

2001

Clean Air Plan

Appendix C

*Transportation Control Measures
On-Road Mobile Source Emissions Analysis*

FINAL

December 2002



FINAL

SANTA BARBARA COUNTY
2001 CLEAN AIR PLAN

APPENDIX C

TRANSPORTATION CONTROL MEASURES
&
ON-ROAD MOBILE SOURCE EMISSIONS ANALYSIS

December 2002

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GLOSSARY OF COMMONLY USED ACRONYMS AND TERMS

AQAP	Air Quality Attainment Plan - The comprehensive document which is required under the 1977 Federal Clean Air Act (FCAA) and the 1988 California Clean Air Act (CCAA). The document details the programs and control measures needed to sufficiently reduce emissions to meet the National Ambient Air Quality Standards and the state standards respectively.
AVO	Average Vehicle Occupancy - The average number of people per vehicle.
AVR	Average Vehicle Ridership - The total number of employees working at a work site relative to the total number of motor vehicles used by the workforce (includes telecommuters).
Caltrans	California Department of Transportation - Agency responsible for state-wide transportation programs in California.
CAP	Clean Air Plan - Santa Barbara County's federal ozone standard attainment demonstration plan. This State Implementation Plan submittal is required of Santa Barbara County by the 1990 Clean Air Act.
CARB	California Air Resources Board - Agency responsible for statewide air quality programs in California.
CCAA	California Clean Air Act - A California law passed in 1988 which provides the basis for state air quality planning and regulation (independent of federal regulations). This Act directs local Air Pollution Control Districts (APCDs), which are non-attainment for the California Ambient Air Quality Standards, to achieve attainment of these standards by the earliest feasible date.
CNG	Compressed Natural Gas - An alternative fuel currently being demonstrated in Santa Barbara County.
CMA	Congestion Management Agency - SBCAG has been designated by the cities and the county as the agency responsible for the development and implementation of the countywide Congestion Management Program (CMP) required by Section 65088 of the California Government Code. SBCAG is responsible, in cooperation with local and state agencies for identifying and resolving traffic congestion problems within the county pursuant to specific legislative requirements.
CMAQ	Congestion Mitigation and Air Quality Program - A program under the Transportation Equity Act for the 21 Century (TEA-21) that provides funds for areas classified as being nonattainment of the National Ambient Air Quality Standards (NAAQS). CMAQ-funded projects must contribute to the attainment of air quality standards by demonstrating a reduction in vehicular emissions.
CMP	Congestion Management Program - The CMP is a comprehensive program designed to reduce auto-related congestion through provision of roadway

improvements, travel demand management, and coordinated land use planning among all local jurisdictions. The program is required of every county in California with an urbanized area of at least 50,000 people. The CMP is updated biennially.

EMFAC2002	Model developed by the California Air Resources Board to develop on-road mobile source emission inventories.
EPA	Environmental Protection Agency - The United States agency charged with setting policies and guidelines, and carrying out legal mandates for the protection of national interests in environmental resources.
FCAA/CAAA	Federal Clean Air Act (Amendments) - Federal legislation that sets national air quality standards and requires each state with areas that have not met federal air quality standards to prepare a State Implementation Plan (SIP). The 1990 FCAA amendments established new air quality requirements for the development of metropolitan transportation plans and programs.
FHWA	Federal Highway Administration - As an agency under the U.S. Department of Transportation (U.S.DOT), FHWA is responsible for all federal highway programs.
FTA	Federal Transit Administration - Formally known as the Urban Mass Transportation Administration (UMTA), FTA is an agency under the U.S. Department of Transportation (U.S.DOT) responsible for all federal programs related to mass transit.
FTIP	Federal Transportation Improvement Program - The FTIP is a multi-year program of transportation projects that are funded from primarily federal sources. The FTIP is developed and adopted by the Metropolitan Planning Organization (SBCAG) on a biennial basis. Once adopted, the FTIP is submitted to the California Transportation Commission (CTC) and the federal funding agencies.
HOV	High Occupancy Vehicle - A vehicle that is transporting more than one person. HOV lanes are segments of roadway that are restricted to HOV vehicles.
LOS	Level of Service - A measure of congestion on a highway facility or intersection based primarily on the comparison between the facility's capacity and its traffic volume. Increasing levels of congestion are designated along a scale from A to F.
Measure D	A 1/2 cent sales tax referendum approved by the voters in 1989 to fund transportation facility maintenance and improvements in Santa Barbara County over the next 20 years.
NAAQS	National Ambient Air Quality Standards - Standards set by the federal Environmental Protection Agency (EPA) for the maximum levels of air

pollutants, which can exist in the outdoor air without unacceptable effects on human health or the public welfare.

ROP	Rate of Progress (Plan) - The 1990 CAAA requires moderate and above nonattainment areas to show progress towards attainment by demonstrating a 15 percent reduction in reactive organic gas emissions below 1990 levels. Santa Barbara County submitted its 1993 ROP Plan to EPA in November 1993 fulfilling this requirement.
RTIP	Regional Transportation Improvement Program - Prepared and adopted biennially by Regional Transportation Planning Agency (SBCAG), the RTIP includes projects from the Regional Transportation Plan (RTP) Action Element nominated for state Flexible Congestion Relief Funds. The RTIP when adopted is submitted to the California Transportation Commission (CTC) for inclusion in the State Transportation Improvement Program (STIP).
RTP	Regional Transportation Plan - The RTP is a long range plan to improve our region's state highways; local streets, roads, and bikeways; airports and marine facilities; transit, para-transit, and passenger rail services. A guide for the development of these facilities, the RTP describes the priorities for making investments in our region's transportation system.
SBAPCD	Santa Barbara Air Pollution Control District - The local agency which governs air quality issues: proposes and adopts local air pollution rules, enforces those rules, responds to air pollution related complaints, issues permits to polluting sources, and inventories sources of air pollution emissions.
SBCAG	Santa Barbara County Association of Governments - SBCAG is a voluntary council of governments formed under a joint powers agreement executed by each of the general purpose local governments in Santa Barbara County. SBCAG is an independent entity governed by a twelve-member board consisting of a city council representative from each of the seven cities in the county and the five members of the county board of supervisors. The city representatives are appointed by their respective city councils. SBCAG is the designated Regional Transportation Planning Agency (state planning mandate), the Metropolitan Planning Organization (federal planning mandate), the local Transportation Authority, and the Congestion Management Agency for Santa Barbara County.
SBMTD	Santa Barbara Metropolitan Transit District - SBMTD is the provider of public transit services on the South Coast. SBMTD's fleet consists of heavy-duty diesel buses and electric shuttle buses. Transit service consists of a combination of fixed route, express, and demand responsive service.
SIP	State Implementation Plan - A document prepared by each state, with input from local Air Pollution Control Districts, describing the existing air quality conditions and measures, which will be taken to attain and maintain national ambient air quality standards (NAAQS).

SMAT	Santa Maria Area Transit - SMAT is the fixed route transit service provider in the Santa Maria/Orcutt Area.
STP	Surface Transportation Program - A program under the Transportation Equity Act for the 21 st Century (TEA-21) that provides greater flexibility for how federal highway funds are spent. Many types of alternative transportation projects are eligible under this program.
TCM	Transportation Control Measure - Any strategy to reduce vehicle trips, vehicle use, vehicle miles of travel, vehicle idling, or traffic congestion for the purpose of reducing motor vehicle emissions.
TDM	Transportation Demand Management - The implementation of measures which encourage people to change their mode of travel, or not to make a trip at all e.g., ridesharing, pricing incentives, parking management and telecommuting.
VMT	Vehicle Miles Traveled - VMT is the sum of miles traveled by all vehicles during a fixed period of time on a fixed expanse of highways.
VMT-SCD	VMT By Speed Class Distribution - A breakdown of regional VMT into 13 speed classes ranging between 0 - 65 mph in five mile increments produced by Caltrans and the California Air Resources Board. The VMT-SCD is an input to the on-road mobile source emissions model EMFAC2002.

C.1 BACKGROUND

In June 1993, the boards of Santa Barbara County Association of Governments (SBCAG) and the Santa Barbara County Air Pollution Control District (APCD) jointly approved a Memorandum of Understanding (MOU), which effectively placed the responsibility for developing the transportation elements of the air quality plans with SBCAG. This MOU allows SBCAG to assist the APCD in a cooperative effort towards meeting the District's responsibilities for developing the transportation elements of its state and federal air quality plans. Under the MOU, SBCAG is responsible for the development and analysis of the 2001 Plan on-road mobile source emission estimates and transportation control measures (TCMs). SBCAG also provides the APCD with socio-economic projections, which formed the basis for many of the stationary and area source growth factor forecasts for this 2001 Plan.

TCMs are programs or activities that states and localities can implement to encourage the traveling public to rely less on the automobile or to use the automobile more efficiently. TCMs reduce emissions from on-road motor vehicles and trucks by: improving the existing transportation system to allow motor vehicles to operate more efficiently; inducing people to change their travel behavior to less polluting modes; or, ensuring emission control technology improvements in the motor vehicle fleet are fully and expeditiously realized. TCMs address the need for the traveling public to: 1) carefully consider the implications of continued reliance on the single occupant vehicle as the major source of commute trips; 2) the need to provide and promote alternatives to single occupant vehicle travel; and, 3) the need to consider regulating those factors which promote single occupant vehicle travel. While the greatest on-road mobile source emission reductions (95+ percent) are attributable to motor vehicle emission controls established by federal and state laws and the natural attrition of older more polluting vehicles (i.e., fleet turnover), TCMs should be considered as part of air quality plans given that they help meet multiple objectives (i.e., congestion relief, energy efficiency, etc.).

Section 108(f) of the Federal Act lists sixteen TCM categories for controlling on-road mobile sources of pollution. These 16 TCMs are listed below.

1 Trip Reduction Ordinances

- 2 Employer-Based Transportation Demand Management Programs
- 3 Work Schedule Changes
- 4 Area-Wide Rideshare Incentives
- 5 Improve Public Transit
- 6 High Occupancy Vehicle Lanes
- 7 Traffic Flow Improvements
- 8 Parking Management
- 9 Park-n-Ride/Fringe Parking
- 10 Bicycle and Pedestrian Programs
- 11 Special Events
- 12 Vehicle Use Limitations/Restrictions
- 13 Accelerated Retirement of Vehicles
- 14 Activity Centers
- 15 Extended Vehicle Idling
- 16 Extreme Low-Temperature Cold Starts.

The Federal Act recognizes that given varying local conditions, all sixteen TCM types may not be appropriate for every nonattainment area. The Federal Act also acknowledges that the Section 108(f) list of TCMs is not an exhaustive list and allows areas to develop and implement other measures, which control on-road mobile sources of pollution.

Table 1 summarizes the implementation characteristics of all currently adopted TCM categories in the county. Identified are: the type of TCM; the adopting agency/agencies; the agency/agencies responsible for implementing the TCM; the formal agreements between the adopting and implementing agencies; and, how TCM implementation will be monitored and by whom. All currently adopted TCMs except for T-18 (Alternative Fuels) are listed as TCMs by EPA in Section 108(f) of the Federal Act. All TCMs adopted as part of the SIP must be implemented in an expeditious manner or federal transportation funds programmed for new road capacity could be withheld. The mechanism by which expeditious implementation of TCMs is demonstrated is through the federal conformity regulation. All future transportation plans and programs for Santa Barbara County are subject to the conformity provisions of the Federal Act which ensures that they are consistent with the SIP.

Control measures are classified as being adopted, proposed, contingency, further study, or deleted. Adopted TCMs are those projects and programs that the APCD has formally adopted and included in the State Implementation Plan (SIP). Adopted TCM projects and programs

developed as part of the 1994 CAP and 1998 CAP are listed in Table 2 and Table 3 respectively. These measures also meet the “all feasible control measure” (Health and Safety Code, Section 40914(b)) provisions of the California Clean Air Act.

In December of 2000 and January of 2001, SBCAG staff briefed its Technical Transportation Advisory Committee (TTAC) on the role of TCMs and attempted to solicit new candidate projects or programs for inclusion in the 2001 Plan. After careful consideration, staff selected several projects for inclusion in the 2001 Plan as contingency measures. There are no new TCM projects being proposed in this 2001 Plan. However, some of the TCM projects identified as contingency measures will likely proceed with implementation under state law and provide additional emission reductions towards maintaining the federal 1-hour ozone standard for ozone but are not identified for federal credit. If the county experiences a violation of the federal 1-hour standard the entire contingency package will be evaluated for possible implementation.

SBCAG evaluated all TCMs considered to be reasonably available control measures (RACM). All the RACM TCMs evaluated for the 2001 Plan were classified as either being:

- Currently Adopted
- Proposed for Adoption
- Proposed for Further Study
- Proposed for Rejection
- Contingency Measures

Table 1.
SANTA BARBARA COUNTY TRANSPORTATION CONTROL MEASURES

TCM #	TCM Designation	Type of TCM	Adopting Agency(ies)	Implementing Agency(ies)	Commitments	Monitoring Mechanism (Agency)
T-1 T-2	Trip Reduction Program Employer-Based TDM Program	Voluntary; TDM Program; State AQAP	Tier 1: Guadalupe; Buellton; Solvang; County, SYV Tier 2: Lompoc; Santa Maria; Carpinteria; County Unincorporated Tier 3: Santa Barbara; County, Goleta	Tier 1 (County/ Cities) Tier 2 (County/Cities) Tier 3 (County/Cities)	Tiers 1 & 2: Resolution of Commitments from Affected jurisdictions; Tier 3: City and County TDM Program City of Santa Barbara and Goleta area	TDM Program (SBCAG) CMP Conformity (SBCAG) SIP Conformity (SBCAG)
T-3	Work Schedule Changes	Voluntary	County and Cities	County and Cities; Private Sector	Adopted Policy, County, 1988	Not Applicable (TDM)
T-4	Area Wide Ridesharing	Voluntary	County and Cities	SBCAG	Interagency Agreement	SIP Conformity (SBCAG)
T-5	Public Transportation	Programmed	County and Cities	SBMTD; SMAT; SBCAG; APCD; Lompoc Transit; Santa Ynez Valley Transit;	FTIP and RTIP; SRTP, TDP	List of Programmed Projects Implemented by 1999 (SBCAG); SIP Conformity (SBCAG)
T-7	Traffic Flow Improvement	Programmed	County and Cities	County and Cities; Caltrans; SBMTD; SBCAG	FTIP and RTIP	List of Programmed Projects Implemented by 1999 (SBCAG); SIP Conformity (SBCAG)
T-8	Parking Management	Parking Ordinance	City of Santa Barbara	City of Santa Barbara	Not Applicable	City of Santa Barbara Parking Task Force; SIP Conformity (SBCAG)
T-9	Park-and-Ride Fringe Parking	Voluntary; Programmed	County and Cities	County and Cities; Caltrans	FTIP and RTIP	Caltrans, District 5; List of Programmed Projects Implemented by 1999 (SBCAG); SIP Conformity (SBCAG)
T-10	Bicycle/Pedestrian	Programmed	County and Cities	County and Cities; Caltrans; SBCAG	FTIP and RTIP; General Bikeway Elements; Bikeway Master Plans	List of Programmed Projects Implemented by 1999 (SBCAG); SIP Conformity (SBCAG)
T-13	Accelerated Retirement of Vehicles	Voluntary	APCD	APCD	Contract APCD/Engineering	APCD; SIP Conformity (SBCAG)
T-17	Telecommunication	Voluntary	County and Cities	County and Cities; Private Sector	Not Applicable	Not Applicable (TDM)
T-18	Alternative Fuel Program	Voluntary	APCD	APCD; County and Cities	Interagency Agreements Unnecessary	APCD; SIP Conformity (SBCAG)
T-19	Public Education	Committal; Voluntary	County and Cities APCD; SBCAG	County and Cities APCD; SBCAG	Interagency Agreements Unnecessary	Not Applicable; CMP Conformance (SBCAG); SIP Conformity (SBCAG);

