WB Q. RGHT  '  'AG'    90.    31.   150.    31.    0.  11.0   1
       67        23       2.0   65  151. 1800 2 0
  1
'CHARSTN WB DEP      '  'AG'     0.    19.  -650.    25. 1003.   8.0  0. 44.
 1.0  130  4  1000. 0.0  'N' 0 0 0
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'FREMONT/EASTERN INT. (HOUR 16)     '       60.  175.   0. 0.  14    0.3048 1 1
'REC 1 (SE CORNER)   '        47.      -68.      6.0
'REC 2 (SW CORNER)   '       -81.      -50.      6.0
'REC 3 (NE CORNER)   '        81.       47.      6.0
'REC 4 (NW CORNER)   '       -53.       68.      6.0
'REC 5 (NB MID Q)    '        44.      -88.      6.0
'REC 6 (NB END Q)    '        42.     -130.      6.0
'REC 7 (EB END Q)    '      -111.      -45.      6.0
'REC 8 (WB MID Q)    '       114.       45.      6.0
'REC 9 (WB END Q)    '       170.       45.      6.0
'REC 10 (SB END Q)   '       -44.      114.      6.0
'REC 11 (NB DEP)     '        62.      135.      6.0
'REC 12 (EB DEP)     '       140.      -45.      6.0
'REC 13 (WB DEP)     '      -155.       45.      6.0
'REC 14 (SB DEP)     '       -60.     -135.      6.0
'FREMONT/EASTERN INT. (HOUR 16)     '      14  1  1  'C'
  1
'EASTERN NB APPR     '  'AG'    58.  -283.    22.     0. 1023.   8.0  0. 54.
  2
'EASTERN NB QUEUE    '  'AG'    22.   -45.    58.  -283.    0.  34.0   3
        74        34       2.0  915  151. 1800 2 0
  2
'EASTERN NB Q. LEFT  '  'AG'    -1.   -45.    -2.  -180.    0.  11.0   1
        74        66       2.0  107  151. 1800 2 0
  1
'EASTERN NB DEP      '  'AG'    22.     0.   368.   722. 1144.   8.0  0. 54.
  1
'EASTERN SB APPR     '  'AG'   331.   758.   -21.     0. 1147.   8.0  0. 54.
  2
'EASTERN SB QUEUE    '  'AG'   -21.    45.   331.   758.    0.  34.0   3
        74        34       2.0  964  151. 1800 2 0
  2
'EASTERN SB LEFT     '  'AG'     3.    45.    14.   180.    0.  11.0   1
        74        66       2.0  184  151. 1800 2 0
  1
'EASTERN SB DEP      '  'AG'   -21.     0.    10.   300. 1046.   8.0  0. 54.
  1
'FREMONT EB APPR     '  'AG'  -650.   -16.     0.   -16.  747.   8.0  0. 48.
  2
'FREMONT EB QUEUE    '  'AG'   -59.   -16.  -650.   -16.    0.  38.0   3
        74        52       2.0  747  151. 1800 2 0
  1
'FREMONT EB DEP      '  'AG'     0.   -16.   550.   -22.  790.   8.0  0. 48.
  1
'FREMONT WB APPR     '  'AG'   550.    16.     0.    16.  726.   8.0  0. 48.
  2
'FREMONT WB QUEUE    '  'AG'    58.    16.   550.    16.    0.  38.0   3
        74        52       2.0  726  151. 1800 2 0
  1
'FREMONT WB DEP      '  'AG'     0.    16.  -650.    22.  699.   8.0  0. 48.
 1.0  130  4  1000. 0.0  'N' 0 0 0
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Attachment C

Hourly Turn Movement Traffic Volumes
At Five-Point Intersections
For 2000, 2010, and 2020

2000 TIP Model Hourly Turn Movement Volumes
Intersection of Eastern at Charleston

Hour	Southbound (from North)					Northbound (from South)					Westbound (from East)					Eastbound (from West)				
Ending	Left	Throu	Rights	App.	Dept.	Left	Throu	Rights	App.	Dept.	Left	Throu	Rights	App.	Dept.	Left	Throu	Rights	App.	Dept.
1	1	58	8	67	105	42	125	7	173	141	22	106	1	129	155	16	93	24	133	104
2	1	56	8	64	83	29	87	6	121	96	12	59	1	72	95	10	57	14	81	65
3	1	60	8	69	81	22	68	7	98	76	8	35	1	42	68	8	46	12	65	54
4	2	122	17	140	141	14	41	14	68	47	9	40	1	48	74	6	34	8	49	47
5	4	338	47	389	366	14	45	39	99	52	14	67	1	82	141	7	37	10	53	70
6	10	832	114	956	889	32	95	95	222	103	38	183	1	222	355	8	47	12	66	125
7	10	850	118	977	982	84	254	97	435	274	103	502	3	608	716	22	127	33	183	212
8	9	749	103	861	1009	156	472	85	713	516	217	1053	7	1276	1296	46	271	70	386	354
9	9	756	104	869	1044	176	532	86	795	594	219	1060	7	1286	1325	61	354	91	506	443
10	7	640	88	737	943	188	570	72	832	660	183	889	5	1078	1155	83	485	125	693	571
11	10	891	123	1023	1220	196	592	100	888	702	175	847	5	1027	1169	99	578	148	825	692
12	11	992	137	1140	1347	212	643	112	968	769	176	853	5	1034	1211	111	650	167	929	778
13	32	861	157	1050	1193	88	737	149	972	896	184	887	11	1082	1136	137	691	146	974	865
14	35	946	173	1154	1272	100	842	163	1105	985	187	901	11	1099	1183	128	650	137	917	835
15	33	897	164	1093	1241	115	964	154	1233	1111	200	962	12	1173	1243	136	689	146	971	869
16	30	821	150	1001	1162	123	1026	142	1289	1180	183	885	11	1080	1161	144	730	154	1028	900
17	22	605	110	738	962	133	1114	104	1351	1278	191	919	11	1121	1154	154	780	165	1100	920
18	17	451	83	551	777	140	1170	78	1386	1332	147	712	9	870	929	157	793	168	1118	910
19	11	304	56	370	538	86	723	52	861	839	117	563	7	686	696	107	544	115	766	622
20	9	242	44	296	427	68	566	42	676	652	101	486	5	592	589	79	403	85	567	464
21	7	203	37	249	350	56	470	35	560	540	74	356	4	434	444	66	336	71	472	386
22	6	148	27	180	255	46	390	25	462	441	53	254	3	310	325	49	252	53	355	289
23	4	109	20	133	188	30	254	18	302	293	39	185	2	227	234	37	187	40	263	215
24	2	72	14	87	132	23	195	13	229	220	36	171	2	209	204	25	126	27	178	145
Total	281	12001	1910	14192	16708	2173	11975	1693	15841	13798	2686	12975	127	15788	17058	1696	8959	2021	12676	10933

2000 TIP Model Hourly Turn Movement Volumes
Intersection of Fremont at Charleston

Hour	Southbound (from North)					Northbound (from South)					Westbound (from East)					Eastbound (from West)				
Ending	Left	Throu	Rights	App.	Dept.	Left	Throu	Rights	App.	Dept.	Left	Throu	Rights	App.	Dept.	Left	Throu	Rights	App.	Dept.
1	46	205	3	253	221	74	156	3	240	168	8	128	9	144	215	3	98	31	133	142
2	30	138	1	171	150	44	93	2	144	102	4	80	5	90	133	3	67	21	91	97
3	29	133	1	165	139	41	86	2	134	92	3	62	4	70	111	2	57	18	77	85
4	22	94	1	117	95	36	76	2	117	80	3	49	3	56	92	1	33	10	44	51
5	16	75	1	93	82	32	67	1	102	74	4	85	5	95	120	1	35	11	47	51
6	22	98	1	120	117	54	113	2	174	129	11	188	13	212	246	2	58	18	78	80
7	43	197	3	243	252	120	254	3	390	296	28	514	35	578	635	5	135	43	182	181
8	76	344	4	425	451	235	497	7	763	577	56	985	67	1106	1224	9	250	78	336	331
9	93	416	5	513	559	226	480	8	736	563	54	956	65	1074	1186	14	356	112	480	461
10	110	497	6	613	674	202	429	9	661	516	49	883	59	991	1088	18	468	147	630	597
11	110	500	6	616	707	234	495	9	762	579	45	792	54	890	1042	20	544	171	732	682
12	128	577	8	712	805	250	530	11	817	627	50	904	61	1015	1169	23	604	190	814	762
13	176	569	4	749	1019	167	658	16	823	719	155	819	62	1037	981	4	599	269	874	792
14	179	580	4	762	1006	171	677	17	846	739	160	843	65	1068	1010	4	563	253	821	754
15	164	530	4	698	995	171	675	15	844	739	159	837	63	1059	1004	4	607	272	885	792
16	185	601	4	790	1085	163	644	17	808	709	161	846	65	1071	1003	5	652	293	951	857
17	192	622	4	816	1139	168	664	18	833	724	149	783	59	991	951	5	725	325	1057	943
18	227	736	5	967	1231	145	573	22	724	628	132	695	52	880	839	5	745	334	1086	991
19	140	452	3	594	794	125	493	13	618	537	109	578	44	731	702	3	474	212	691	626
20	103	331	3	436	597	101	399	10	498	434	93	488	37	618	587	3	352	158	513	465
21	105	339	3	446	568	102	402	10	504	433	80	421	32	533	525	2	317	142	463	428
22	88	283	1	371	437	78	311	9	389	331	55	288	22	365	371	1	228	102	332	316
23	90	289	3	380	394	64	250	9	316	268	47	246	19	312	312	1	167	75	244	251
24	66	214	1	283	289	58	228	7	287	240	34	181	14	228	243	1	120	54	175	181
Total	2439	8819	77	11335	13807	3060	9251	221	12532	10305	1650	12651	914	15215	15788	140	8257	3338	11735	10917