TABLE 2**1994 CLEAN AIR PLAN - ON ROAD MOBILE SOURCE CONTROL MEASURES**

TCM	Description	Project Sponsor	Project/Program Description	Implementation Status	SIP Analysis
1-4	Travel Demand Management	Traffic Solutions	City-County TDM Program	Program On-Going	Yes
	Areawide Ridesharing	Traffic Solutions	County Rideshare Program	Program On-Going	Yes
	Work Schedule Changes	Traffic Solutions/Business	Flexible Work Hours	Program On-Going	No
5	Public Transportation	SBMTD	Isla Vista - SBCC Express Service	Service On-Going	Yes
		SBMTD	Downtown Waterfront Shuttle Expansion	Service On-Going	Yes
		APCD	Clean Air Express Expansion	Service On-Going	Yes
		City of Santa Maria	SMAT Expansion - 1 30 foot bus	Service On-Going	Yes
		City of Lompoc	Lompoc Transit Expansion - 2 buses & farebox system	Service On-Going	Yes
		City of Solvang	SYVT Expansion - 1 van to establish fixed route service	Service On-Going	Yes
		AMTRAK	Service Expansion from 2 to 4 train stops per day	Service On-Going	Yes
7	Traffic Flow Improvements	Caltrans	Crosstown Freeway Project	Completed	Yes
		County/Caltrans	Rte. 101/ Patterson Avenue I/C	Completed	Yes
		SBCAG/Caltrans	Rte. 101 / La Cumbre Road I/C	Completed	Yes
		SBCAG/Caltrans	Rte. 101 / Storke Road I/C	Completed	Yes
		SBCAG/Caltrans	Rte. 101/ Betteravia Road I/C	Completed	Yes
		County/Caltrans	Rte. 101/Fairview Avenue I/C	Completed	Yes
		City of Santa Maria	Rte. 135/Betteravia Road Intersection	Completed	Yes
		County of Santa Barbara	Hollister Avenue/Fairview Avenue	Completed	Yes
		City of Santa Barbara	Castillo Street/Montecito Street	Completed	Yes
		County of Santa Barbara	Signal Synchronization – Hollister Avenue	Completed	Yes
8	Parking Management	City of Santa Barbara	Residential Parking Program	On-going	No
9	Park-n-Ride Lots	N/A	N/A	N/A	No
10	Bicycle/Pedestrian	City of Santa Maria	Santa Maria Valley Railroad Bikeway	Completed	Yes
		City of Santa Maria	Battles Road Bicycle and Pedestrian Project	Completed	Yes
		City of Solvang	Alamo Pintado Creek Bikeway/Pedestrian Bridge	Partially Completed	Yes
		City of Santa Barbara	SBCC - East Campus Bicycle and Pedestrian Project	Completed	Yes
		City of Santa Barbara	Crosstown East - West Bike lane Couplet	Completed	No
		City of Santa Barbara	Shoreline Drive/Cabrillo Blvd. Bikeway	Completed	No
		County of Santa Barbara	Fairview Avenue Bicycle Lane	Completed	Yes
		County of Santa Barbara	Bradley Road Bikeway	Completed	Yes
		County of Santa Barbara	El Capitan Ranch Bikeway	Completed	No
13	Old Car Buyback	Parsons Inc. - APCD	Vehicle Buyback Program	Completed 1993-96	Yes
17	Telecommunication	County of SB - Probation	Expansion of Video Conferencing Network	Completed	Yes
18	Alternative Fuel Program	APCD	ITG Program	On-Going	Yes
		APCD	Clean Air Express Expansion	Completed - On-Going	Yes -T-5
		SBMTD	Waterfront Shuttle Service Expansion	Completed - On-Going	Yes -T-5
		SBMTD	Easy Lift Conversion of 5 vans to CNG	Completed - On-Going	Yes
		SBMTD	Gillig Bus Refurbishment	Completed - On-Going	Yes
		SBMTD	AMG Bus Refurbishment	Completed - On-Going	Yes
19	Public Education	APCD	Overall Work Program	On-going	No
		SBCAG	Overall Work Program	On-going	No

CONTINGENCY PLAN - FY 1997

21	Enhanced I/M Program	BAR	Enhanced I/M Program	Delayed -Pending	Yes
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TABLE 3

1998 CLEAN AIR PLAN - ON ROAD MOBILE SOURCE CONTROL MEASURES

TCM	Description	Project Sponsor	Project/Program Description	Implementation Status	SIP Analysis
1-4	Travel Demand Management	Traffic Solutions	City-County TDM Program	Program On-Going	Yes
	Areawide Ridesharing	Traffic Solutions	County Rideshare Program	Program On-Going	Yes
	Work Schedule Changes	Traffic Solutions/Business	Flexible Work Hours	Program On-Going	No
5	Public Transportation	City of Santa Maria	CNG Transit Bus, expanded service to Guadalupe	Service On-Going	Yes
		County of Santa Barbara	Goleta Rail Platform - San Diegan Extension	Service On-Going	Yes
			Surf Rail Platform - San Diegan Extension	Service On-Going	Yes
		City of Guadalupe	Guadalupe Rail Platform - San Diegan Extension	Service On-Going	Yes
7	Traffic Flow Improvements	N/A	N/A	NA	NA
8	Parking Management	City of Santa Barbara	Residential Parking Program	On-going	No
9	Park-n-Ride Lots	County of Santa Barbara	Lompoc Park-n-Ride Lot – Ocean Ave./7 th Ave.	Completed	Yes
		County of Santa Barbara	Santa Maria Park-n-Ride Lot – Clark/HWY101	Completed	Yes
10	Bicycle/Pedestrian	City of Santa Maria	1 Bike Locker	Completed	Yes
		County of Santa Barbara	Class II Bikeway in Santa Ynez - Alamo Pintado Rd.	Completed	Yes
		County of Santa Barbara	Rufugio Road Class II Bikeway-Samantha Dr-SR246	Completed	Yes
		County of Santa Barbara	Phelps Road Class II Bike lane	Completed	Yes
		County of Santa Barbara	Via Real Class II Bikeway – Cravens Lane to Padaro	Completed	No
		County of Santa Barbara	Maria Ygnacia Creek Class I Bikeway	Completed	No
13	Old Car Buyback	Parsons Inc. – APCD	Vehicle Buyback Program (1998-2002)	Completed	Yes
17	Telecommunication	County of SB – Probation	Expansion of Video Conferencing Network	Completed	Yes
18	Alternative Fuel Program	UCSB	2 CNG Truck Conversions/fuel maker	On-Going	Yes
		City of Lompoc	NG Garbage Truck, roll-off bins, compactors	Project Dropped*	Yes -T-5
		City of Santa Maria	Purchase Dual Fuel Van	Completed - On-Going	Yes -T-5
		City of Santa Maria	Purchase 1 CNG Bus	Completed - On-Going	Yes
19	Public Education	APCD	Overall Work Program	On-going	No
		SBCAG	Overall Work Program	On-going	No
		SB Bike Coalition	Bicycle Video	On-going	No
		County of Santa Barbara	Local Regulations for Electric Vehicles	On-going	No
CONTINGENCY PLAN - FY 1997					
21	Enhanced I/M Program	BAR	Enhanced I/M Program	Delayed by State	Yes
22	Expanded TDM Program	Local Businesses+APCD+	Countywide Employer-Based	Pending	
		Traffic Solutions	Trip Reduction Ordinance 100+EMPLOYEES		

* alternative fuel projects are not subject to the expeditious implementation test of the federal conformity regulation

All TCM's evaluated as part of the 2001 Plan are listed below.

Currently Adopted

- T-1 Trip Reduction Ordinance
- T-2 Employer Based Transportation Demand Management Programs
- T-3 Work Schedule Changes
- T-4 Area-wide Ridesharing Incentives
- T-5 Improve Commuter Public Transit Service
- T-7 Traffic Flow Improvements
- T-8 Parking Management
- T-9 Park-and-Ride / Fringe Parking
- T-10 Bicycle and Pedestrian Programs
- T-13 Accelerated Retirement of Vehicles
- T-17 Telecommunications
- T-18 Alternative Fuels
- T-19 Public Education

Proposed for Adoption

None.

Proposed For Further Study

- T-6 High Occupancy Vehicle Lanes
- T-12 Vehicle Use Limitations/Restrictions
- T-14 Activity Centers (i.e., Indirect Source Review – Land use measures)
- T-15 Extended Vehicle Idling
- T-20 Parking Management to Reduce Non-commute Single Occupant Vehicle Use

Proposed For Rejection

- T-11 Special Events
- T-16 Extremely Low-Temperature Cold Starts

Proposed As Contingency Measures

- T-1,2 Trip Reduction - Employer Based Transportation Demand Management (Countywide Implementation of Tier III TDM Program)
- T-5 Improve Commuter Public Transit Service (new projects)
- T-7 Traffic Flow Improvements (new projects)
- T-9 Park-and-Ride / Fringe Parking (new project)
- T-21 Enhanced Inspection and Maintenance Program

Currently adopted TCMs are discussed in Section C.2. Measures proposed for further study and those not considered appropriate for Santa Barbara County are listed in Sections C.3 and C.4

respectively. These measures are described in detail in Appendix C of the 1994 Clean Air Plan. Section C.5 discusses TCMs that are to be "reserved" as contingency measures. Contingency measures are to be implemented in the event Santa Barbara County violates the federal 1-hour National Ambient Air Quality Standard (NAAQS) for ozone prior to 2015.

C.2 CURRENTLY ADOPTED MEASURES

The 1994 CAP and the 1998 CAP include all the TCM programs and projects currently adopted in the SIP. A listing of the 1994 and 1998 CAP TCM programs and projects and their implementation status were listed previously in Table 2 and Table 3 respectively. Because this 2001 Plan does not propose any "new" TCM programs or projects under Section 175 A of the Federal Act, the TCM programs and projects listed in Table 2 and Table 3 will continue to represent the on-road transportation control program for federal air quality planning purposes. Pursuant to the federal conformity regulation, the implementation status of these TCM programs and projects will be evaluated during updates to the county's regional transportation plans and programs.

The 2001 Plan does identify "new" TCM programs or projects as federal contingency measures. In the event Santa Barbara County violates the federal 1-hour ozone standard, these programs and projects will be considered for implementation along with other stationary and area source measures identified as federal contingency measures in this 2001 Plan.

C.3 MEASURES PROPOSED FOR FURTHER STUDY

As part of the development of the 2001 Plan those TCMs proposed for further study in the 1994 and 1998 CAPs were re-evaluated by SBCAG. Table 4 lists the further study measures and provides an assessment of the potential effectiveness or implementation feasibility of each measure for Santa Barbara County. For a description of these measures refer to Appendix C of the 1994 CAP.

C.4 MEASURES PROPOSED FOR REJECTION

These measures are proposed for rejection given that they were deemed ineffective and/or inapplicable for Santa Barbara County. Table 4 lists those measures rejected from consideration and why. For a description of these measures refer to Appendix C of the 1994 CAP.

C.5 MEASURES PROPOSED AS CONTINGENCY MEASURES

Contingency measures are measures that can be implemented if an area violates the federal 1-hour ozone standard during its maintenance period. This 2001 Plan includes several on-road measures as part of its contingency package. Since these measures are federal contingency measures, they are not subject to the federal conformity regulation, specifically the expeditious implementation test.

Table 5 lists the federal on-road mobile source contingency control measures that may be considered for implementation if the county records a violation of the 1-hour federal ozone standard during its maintenance period (1999 – 2015)

TABLE 4**2001 PLAN – PROPOSED FOR FURTHER STUDY AND REJECTED MEASURES**

TCM	Description	Lead Agencies	Present Status	Recommendation
6	High Occupancy Vehicle Lane Route 101 – Segment 1: between Ventura County Line to Milpas. Segment 2: between Milpas and Glen Annie/Storke.	Caltrans/SBCAG	HOV/HOT Lane feasibility was evaluated as part of the South Coast Highway 101 Deficiency Plan. Existing conditions are looking more favorable (e.g., increased congestion with establishment of transit service between Ventura County and the South Coast. Operational and political feasibility of the various alternative designs/alignments continues to be evaluated.	Proposed for Further Study
11	Special Events – Manage Travel Demand for Special Events	Local Agencies	Large Events are not regularly hosted in Santa Barbara County (e.g., professional sporting events).	Reject From Further Consideration
12	Vehicle Use Restrictions	Local Agencies/SBCAG	Lacks political support.	Reject From Further Consideration
14	Activity Centers (Indirect Source Review)	Local Agencies/SBCAG	See Chapter 9	Proposed for Further Study
15	Extended Vehicle Idling	City of Santa Barbara	Scale of applicability too small – City Ordinance restricting extended bus idling in the vicinity of the County Courthouse continues.	Proposed for Further Study
16	Extreme Low Temperature Cold Starts		This measure is designed to reduce carbon monoxide emissions – Santa Barbara County currently attains all applicable state and federal health based standards for carbon monoxide.	Reject From Further Consideration
20	Parking Management to Reduce Non- Commute Single Occupant Vehicle Activity	City of Santa Barbara	In 1999, the City of Santa Barbara reduced the allotted time for free parking from 90 to 75 minutes and extended the hours of parking restrictions within downtown Santa Barbara. At this time, the parking pricing structure does not account for vehicle occupancy (i.e., reduced cost for carpools).	Proposed for Further Study
22	County-wide Implementation Tier III TDM Program	Traffic Solutions	Considered feasible.	Listed as a Contingency Measure in the 1998 CAP and the 2001 Plan

TABLE 5				
2001 PLAN - ON ROAD MOBILE SOURCE CONTINGENCY CONTROL MEASURES				
TCM	Description	Project Sponsor	Project/Program Description	Funding
5	Public Transportation	SBCAG	Express Transit Service – Ventura Cnty – Santa Barbara	CMAQ
			Express Transit Service – Carpinteria – Goleta	N/A
			Express Transit Service – Carpinteria – Santa Barbara	N/A
			Express Transit Service – Westside SB – Goleta	N/A
			Express Transit Service – UCSB Line 24 Extension	N/A
7	Traffic Flow Improvements	Caltrans/SBCAG	Network Surveillance – CCTV&Loop Detectors on Route 101 between Ventura County Line and Hollister	SHOPP
		Caltrans/SBCAG	Changeable Message Signs – Junction of Route 101/Route 154 (N&S) and Junction of Route 101 and Route 1	SHOPP
		Caltrans/CHP	Traffic Management Center (in SLO) – integrated freeway and arterial control	N/A
		SBMTD	Transit Operations – vehicle tracking/passenger counts/electronic fare collection/surveillance and /communications	N/A
		Caltrans/SBCAG	Smart Call Boxes on Route 101 between Ventura County Line and Hollister	N/A
8	Parking Management	City of Santa Barbara	Residential Parking Program	N/A
9	Park-n-Ride Lots	City of Carpinteria	Park-n-Ride Lot – Bailard Interchange	CMAQ
10	Bicycle/Pedestrian	N/A	N/A	N/A
13	Old Car Buyback	EES – APCD	Vehicle Buyback Program (2002+)	ITG/DMV
17	Telecommunication	N/A	N/A	
18	Alternative Fuel Program	N/A	N/A	N/A
19	Public Education	APCD	On-going Efforts	APCD
		SBCAG	On-going Efforts	SBCAG
21	Inspection and Maintenance	BAR	Enhanced I/M Program	Pending

C.6 ON-ROAD MOBILE SOURCE EMISSIONS ANALYSIS

On-road emission estimates for this 2001 Plan were analyzed, in aggregate, using the California Air Resources Board's (ARB) EMFAC2002 on-road emissions model. EMFAC2002 is the successor to the EMFAC7F and EMFAC7G emission models used as part of the 1994 CAP and 1998 CAP respectively. On-road mobile source emission forecasts were generated using the EMFAC2002 model for 1999 (baseline year), 2005, and 2015. For informational purposes, a 2010 emission forecast was also generated. The transportation activity data (e.g., regional vehicle miles of travel (VMT), a VMT by speed class distribution, and regional vehicle trips) generated by the Santa Barbara Travel Model provided the basis for the on-road mobile source emission estimates contained in this plan. For the 2010 emission forecast travel, on-road activity data was interpolated from the 2005 and 2015 model forecasts.

On-Road Activity Data Inputs

On-road activity data inputs (countywide VMT, vehicle trips, and VMT by speed class distribution (SCD)) were generated by SBCAG using the Santa Barbara Travel Model. For purposes of emissions modeling, all on-road activity data was stratified into 24 1-hour time intervals within EMFAC2002. Summer ozone temperatures for each EMFAC2002 time period were derived from the 10 worst episodic days monitored in Santa Barbara County.

EMFAC2002 will compute the emissions associated with the following emitting:

- 1) Running exhaust emissions based on VMT;
- 2) Cold start incremental emissions and hot start incremental emissions based on the number of trips as a function of time after engine shutoff;
- 3) Diurnal emissions based on numbers of vehicles;
- 4) Hot soak emissions based on total numbers of trips;
- 5) Evaporative running losses based on VMT; and,
- 6) Resting loss emissions based on numbers of vehicles.

Depending on the activity data used, EMFAC2002 will produce two types of inventories, an annual average inventory or a planning inventory. As required by the Federal Act for ozone non-attainment areas, the 2001 Plan for Santa Barbara County is based on a summer ozone

season (June to October) average daily emissions planning inventory. The latter is based on meteorological and activity conditions that exist during peak episodic conditions for a given pollutant.

ARB distributions were used to allocate VMT and vehicle trips into 24 1-hour EMFAC2002 time periods. To compute running emissions, each time period's VMT total was stratified into 13 speed classes (0 - 65 in 5 mile increments). Hence, there are 24 VMT by Speed Class Distributions (SCD), one for each EMFAC2002 time period.

The emissions associated with vehicle starts are accounted for in the EMFAC2002 model based on the distribution of these trips by vehicle classification, vehicle technology class, and operating mode. This allows the model to compute emissions associated with vehicle starts and evaporative processes (for ROC). EMFAC2002 adds these emissions to running emissions to compute total on-road mobile source emissions.

As required by the EMFAC2002 model, vehicle trips were stratified into the following vehicle classifications: Light Duty Auto (LDA); Light Duty Truck (LDT); Medium Duty Truck (MDT); Urban Bus Diesel (UBD); Heavy Duty Gas Truck (HDG); Heavy Duty Diesel Truck (HDD); and, Motorcycle (MCY). The distribution of each vehicle by age (model year), operating mode (e.g., cold start, hot start), and technology class (e.g. catalytic, non-catalytic, diesel) was based on the most recent ARB distributions for Santa Barbara County. Vehicle age distributions for LDA and LDT were based on 2000-2001 vehicle registration data for Santa Barbara County.

The EMFAC2002 activity data summaries for the 1999 baseline, and the 2005, 2010, and 2015 forecasts are provided on the following pages.

ON-ROAD ACTIVITY DATA INPUTS

1999	(Reflects programmed and planned roadway improvement projects only)		
	Vehicles	VMT	Starts
LDA	155371	5198000	1177930
LDT	95720	3248000	730089
MDT	26296	976000	326336
UBD	257	33000	1028
HDGT	5970	163000	84874
HDDT	3163	302000	48615
MCY	<u>6091</u>	<u>40000</u>	<u>8716</u>
TOTAL	292868	9960000	2377580
2005	(Reflects programmed and planned roadway improvement projects only)		
	Vehicles	VMT	Starts
LDA	166845	5593000	1245760
LDT	103515	3419000	772179
MDT	28480	1085000	338967
UBD	280	36000	1120
HDGT	5932	138000	70209
HDDT	4001	371000	63069
MCY	<u>6548</u>	<u>52000</u>	<u>9278</u>
TOTAL	315601	10692000	2500580
2010	(Linear interpolation of the 2005 and 2015 activity estimates)		
	Vehicles	VMT	Starts
LDA	177395	5949000	1290490
LDT	110601	3594000	798735
MDT	30433	1116000	350093
UBD	297	38000	1187
HDGT	5876	125000	59319
HDDT	4634	449000	72234
MCY	<u>7005</u>	<u>59000</u>	<u>9651</u>
TOTAL	336241	11329000	2581710
2015	(Reflects programmed and planned roadway improvement projects only)		
	Vehicles	VMT	Starts
LDA	188743	6283000	1336940
LDT	117555	3795000	823842
MDT	32362	1146000	360882
UBD	313	40000	1252
HDGT	5860	118000	50388
HDDT	5213	522000	80218
MCY	<u>7474</u>	<u>63000</u>	<u>10016</u>
TOTAL	357520	11967000	2663540

ON-ROAD ACTIVITY DATA INPUTS

Time Period Distribution (1999)

Period	12-6	6-9	9-12	12-3	3-6	6-12
VMT	3.57	13.42	17.79	21.18	23.73	20.31
Starts	1.2	15.37	19.99	22.01	25.01	16.42

Time Period Distribution (all other scenarios)

Period	12-6	6-9	9-12	12-3	3-6	6-12
VMT	3.56	13.54	17.74	21.12	23.81	20.23
Starts	1.2	15.37	19.99	22.01	25.01	16.42

VMT by Speed Class Distributions (LDA, LDT, MDT only)

1999

	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	60-65
12-6	0.0000	0.0000	0.0000	0.0000	3.4482	9.1333	14.5909	19.2818	20.7724	3.8005	6.3279	10.6656	11.9793
6-9	0.6774	1.0030	27.1672	2.4313	3.5096	7.8138	6.1951	13.1682	7.5551	11.8149	6.1072	4.2279	8.3292
9-12	0.4760	0.4510	12.6804	3.1597	6.8238	8.4812	11.1490	13.8315	14.7529	7.9319	7.0663	3.8425	9.3538
12-3	0.0924	0.4993	9.2963	1.2936	3.8212	5.2794	5.6661	12.0554	6.6612	13.6514	9.8117	8.8200	23.0519
3-6	0.8683	0.6988	19.3233	1.6961	4.5771	1.8125	9.2325	16.5862	14.0317	16.9630	3.9465	5.6703	4.5936
6-12	0.0000	0.0000	0.0000	0.0000	3.6962	8.8134	5.1191	17.7463	6.3718	8.7865	12.8128	5.8076	30.8462

2005

	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	60-65
12-6	0.0000	0.0000	0.0000	0.0000	3.1722	9.1331	14.8671	17.1333	20.7724	3.7376	6.3278	7.2143	17.6420
6-9	0.5368	0.7796	27.2255	2.3306	3.3047	9.3583	5.9114	15.9306	7.9562	9.2002	5.5137	5.4826	6.4698
9-12	0.3098	0.4510	12.5322	3.1574	5.6613	9.0782	11.5921	12.6466	16.0231	6.5468	7.4201	3.5655	11.0160
12-3	0.0924	0.3553	9.1718	1.3678	3.1232	6.4032	5.8988	10.9243	6.6301	11.5571	10.5098	8.5874	25.3789
3-6	0.5166	0.4740	19.3565	1.6183	4.3432	2.7048	9.2344	18.1572	13.9707	15.0633	4.2282	6.3184	4.0143
6-12	0.0000	0.0000	0.0000	0.0000	3.4047	8.8134	5.3621	16.2887	6.4205	7.0373	14.2218	5.0788	33.3728

2010 (same as 2005)

	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	60-65
12-6	0.0000	0.0000	0.0000	0.0000	3.1722	9.1331	14.8671	17.1333	20.7724	3.7376	6.3278	7.2143	17.6420
6-9	0.5368	0.7796	27.2255	2.3306	3.3047	9.3583	5.9114	15.9306	7.9562	9.2002	5.5137	5.4826	6.4698
9-12	0.3098	0.4510	12.5322	3.1574	5.6613	9.0782	11.5921	12.6466	16.0231	6.5468	7.4201	3.5655	11.0160
12-3	0.0924	0.3553	9.1718	1.3678	3.1232	6.4032	5.8988	10.9243	6.6301	11.5571	10.5098	8.5874	25.3789
3-6	0.5166	0.4740	19.3565	1.6183	4.3432	2.7048	9.2344	18.1572	13.9707	15.0633	4.2282	6.3184	4.0143
6-12	0.0000	0.0000	0.0000	0.0000	3.4047	8.8134	5.3621	16.2887	6.4205	7.0373	14.2218	5.0788	33.3728

2015

	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	60-65
12-6	0.0000	0.0000	0.0000	0.0000	3.1721	9.1333	14.8671	20.3204	17.5855	3.7377	6.3278	7.2144	17.6420
6-9	0.9186	2.2316	26.2148	1.0595	3.7530	10.0744	10.4266	15.1757	2.7631	9.5542	5.2714	7.4541	5.1031
9-12	0.4965	0.9199	12.4163	2.0899	5.6613	10.4688	17.4536	14.0700	8.0198	6.5468	7.4201	4.7527	9.6840
12-3	0.2493	0.8234	9.0745	0.6807	3.1232	6.7301	8.3605	11.0456	4.0008	11.5571	10.5098	9.5846	24.2604
3-6	0.7337	1.2997	18.7817	0.6640	4.5917	3.3499	13.9856	18.6809	7.8810	15.2646	4.0905	7.4395	3.2372
6-12	0.0000	0.0000	0.0000	0.0000	3.4047	8.8134	5.3621	16.8495	5.8596	7.0373	14.2218	5.0788	33.3728

C.7.1 EMISSION RESULTS

The EMFAC2002 emission results are summarized below. The EMFAC2002 output sheets are attached to the back of this appendix.

The total 2005 ROC on-road mobile source emissions reduction is as follows:

1999 ROC	18.51 tons/day
2005 ROC (Emission Budget)	11.91 tons/day
Total On-Road Mobile Source	6.60 tons/day
ROC Emission Reduction	

The total 2015 ROC on-road mobile source emissions reduction is as follows:

1999 ROC	18.51 tons/day
2015 ROC (Emission Budget)	5.90 tons/day
Total On-Road Mobile Source	12.61 tons/day
ROC Emission Reduction	

The total 2005 NO_x on-road mobile source emissions reduction is as follows:

1999 NO _x	25.24 tons/day
2005 NO _x (Emission Budget)	19.59 tons/day
Total On-Road Mobile Source	5.65 tons/day
NO _x Emission Reduction	

The total 2015 NO_x on-road mobiles source emissions reduction is as follows:

1999 NO _x	25.24 tons/day
2015 NO _x (Emission Budget)	9.75 tons/day
Total On-Road Mobile Source	15.49 tons/day
NO _x Emission Reduction	

According to the EMFAC2002 emissions analysis, between 1999 and 2005, on-road mobile source emissions of ROC and NO_x will decline by 6.60 and 5.65 tons per day respectively. This represents a 36 percent reduction in ROC and a 22 percent reduction in NO_x. Between 2005 and 2015, on-road mobile source emission reductions of ROC and NO_x are anticipated to decline another 6.01 and 9.84 tons per day respectively. Figure 1 illustrates the ROC and NO_x emissions reduction resulting from the 2001 Plan TCMs. These on-road mobile source ROC and NO_x emission reductions will be a result

of state and federal controls on vehicle emissions and the natural attrition of older more polluting vehicles being replaced by newer vehicles (i.e., fleet turnover).

On-road mobile source emissions by vehicle type category for 1999, 2005, and 2015 are graphically shown in [Figure 2](#), [Figure 3](#), and [Figure 4](#) respectively. Light, medium, and heavy-duty trucks continue to emit the majority of NOx emissions throughout the maintenance period (1999-2015). Although dominated by light duty autos in the base year, trucks will become the primary source of on-road mobile source emissions of ROC by 2015.

Emission Budgets

The ROC emission estimate of 11.91 tons/day and the NOx emission estimate of 19.59 tons/day establish the 2005 emissions budgets for these two ozone precursors. The ROC emission estimate of 5.90 tons/day and the NOx emission estimate of 9.75 tons/day establish the 2015 emissions budgets for these two ozone precursors. These budgets act as a "ceiling" for future on-road mobile source emissions. Exceeding either one of these emission budgets will jeopardize the flow of federal funds for transportation improvements and greatly restrict what transportation improvements may be pursued within the county. As required by the 1990 CAAA, a comparison of regional on-road mobile source emissions to these budgets will occur during updates of federal and state regional transportation plans and programs for Santa Barbara County.

Budget Adequacy Findings

The Federal Conformity Rule (Section 93.118(e)(4)) lists a set of criteria that emission budgets identified in submitted maintenance plans must satisfy in order for EPA to find them adequate for conformity purposes. How each of these criteria is satisfied is described below.

- i. Submitted control strategy SIP must be endorsed by the Governor and subject to a State public hearing

After APCD adoption, the 2001 Maintenance Plan will be forwarded to ARB for state approval. The ARB approval process will be subject to a state public hearing. The state will then forward the plan to EPA who will then initiate the budget adequacy process.

- ii. Development of the control strategy SIP and emission budgets was consistent with the conformity interagency consultation process

Since February 2, 2000, the APCD and SBCAG have had 10 formal interagency consultation meetings with its state and federal conformity partners to discuss the development of the 2001 Maintenance Plan specifically, the development of the on-road mobile source emission inventories/budgets and development of the list of TCMs included in the 2001 Maintenance Plan.

All public consultation procedures were also met or exceeded. The APCD provided a 30-day public comment period on the draft plan (45-day comment period for the EIR Addendum) and formal public hearings at the SBCAG board (September 20, 2001) and APCD boards (September 20, 2001, October 18, 2001, November 15, 2001). Additional forums to receive public input on the 2001 Maintenance Plan emission budgets and/or TCMs were held at the APCD's Community Advisory Committee (July 11, 2001, August 8, 2001, October 10, 2001) and at SBCAG's Technical Transportation Advisory Committee (December 7, 2000, January 11, 2001, September 6, 2001). A public workshop was also conducted on the 2001 Maintenance Plan on August 8, 2000. Written and oral comments received from the public at the aforementioned meetings and APCD/SBCAG responses are provided in Chapter 12 of the 2001 Maintenance Plan.

- iii. Emission budgets must be clearly identified in the control strategy SIP submittal

The ROC and NO_x on-road mobile source emission budgets for 2005 and 2015 are clearly identified in the plan in Chapter 5 (see section 5.4, p. 5-5) and Appendix C (see section C.7.1. pp. C-17 and C-18).

Given that the 2010 on-road emission inventory was derived from interpolating the 2005 and 2015 on-road activity forecasts, identifying this inventory as an on-road mobile source emission budget would be inconsistent with SBCAG's conformity modeling protocol and the federal conformity regulation.