2000 TIP Model Hourly Turn Movement Volumes
Intersection of Eastern at Fremont

Hour	Southbound (from North)					Northbound (from South)					Westbound (from East)					Eastbound (from West)				
Ending	Left	Throu	Rights	App.	Dept.	Left	Throu	Rights	App.	Dept.	Left	Throu	Rights	App.	Dept.	Left	Throu	Rights	App.	Dept.
1	11	112	4	128	144	31	185	1	217	251	4	179	35	219	209	35	234	30	302	235
2	8	80	3	91	102	15	91	1	108	137	3	119	24	144	133	27	173	23	222	173
3	8	77	3	88	96	14	82	1	96	120	3	104	20	126	116	23	149	20	192	150
4	7	64	2	73	81	10	58	1	69	90	1	84	17	104	94	18	121	16	157	123
5	7	66	2	75	81	10	56	1	67	85	3	87	17	105	95	16	102	13	132	106
6	22	210	7	239	234	18	111	2	131	151	3	129	25	157	151	18	121	16	157	144
7	57	560	19	637	614	45	271	6	322	356	7	293	57	357	354	33	207	27	267	277
8	99	968	33	1099	1055	80	483	12	573	626	13	518	101	632	622	47	306	40	394	430
9	85	835	28	949	923	95	572	10	677	720	11	441	85	538	564	61	400	51	514	497
10	83	807	28	917	900	98	591	10	698	748	11	438	85	535	565	72	471	61	605	560
11	77	750	26	853	846	105	641	10	756	817	13	508	99	620	637	79	515	65	662	591
12	77	752	26	855	854	111	672	10	791	854	13	493	97	602	629	88	572	74	736	645
13	150	747	37	934	654	85	718	5	809	927	20	477	140	637	598	74	572	88	734	735
14	167	834	42	1041	958	98	827	5	930	1053	21	518	151	691	656	75	584	89	751	771
15	161	806	40	1006	927	115	976	5	1097	1208	21	521	153	695	680	74	572	88	734	751
16	184	918	46	1147	1046	107	909	6	1023	1144	22	545	160	726	699	75	582	89	747	790
17	169	845	42	1056	989	129	1092	5	1226	1347	21	511	150	682	690	98	762	118	979	938
18	164	821	41	1025	958	139	1180	5	1324	1421	18	447	132	595	641	94	728	112	935	874
19	128	637	32	796	729	101	852	4	958	1019	13	325	95	433	467	57	441	68	568	585
20	102	511	26	639	587	79	670	3	752	814	13	309	91	412	419	47	365	57	470	479
21	81	402	20	503	472	61	513	3	577	655	14	333	98	445	412	44	346	54	445	432
22	69	347	17	433	408	57	483	2	542	602	10	262	77	349	337	41	316	48	378	389
23	55	274	14	341	329	39	331	2	371	434	10	232	69	311	283	40	315	48	404	367
24	32	162	8	203	206	29	243	1	273	329	8	193	57	258	226	34	264	41	339	289
Total	2000	12583	545	15128	14192	1668	12605	113	14386	15909	274	8064	2034	10372	10277	1270	9217	1335	11822	11330

2010 TIP Model Hourly Turn Movement Volumes
Intersection of Eastern at Charleston

Hour	Southbound (from North)					Northbound (from South)					Westbound (from East)					Eastbound (from West)				
Ending	Left	Throu	Rights	App.	Dept.	Left	Throu	Rights	App.	Dept.	Left	Throu	Rights	App.	Dept.	Left	Throu	Rights	App.	Dept.
1	1	74	11	86	136	46	149	8	205	176	25	124	1	150	183	26	149	39	214	161
2	1	71	11	82	107	32	103	7	144	119	14	68	1	83	113	16	91	23	129	100
3	1	77	11	90	104	24	81	8	116	95	9	40	1	49	80	12	73	19	104	83
4	3	154	23	181	182	15	49	17	81	58	10	47	1	55	87	9	54	14	78	73
5	7	428	65	504	473	16	53	48	117	65	16	78	1	96	166	10	59	16	84	108
6	18	1055	158	1239	1148	35	114	117	263	128	44	213	1	258	419	12	75	19	106	193
7	18	1079	163	1267	1269	92	303	119	515	340	120	584	4	707	844	35	204	53	293	329
8	16	950	143	1115	1303	172	563	105	844	641	252	1224	7	1483	1528	74	433	111	619	549
9	16	959	144	1125	1348	193	635	106	941	738	255	1233	7	1494	1563	97	568	146	810	688
10	13	812	122	955	1218	207	680	89	986	820	213	1033	6	1252	1362	133	777	200	1110	887
11	19	1130	170	1326	1576	216	705	124	1051	871	203	984	6	1193	1378	158	925	238	1321	1074
12	21	1258	189	1478	1741	234	767	138	1147	955	204	992	6	1202	1428	178	1040	268	1488	1207
13	60	1092	217	1360	1541	97	878	184	1152	1113	214	1031	12	1257	1339	219	1107	234	1559	1342
14	66	1200	239	1495	1643	111	1004	201	1309	1223	217	1047	12	1278	1395	205	1042	220	1468	1296
15	61	1138	226	1417	1603	127	1149	191	1460	1380	232	1118	13	1363	1466	218	1104	233	1555	1348
16	57	1041	208	1297	1502	135	1223	175	1527	1466	213	1028	12	1255	1369	230	1169	247	1646	1396
17	42	767	153	957	1243	147	1329	129	1600	1588	222	1069	12	1303	1361	247	1250	265	1762	1427
18	31	573	114	714	1004	154	1395	97	1642	1654	171	828	10	1011	1096	251	1271	269	1790	1412
19	21	385	77	479	695	95	862	64	1019	1042	136	654	7	798	820	172	871	184	1226	966
20	16	307	61	383	552	74	675	51	801	810	117	565	6	688	694	127	645	136	908	720
21	13	258	52	322	452	62	560	43	664	671	86	413	5	504	524	106	537	114	756	599
22	10	187	37	234	330	51	465	31	548	547	62	295	4	360	384	79	403	85	568	449
23	7	138	27	172	243	33	303	23	358	364	45	216	2	263	276	59	299	64	421	333
24	4	92	19	113	171	26	232	15	271	274	42	199	2	243	241	40	202	43	284	224
Total	527	15224	2640	18391	21584	2393	14277	2091	18761	17135	3122	15082	143	18347	20115	2715	14347	3238	20300	16965

2010 TIP Model Hourly Turn Movement Volumes
Intersection of Fremont at Charleston

Hour	Southbound (from North)					Northbound (from South)					Westbound (from East)					Eastbound (from West)				
Ending	Left	Throu	Rights	App.	Dept.	Left	Throu	Rights	App.	Dept.	Left	Throu	Rights	App.	Dept.	Left	Throu	Rights	App.	Dept.
1	52	207	4	264	275	59	151	4	225	169	9	162	11	182	252	6	169	59	235	225
2	35	139	2	178	187	35	91	3	135	103	5	101	7	113	156	5	116	40	161	154
3	34	134	2	171	174	33	83	3	126	93	4	79	5	88	130	4	98	33	136	134
4	25	94	2	121	118	29	74	3	109	81	4	62	4	70	109	3	57	19	78	81
5	19	75	2	96	103	25	65	1	96	75	5	108	7	120	141	3	60	21	84	80
6	25	98	2	125	145	43	110	3	163	130	13	238	16	267	288	4	99	35	138	126
7	50	198	4	253	314	96	247	4	365	298	35	650	43	726	746	10	232	81	322	286
8	87	345	6	442	562	187	483	9	713	581	68	1244	82	1391	1437	18	428	148	594	524
9	106	418	8	534	697	180	466	10	688	567	66	1208	79	1351	1393	26	611	212	849	729
10	127	500	10	638	841	161	416	12	618	519	60	1116	73	1246	1278	33	803	279	1114	944
11	127	502	10	641	883	186	480	12	712	583	55	1001	66	1119	1224	39	933	324	1296	1078
12	147	580	12	741	1005	199	514	14	763	631	62	1142	75	1277	1373	44	1037	360	1441	1204
13	203	572	6	779	1271	133	639	22	769	724	190	1035	77	1304	1152	8	1028	511	1546	1253
14	206	583	6	792	1256	136	657	23	791	744	196	1066	79	1343	1186	8	966	480	1452	1192
15	188	533	6	726	1241	136	656	20	789	744	194	1057	78	1332	1179	8	1041	517	1566	1252
16	213	604	6	821	1353	130	625	23	755	714	197	1069	79	1347	1178	9	1119	556	1683	1355
17	220	625	6	849	1422	134	645	25	779	729	182	990	73	1246	1116	9	1244	617	1871	1491
18	261	739	8	1006	1536	115	557	29	677	632	162	878	65	1106	985	9	1279	634	1922	1567
19	160	454	4	618	991	100	479	17	578	540	134	730	54	919	824	6	813	403	1222	990
20	118	333	4	453	745	80	387	13	466	437	114	617	46	777	689	5	605	300	908	735
21	121	340	4	464	709	81	391	13	471	436	98	532	39	670	617	4	544	270	820	676
22	101	284	2	386	545	62	302	12	364	333	67	364	27	460	436	3	391	194	588	500
23	103	291	4	395	491	51	243	12	296	270	58	311	23	392	367	3	287	143	432	397
24	76	215	2	294	360	46	221	9	268	241	42	228	17	286	285	1	206	103	310	286
Total	2803	8864	120	11787	17225	2436	8983	294	11713	10374	2022	15985	1125	19132	18541	266	14163	6339	20768	17260

2010 TIP Model Hourly Turn Movement Volumes
Intersection of Eastern at Fremont

Hour	Southbound (from North)					Northbound (from South)					Westbound (from East)					Eastbound (from West)				
Ending	Left	Throu	Rights	App.	Dept.	Left	Throu	Rights	App.	Dept.	Left	Throu	Rights	App.	Dept.	Left	Throu	Rights	App.	Dept.
1	14	147	5	168	183	40	241	1	283	311	4	179	35	219	223	35	229	29	295	244
2	10	105	4	119	130	19	119	1	141	169	3	119	24	144	142	26	169	22	217	180
3	10	101	4	115	123	18	107	1	125	148	3	104	20	126	124	22	146	19	188	157
4	9	84	3	96	103	12	76	1	90	111	1	84	17	104	100	18	118	15	153	128
5	9	87	3	98	103	12	73	1	87	105	3	87	17	105	102	15	100	12	129	110
6	29	275	9	313	298	24	144	3	171	187	3	129	25	157	161	18	118	15	153	150
7	75	735	25	836	782	58	353	8	420	441	7	293	57	357	377	32	203	26	262	288
8	130	1270	43	1443	1345	104	629	15	747	776	13	518	101	632	664	46	300	39	385	448
9	111	1096	37	1245	1177	123	746	12	883	892	11	441	85	538	601	60	391	50	502	518
10	109	1059	37	1203	1147	128	771	12	911	927	11	438	85	535	602	71	461	60	591	582
11	101	984	34	1119	1079	137	836	12	986	1013	13	508	99	621	679	78	504	64	647	615
12	101	987	34	1122	1089	144	876	12	1031	1059	13	493	97	602	670	86	559	72	719	671
13	197	980	49	1225	834	111	937	7	1055	1149	20	477	140	637	637	72	559	86	718	765
14	219	1094	55	1367	1221	128	1078	7	1213	1304	21	518	151	691	700	74	572	87	735	802
15	211	1058	52	1321	1182	150	1273	7	1431	1497	21	521	153	695	725	72	559	86	718	781
16	241	1205	60	1506	1333	140	1185	8	1334	1418	22	545	160	726	746	74	569	87	731	822
17	221	1109	55	1387	1261	168	1424	7	1598	1669	21	511	150	682	736	96	745	115	957	976
18	215	1077	54	1346	1221	182	1539	7	1727	1761	18	447	132	595	683	92	712	110	914	909
19	168	836	42	1045	929	132	1112	6	1249	1263	13	325	95	433	498	56	432	67	555	608
20	134	671	34	839	749	103	873	4	980	1009	13	309	91	412	447	46	357	56	459	498
21	106	528	26	661	602	79	670	4	753	812	14	333	98	445	440	43	339	53	436	449
22	90	455	22	569	520	75	629	3	707	747	10	262	77	349	359	40	309	47	370	405
23	72	359	18	448	420	51	431	3	484	538	10	232	69	311	302	39	308	47	395	382
24	42	212	10	266	262	37	317	1	356	408	8	193	57	258	241	33	258	40	331	301
Total	2625	16515	716	19856	18095	2175	16440	147	18762	19716	274	8065	2034	10373	10956	1242	9015	1306	11563	11787