Given the considerable resources needed to develop a planning emission inventory for a given forecast year, parsimony has to be exercised when selecting emission forecast years that meet not only Clean Air Act mandates but also federal conformity regulation mandates. The federal conformity regulation requires emission budgets to be established relative to CAAA milestone years and stipulates that conformity analysis years be no greater than 10 years. The two forecast horizons that meet both these legislative requirements are 2005 and 2015.

- iv. Emission budgets along with the rest of the inventory meets the applicable CAAA requirements for Maintenance Plans

The 2001 Maintenance Plan demonstrates that Santa Barbara County will remain below its attainment inventory through 2015 (see Chapter 6 and Chapter 7).

- v. Emission budgets are consistent with the on-road emission inventories in the SIP

The emission budgets identified in Chapter 5 of the 2001 Maintenance Plan (and Appendix C) are consistent with the on-road emission inventories reported in Chapter 3 and Chapter 6. The 1999, 2005, and 2015 on-road mobile source emission estimates were generated using the EMFAC2002 model with identical inputs (see On-Road Activity Data Inputs). The emission results may be reported differently between chapters however for purposes of exposition.

- vi. Any changes made to previously submitted budgets are fully described; any changes to established safety margins and reasons for the changes (including the basis for any changes related to emission factors or estimates of vehicle miles traveled) are fully described.

Since the 2005 and 2015 on-road mobile source emission budgets identified in the 2001 Maintenance Plan are “new” budgets, the need to describe changes to already submitted emission budgets (emission factors or vehicle activity data) is not applicable.

Departures from EMFAC2002 Defaults

ARB approved the use of EMFAC2002 for purposes of on-road mobile source emission inventory development in California in September 2002. Prior to this date EMFAC2001 was the most recently approved emissions model allowed for inventory development. The APCD approved the 2001 Maintenance Plan with EMFAC2001 based on-road emission inventories and emission budgets on November 15, 2001. In order to provide the most up-to-date information possible as well as obviate the need to update the SIP in less than three years, the APCD/SBCAG chose to revise the 2001 Maintenance Plan's on-road mobile source emission inventory and emission budgets with the latest approved emission factor model EMFAC2002. As part of this exercise, several changes were also made to the vehicle activity data default values resident in the EMFAC2002 model. For each of the 2001 Maintenance Plan emission forecasts, adjustments were made to: vehicle starts; and, vehicle miles of travel related to commercial vehicle activity EMFAC2002 allows these adjustments through its WIS (what-if-scenario) user-interface module. Justification for each of these vehicle activity adjustments is provided below.

Vehicle Starts

Departing from its predecessors¹, the EMFAC2002 methodology for generating vehicle starts for the LDA, LDT, and MDT vehicle types is now based solely on factoring an area's county specific vehicle registration data. There are two concerns that SBCAG has with respect to this approach.

- 1) It effectively ignores the contribution of internal visitor trips i.e., trip starts from vehicles that are registered outside the county. ARB is developing a county-to-county trip matrix based on instrumented vehicle data to address these trips. However, this matrix is currently not complete and will not be operational for this generation of EMFAC. This may be an issue for MPOs like SBCAG that have destination resort areas within its modeling domains. The relative accuracy of this approach compared to a travel demand model which can explicitly address visitor trips

¹ For EMFAC7F and MVEI7G, ARB accepted travel demand model activity estimates of trip ends, VMT, and VMT by speed class distributions from MPOs/RTPAs. In MVEI7G, vehicle trip ends as produced by the regional transportation planning agency network models (or statewide travel survey derived trip end estimates) were adjusted to vehicle starts. These adjustments were based on ARB instrumented vehicle surveys and appropriately allowed the estimate of vehicle emissions to capture non-destination trips (i.e., trip chaining activity) and short trips (e.g., ignition key events associated with shuffling cars at home or moving a car in a parking lot). Because the resulting trip start control totals for each vehicle type are factored from the trip end data, the nexus between vehicle start emissions with MPO travel model results was maintained.

as a function of hotel/motel stock, hotel/motel occupancy data, and survey based trip generation data is also of interest.

- 2) It creates an analytical disconnect between regional transportation network model output and vehicle start emissions. This is especially problematic when making emission forecasts. Relying on model defaults for vehicle starts makes EMFAC2002 insensitive to present/future mode split/vehicle trip changes resulting from HOV facilities, new transit services, transit fare policy changes, market based TCMs, traditional TCMs etc.

Based on these concerns, SBCAG revised the estimate of total countywide vehicle trip starts by applying the EMFAC7G trip-end to vehicle start adjustment factors to SBCAG's travel model output for trip-ends. The revised vehicle start control totals were then input into EMFAC2002 and allocated by vehicle type based on EMFAC2002's existing activity data distribution percentages. This resulted in the following vehicle start adjustments:

Analysis Year	Vehicles Starts EMFAC2002	Vehicle Starts Adjusted	Percentage Change
1999	1,896,970	2,377,580	+ 25.34%
2005	2,034,930	2,500,580	+22.88%
2015	2,228,160	2,663,540	+19.54%

Commercial Vehicle Activity

Since SBCAG does not explicitly model commercial truck activity, a two-step process was taken to appropriately augment SBCAG's modeled VMT estimates with VMT from heavy-duty gas trucks (HDGT), heavy-duty diesel trucks (HDDT) and urban diesel buses (UBD). This task is accomplished by distributing SBCAG's modeled VMT and trip activity to only the light and medium duty vehicle classes (including motorcycles) and retaining the ARB default estimates of VMT and vehicle trips for heavy duty trucks and urban buses. The sum of SBCAG's modeled VMT and ARB's default VMT estimates for commercial truck and urban diesel bus activity yields the total countywide VMT estimate. This new countywide VMT total is then input into EMFAC2002 for emissions modeling.

For consistency, future SBCAG travel model link-based comparisons will remove commercial vehicles for model validation purposes. The following countywide VMT adjustments resulted from this exercise.

Analysis Year	TOTAL VMT TRAVEL MODEL	TOTAL VMT Adjusted	Percentage Change
1999	9,460,000	9,960,000	+5.29%
2005	10,148,000	10,692,000	+5.36%
2015	11,288,000	11,967,000	+6.02%

Route 101: Congestion and Air Quality

The source of all the contingency measure TCMs listed in Table 5 are from the South Coast Highway 101 Deficiency Plan. This multi-jurisdictional plan is being prepared as a result of the growing congestion on Highway 101 within the South Coast. The purpose of the deficiency plan is to identify short-term Highway 101 improvements that will ostensibly obviate the need to widen the freeway after 2015. The air quality impact of the growing Highway 101 congestion and the overall increase in travel demand on this facility was raised as a major concern by the APCD's Community Advisory Council and by members of the public during the development of the 2001 Maintenance Plan and South Coast Highway 101 Deficiency Plan.

Approximately half of the total VMT driven in Santa Barbara County on a daily basis takes place on Route 101 (4.7 million of 9.5 million VMT). This equates to approximately 5 and 14 tons per day of ROC and NO_x respectively. Close to 30 percent of the County's daily VMT occurs on Route 101 within the South Coast (2.6 million VMT). In 1995, as part of the Route 101 Alternatives Study, a video license plate origin-destination study was conducted to assess travel behavior on Route 101 within the South Coast area. This survey revealed that during the weekday evening peak hour (Tuesday Peak Period) approximately three percent of those traveling on Route 101 neither began nor

ended their trip within Santa Barbara County (i.e., interregional or through trips). This indicates the approximately 97 percent of those traveling on Route 101 within the South Coast during the commute hours either live or work in the South Coast. As such, the recurring weekday congestion on Highway 101 can be considered a local problem.

Trip Component	Sunday Peak Period	Tuesday Midday	Tuesday Peak Period
Hwy 101 Internal – Internal	29.0%	17.4%	40.6%
Hwy 101 Internal – External	60.9%	64.4%	56.5%
Hwy 101 External – External	10.1%	18.2%	2.9%

Exacerbating the demand for travel on Route 101 in Santa Barbara County is the jobs housing imbalance that exists in the South Coast (Goleta, Santa Barbara, and Carpinteria) that serves to foster long-distance commuting. Although over ten years old, the 1990 Census data provides accurate survey-based estimate of inter- and intra-county long distance commuting characteristics for Santa Barbara County. According to Census data, approximately 22,000 workers commuted to the South Coast from areas outside the South Coast in 1990. This equates to approximately 2 million VMT each day resulting in approximately 2.0 and 5.5 tons of ROC and NOx emissions respectively. Although a portion of this VMT takes place on other state highways that serve inter-city trips in Santa Barbara County (e.g., Rte. 1, Rte. 246, and Rte. 154), most takes place on Route 101. The release of the 2000 Census some time in 2002-2004 will provide information on how these commute patterns have changed over the last ten years. It is anticipated that these long distance commute patterns have been exacerbated by the steep rise in housing costs in the South Coast coupled with only nominal increases in South Coast housing supply, relative to continued job growth, since 1990.

Research conducted by the Environmental Protection Agency (EPA) and the California Air Resources Board (CARB) indicates that sharp accelerations, which cause a vehicle to operate in a fuel enrichment mode, contribute significantly to high emission levels for carbon monoxide (CO) and reactive organic gases (ROC). Oxides of nitrogen (NOx) emissions under fuel enrichment conditions are less dramatic. Nonetheless, traffic-smoothing projects, which keep speeds constant will reduce CO and ROC tailpipe emissions, but might slightly increase NOx emissions at free-flow freeway speeds (60-75 mph). The situations most conducive to sharp accelerations at high speeds include entering freeways from on-ramps, maneuvering within merging lanes, passing slower vehicles, and stop-start conditions on congested freeways.

To the extent that capacity enhancement projects smooth traffic flows, reducing speed variability and the incidence of sharp accelerations, they should reduce emissions. The effects are greater for projects that increase capacity on roads that experience heavy congestion for a large part of the day and serve large volumes of traffic. The extent to which these emissions savings will be lost due to increased travel demand and therefore emissions on the improved facility depends on the socio-economic characteristics of the area traversed by the facility, land use decisions by local agencies, and the changes in travel behavior caused by the improvement. Therefore, it is difficult to determine the ROC and NO_x emission reductions due to lane increases since there are many factors involved including normal growth and increased traffic from such growth.

The South Coast Route 101 Deficiency Plan indicates that at this time, approximately 100,000 vehicle miles of travel occur in LOS E or F conditions (unstable flow < 30 mph) each day during the AM and PM peak hour. Mitigating these conditions by adding additional lanes on Route 101 is estimated to result in approximately .25 tons per day or 62 tons per year of ROC and NO_x combined. This calculation is somewhat crude as it does not consider the possible negative impact of induced travel growth as a result of widening, nor the inevitable worsening of congestion and greater emissions that will occur over time if the freeway is not widened and vehicle trips are not reduced through demand management.

A popular argument against adding highway capacity is that the roads will simply fill up again with traffic as service levels improve. Traffic conditions will become congested again but with larger volumes, thus increasing total emissions. How much of this traffic growth is due to the freeway improvement rather than growth in population and employment, effective reduction in fuel prices, rising personal income levels, and land use policies that favor dispersed development patterns is central to this debate and significantly adds to the complexity of the problem. A common misperception is that the observed greater utilization of a newly expanded roadway is the direct result of people increasing the frequency of their daily trip making behavior simply due to the capacity increase. However, studies show that well over 90% of “new” traffic is actually the result of shifts in traffic from other routes or time periods rather than new increases in highway travel.

Longer-term (10-20 years) induced travel impacts appear to increase over time as people gradually modify their activity schedules to take advantage of the travel-time savings afforded by capacity improvements. Possible long-term induced effects of increased highway capacity are: increased car ownership; choice of residence; choice of work location; and choice of business location. Of these potential behavioral responses to new highway capacity, choice of residence, namely the choice to live in Ventura County or northern Santa Barbara County is the most applicable to any Route 101 improvements within the South Coast. Although choice of residence decisions are influenced to a far greater degree by the disparity of jobs relative to affordable housing in the South Coast (Carpinteria, Santa Barbara, Goleta) and the economic conditions that govern discretionary trip making behavior (e.g., recreation and shopping), this long-term behavioral response to improved accessibility should be recognized as a potential source of induced travel.

Monitoring

Because this 2001 Plan does not propose any "new" TCM programs or projects under Section 175 A of the Federal Act, the TCM programs and projects listed previously in Table 2 and Table 3 will continue to represent the on-road transportation control program for federal air quality planning purposes. Pursuant to the federal conformity regulation, the implementation status of these TCM programs and projects will be evaluated during updates to the county's regional transportation plans and programs. To ensure that the on-road activity data used to generate the 2005 and 2015 on-road mobile source emissions forecasts remain accurate, "ground truth" VMT data from Caltrans Highway Performance Monitoring Program (HPMS) is annually monitored/tracked. VMT tracking is necessary to protect the integrity of the 2001 Plan emission forecasts. Figure 5 illustrates the 3.0 percent VMT growth error tolerance or "ceiling" between actual VMT as measured by Caltrans and SBCAG's 2005 and 2015 VMT forecasts. If actual VMT exceeds this 3.0 percent error tolerance, revised 2005 and 2015 travel forecasts, and hence a SIP revision, may be warranted.

Table 6 compares the 2001 Plan on-road mobile source emissions estimates and forecasts to emissions forecasts prepared in past air quality attainment plans for Santa Barbara County.