2020 TIP Model Hourly Turn Movement Volumes
Intersection of Eastern at Charleston

Hour	Southbound (from North)					Northbound (from South)					Westbound (from East)					Eastbound (from West)				
Ending	Left	Throu	Rights	App.	Dept.	Left	Throu	Rights	App.	Dept.	Left	Throu	Rights	App.	Dept.	Left	Throu	Rights	App.	Dept.
1	2	82	12	96	153	49	159	9	219	191	28	140	1	169	205	31	177	46	253	189
2	2	78	12	92	121	34	111	8	154	129	16	77	1	94	126	19	107	27	153	117
3	2	85	12	100	118	26	87	9	124	103	10	46	1	56	89	15	86	22	124	97
4	3	172	26	202	204	16	52	18	86	63	11	53	1	63	98	11	64	16	93	85
5	8	476	72	560	532	17	57	51	126	71	19	88	1	108	186	12	70	19	100	126
6	20	1174	176	1378	1293	38	122	125	282	139	50	241	1	292	469	15	89	22	126	226
7	20	1200	181	1409	1429	99	324	128	551	370	135	660	4	799	946	42	242	63	347	385
8	18	1056	159	1240	1468	184	602	112	904	698	285	1383	8	1676	1712	88	514	132	734	642
9	18	1066	160	1252	1518	207	679	114	1007	804	288	1393	8	1689	1752	115	673	173	961	805
10	15	904	136	1062	1371	222	728	96	1055	893	241	1168	7	1416	1527	158	922	237	1317	1037
11	22	1257	189	1475	1774	231	755	133	1125	949	229	1112	7	1349	1544	188	1097	282	1567	1256
12	23	1399	210	1643	1960	250	821	148	1227	1040	231	1121	7	1359	1600	211	1234	318	1765	1412
13	66	1214	242	1513	1736	104	940	196	1232	1212	242	1165	14	1421	1501	259	1313	278	1850	1569
14	73	1334	266	1663	1849	118	1074	216	1401	1331	245	1184	14	1444	1563	243	1235	261	1741	1516
15	68	1266	252	1576	1805	135	1229	204	1562	1503	262	1263	15	1541	1643	258	1310	277	1845	1577
16	63	1158	231	1443	1691	144	1309	187	1634	1596	241	1162	14	1418	1535	273	1386	293	1952	1633
17	46	853	170	1064	1399	157	1422	138	1712	1729	251	1208	14	1472	1525	293	1483	314	2090	1669
18	35	637	127	794	1130	165	1492	103	1757	1801	194	936	11	1142	1228	298	1507	319	2123	1652
19	23	428	85	533	783	101	923	69	1091	1135	154	739	8	901	919	204	1033	219	1454	1129
20	18	342	68	426	622	80	723	55	857	882	132	638	7	778	778	151	765	162	1078	842
21	15	287	57	358	509	66	600	46	710	730	97	467	6	570	587	126	638	135	897	701
22	12	209	42	260	371	55	498	33	586	596	70	333	4	407	430	94	478	101	673	525
23	8	154	31	191	274	35	324	24	383	396	51	244	3	298	309	70	355	75	499	390
24	5	102	21	126	193	27	248	17	291	298	47	225	3	275	270	47	240	51	337	262
Total	586	16932	2936	20454	24302	2561	15277	2237	20075	18659	3529	17046	161	20736	22543	3221	17019	3841	24081	19842

2020 TIP Model Hourly Turn Movement Volumes
Intersection of Fremont at Charleston

Hour	Southbound (from North)					Northbound (from South)					Westbound (from East)					Eastbound (from West)				
Ending	Left	Throu	Rights	App.	Dept.	Left	Throu	Rights	App.	Dept.	Left	Throu	Rights	App.	Dept.	Left	Throu	Rights	App.	Dept.
1	76	298	6	381	344	67	172	5	256	191	10	180	12	202	282	7	172	60	240	245
2	51	201	3	257	233	40	103	3	154	117	6	112	7	126	174	5	118	41	164	168
3	48	193	3	247	217	37	95	3	143	105	4	88	6	98	146	4	100	34	139	146
4	36	136	3	175	148	33	84	3	124	92	4	69	4	78	121	3	58	20	80	89
5	27	109	3	139	129	29	74	2	109	85	6	120	7	133	158	3	62	21	85	87
6	36	142	3	181	182	49	125	3	185	147	15	265	18	297	323	4	101	35	140	138
7	72	285	6	365	392	109	281	5	415	337	39	723	48	808	834	10	236	83	328	312
8	126	499	9	637	702	213	550	10	812	658	76	1384	91	1548	1607	18	437	151	607	572
9	154	604	11	771	871	205	530	11	783	642	73	1344	88	1504	1557	26	624	217	867	795
10	183	722	14	921	1051	183	474	13	704	588	67	1241	81	1387	1429	34	819	285	1137	1030
11	183	725	14	925	1102	212	547	13	810	660	61	1114	73	1245	1369	39	952	331	1322	1177
12	213	837	17	1069	1255	227	585	16	869	715	69	1271	84	1421	1536	45	1058	368	1471	1314
13	293	826	9	1125	1588	151	727	25	876	820	212	1152	85	1451	1289	8	1049	521	1578	1367
14	297	841	9	1144	1569	155	748	26	901	842	218	1186	88	1494	1327	8	986	490	1482	1301
15	271	769	9	1049	1551	155	747	23	898	842	216	1177	87	1482	1319	8	1062	528	1598	1366
16	307	872	9	1186	1691	148	712	26	860	809	219	1189	88	1499	1317	9	1142	567	1717	1479
17	318	902	9	1225	1776	153	734	28	887	826	203	1101	81	1387	1248	9	1270	630	1909	1627
18	377	1068	11	1452	1919	131	634	33	771	716	181	977	72	1231	1101	9	1305	647	1962	1710
19	231	655	6	892	1237	113	545	20	658	612	149	812	60	1023	922	7	830	411	1247	1081
20	170	480	6	655	931	91	441	15	530	495	127	686	51	865	771	5	617	306	927	803
21	175	491	6	670	886	93	445	15	536	494	109	592	43	746	690	4	555	276	836	738
22	145	410	3	558	681	71	344	13	414	377	75	405	30	511	487	3	399	198	600	546
23	149	420	6	571	614	58	277	13	337	305	64	346	25	436	410	3	293	146	441	433
24	109	311	3	424	450	53	252	10	305	273	46	254	19	318	319	1	210	105	316	312
Total	4047	12798	173	17018	21518	2774	10227	335	13336	11750	2250	17789	1252	21291	20736	271	14455	6470	21196	18837

2020 TIP Model Hourly Turn Movement Volumes
Intersection of Eastern at Fremont

Hour	Southbound (from North)					Northbound (from South)					Westbound (from East)					Eastbound (from West)				
Ending	Left	Throu	Rights	App.	Dept.	Left	Throu	Rights	App.	Dept.	Left	Throu	Rights	App.	Dept.	Left	Throu	Rights	App.	Dept.
1	16	160	6	182	207	48	285	2	334	398	8	349	68	425	387	52	344	44	443	343
2	11	114	4	130	147	23	141	2	167	217	5	231	46	281	247	40	254	33	326	253
3	11	110	4	125	139	21	126	2	147	190	5	201	38	245	215	33	219	29	282	220
4	10	91	3	104	116	15	90	2	107	142	3	163	33	202	174	27	177	23	230	179
5	10	94	3	107	116	15	87	2	103	135	5	169	33	204	176	23	150	19	194	154
6	31	299	10	341	337	28	170	3	202	240	5	250	49	305	280	27	177	23	230	210
7	81	800	27	909	884	69	418	10	496	565	14	569	112	695	655	48	304	40	393	405
8	141	1381	47	1569	1521	123	744	18	883	993	25	1007	196	1229	1153	69	450	58	579	629
9	121	1192	40	1354	1330	146	881	15	1044	1143	22	858	166	1046	1044	90	587	75	754	727
10	118	1152	40	1308	1297	151	911	15	1077	1187	22	852	166	1041	1047	106	691	90	888	818
11	110	1070	37	1217	1220	162	988	15	1165	1297	25	988	193	1207	1179	117	756	96	971	864
12	110	1073	37	1220	1230	170	1035	15	1219	1356	25	958	188	1172	1165	129	839	108	1080	943
13	214	1066	53	1333	943	131	1108	8	1247	1472	38	928	272	1240	1107	108	839	129	1078	1074
14	238	1190	60	1487	1380	151	1275	8	1434	1671	41	1007	294	1343	1216	110	858	131	1103	1126
15	229	1150	57	1437	1336	177	1504	8	1691	1918	41	1013	297	1351	1259	108	839	129	1078	1097
16	262	1310	66	1638	1507	166	1401	10	1576	1816	44	1059	310	1411	1295	110	854	131	1097	1155
17	241	1206	60	1508	1425	198	1683	8	1889	2138	41	994	291	1327	1279	144	1118	173	1437	1371
18	234	1172	58	1464	1380	215	1819	8	2042	2255	35	869	256	1158	1187	137	1068	165	1372	1277
19	182	909	46	1136	1051	156	1314	7	1476	1617	25	632	185	842	865	83	648	100	833	854
20	145	730	37	912	847	121	1032	5	1158	1292	25	602	177	801	776	69	535	83	689	700
21	115	574	29	718	680	93	791	5	890	1040	27	648	191	866	764	65	508	79	654	631
22	98	495	24	619	588	88	744	3	836	956	19	509	150	678	624	60	464	71	556	569
23	78	391	20	487	475	61	510	3	572	690	19	452	133	605	524	58	462	71	593	536
24	46	231	11	289	296	44	375	2	421	523	16	376	112	501	418	50	387	60	497	422
Total	2855	17960	779	21594	20454	2571	19431	174	22176	25251	534	15686	3956	20176	19036	1864	13531	1960	17355	16560