Figure 1
Emission Reduction Results

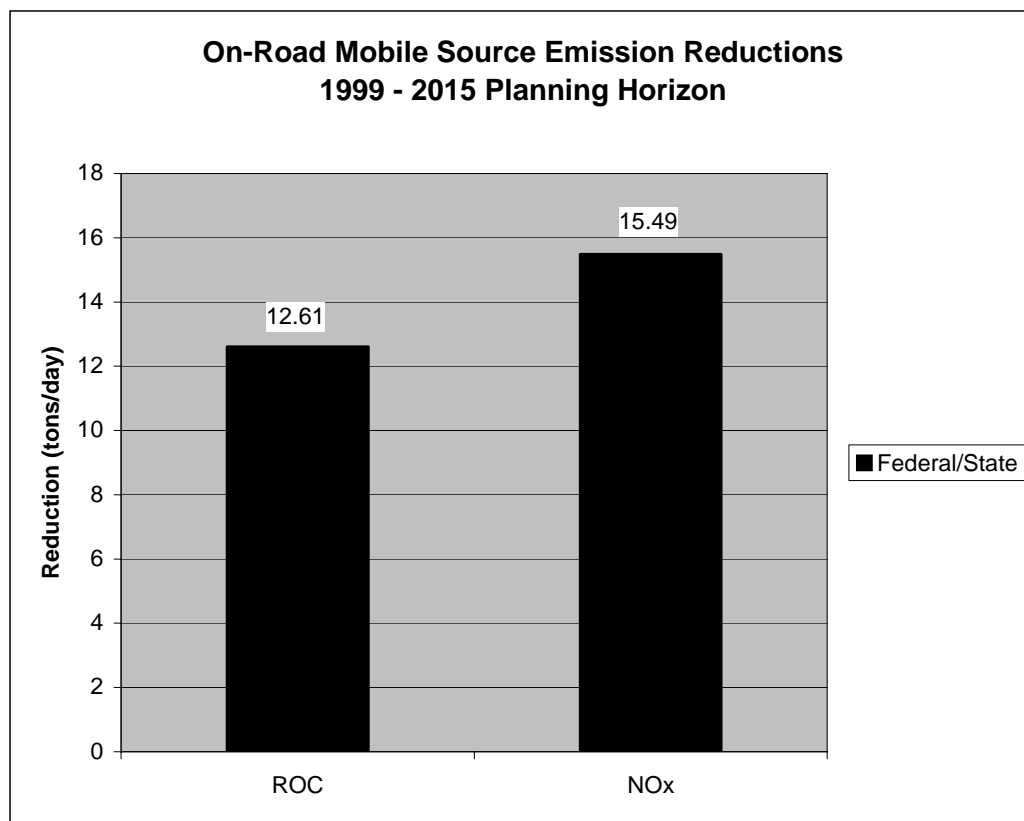
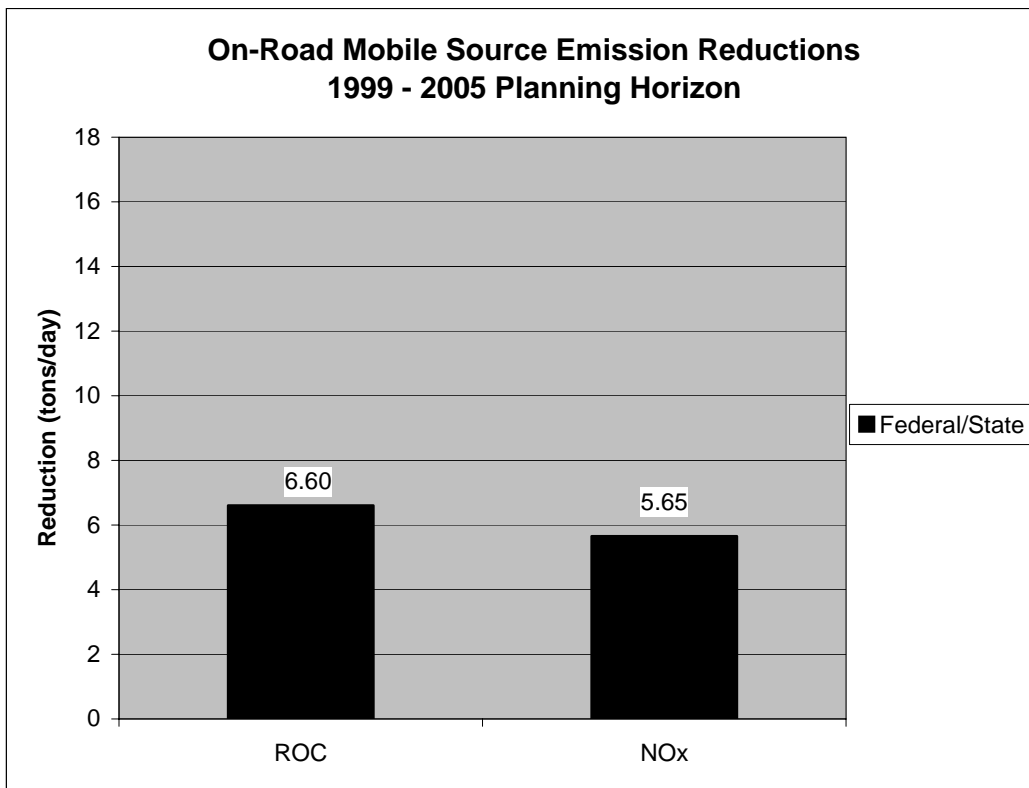