Attachment D

CAL3QHC + UAM CO Concentrations for 2000, 2010 and 2020 Primary Control Scenario

December 8 - 9, 1996 Episode

Predicted CO Concentrations (ppm) for 2000 Primary Control Case

December 8 - 9, 1996 Episode

Eastern/Charleston Intersection

Hour Beginning	UAM		CAL3QHC		UAM + CAL3QHC	
	1-hour	8-hour	1-hour	8-hour	1-hour	8-hour
15	0.40	4.15	3.20	3.14	3.60	7.29
16	1.09	4.80	3.10	3.08	4.19	7.87
17	2.18	5.35	2.90	2.84	5.08	8.19
18	3.23	5.73	3.80	2.55	7.03	8.28
19	5.40	5.87	3.50	2.13	8.90	8.00
20	7.25	5.65	4.00	1.73	11.25	7.37
21	7.30	5.13	2.30	1.34	9.60	6.47
22	6.35	4.60	2.30	1.29	8.65	5.88
23	5.60	4.27	2.70	1.45	8.30	5.72
0	5.48	4.22	1.20	1.64	6.68	5.86
1	5.26	4.38	0.60	1.90	5.86	6.28
2	4.35	4.47	0.40	2.34	4.75	6.81
3	3.59	4.25	0.30	2.70	3.89	6.95
4	3.14		0.90		4.04	
5	3.00		1.90		4.90	
6	3.73		3.60		7.33	
7	5.20		4.20		9.40	
8	6.75		3.30		10.05	
9	6.02		4.10		10.12	
10	2.58		3.30		5.88	
Maximum	7.30	5.87	4.20	3.14	11.25	8.28

Predicted CO Concentrations (ppm) for 2000 Primary Control Case

December 8 - 9, 1996 Episode

Fremont/Charleston Intersection

Hour Beginning	UAM		CAL3QHC		UAM + CAL3QHC	
	1-hour	8-hour	1-hour	8-hour	1-hour	8-hour
15	0.40	4.15	2.30	1.70	2.70	5.85
16	1.09	4.80	1.90	1.49	2.99	6.29
17	2.18	5.35	2.70	1.29	4.88	6.64
18	3.23	5.73	1.60	0.98	4.83	6.71
19	5.40	5.87	1.40	0.78	6.80	6.65
20	7.25	5.65	1.50	0.60	8.75	6.25
21	7.30	5.13	1.70	0.41	9.00	5.55
22	6.35	4.60	0.50	0.23	6.85	4.82
23	5.60	4.27	0.60	0.26	6.20	4.53
0	5.48	4.22	0.30	0.44	5.78	4.66
1	5.26	4.38	0.20	0.55	5.46	4.93
2	4.35	4.47	0.00	0.96	4.35	5.43
3	3.59	4.25	0.00	1.23	3.59	5.47
4	3.14		0.00		3.14	
5	3.00		0.20		3.20	
6	3.73		0.80		4.53	
7	5.20		2.00		7.20	
8	6.75		1.20		7.95	
9	6.02		3.50		9.52	
10	2.58		2.10		4.68	
Maximum	7.30	5.87	3.50	1.70	9.52	6.71

Predicted CO Concentrations (ppm) for 2000 Primary Control Case

December 8 - 9, 1996 Episode
Eastern/Fremont Intersection

Hour Beginning	UAM		CAL3QHC		UAM + CAL3QHC	
	1-hour	8-hour	1-hour	8-hour	1-hour	8-hour
15	0.40	4.15	2.60	2.74	3.00	6.89
16	1.09	4.80	3.30	2.50	4.39	7.30
17	2.18	5.35	3.20	2.24	5.38	7.59
18	3.23	5.73	2.90	1.88	6.13	7.61
19	5.40	5.87	2.70	1.58	8.10	7.45
20	7.25	5.65	2.70	1.30	9.95	6.95
21	7.30	5.13	2.80	1.03	10.10	6.16
22	6.35	4.60	1.70	0.78	8.05	5.37
23	5.60	4.27	0.70	0.80	6.30	5.07
0	5.48	4.22	1.20	1.06	6.68	5.28
1	5.26	4.38	0.30	1.21	5.56	5.59
2	4.35	4.47	0.50	1.56	4.85	6.03
3	3.59	4.25	0.50	1.94	4.09	6.19
4	3.14		0.50		3.64	
5	3.00		0.80		3.80	
6	3.73		1.90		5.63	
7	5.20		2.80		8.00	
8	6.75		2.40		9.15	
9	6.02		3.10		9.12	
10	2.58		3.50		6.08	
Maximum	7.30	5.87	3.50	2.74	10.10	7.61

Predicted CO Concentrations (ppm) for 2010 Primary Control Case

December 8 - 9, 1996 Episode

Eastern/Charleston Intersection

Hour Beginning	UAM		CAL3QHC		UAM + CAL3QHC	
	1-hour	8-hour	1-hour	8-hour	1-hour	8-hour
15	0.38	3.62	2.60	2.66	2.98	6.28
16	0.96	4.20	2.50	2.63	3.46	6.83
17	1.88	4.69	2.60	2.44	4.48	7.13
18	2.76	5.05	3.00	2.20	5.76	7.25
19	4.64	5.20	3.50	1.88	8.14	7.07
20	6.26	5.03	3.20	1.49	9.46	6.51
21	6.40	4.60	1.90	1.21	8.30	5.82
22	5.69	4.15	2.00	1.18	7.69	5.32
23	5.03	3.86	2.30	1.31	7.33	5.17
0	4.90	3.81	1.00	1.45	5.90	5.26
1	4.72	3.94	0.70	1.68	5.42	5.62
2	3.94	4.02	0.40	2.03	4.34	6.05
3	3.28	3.82	0.40	2.33	3.68	6.15
4	2.87		1.00		3.87	
5	2.74		1.60		4.34	
6	3.36		3.10		6.46	
7	4.64		3.40		8.04	
8	5.96		2.80		8.76	
9	5.37		3.50		8.87	
10	2.35		2.80		5.15	
Maximum	6.40	5.20	3.50	2.66	9.46	7.25

Predicted CO Concentrations (ppm) for 2010 Primary Control Case

December 8 - 9, 1996 Episode

Fremont/Charleston Intersection

Hour Beginning	UAM		CAL3QHC		UAM + CAL3QHC	
	1-hour	8-hour	1-hour	8-hour	1-hour	8-hour
15	0.38	3.62	2.10	1.53	2.48	5.14
16	0.96	4.20	1.70	1.31	2.66	5.51
17	1.88	4.69	2.10	1.13	3.98	5.82
18	2.76	5.05	1.70	0.88	4.46	5.92
19	4.64	5.20	1.50	0.68	6.14	5.87
20	6.26	5.03	1.20	0.49	7.46	5.51
21	6.40	4.60	1.40	0.34	7.80	4.94
22	5.69	4.15	0.50	0.19	6.19	4.33
23	5.03	3.86	0.40	0.20	5.43	4.06
0	4.90	3.81	0.20	0.36	5.10	4.17
1	4.72	3.94	0.10	0.53	4.82	4.47
2	3.94	4.02	0.10	0.86	4.04	4.88
3	3.28	3.82	0.00	1.06	3.28	4.88
4	2.87		0.00		2.87	
5	2.74		0.20		2.94	
6	3.36		0.60		3.96	
7	4.64		1.70		6.34	
8	5.96		1.50		7.46	
9	5.37		2.80		8.17	
10	2.35		1.70		4.05	
Maximum	6.40	5.20	2.80	1.53	8.17	5.92

Predicted CO Concentrations (ppm) for 2010 Primary Control Case

December 8 - 9, 1996 Episode

Eastern/Fremont Intersection

Hour Beginning	UAM		CAL3QHC		UAM + CAL3QHC	
	1-hour	8-hour	1-hour	8-hour	1-hour	8-hour
15	0.38	3.62	2.30	2.18	2.68	5.79
16	0.96	4.20	2.50	1.99	3.46	6.19
17	1.88	4.69	2.30	1.80	4.18	6.49
18	2.76	5.05	2.20	1.55	4.96	6.60
19	4.64	5.20	2.20	1.33	6.84	6.52
20	6.26	5.03	2.40	1.10	8.66	6.13
21	6.40	4.60	2.20	0.85	8.60	5.45
22	5.69	4.15	1.30	0.65	6.99	4.80
23	5.03	3.86	0.80	0.69	5.83	4.54
0	4.90	3.81	1.00	0.89	5.90	4.70
1	4.72	3.94	0.30	1.03	5.02	4.97
2	3.94	4.02	0.40	1.29	4.34	5.31
3	3.28	3.82	0.40	1.58	3.68	5.40
4	2.87		0.40		3.27	
5	2.74		0.60		3.34	
6	3.36		1.60		4.96	
7	4.64		2.40		7.04	
8	5.96		2.10		8.06	
9	5.37		2.40		7.77	
10	2.35		2.70		5.05	
Maximum	6.40	5.20	2.70	2.18	8.66	6.60

Predicted CO Concentrations (ppm) for 2020 Primary Control Case

December 8 - 9, 1996 Episode

Eastern/Charleston Intersection

Hour Beginning	UAM		CAL3QHC		UAM + CAL3QHC	
	1-hour	8-hour	1-hour	8-hour	1-hour	8-hour
15	0.39	3.89	2.60	2.54	2.99	6.43
16	0.98	4.53	2.50	2.49	3.48	7.02
17	1.95	5.08	2.50	2.31	4.45	7.39
18	2.90	5.48	2.90	2.10	5.80	7.58
19	4.97	5.66	2.80	1.79	7.77	7.44
20	6.81	5.49	3.10	1.49	9.91	6.98
21	6.97	5.03	1.90	1.24	8.87	6.27
22	6.20	4.54	2.00	1.20	8.20	5.74
23	5.48	4.23	2.20	1.33	7.68	5.55
0	5.35	4.18	1.10	1.46	6.45	5.64
1	5.15	4.35	0.80	1.70	5.95	6.05
2	4.33	4.46	0.40	2.01	4.73	6.48
3	3.63	4.25	0.40	2.30	4.03	6.55
4	3.17		1.10		4.27	
5	3.01		1.60		4.61	
6	3.68		3.00		6.68	
7	5.14		3.30		8.44	
8	6.69		3.00		9.69	
9	6.05		3.30		9.35	
10	2.63		2.70		5.33	
Maximum	6.97	5.66	3.30	2.54	9.91	7.58

Predicted CO Concentrations (ppm) for 2020 Primary Control Case

December 8 - 9, 1996 Episode

Fremont/Charleston Intersection

Hour Beginning	UAM		CAL3QHC		UAM + CAL3QHC	
	1-hour	8-hour	1-hour	8-hour	1-hour	8-hour
15	0.39	3.89	2.00	1.55	2.39	5.44
16	0.98	4.53	1.80	1.36	2.78	5.89
17	1.95	5.08	2.10	1.16	4.05	6.24
18	2.90	5.48	1.80	0.91	4.70	6.39
19	4.97	5.66	1.60	0.70	6.57	6.36
20	6.81	5.49	1.30	0.50	8.11	5.99
21	6.97	5.03	1.30	0.35	8.27	5.38
22	6.20	4.54	0.50	0.21	6.70	4.75
23	5.48	4.23	0.50	0.25	5.98	4.48
0	5.35	4.18	0.20	0.41	5.55	4.59
1	5.15	4.35	0.10	0.69	5.25	5.04
2	4.33	4.46	0.10	1.06	4.43	5.53
3	3.63	4.25	0.00	1.26	3.63	5.51
4	3.17		0.10		3.27	
5	3.01		0.20		3.21	
6	3.68		0.80		4.48	
7	5.14		1.80		6.94	
8	6.69		2.40		9.09	
9	6.05		3.10		9.15	
10	2.63		1.70		4.33	
Maximum	6.97	5.66	3.10	1.55	9.15	6.39