FIGURE 2
1999 Vehicle Distribution by Vehicle Type

Total Vehicles = 292,868

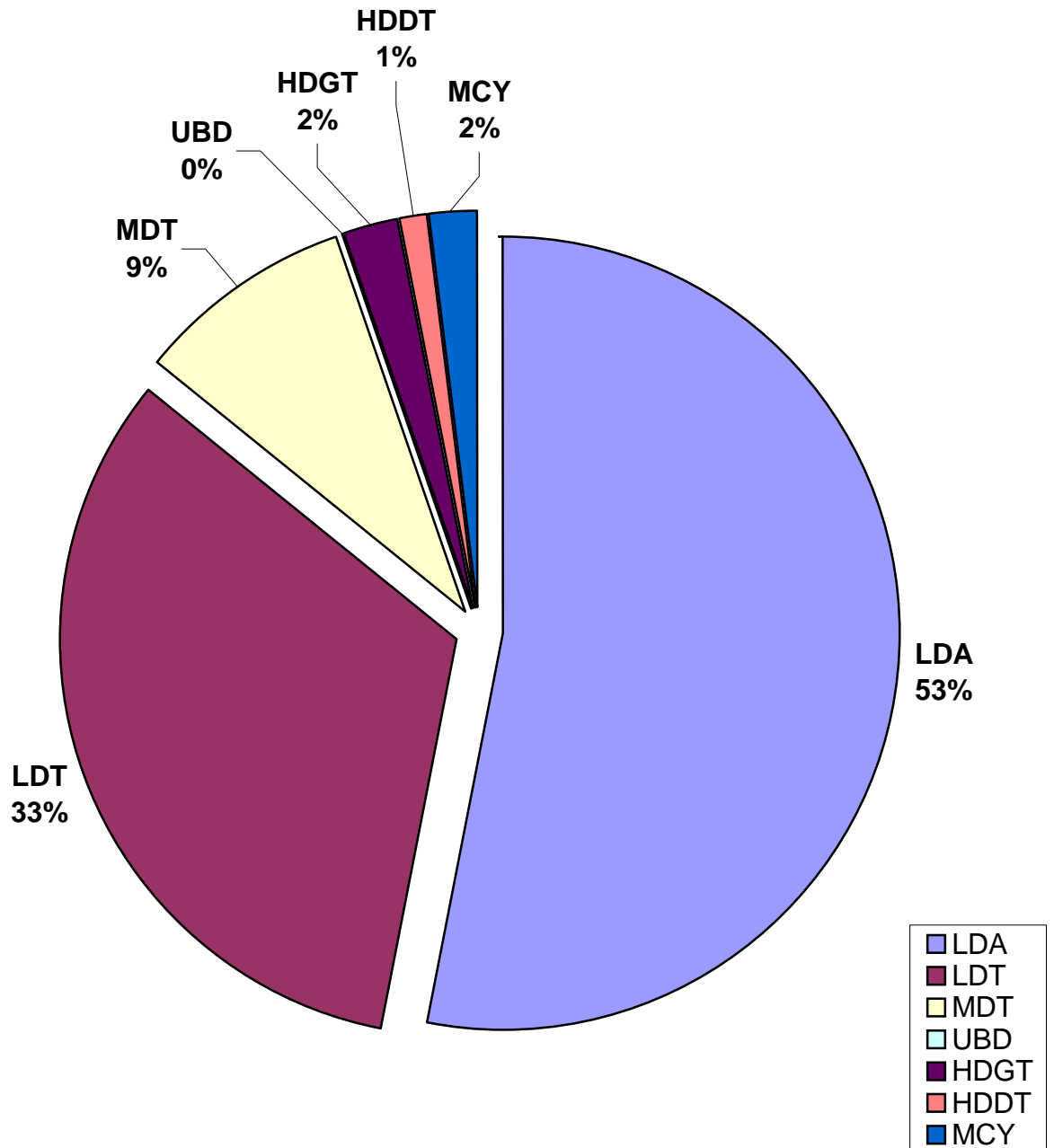


FIGURE 2 (continued)
1999 On-Road Emission Inventory by Vehicle Type

REACTIVE ORGANIC COMPOUNDS

Total Emissions = 18.51 tons/day

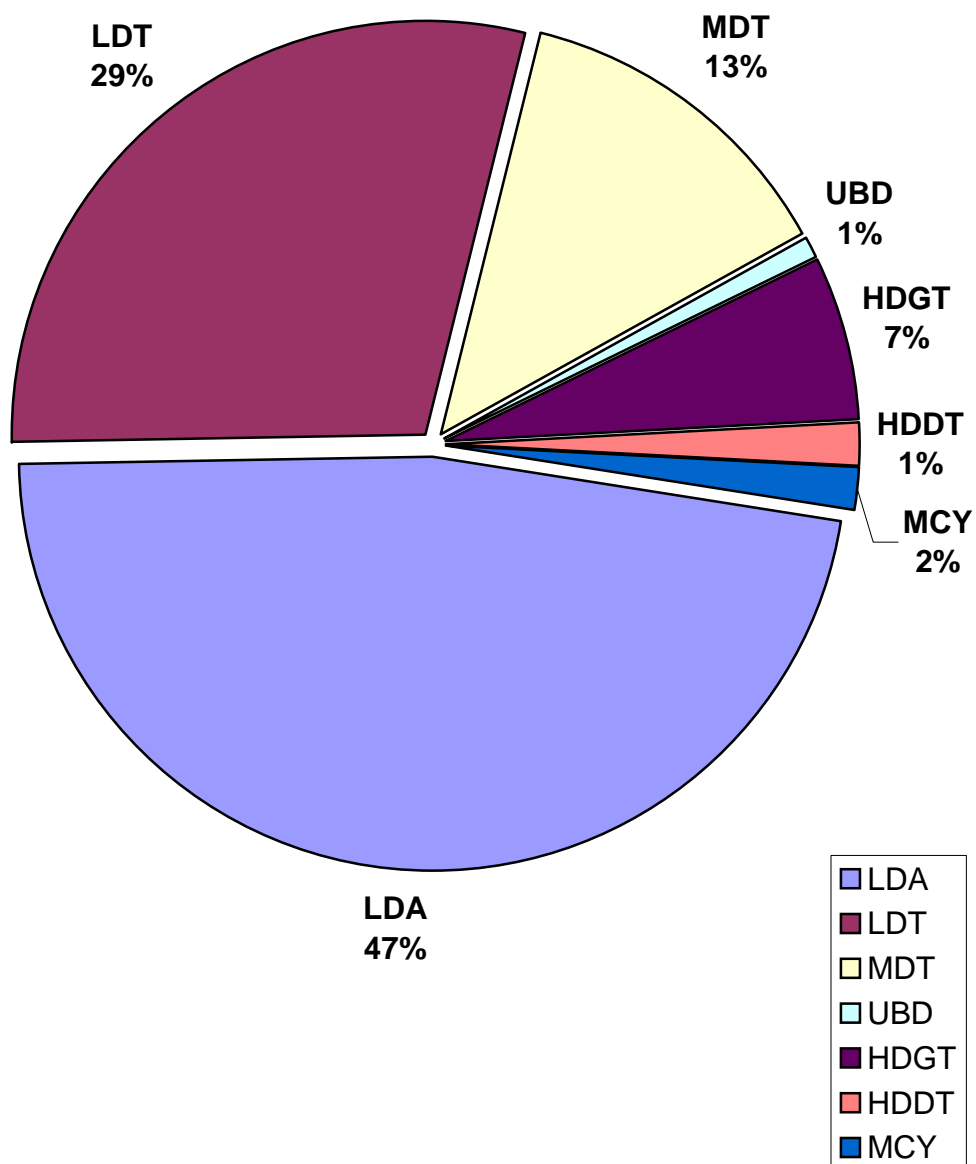


FIGURE 2 (concluded)
1999 On-Road Emission Inventory by Vehicle Type

OXIDES OF NITROGEN

Total Emissions = 25.24 tons/day

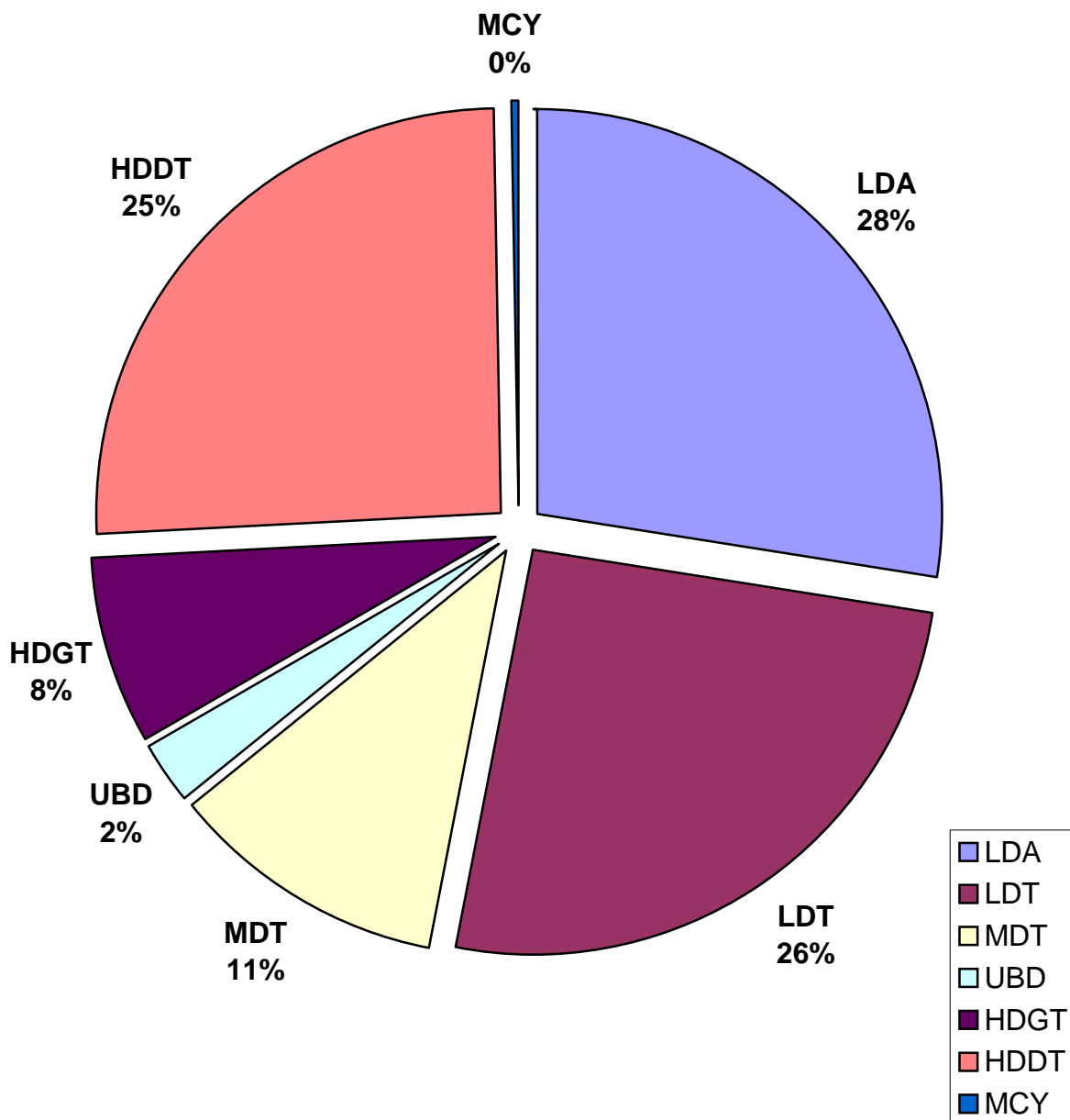


FIGURE 3
2005 Vehicle Distribution by Vehicle Type

Total Vehicles = 315,601

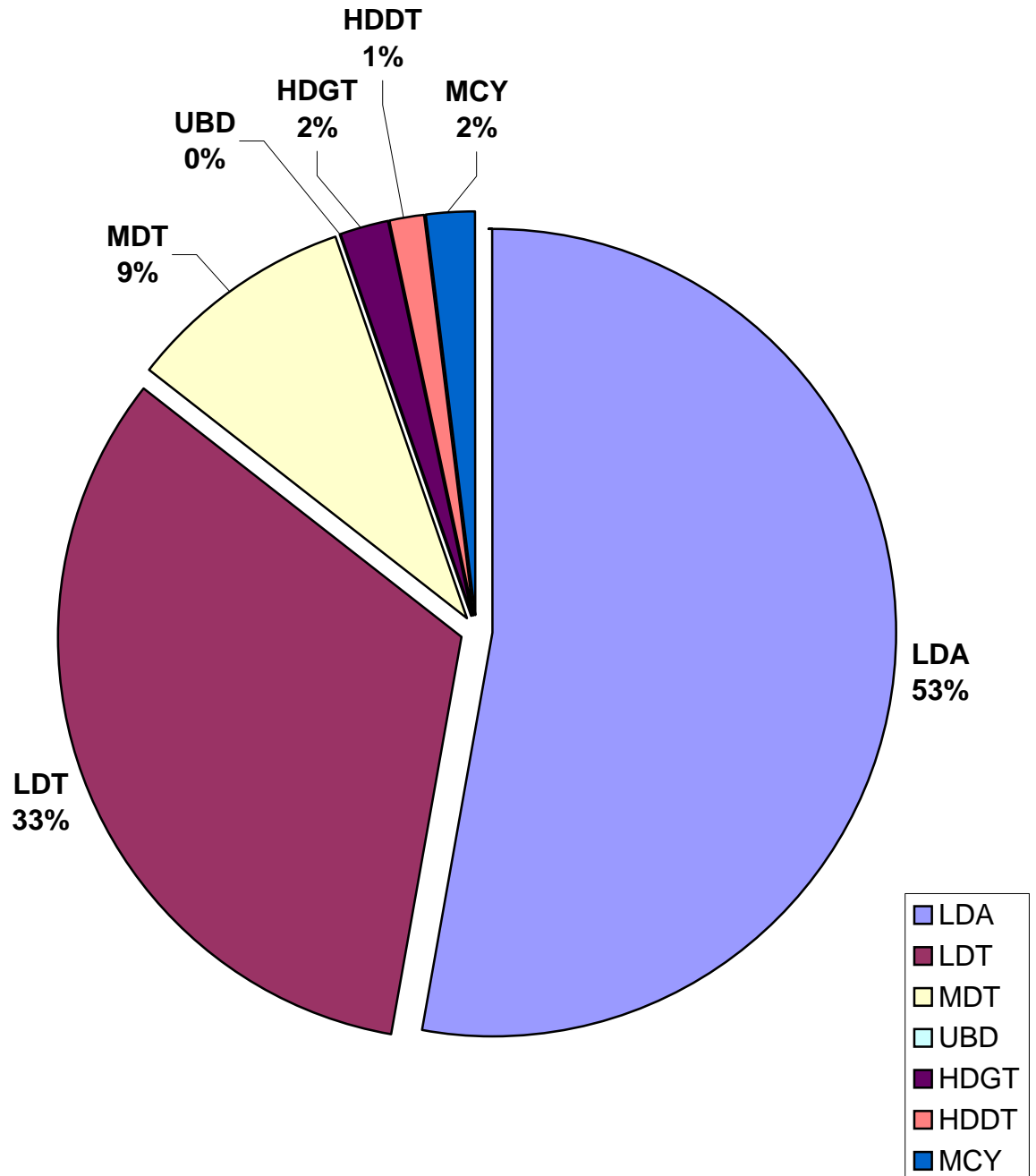
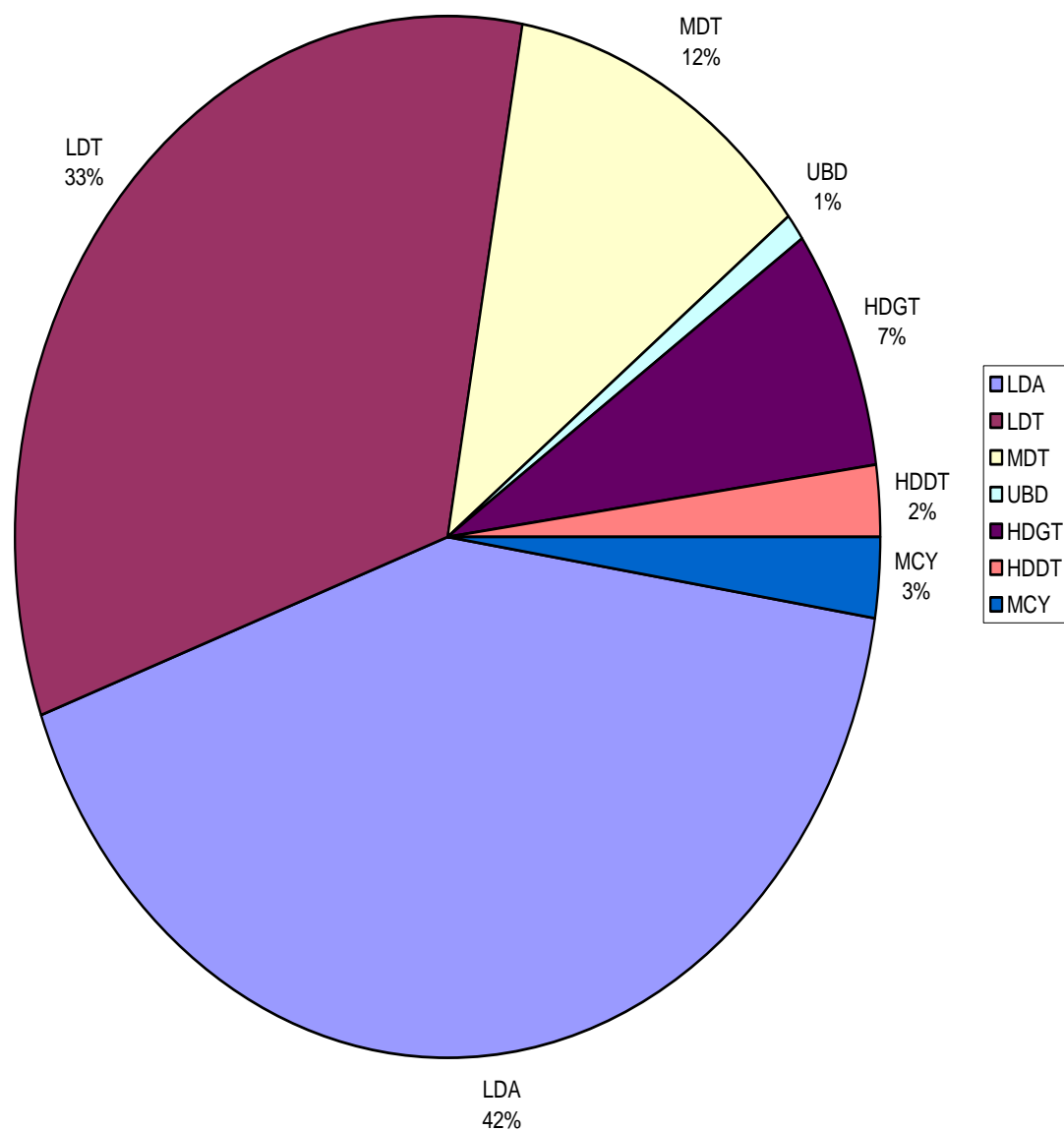