Predicted CO Concentrations (ppm) for 2020 Primary Control Case

December 8 - 9, 1996 Episode

Eastern/Fremont Intersection

Hour Beginning	UAM		CAL3QHC		UAM + CAL3QHC	
	1-hour	8-hour	1-hour	8-hour	1-hour	8-hour
15	0.39	3.89	2.60	2.50	2.99	6.39
16	0.98	4.53	2.70	2.33	3.68	6.86
17	1.95	5.08	2.50	2.19	4.45	7.26
18	2.90	5.48	2.50	1.93	5.40	7.40
19	4.97	5.66	2.80	1.71	7.77	7.37
20	6.81	5.49	2.40	1.46	9.21	6.95
21	6.97	5.03	2.40	1.26	9.37	6.30
22	6.20	4.54	2.10	1.10	8.30	5.64
23	5.48	4.23	1.20	1.20	6.68	5.43
0	5.35	4.18	1.60	1.36	6.95	5.54
1	5.15	4.35	0.40	1.43	5.55	5.78
2	4.33	4.46	0.80	1.73	5.13	6.19
3	3.63	4.25	0.80	1.98	4.43	6.23
4	3.17		0.80		3.97	
5	3.01		1.10		4.11	
6	3.68		2.90		6.58	
7	5.14		2.50		7.64	
8	6.69		2.10		8.79	
9	6.05		2.80		8.85	
10	2.63		2.80		5.43	
Maximum	6.97	5.66	2.90	2.50	9.37	7.40

REGIONAL TRANSPORTATION COMMISSION

600 S. Grand Central Parkway, Suite 350 • Las Vegas, NV 89106-4512 • (702) 676-1500
Fax: (702) 676-1518 • TDD: (702) 676-1837

JACOB L. SNOW
General Manager

May 17, 2000

Mr. John Schlegel, Director
Clark County Comprehensive Planning Department
500 S. Grand Central Parkway; 3rd Floor
Las Vegas, NV 89155

TRANSMITTAL OF REVISED TRAFFIC COUNTS- FIVE POINTS INTERSECTION (CHARLESTON/EASTERN/FREMONT)

Dear Mr. Schlegel:

The Regional Transportation Commission (RTC) is transmitting revised traffic count data for the five points intersection to use for the air quality planning effort in support of the 2000 Carbon Monoxide State Implementation Plan

I would like to begin by indicating that the enclosed traffic data represents a disparity from the volumes that were originally provided to the County in 1998 to develop the Serious Area CO SIP. In fact, the volume information indicates a reduction in total demand, something that is unusual for the metropolitan area. At the time of transmittal, however, the information provided to your agency was the best available data. I will explain.

The travel forecast model used by the RTC was last validated in late 1997 using 1995 observed traffic volumes in support of the 1998-2020 Regional Transportation Plan update. Travel forecasts are typically validated against observed volumes from the preceding years of count data, however, in this case the volume information from the Nevada Department of Transportation (NDOT) was only available through 1995. Both the RTC and Nevada Department of Transportation (NDOT) are engaged in annual traffic counts that form the basis of these comparisons (observed vs predicted). The RTC initiated its traffic count program in late 1997.

The process of model validation consist of a series of analytical efforts focused on reducing the gap between predicted travel and actual travel, which is of course documented by actual ground counts. Since the time the original data was provided to your agency, the RTC has been working towards the completion of a fully integrated mode choice model, which will vastly improve the model's accuracy and overall capabilities. Work on the model enhancements continues and is not expected to be completed until August 2000. This is the principal reason why the RTC has not been able to conduct a more recent than 1997 model validation.

At the same time, it is worth noting that both traffic patterns and travel demands are dynamic in nature and that variations in travel patterns and demand can be expected. In fact, a substantial variation was observed in and around the area of the five points intersection. The NDOT traffic counts for the 5 points are currently available for the years 1996-1998. In general, the traffic demand for this area exhibits a fastening trend and, in some cases, actually exhibits negative growth.

This volume trend is unusual for the Las Vegas Valley, so staff sought to determine the extent of the trend and what might be causing the demand reduction. Our agency reviewed traffic data as far to the east as Pecos Rd. and to the west to the intersection of Casino Center Blvd. We also examined information on Eastern Ave. north to I-515 and south to Sarah Ave. In total, the RTC reviewed volume data at 12 intersections, which are displayed on the enclosed graphic and tabular volume chart.

Interestingly, the following information emerged. Averaged, the 12 intersections only grew by 4% between 1995-96, which is somewhat low compared to other valley traffic demand increases for the same period. However, between 1996-97, the average for the 12 intersections only displayed a 1.41% increase. Between 1997-98, the average demand for the 12 intersections actually decreased by -3.86%.

These observations are unusual, but when the connection to land use is considered, it makes sense. Using Planning Variable data collected in 1998 and reported in 1999, a marked trend emerges. Staff evaluated socioeconomic information for traffic analysis zones (TAZs) 571-576, since this encompassed the area in question. The results indicate the following.

Mr. John Schlegel
May 17, 2000
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Between 1995-2000, there was no increase in population across the 6 TAZs, only a 31 unit increase in housing and an occupancy rate that stayed flat. Assuming that an average household travels a total of between 7 to 9 trips daily (RTC 1996 Household Travel Survey), it becomes clear why there has been a downward trend in traffic volume demand.

The RTC modeled numbers originally provided to the County for air quality modeling were based on the previous Planning Variable numbers developed in 1995, prior to when this trend began to emerge in the area of the 5 points intersection. The more recent Planning Variable numbers reported above further support the validity of the NDOT's 1996-1998 volume data.

If you have any questions regarding this matter, please contact Jerry Duke of my staff at 676-1729.

Sincerely,

FRED OHENE
Assistant General Manager

FO/jd

Enclosures:

cc: Jerry Duke, RTC
Adiyana Sharag-Eldin, RTC
Russell Roberts, Clark County Environmental Team
Clete Kus, Clark County Environmental Team
Bruce Arkell, Clark County Consultant

Exhibit 1-7
Planning Variables Update
Socioeconomic Estimates by TAZ
1995

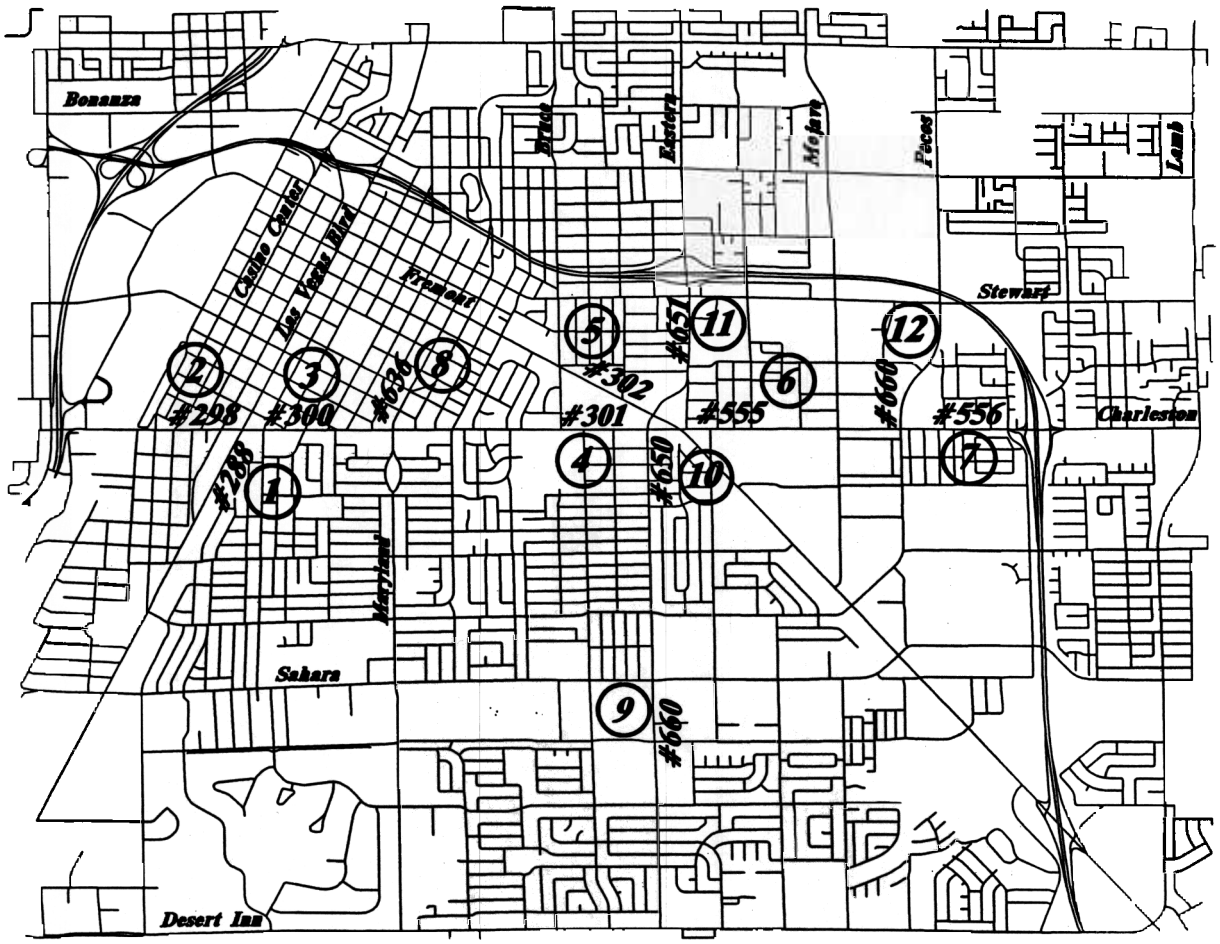
TAZ	District	Population	Total Housing Units	Occupancy Rate	Occupied Housing Units	Household Size	Household Income Quartile	Total Employment	Employment by Land Use: Resort /Casino	Office	Industrial	Retail Regional	Other	Other
556	16	1,240	316	98%	310	4.00	1	1,139	0	710	0	0	65	364
557	16	462	201	98%	197	2.35	4	649	0	598	0	0	51	0
558	15	0	0	0%	0	0.00	0	322	0	51	148	0	118	5
559	15	0	0	0%	0	0.00	0	664	0	225	87	0	335	17
560	15	9	4	100%	4	2.25	1	870	8	302	290	0	259	11
561	15	1,395	495	98%	485	2.88	1	1,602	195	512	800	0	82	13
562	15	2,926	1,038	98%	1017	2.88	1	590	243	117	25	0	194	11
563	15	276	162	98%	159	1.74	1	113	8	40	12	0	49	4
564	15	314	111	98%	109	2.88	1	249	74	132	0	0	43	0
565	15	33	19	100%	19	1.74	1	149	117	0	0	0	27	4
566	15	0	0	0%	0	0.00	0	68	25	0	0	0	43	0
567	8	527	187	98%	183	2.88	1	391	216	135	0	0	40	0
568	8	2,158	765	98%	750	2.88	1	956	190	551	0	0	116	98
569	8	2,593	881	98%	863	3.00	1	346	67	214	0	0	39	26
570	8	810	347	98%	340	2.38	2	1,596	0	1,297	0	0	190	109
571	8	3,688	1,360	94%	1281	2.88	2	888	0	516	78	0	219	75
572	8	1,699	605	98%	590	2.88	2	156	0	61	0	0	0	95
573	8	1,932	656	98%	643	3.00	1	751	0	560	0	0	184	7
574	8	1,582	633	88%	558	2.84	2	1,505	1,300	119	0	0	67	19
575	8	1,194	430	98%	421	2.84	2	394	0	153	0	0	93	148
576	8	0	0	0%	0	0.00	0	476	0	184	0	0	24	268
577	3	1,925	668	98%	655	2.94	1	483	69	79	44	0	286	5
578	3	1,743	593	98%	581	3.00	2	794	0	25	684	0	67	18
579	8	318	114	98%	112	2.84	2	323	0	0	0	0	323	0
580	3	6,175	2,100	98%	2058	3.00	2	197	49	0	35	0	111	3
581	3	3,464	980	96%	940	3.69	3	860	0	638	0	0	102	120
582	3	5,888	1,631	98%	1598	3.68	3	360	0	29	35	0	285	11
583	3	43	19	100%	19	2.26	1	449	15	105	9	0	279	41
584	3	1,147	746	97%	721	1.59	1	2,113	1,700	0	378	0	26	9
585	3	3,787	2,727	87%	2380	1.59	1	541	0	0	122	0	414	5
586	3	3,532	1,511	98%	1481	2.38	1	53	0	0	0	0	0	53
587	3	463	160	98%	157	2.95	3	0	0	0	0	0	0	0
588	3	2,866	940	94%	883	3.25	3	207	0	0	0	0	146	61
589	3	6,420	2,312	98%	2266	2.83	2	225	0	0	0	0	151	74
590	3	2,013	564	98%	553	3.64	4	0	0	0	0	0	0	0
591	3	237	66	98%	65	3.65	4	443	0	0	0	0	0	443
592	3	0	0	0%	0	0.00	0	401	0	0	0	0	328	73
593	4	0	0	0%	0	0.00	0	303	0	0	0	0	0	303
594	12	8,611	3,401	98%	3333	2.58	3	2,030	0	1,735	36	0	74	185
595	12	2,189	754	89%	673	3.25	4	93	0	0	0	0	4	89
596	12	927	291	98%	285	3.25	4	65	0	0	55	0	6	4
597	12	1,008	320	98%	314	3.21	4	567	0	471	0	0	64	32