FIGURE 3 (continued)
2005 On-Road Emission Inventory by Vehicle Type

REACTIVE ORGANIC COMPOUNDS



Total Emissions = 11.91 tons/day

FIGURE 3 (concluded)
2005 On-Road Emission Inventory by Vehicle Type

OXIDES OF NITROGEN

Total Emissions = 19.59 tons/day

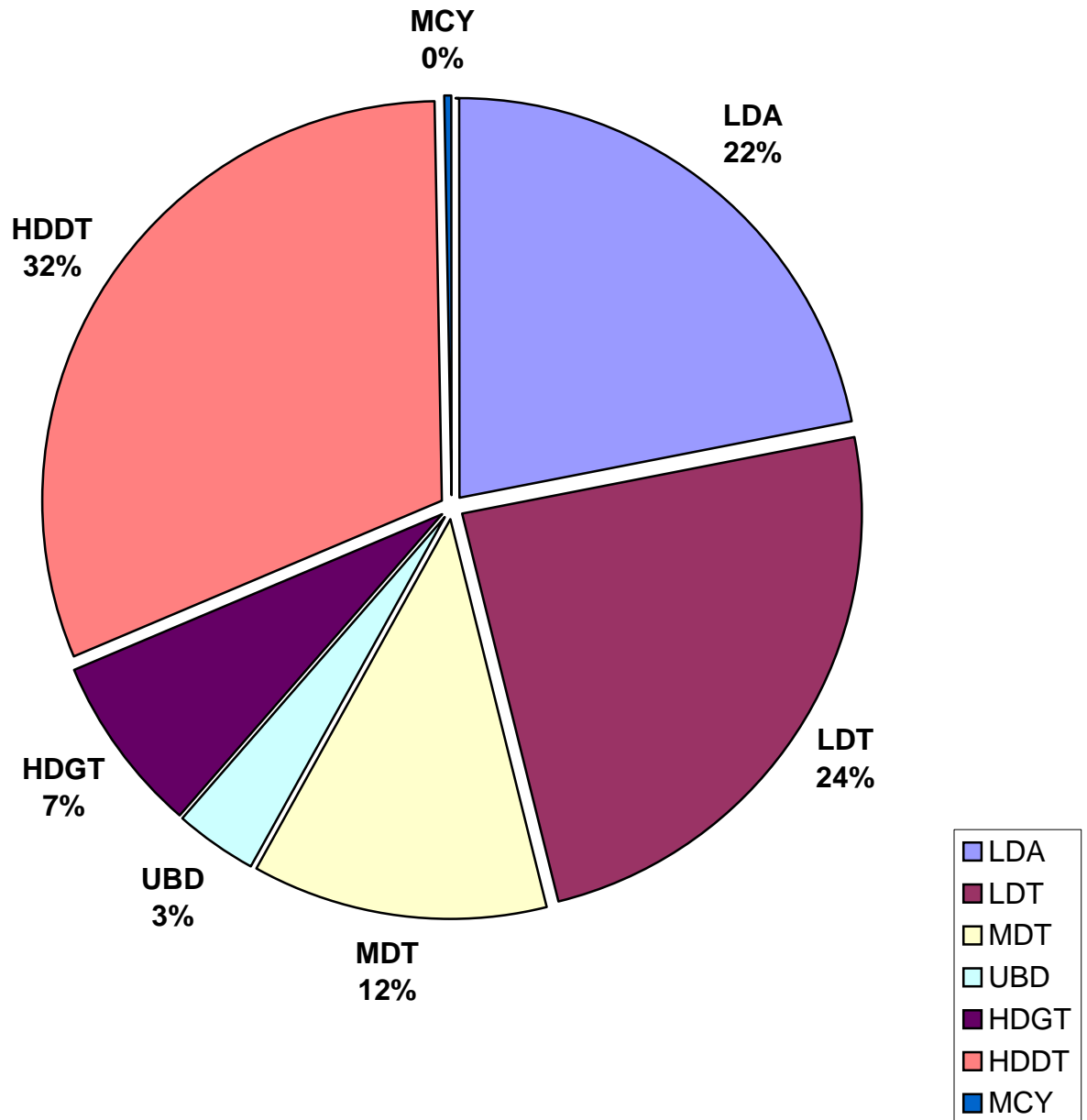


FIGURE 4
2015 Vehicle Distribution by Vehicle Type

Total Vehicles = 357,520

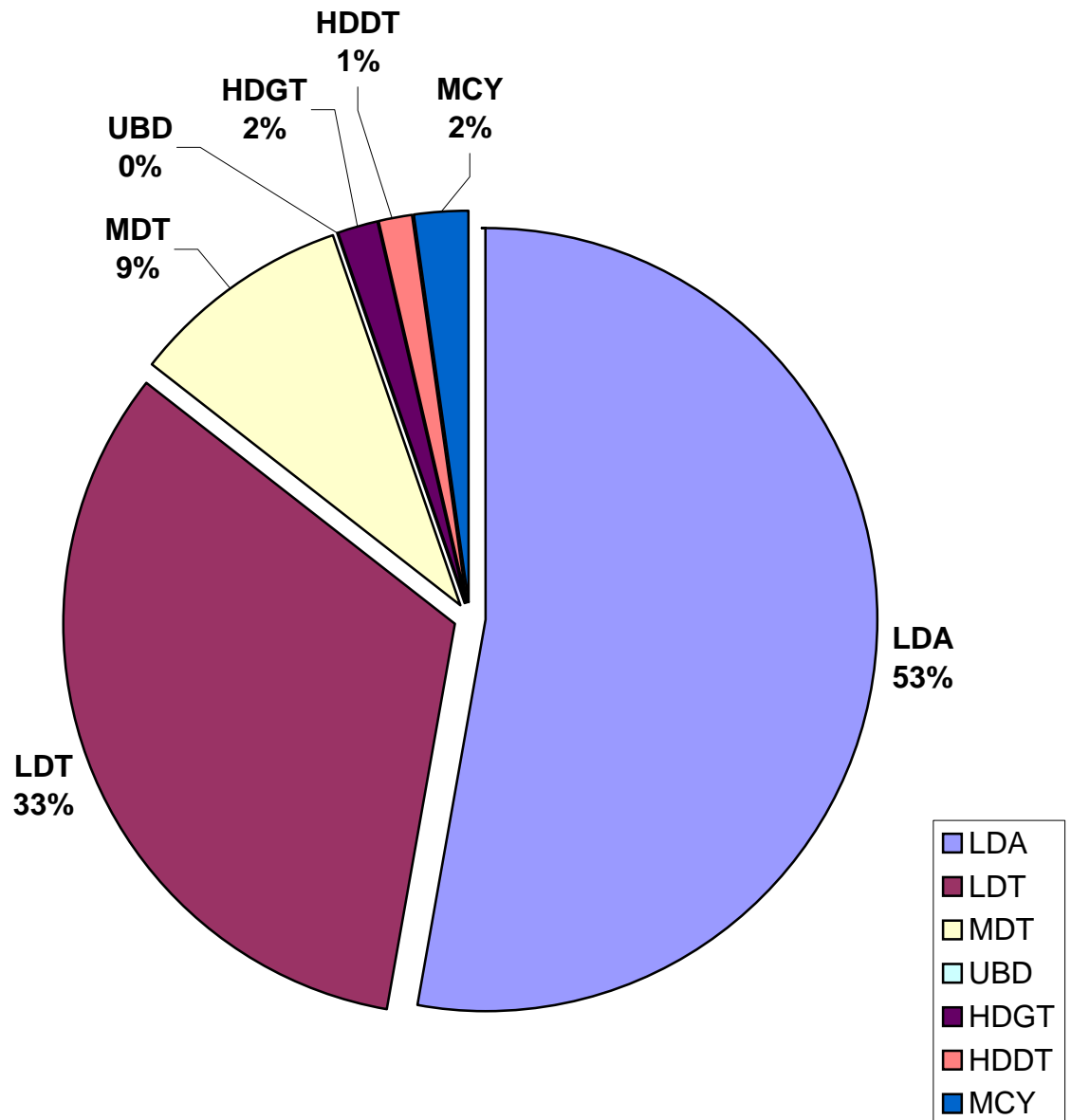


FIGURE 4 (continued)
2015 On-Road Emission Inventory by Vehicle Type

REACTIVE ORGANIC COMPOUNDS

Total Emissions = 5.90 tons/day

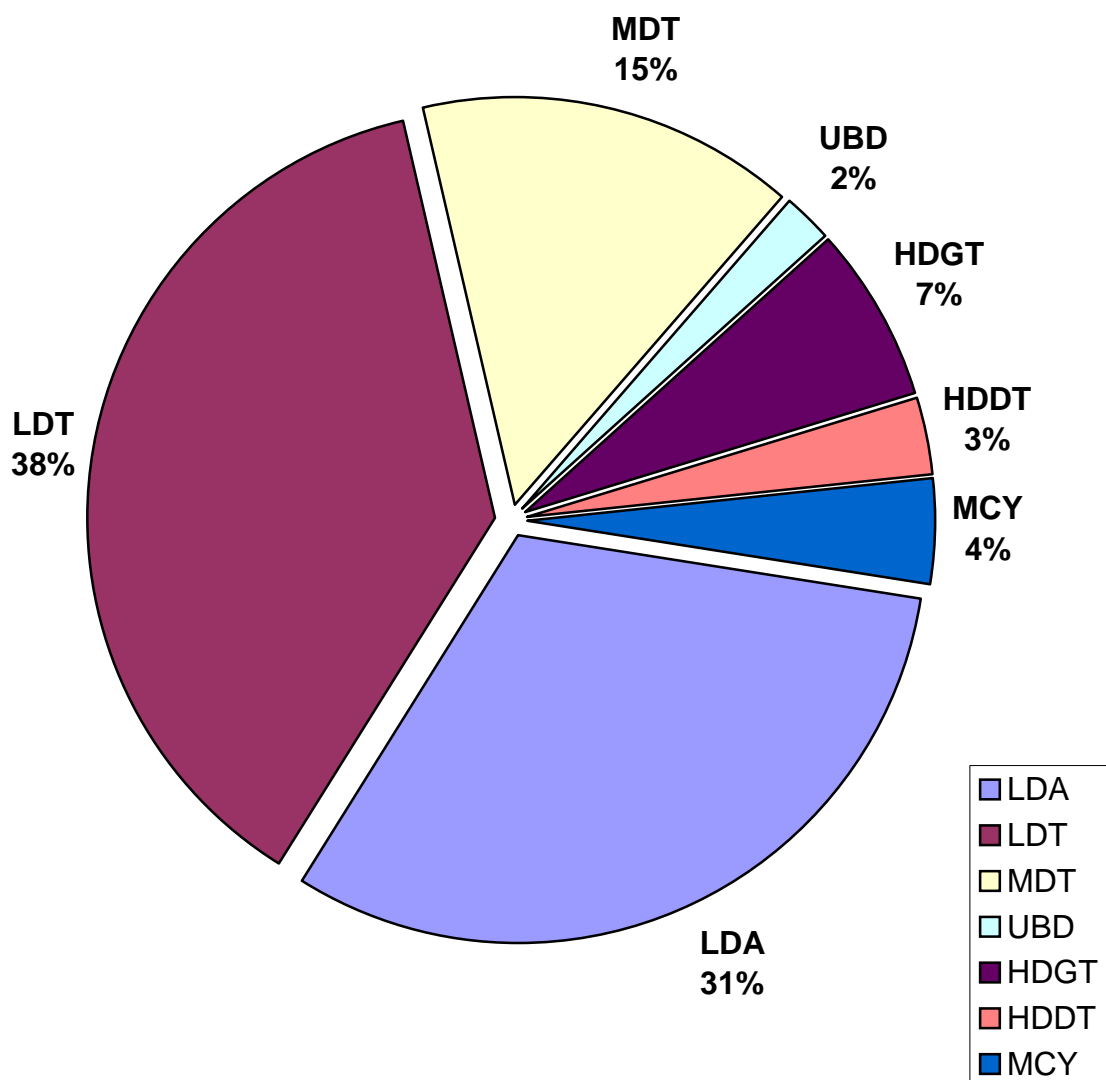


FIGURE 4 (concluded)
2015 On-Road Emission Inventory by Vehicle Type

OXIDES OF NITROGEN

Total Emissions = 9.75 tons/day

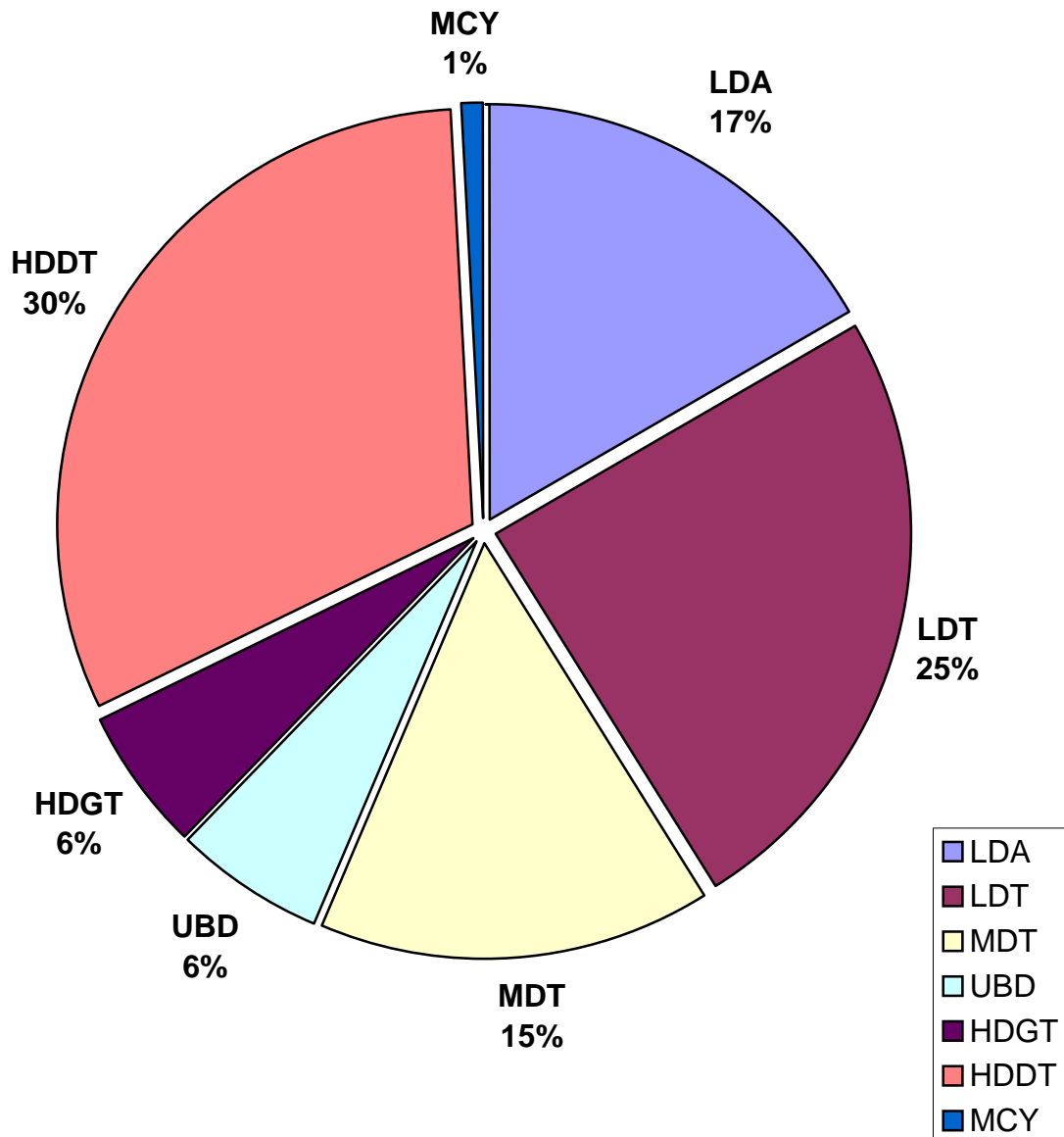


TABLE 6
AQAP TRACKING OF ON-ROAD MOBILE SOURCE EMISSIONS FORECASTS

Parameter	1982 AQAP	1989 AQAP	1991 AQAP	1993 ROP	1994 CAP	1998 CAP	2001 Plan
Emissions Model	EMFAC6C	EMFAC7D	EMFAC7D	EMFAC7F	EMFAC7F1.1	MVEI7G1.0c	EMFAC2002
Baseline Year	1979	1987	1987	1990	1990	1996	1999
Baseline VMT [‡]	5,372,000	7,437,000	7,437,000	8,464,000*	8,269,000	9,100,000	9,460,000
1990 VMT Forecast [‡]	7,237,000	8,019,000	8,019,000	8,464,000**	8,531,000**	9,085,500**	9,085,500**
1996 VMT Forecast [‡]	8,150,000	8,899,000	8,899,000	8,915,000 8,586,000 TCM	8,345,000 8,208,000 TCM	9,100,000**	9,100,000**
1999 VMT Forecast [‡]	N/A	N/A	N/A	N/A	N/A	9,460,000	9,460,000
2005 VMT Forecast [‡]	N/A	N/A	N/A	N/A	N/A	N/A	10,147,648
2015 VMT Forecast [‡]	N/A	N/A	N/A	N/A	N/A	N/A	11,288,265
1990 ROC Estimate	10.64 t/d	16.58 t/d 16.25 t/d TCM	16.58 t/d 16.25 t/d TCM	18.39 t/d	20.34 t/d	43.82 t/d	N/A
1996 ROC Estimate	10.67 t/d	9.36 t/d 9.09 t/d TCM	9.36 t/d 9.09 t/d TCM	10.30 t/d 9.81 t/d TCM	11.15 t/d 10.87 t/d TCM	20.38 t/d	N/A
1990 NOx Estimate	19.38 t/d	21.48 t/d 21.41 t/d TCM	21.48 t/d 21.41 t/d TCM	22.90 t/d	24.53 t/d	38.64 t/d	N/A
1996 NOx Estimate	20.04 t/d	15.75 t/d 15.21 t/d TCM	15.75 t/d 15.21 t/d TCM	15.44 t/d	16.14 t/d 15.95 t/d TCM	25.24 t/d	N/A
1999 ROC Estimate	N/A	N/A	N/A	N/A	N/A	17.52 t/d 17.42 t/d TCM	18.51 t/d
1999 NOx Estimate	N/A	N/A	N/A	N/A	N/A	22.16 t/d 22.07 t/d TCM	25.24 t/d
2005 ROC Estimate	N/A	N/A	N/A	N/A	N/A	N/A	11.91 t/d
2005 NOx Estimate	N/A	N/A	N/A	N/A	N/A	N/A	19.59 t/d
2015 ROC Estimate	N/A	N/A	N/A	N/A	N/A	N/A	5.90 t/d
2015 NOx Estimate	N/A	N/A	N/A	N/A	N/A	N/A	9.75 t/d

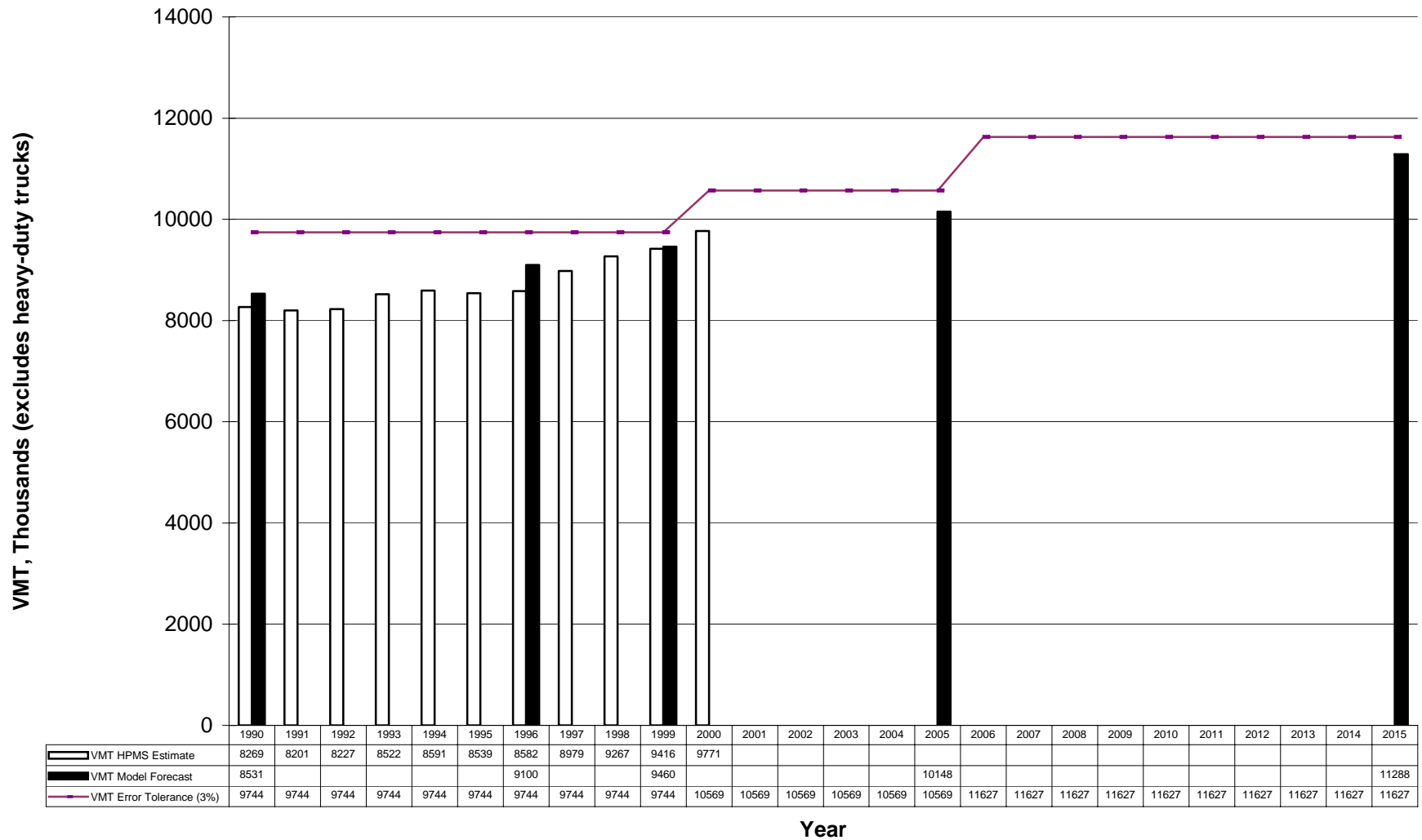
N/A – not applicable

‡ Excludes Commercial and Urban Bus vehicle VMT

* Baseline VMT Estimate was a forecast based on Previous Plan Baseline

** Baseline VMT Estimate (not a forecast).

**Figure 5.
VMT TRACKING**



ATTACHMENT 1.