Exhibit 1-8
Planning Variables Update
Socioeconomic Estimates by TAZ
2000

TAZ	District	Population	Total Housing Units	Occupancy Rate	Occupied Housing Units	Household Size	Household Income Quartile *	Total Employment	Employment by Land Use					
									Resort /Casino	Office	Industrial	Retail Regional	Retail Other	Other Non-Retail
569	8	2,593	890	97%	861	3.01	1	380	67	214	0	0	67	32
570	8	810	348	97%	338	2.40	2	1,626	0	1,297	0	0	213	116
571	8	3,688	1,361	95%	1296	2.85	2	932	0	516	78	0	258	80
572	8	1,699	605	97%	589	2.88	2	196	0	61	0	0	33	102
573	8	1,932	660	97%	639	3.02	1	972	0	759	0	0	186	27
574	8	1,620	657	91%	601	2.70	2	1,865	1,628	119	0	0	95	23
575	8	1,194	432	98%	422	2.83	2	454	0	215	0	0	93	146
576	8	0	0	0%	0	0.00	0	478	0	184	0	0	26	268
577	3	2,685	1,093	95%	1041	2.58	1	595	88	79	44	38	327	19
578	3	1,743	594	97%	576	3.03	2	861	0	25	706	0	107	23
579	8	318	114	97%	111	2.86	2	386	0	0	0	11	366	9
580	3	6,175	2,115	97%	2062	2.99	2	250	49	0	35	0	151	15
581	3	3,946	1,183	96%	1141	3.46	3	1,007	0	768	0	0	138	101
582	3	6,302	1,913	97%	1862	3.38	3	480	0	29	35	0	354	62
583	3	416	206	94%	194	2.14	1	714	269	105	9	0	318	13
584	3	1,147	749	97%	725	1.58	1	2,149	1,700	0	378	0	57	14
585	3	4,766	3,175	91%	2898	1.64	1	631	0	0	122	0	450	59
586	3	4,043	1,780	97%	1721	2.35	1	105	0	0	0	0	0	105
587	3	463	160	96%	153	3.03	3	0	0	0	0	0	0	0
588	3	3,174	1,069	95%	1019	3.11	3	223	0	0	0	0	150	73
589	3	7,308	2,725	97%	2650	2.76	2	337	0	0	0	0	176	161
590	3	3,685	1,166	98%	1137	3.24	4	44	0	0	0	0	0	44
591	3	1,405	471	97%	459	3.06	4	386	0	0	0	0	0	386
592	3	391	135	97%	131	2.98	3	451	0	0	0	0	328	123
593	4	209	72	97%	70	2.99	4	311	0	0	0	0	0	311
594	12	8,611	3,503	97%	3385	2.54	3	2,320	0	2,034	36	0	74	176
595	12	5,100	1,950	94%	1828	2.79	4	351	0	0	0	0	4	347
596	12	958	314	97%	306	3.13	4	144	0	0	55	0	6	83
597	12	1,010	334	98%	326	3.10	4	710	0	572	0	0	87	51
598	14	1,068	354	98%	346	3.09	4	699	0	384	0	0	148	167
599	14	764	326	98%	319	2.39	3	858	0	735	0	0	62	61
600	14	856	375	97%	363	2.36	3	707	0	272	0	0	255	180
601	14	3,653	1,541	96%	1487	2.46	3	586	0	155	32	0	319	80
602	14	9,574	3,243	96%	3112	3.08	1	630	0	35	0	0	268	327
603	14	5,587	2,500	96%	2402	2.33	2	1,202	0	234	611	0	195	162
604	14	3,301	1,787	96%	1719	1.92	1	2,402	2,000	103	0	0	219	80
605	14	671	363	98%	355	1.89	1	2,753	1	471	1,577	0	687	17
606	15	0	0	0%	0	0.00	0	2,479	83	818	1,293	0	270	15
607	15	0	0	0%	0	0.00	0	1,685	1,584	0	34	0	51	16
608	15	0	0	0%	0	0.00	0	5,819	5,632	39	16	0	57	75
609	15	0	0	0%	0	0.00	0	4,155	3,423	536	0	0	103	93
610	15	0	0	0%	0	0.00	0	1,600	1,600	0	0	0	0	0
611	15	0	0	0%	0	0.00	0	1,235	976	0	0	0	187	72

Exhibit 1-9
Planning Variables Update
Socioeconomic Estimates by TAZ
2010

TAZ	District		Total Housing Units	Occupancy Rate	Occupied Housing Units	Household Size	Household Income	Total Employment	Employment by Land Use					
									Resort /Casino	Office	Industrial	Retail	Other	Other Non-Retail
569	8	2,593	890	96%	855	3.03	1	528	67	214	0	0	219	28
570	8	810	357	97%	346	2.34	2	1,769	0	1,297	0	0	358	114
571	8	3,688	1,361	96%	1303	2.83	2	1,079	0	516	78	0	396	89
572	8	1,699	605	97%	588	2.89	2	353	0	61	0	0	186	106
573	8	1,932	660	96%	635	3.04	1	1,493	0	1,294	0	0	186	13
574	8	2,134	911	94%	852	2.50	2	1,865	1,628	119	0	0	101	17
575	8	1,194	432	97%	421	2.84	2	454	0	215	0	0	93	146
576	8	3	1	100%	1	3.00	2	478	0	184	0	0	26	268
577	3	3,016	1,233	95%	1167	2.58		624	88	79	44	55	355	3
578	3	1,743	597	96%	575	3.03	2	991	0	25	706	0	241	19
579	8	318	114	97%	111	2.86	2	465	0	0	0	15	445	5
580	3	6,364	2,352	97%	2287	2.78	2	414	49	0	35	0	273	57
581	3	4,376	1,353	97%	1308	3.35	3	1,453	0	1,116	0	0	241	96
582	3	7,286	2,299	97%	2231	3.27	3	693	0	88	35	0	535	35
583	3	416	206	94%	194	2.14		936	370	105	28	0	428	5
584	3	1,147	749	97%	725	1.58	1	2,268	1,700	15	378	0	155	20
585	3	6,132	3,735	93%	3473	1.77	1	573	0	0	122	0	450	1
586	3	6,417	2,710	96%	2602	2.47	1	151	0	42	0	0	70	39
587	3	463	160	94%	151	3.07	3	0	0	0	0	0	0	0
588	3	3,459	1,182	96%	1133	3.05	3	211	0	0	0	0	150	61
589	3	9,473	3,575	97%	3464	2.73	2	326	0	1	0	0	246	79
590	3	4,665	1,543	97%	1502	3.11	4	76	0	0	0	0	50	26
591	3	2,515	863	97%	840	2.99	4	824	0	0	0	0	12	812
592	3	1,579	540	97%	525	3.01	3	418	0	0	0	0	328	90
593	4	326	113	97%	110	2.96	4	437	0	0	0	0	0	437
594	12	10,293	4,374	96%	4193	2.45	3	3,119	29	2,761	36	0	135	158
595	12	13,153	4,833	95%	4571	2.88	4	160	0	68	20	0	57	15
596	12	1,407	472	97%	460	3.06	4	378	0	54	55	0	76	193
597	12	1,442	487	98%	475	3.04	4	1,015	0	829	0	0	166	20
598	14	1,317	446	98%	435	3.03	4	1,333	0	606	0	0	232	495
599	14	941	396	97%	386	2.44	3	1,318	0	1,112	0	0	150	56
600	14	1,052	461	96%	444	2.37	3	830	0	277	0	0	356	197
601	14	3,913	1,725	96%	1651	2.37	3	758	0	332	32	0	319	75
602	14	9,574	3,243	95%	3078	3.11		942	0	35	0	0	268	639
603	14	5,587	2,500	95%	2378	2.35	2	1,202	0	234	611	0	195	162
604	14	3,301	1,814	95%	1729	1.91	1	2,415	2,000	103	14	0	219	79
605	14	671	363	98%	354	1.90	1	2,832	1	554	1,577	0	687	13
606	15		0	0%	0	0.00	0	2,726	83	818	1,444	0	358	23
607	15		0	0%	0	0.00	0	2,007	1,801	0	34	0	51	121
608	15		0	0%	0	0.00	0	7,516	7,404	39	16	0	57	0
609	15		0	0%	0	0.00	0	5,843	5,084	536	0	0	200	23
610	15		0	0%	0	0.00	0	1,600	1,600	0	0	0	0	0
611	15		0	0%	0	0.00	0	2,858	2,671	0	0	0	187	0



Traffic Count History

NDOT Count Station	Year 1995	Year 1996	Year 1997	Year 1998
#288	37,765	39,300	37,100	36,000
#298	34,760	34,300	36,000	36,600
#300	32,030	32,500	34,600	31,000
#301	34,560	36,200	34,000	31,000
#302	17,330	17,900	17,500	16,500
#555	30,000	30,500	31,000	30,000
#556	30,960	33,400	34,000	32,000
#636	18,200	18,600	19,400	19,500
#649	30,770	33,300	34,500	34,500
#650	30,570	32,300	32,300	31,500
#651	30,040	30,200	31,400	29,500
#660	17,060	18,700	19,900	20,000

RTC PLANNING DIVISION

APRIL 2000

LAS VEGAS, NEVADA

"FIVE POINTS" INTERSECTION TRAFFIC COUNT TRENDS

Listing of Traffic Count Locations - Las Vegas "Five Points" Count Trends

SITE ID	LOCATION
03-0288	SR-604 (Las Vegas Bl.), .1 mi S. of Charleston Bl.
03-0298	SR-159 (Charleston Bl.), 100 ft. W. of 4th St. for W/B and 150 ft. W. for E/B
03-0300	SR-159 (Charleston Bl.), 100 ft. W. of South 6th St.
03-0301	SR-159 (Charleston Bl.), .2 mi. W. of SR-607 (Eastern Ave.
03-0302	SR-582 (Fremont St.), 300 ft. W. of SR-607 (Eastern Ave.)
03-0555	SR-159 (E. Charleston Bl.), .1 mi. W. of Mojave Rd.
03-0556	SR-159 (E. Charleston Bl.), .1 mi. W. of Sandhill Rd.
03-0636	Maryland Pkwy., .1 mi. N. of Charleston, just N. of Bonneville
03-0649	SR-607 (Eastern Ave.), .1 mi. S. of SR-589 (Sahara Ave.)
03-0650	SR-607 (Eastern Ave.), 200 ft. S. of Peyton Dr.
03-0651	SR-607 (Eastern Ave.), 400 ft. S. of Stewart St.
03-0660	Pecos Rd., 250 ft. S. of Stewart Ave.

LAS VEGAS, NEVADA - "Five Points" Intersection Traffic Count Trends Analysis

SITE ID	MAP ID	BASE 1995	1996	% 1995-1996	1997	% 1996-1997	1998	% 1997-1998
03-0288	1	37,765	39,300	4.06	37,100	-5.93	36,000	-3.06
03-0298	2	34,760	34,300	-1.32	36,000	4.72	36,600	1.64
03-0300	3	32,030	32,500	1.47	34,600	6.07	31,000	-11.61
03-0301	4	34,560	36,200	4.75	34,000	-6.47	31,000	-9.68
03-0302	5	17,330	17,900	3.29	17,500	-2.29	16,500	-6.06
03-0555	6	30,000	30,500	1.67	31,000	1.61	30,000	-3.33
03-0556	7	30,960	33,400	7.88	34,000	1.76	32,000	-6.25
03-0636	8	18,200	18,600	2.20	19,400	4.12	19,500	0.51
03-0649	9	30,770	33,300	8.22	34,500	3.48	34,500	0.00
03-0650	10	30,570	32,300	5.66	32,300	0.00	31,500	-2.54
03-0651	11	30,040	30,200	0.53	31,400	3.82	29,500	-6.44
03-0660	12	17,060	18,700	9.61	19,900	6.03	20,000	0.50
AVERAGE CORRIDOR DEMAND TRENDS				4.00		1.41		-3.86

Department of Comprehensive Planning
Environmental Division

500 S Grand Central Pky • Ste 3012 • PO Box 551745 • Las Vegas NV 89155-1745
(702) 455-4181 • Fax (702) 385-8940

John L. Schlegel, Director • Christine Robinson, Planning Manager

April 13, 2000

Mr. Scott Bohning
U.S. EPA AIR-7
75 Hawthorne Street
San Francisco, CA 94105-3901

Dear Mr. Bohning:

This letter is written as a follow up to discussions on the modeling analyses that will be conducted in conjunction with Clark County's forthcoming Carbon Monoxide State Implementation Plan revision. As you are aware, it is our intent to include emission budgets for 2010 and 2020, along with a 2000 attainment year budget. To insure that these budgets will not jeopardize attainment of the standard in future years, the SIP revision will include microscale hotspot analyses for these future horizon years, As a result of this modeling, the validity of the emission budgets will be confirmed and should belay any remaining uncertainties or concerns regarding their ability to maintain progress of attaining national air quality standards.

The methodology for the 2010 and 2020 microscale analyses will be identical to that used in the attainment demonstration. More specifically, the analysis will be conducted as specified in the document titled, *Modeling Protocol for the Las Vegas Valley Carbon Monoxide Urban Airshed Model Update Project,* which you received on September 11, 1996. It is also our intent to provide additional detailed information on this modeling exercise in the plan's technical appendices.

I believe that you will find this methodology acceptable as it follows customary modeling practices for attainment and maintenance demonstrations. Should you have any additional questions or concerns regarding this approach, please do not hesitate to contact me.

Sincerely,

Clete Kus
Principal Planner

CK/jda
cc: Julia Barrow
Ken Bigos

APPENDIX E

Section Seven
Inspection / Maintenance Program Performance

INSPECTION MAINTENACE PROGRAM PERFORMANCE

The following information is provided to demonstrate that the performance of the State's Motor Vehicle Inspection Maintenance Program meets the EPA's low enhanced performance standard. In developing the air quality plan, numerous modeling analyses were conducted using the EPA's MOBILE5 model. It is important that these modeling analyses are conducted in manner that reflects the actual program's design and that consistency is maintained with the State's of Nevada's *State Implementation Plan for an Enhanced Program for the Inspection and Maintenance of Motor Vehicles for Las Vegas Valley and Boulder, City Nevada* (March 1996). In doing so, the integrity of the SIP remains intact.

The EPA's MOBILE5 model was used to demonstrate performance of the I/M Program. First, an input file reflective of the EPA's low enhanced program design were developed and run. Next, an input file reflective of the State's I/M program requirements for the Las Vegas Area was prepared and run through the model. The run replicating the EPA's program design resulted in a composite CO emission factor of 15.49 grams per mile. To demonstrate equivalency, the Las Vegas run must equal or be less than this value. The Las Vegas runs resulted in a value of 15.18 grams per mile. As this value is lower than the EPA's design program, the I/M program meets the performance standard.

The remainder of this section contains the two MOBILE5 input and output files that were developed to demonstrate that the State's I/M program for the Las Vegas Area meets the low enhanced performance standard.

EPA Performance Standard Run Input File

```
5       PROMPT
  EPA Low Enhanced I/M Design, 2002
1       TAMFLG
1       SPDFLG
3       VMFLAG - Use Las Vegas VMT mix
3       MYMRFG
1       NEWFLG
6       IMFLAG - I/M program without TTC
1       ALHFLG
2       ATPFLG - Anti-Tampering program
2       RLFLAG - Las Vegas Vapor Recovery Program
2       LOCFLG - LAP record will appear once, in one-time data section.
1       TEMFLG - Mobile 5 will calculate the ambient temperature
4       OUTFMT - 80 Column Descriptive Format
2       PRTFLG - print exhaust CO results
1       IDLFLG -   No idle emission outputs
4       NMHFLG - Total organic gasses (TOG)
3       HCFLAG - Detailed component HC printed
.735.123.067.012.019.007.027.010                  Local VMT Mix
.043 .090 .083 .077 .077 .072 .066 .045 .042 .044     LDGV
.046 .060 .053 .045 .031 .019 .018 .019 .014 .009
.009 .008 .006 .006 .018
.027 .099 .089 .080 .104 .075 .059 .037 .037 .035     LDGT1
.035 .048 .042 .032 .024 .017 .020 .018 .019 .012
.014 .010 .007 .010 .050
.008 .042 .046 .033 .054 .043 .036 .029 .030 .043     LDGT2
.036 .082 .080 .070 .059 .041 .045 .050 .042 .027
.029 .027 .022 .008 .018
.013 .045 .041 .030 .045 .040 .036 .025 .022 .020     HDGV
.035 .079 .073 .065 .049 .039 .044 .054 .040 .028
.030 .027 .017 .083 .020
.043 .090 .083 .077 .077 .072 .066 .045 .042 .044     LDDV
.046 .060 .053 .045 .031 .019 .018 .019 .014 .009
.009 .008 .006 .006 .018
.027 .099 .089 .080 .104 .075 .059 .037 .037 .035     LDDT
.035 .048 .042 .032 .024 .017 .020 .018 .019 .012
.014 .010 .007 .010 .050
.040 .144 .084 .073 .095 .098 .076 .048 .046 .033     HDDV
.038 .035 .032 .016 .013 .014 .020 .016 .019 .012
.012 .008 .006 .004 .018
.024 .056 .059 .074 .112 .098 .079 .096 .134 .098     MC
.091 .079 .000 .000 .000 .000 .000 .000 .000 .000
.000 .000 .000 .000 .000
1 1 1 1
83 20 68 20 03 03 096 1 1 2221 1222 220. 1.20 999.     idle test 68-on
TECH12.D                                  I/M data file
IMDATA4.D                                 I/M data file
83 68 20 2221 11 096. 11112111                  Anti-Tampering
92 3 095 095                              RLFLAG refueling emission
            C  36.  64. 13.5 09.0 95 2 1 1      Local Area Parameter record
.000 1.00 .000 .035 1                        Ether Alcohol oxyEther ox
4 02 19.6 50.0 20.6 27.3 20.6 01                Scenario description record
01 11
```

EPA Performance Standard Run Output File

1 EPA Low Enhanced I/M Design, 2002
MOBILE5b (14-Sep-96)
0I/M program selected:

0 Start year (January 1): 1983
Pre-1981 MYR stringency rate: 20%
First model year covered: 1968
Last model year covered: 2020
Waiver rate (pre-1981): 3.%
Waiver rate (1981 and newer): 3.%
Compliance Rate: 96.%
Inspection type: Test Only
Inspection frequency Annual
Vehicle types covered: LDGV - Yes
LDGT1 - Yes
LDGT2 - Yes
HDGV - No
1981 & later MYR test type: Idle
Cutpoints, HC: 220.000 CO: 1.200 NOx: 999.000
Low alt, Annl and Bien Insp Freq TECH 1 & 2 I/M cred data
Annl Insp Freq & TECH 4+ I/M credit Idle test data
0Functional Check Program Description:
0Check Start Model Yrs Vehicle Classes Covered Inspection Comp Eff
(Jan1) Covered LDGV LDGT1 LDGT2 HDGV Type Freq Rate Adj
ATP 1983 1968-2020 Yes Yes Yes No Test Only Annual 96.0% 1.00
0Air pump system disablements: No Catalyst removals: No
Fuel inlet restrictor disablements: No Tailpipe lead deposit test: No
EGR disablement: Yes Evaporative system disablements: No
PCV system disablements: No Missing gas caps: No
0Stage II program selected:

0 Start year (January 1): 1992
Phase-in period (yrs.): 3
Percent Efficiency for LDGV & LDGT: 95.%
Percent Efficiency for HDGV: 95.%

0
Minimum Temp: 36. (F) Maximum Temp: 64. (F)
Period 1 RVP: 13.5 Period 2 RVP: 9.0 Period 2 Yr: 1995
0TOG HC emission factors include evaporative HC emission factors.
0_____
0Emission factors are as of Jan. 1st of the indicated calendar year.
LEV phase-in begins in 2001 without using (4/8/94) Guidance Memo Credits
0LEV phase-in data read from file: nlevstd.d
0User supplied veh registration distributions.
0Cal. Year: 2002 Region: Low Altitude: 500. Ft.
I/M Program: Yes Ambient Temp: 55.9 (F)
Anti-tam. Program: Yes Operating Mode: 20.6 / 27.3 / 20.6
Reformulated Gas: No
0 Ether Blend Market Share: 0.000 Alcohol Blend Market Share: 1.000
Ether Blend Oxygen Content: 0.000 Alcohol Blend Oxygen Content: 0.035
Alcohol Blend RVP Waiver: No
0Veh. Type: LDGV LDGT1 LDGT2 LDGT HDGV LDDV LDDT HDDV MC All Veh
+ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____
Veh. Spd.: 19.6 19.6 19.6 19.6 19.6 19.6 19.6 19.6
VMT Mix: 0.735 0.123 0.067 0.012 0.019 0.007 0.027 0.010
ZEV Fract: 0.00% 0.00%
0Composite Emission Factors (Gm/Mile)
Exhst CO: 14.60 16.64 26.85 20.24 30.91 1.55 1.68 11.01 19.74 **15.49**
_____

Las Vegas Run Input File

```
5       PROMPT
  Las Vegas 2001 run; LV I/M with TTC begins on 3rd reg,incl HDGV
1       TAMFLG
1       SPDFLG
3       VMFLAG - Use Las Vegas VMT mix
3       MYMRFG
1       NEWFLG
6       IMFLAG - I/M program with TTC
1       ALHFLG
2       ATPFLG - Anti-Tampering program
2       RLFLAG - Las Vegas Vapor Recovery Program
2       LOCFLG - LAP record will appear once, in one-time data section.
1       TEMFLG - Mobile 5 will calculate the ambient temperature
4       OUTFMT - 80 Column Descriptive Format
2       PRTFLG - print exhaust CO results
1       IDLFLG - No idle emission outputs
4       NMHFLG - Total organic gasses (TOG)
3       HCFLAG - Detailed component HC printed
.735.123.067.012.019.007.027.010                Local VMT Mix
.043 .090 .083 .077 .077 .072 .066 .045 .042 .044     LDGV
.046 .060 .053 .045 .031 .019 .018 .019 .014 .009
.009 .008 .006 .006 .018
.027 .099 .089 .080 .104 .075 .059 .037 .037 .035     LDGT1
.035 .048 .042 .032 .024 .017 .020 .018 .019 .012
.014 .010 .007 .010 .050
.008 .042 .046 .033 .054 .043 .036 .029 .030 .043     LDGT2
.036 .082 .080 .070 .059 .041 .045 .050 .042 .027
.029 .027 .022 .008 .018
.013 .045 .041 .030 .045 .040 .036 .025 .022 .020     HDGV
.035 .079 .073 .065 .049 .039 .044 .054 .040 .028
.030 .027 .017 .083 .020
.043 .090 .083 .077 .077 .072 .066 .045 .042 .044     LDDV
.046 .060 .053 .045 .031 .019 .018 .019 .014 .009
.009 .008 .006 .006 .018
.027 .099 .089 .080 .104 .075 .059 .037 .037 .035     LDDT
.035 .048 .042 .032 .024 .017 .020 .018 .019 .012
.014 .010 .007 .010 .050
.040 .144 .084 .073 .095 .098 .076 .048 .046 .033     HDDV
.038 .035 .032 .016 .013 .014 .020 .016 .019 .012
.012 .008 .006 .004 .018
.024 .056 .059 .074 .112 .098 .079 .096 .134 .098     MC
.091 .079 .000 .000 .000 .000 .000 .000 .000 .000
.000 .000 .000 .000 .000
1 1 2 1
83 20 68 99 01 01 096 2 1 2222 2222 220. 1.20 999.     2-speed test 68, incl HDGV
TECH12.D                                I/M data file
IMDATA4.D                               I/M data file
83 81 99 2222 21 096. 22212112                  Anti-Tampering
92 3 095 095                            RLFLAG refueling emission
            C  36.  64. 13.5 09.0 95 2 1 1      Local Area Parameter record
.000 1.00 .000 .035 1                     Ether Alcohol oxyEther ox
4 02 19.6 50.0 20.6 27.3 20.6 01                Scenario description record
01 11
```

Las Vegas Run Output File

```
1    Las Vegas 2001 run; LV I/M with TTC begins on 3rd reg,incl HDGV
 MOBILE5b (14-Sep-96)
0I/M program selected:

0    Start year (January 1):            1983
     Pre-1981 MYR stringency rate:       20%
     First model year covered:          1968
     Last model year covered:           1999
     Waiver rate (pre-1981):            1.%
     Waiver rate (1981 and newer):       1.%
     Compliance Rate:                  96.%
     Inspection type:                  Computerized Test and Repair
     Effectiveness - HC: 0.50  CO: 0.50  NOx: 0.50
     Inspection frequency              Annual
     Vehicle types covered:             LDGV - Yes
                                       LDGT1 - Yes
                                       LDGT2 - Yes
                                        HDGV - Yes
     1981 & later MYR test type:        2500 rpm / Idle
     Cutpoints, HC:  220.000   CO:    1.200   NOx:  999.000
  Low alt, Annl and Bien Insp Freq TECH 1 & 2 I/M cred data
 Annl Insp Freq & TECH 4+ I/M credit 2500/Idle test data
 With 100.0% Technician Training and Certification Credit
0Functional Check Program Description:
0Check Start Model Yrs Vehicle Classes Covered    Inspection        Comp   Eff
      (Jan1) Covered   LDGV LDGT1 LDGT2 HDGV   Type        Freq     Rate   Adj
 ATP   1983  1981-1999 Yes  Yes   Yes   Yes Test & Repair Annual    96.0%  0.00
0Air pump system disablements:       Yes  Catalyst removals:                Yes
 Fuel inlet restrictor disablements: Yes  Tailpipe lead deposit test:        No
 EGR disablement:                    Yes  Evaporative system disablements:    No
 PCV system disablements:            No   Missing gas caps:                 Yes
0Stage II program selected:

0    Start year (January 1):            1992
     Phase-in period (yrs.):             3
     Percent Efficiency for LDGV & LDGT: 95.%
     Percent Efficiency for HDGV:       95.%
0
                Minimum Temp: 36. (F)   Maximum Temp: 64. (F)
                Period 1 RVP: 13.5      Period 2 RVP:  9.0 Period 2 Yr: 1995
0TOG HC emission factors include evaporative HC emission factors.
0_____________________________________________________________________________
0Emission factors are as of Jan. 1st of the indicated calendar year.
 LEV phase-in begins in 2001 without using (4/8/94) Guidance Memo Credits
0LEV phase-in data read from file: nlevstd.d
0User supplied veh registration distributions.
0Cal. Year: 2002          Region: Low          Altitude:  500. Ft.
                 I/M Program: Yes       Ambient Temp:   55.9 (F)
              Anti-tam. Program: Yes     Operating Mode:   20.6 / 27.3 / 20.6
               Reformulated Gas: No
0  Ether Blend Market Share: 0.000       Alcohol Blend Market Share: 1.000
 Ether Blend Oxygen Content: 0.000     Alcohol Blend Oxygen Content: 0.035
                                  Alcohol Blend RVP Waiver: No
0Veh. Type:  LDGV  LDGT1  LDGT2   LDGT   HDGV   LDDV   LDDT   HDDV   MC   All Veh
+            ______ ______ ______ ______ ______ ______ ______ ______ ______ ______
 Veh. Spd.: 19.6   19.6   19.6         19.6   19.6   19.6   19.6   19.6
   VMT Mix:  0.735  0.123  0.067        0.012  0.019  0.007  0.027  0.010
 ZEV Fract:  0.00%  0.00%
0Composite Emission Factors (Gm/Mile)
 Exhst  CO: 14.43  16.02  25.76  19.46  28.08   1.55   1.68  11.01  19.74  15.18
_____________________________________________________________________________
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APPENDIX E

Section Eight
Contingency Measures Deemed Not Feasible

CONTINGENCY MEASURES DEEMED NOT FEASIBLE

The following section lists those contingency measures that were considered for inclusion in the Carbon Monoxide Plan but were deemed not feasible to be considered. The following Table highlights the barriers to their selection and implementation in the plan. Based on information contained in the *Maricopa Association of Governments 1999 Serious Area Carbon Monoxide Plan*, the cumulative benefit from these contingency measures is estimated to be less than a 2 percent reduction. When this reduction is considered along with the implementation costs associated with these measures, they are not considered as being cost effective.

MEASURE	BARRIER TO IMPLEMENTATION
Increased Registration Enforcement	DMV & PS and Nevada Highway Patrol are actively enforcing the registration requirement. Also, budgetary constraints will not allow for increased enforcement activities.
Catalytic Converter Program	Based on information from Clark County's Voluntary Vehicle Repair Pilot Program, less than 1% of repairs have required catalyst replacement.
Lawn Mower Replacement Program	It is estimated that lawn and garden equipment contribute only 0.09% on a peak season day. This program would not be cost effective and provide minimal reduction.
Fireplace Burning Restrictions	Contributions from this source are negligible; therefore reductions would be minimal. Not pubilcly acceptable, it is considered as intrusive and enforcement is difficult. Additionally, all local governments have adopted ordinances requiring EPA certified (low emission) fireplaces in new construction.
Remove Gross Emitter Waiver Provision	Such a requirement would conflict with the State of Nevada's Constitution.
Increase Waiver Repair Limits	Current waiver amount is $450 for garage repairs. There is no dollar limit for self repairs. On a quarterly basis, less than 5 waivers are granted. No additional CO reductions would result from increasing waiver amount.
National LEV Program	These vehicles would begin entering the local fleet beginning with the 2001 model year. The effects of NLEV's in the fleet will not provide substantial reductions in the timeframe which they would be needed.