EMFAC2002 OUTPUT SHEETS

1999 BASELINE
2005 FORECAST
2010 FORECAST
2015 FORECAST

Title : Santa Barbara County Avg 1999 Summer ChgVehbyClass+Starts
Version : Emfac2002 V2.2 Sept 23 2002 ** WIS Enabled **
Run Date : 10/11/02 10:36:59
Scen Year: 1999 -- Model Years: 1965 to 1999
Season : Summer
Area : Santa Barbara County Average
I/M Stat : I and M program in effect
Emissions: Tons Per Day

	Light Duty Passenger Cars				Light Duty Trucks				Medium Duty Trucks				Heavy Duty Trucks				Diesel Trucks	Total HD Trucks	Urban Buses	Motor-cycles	All Vehicles
	Non-cat	Cat	Diesel	Total	Non-cat	Cat	Diesel	Total	Non-cat	Cat	Diesel	Total	Non-cat	Cat	Total						
Vehicles	10338.	143566.	1468.	155371.	6384.	87394.	1942.	95720.	1991.	23395.	910.	26296.	1496.	4474.	5970.	3163.	9133.	257.	6091.	292868.	
VMT/1000	129.	5034.	35.	5198.	147.	3035.	65.	3248.	37.	890.	49.	976.	21.	143.	163.	302.	465.	33.	40.	9960.	
Trips	58494.	1108740.	10689.	1177930.	37546.	677634.	14909.	730089.	37371.	276806.	12160.	326336.	25984.	58890.	84874.	48615.	133489.	1028.	8716.	2377580.	
Reactive Organic Gas Emissions																					
Run Exh	0.76	1.93	0.01	2.70	0.87	1.28	0.01	2.17	0.26	0.61	0.02	0.89	0.16	0.31	0.48	0.26	0.74	0.13	0.17	6.79	
Idle Exh	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.01	0.02	0.00	0.00	0.02	
Start Ex	0.30	1.80	0.00	2.10	0.19	1.09	0.00	1.28	0.26	0.44	0.00	0.70	0.32	0.18	0.50	0.00	0.50	0.00	0.03	4.62	
Total Ex	1.07	3.73	0.01	4.81	1.06	2.37	0.01	3.44	0.52	1.06	0.02	1.60	0.49	0.49	0.98	0.27	1.25	0.13	0.20	11.43	
Diurnal	0.06	0.22	0.00	0.28	0.03	0.13	0.00	0.17	0.01	0.03	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.50	
Hot Soak	0.14	0.25	0.00	0.39	0.09	0.16	0.00	0.25	0.03	0.05	0.00	0.08	0.01	0.01	0.02	0.00	0.02	0.00	0.01	0.75	
Running	1.09	2.00	0.00	3.10	0.45	1.03	0.00	1.48	0.30	0.39	0.00	0.69	0.13	0.08	0.21	0.00	0.21	0.00	0.09	5.56	
Resting	0.04	0.11	0.00	0.15	0.02	0.06	0.00	0.09	0.00	0.02	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.26	
Total	2.40	6.31	0.01	8.73	1.66	3.75	0.01	5.42	0.86	1.54	0.02	2.43	0.62	0.58	1.21	0.27	1.48	0.14	0.33	18.51	
Carbon Monoxide Emissions																					
Run Exh	9.87	39.65	0.03	49.55	11.47	34.39	0.06	45.91	4.40	10.19	0.06	14.65	4.30	5.96	10.26	1.28	11.54	1.16	2.14	124.96	
Idle Exh	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.03	0.00	0.04	0.01	0.02	0.03	0.07	0.10	0.00	0.00	0.14	
Start Ex	1.87	18.99	0.00	20.86	1.21	13.39	0.00	14.60	1.79	5.30	0.00	7.10	3.08	2.92	6.00	0.00	6.00	0.05	0.09	48.70	
Total Ex	11.75	58.63	0.03	70.42	12.68	47.77	0.06	60.51	6.21	15.53	0.06	21.79	7.39	8.89	16.29	1.35	17.63	1.21	2.23	173.79	
Oxides of Nitrogen Emissions																					
Run Exh	0.68	5.16	0.06	5.89	0.76	4.83	0.10	5.69	0.22	1.76	0.33	2.31	0.14	1.39	1.54	6.20	7.74	0.61	0.06	22.30	
Idle Exh	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.22	0.22	0.00	0.00	0.22	
Start Ex	0.09	0.93	0.00	1.02	0.06	0.76	0.00	0.82	0.04	0.43	0.00	0.47	0.05	0.35	0.40	0.00	0.40	0.00	0.00	2.72	
Total Ex	0.77	6.09	0.06	6.92	0.82	5.59	0.10	6.50	0.26	2.20	0.33	2.79	0.20	1.74	1.94	6.42	8.36	0.61	0.07	25.24	
Carbon Dioxide Emissions (000)																					
Run Exh	0.07	2.20	0.01	2.29	0.08	1.54	0.03	1.65	0.03	0.71	0.03	0.76	0.02	0.10	0.12	0.64	0.76	0.07	0.00	5.53	
Idle Exh	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.01	
Start Ex	0.01	0.10	0.00	0.11	0.01	0.07	0.00	0.08	0.01	0.03	0.00	0.03	0.01	0.00	0.01	0.00	0.01	0.00	0.00	0.23	
Total Ex	0.09	2.30	0.01	2.40	0.09	1.61	0.03	1.73	0.04	0.73	0.03	0.80	0.02	0.10	0.13	0.66	0.78	0.07	0.01	5.78	
PM10 Emissions																					
Run Exh	0.00	0.06	0.01	0.08	0.01	0.05	0.01	0.06	0.00	0.02	0.01	0.03	0.00	0.00	0.00	0.16	0.16	0.01	0.00	0.34	
Idle Exh	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.01	
Start Ex	0.00	0.01	0.00	0.01	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	
Total Ex	0.01	0.07	0.01	0.09	0.01	0.06	0.01	0.07	0.00	0.02	0.01	0.03	0.00	0.00	0.00	0.17	0.17	0.01	0.00	0.37	
TireWear	0.00	0.04	0.00	0.05	0.00	0.03	0.00	0.03	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.10	
BrakeWr	0.00	0.07	0.00	0.07	0.00	0.04	0.00	0.04	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.14	
Total	0.01	0.19	0.01	0.20	0.01	0.13	0.01	0.14	0.00	0.04	0.01	0.05	0.00	0.01	0.01	0.18	0.19	0.01	0.00	0.60	
Lead	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
SOx	0.00	0.03	0.00	0.04	0.00	0.02	0.00	0.03	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.06	0.06	0.00	0.00	0.14	
Fuel Consumption (000 gallons)																					
Gasoline	11.01	246.22	0.00	257.23	11.80	173.31	0.00	185.11	4.82	77.83	0.00	82.65	3.55	12.24	15.79	0.00	15.79	1.58	0.98	543.33	
Diesel	0.00	0.00	1.29	1.29	0.00	0.00	2.27	2.27	0.00	0.00	2.64	2.64	0.00	0.00	0.00	59.03	59.03	4.70	0.00	69.94	

Title : Santa Barbara County Avg 2005 Summer Chg Vehs Starts Speed
Version : Emfac2002 V2.2 Sept 23 2002 ** WIS Enabled **
Run Date : 10/15/02 15:28:43
Scen Year: 2005 -- Model Years: 1965 to 2005
Season : Summer
Area : Santa Barbara County Average
I/M Stat : I and M program in effect
Emissions: Tons Per Day

	--- Light Duty Passenger Cars ---				--- Light Duty Trucks ---				--- Medium Duty Trucks ---				--- Heavy Duty Trucks ---				Urban Buses	Motor- cycles	All Vehicles	
	Non-cat	Cat	Diesel	Total	Non-cat	Cat	Diesel	Total	Non-cat	Cat	Diesel	Total	Gasoline Trucks	Cat	Total	Diesel Trucks				Total HD Trucks
Vehicles	4983.	160957.	906.	166845.	3344.	98444.	1727.	103515.	721.	26021.	1737.	28480.	903.	5029.	5932.	4001.	9933.	280.	6548.	315601.
VMT/1000	52.	5522.	18.	5593.	74.	3291.	54.	3419.	15.	973.	97.	1085.	11.	127.	138.	371.	509.	36.	52.	10692.
Trips	25480.	1214090.	6182.	1245760.	17529.	741045.	12805.	772179.	7806.	310104.	21057.	338967.	12893.	57316.	70209.	63069.	133278.	1120.	9278.	2500580.
Reactive Organic Gas Emissions																				
Run Exh	0.34	1.13	0.01	1.47	0.47	0.96	0.01	1.43	0.10	0.35	0.04	0.49	0.08	0.24	0.33	0.24	0.57	0.12	0.20	4.29
Idle Exh	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.01	0.02	0.00	0.00	0.02
Start Ex	0.14	1.34	0.00	1.47	0.09	0.90	0.00	0.99	0.05	0.35	0.00	0.40	0.16	0.17	0.33	0.00	0.33	0.00	0.03	3.22
Total Ex	0.48	2.46	0.01	2.94	0.56	1.85	0.01	2.42	0.15	0.71	0.04	0.90	0.24	0.42	0.66	0.26	0.91	0.13	0.22	7.53
Diurnal	0.03	0.18	0.00	0.21	0.02	0.12	0.00	0.14	0.00	0.03	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.40
Hot Soak	0.06	0.15	0.00	0.21	0.04	0.10	0.00	0.15	0.01	0.03	0.00	0.04	0.01	0.01	0.01	0.00	0.01	0.00	0.01	0.41
Running	0.45	1.08	0.00	1.53	0.18	1.00	0.00	1.18	0.05	0.34	0.00	0.39	0.06	0.15	0.21	0.00	0.21	0.00	0.05	3.36
Resting	0.02	0.09	0.00	0.11	0.01	0.06	0.00	0.07	0.00	0.01	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.20
Total	1.04	3.96	0.01	5.00	0.82	3.14	0.01	3.96	0.22	1.12	0.04	1.38	0.31	0.57	0.88	0.26	1.13	0.13	0.30	11.91
Carbon Monoxide Emissions																				
Run Exh	4.09	25.89	0.02	30.00	5.82	25.07	0.04	30.93	1.70	6.31	0.12	8.13	2.14	4.17	6.31	1.14	7.44	1.01	2.54	80.06
Idle Exh	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.04	0.00	0.02	0.02	0.09	0.11	0.00	0.00	0.15
Start Ex	0.83	13.89	0.00	14.72	0.58	10.58	0.00	11.16	0.37	3.72	0.00	4.09	1.51	2.56	4.07	0.00	4.07	0.05	0.09	34.19
Total Ex	4.92	39.78	0.02	44.72	6.40	35.65	0.04	42.09	2.07	10.07	0.12	12.26	3.66	6.75	10.40	1.22	11.62	1.07	2.63	114.39
Oxides of Nitrogen Emissions																				
Run Exh	0.27	3.15	0.03	3.45	0.37	3.54	0.08	3.99	0.09	1.28	0.55	1.92	0.07	1.01	1.07	5.80	6.87	0.61	0.08	16.92
Idle Exh	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.26	0.26	0.00	0.00	0.27
Start Ex	0.04	0.81	0.00	0.85	0.03	0.70	0.00	0.73	0.01	0.44	0.00	0.45	0.02	0.34	0.37	0.00	0.37	0.00	0.00	2.40
Total Ex	0.31	3.96	0.03	4.30	0.40	4.24	0.08	4.72	0.10	1.71	0.56	2.37	0.09	1.35	1.44	6.06	7.50	0.61	0.08	19.59
Carbon Dioxide Emissions (000)																				
Run Exh	0.03	2.31	0.01	2.35	0.04	1.67	0.02	1.74	0.01	0.77	0.05	0.84	0.01	0.09	0.10	0.79	0.89	0.07	0.01	5.89
Idle Exh	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.02
Start Ex	0.01	0.10	0.00	0.11	0.00	0.07	0.00	0.08	0.00	0.03	0.00	0.03	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.22
Total Ex	0.04	2.41	0.01	2.46	0.05	1.75	0.02	1.81	0.01	0.80	0.05	0.87	0.01	0.09	0.11	0.80	0.91	0.07	0.01	6.12
PM10 Emissions																				
Run Exh	0.00	0.07	0.00	0.08	0.00	0.07	0.00	0.07	0.00	0.02	0.01	0.03	0.00	0.00	0.00	0.13	0.14	0.01	0.00	0.33
Idle Exh	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.01
Start Ex	0.00	0.01	0.00	0.01	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02
Total Ex	0.00	0.08	0.00	0.09	0.00	0.08	0.00	0.08	0.00	0.03	0.01	0.03	0.00	0.00	0.00	0.14	0.14	0.01	0.00	0.36
TireWear	0.00	0.05	0.00	0.05	0.00	0.03	0.00	0.03	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.10
BrakeWr	0.00	0.08	0.00	0.08	0.00	0.05	0.00	0.05	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.15
Total	0.00	0.21	0.00	0.21	0.00	0.15	0.01	0.16	0.00	0.05	0.01	0.06	0.00	0.01	0.01	0.16	0.16	0.01	0.00	0.61
Lead	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SOx	0.00	0.02	0.00	0.02	0.00	0.02	0.00	0.02	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.07	0.07	0.01	0.00	0.14
Fuel Consumption (000 gallons)																				
Gasoline	4.55	254.48	0.00	259.03	5.87	185.28	0.00	191.14	1.57	84.09	0.00	85.66	1.83	10.93	12.75	0.00	12.75	1.65	1.24	551.48
Diesel	0.00	0.00	0.66	0.66	0.00	0.00	1.87	1.87	0.00	0.00	4.74	4.74	0.00	0.00	0.00	72.16	72.16	5.08	0.00	84.52

Title : Santa Barbara County Avg 2010 Summer chg VehStartsSpeed
Version : Emfac2002 V2.2 Sept 23 2002 ** WIS Enabled **
Run Date : 10/15/02 16:36:28
Scen Year: 2010 -- Model Years: 1965 to 2010
Season : Summer
Area : Santa Barbara County Average
I/M Stat : I and M program in effect
Emissions: Tons Per Day

	--- Light Duty Passenger Cars ---				--- Light Duty Trucks ---				--- Medium Duty Trucks ---				--- Heavy Duty Trucks ---				Total HD Trucks	Urban Buses	Motor-cycles	All Vehicles
	Non-cat	Cat	Diesel	Total	Non-cat	Cat	Diesel	Total	Non-cat	Cat	Diesel	Total	Non-cat	Cat	Total					
Vehicles	2259.	174619.	517.	177395.	1746.	107576.	1279.	110601.	393.	28217.	1822.	30433.	418.	5459.	5876.	4634.	10510.	297.	7005.	336241.
VMT/1000	20.	5920.	9.	5949.	37.	3520.	37.	3594.	8.	1014.	94.	1116.	5.	120.	125.	449.	573.	38.	59.	11329.
Trips	10611.	1276690.	3187.	1290490.	8363.	781417.	8955.	798735.	3232.	324890.	21970.	350093.	6966.	52353.	59319.	72234.	131553.	1187.	9651.	2581710.
Reactive Organic Gas Emissions																				
Run Exh	0.13	0.62	0.00	0.76	0.24	0.69	0.01	0.94	0.06	0.25	0.03	0.34	0.04	0.15	0.19	0.20	0.39	0.12	0.20	2.75
Idle Exh	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.02	0.02	0.00	0.00	0.03
Start Ex	0.06	0.87	0.00	0.92	0.04	0.67	0.00	0.71	0.02	0.28	0.00	0.31	0.08	0.14	0.21	0.00	0.21	0.00	0.02	2.18
Total Ex	0.19	1.49	0.00	1.68	0.28	1.36	0.01	1.65	0.08	0.54	0.03	0.65	0.12	0.29	0.41	0.22	0.63	0.12	0.22	4.96
Diurnal	0.01	0.15	0.00	0.17	0.01	0.12	0.00	0.13	0.00	0.03	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.33
Hot Soak	0.03	0.12	0.00	0.14	0.02	0.10	0.00	0.12	0.00	0.03	0.00	0.03	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.30
Running	0.18	0.73	0.00	0.92	0.08	0.96	0.00	1.04	0.02	0.33	0.00	0.35	0.03	0.17	0.20	0.00	0.20	0.00	0.02	2.54
Resting	0.01	0.09	0.00	0.10	0.01	0.07	0.00	0.07	0.00	0.02	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.19
Total	0.42	2.58	0.00	3.00	0.40	2.60	0.01	3.01	0.11	0.94	0.03	1.08	0.15	0.46	0.62	0.22	0.84	0.13	0.27	8.32
Carbon Monoxide Emissions																				
Run Exh	1.57	16.77	0.01	18.34	2.94	18.98	0.03	21.95	0.99	4.82	0.12	5.93	0.94	2.63	3.57	0.98	4.55	0.89	2.24	53.91
Idle Exh	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.04	0.00	0.02	0.02	0.10	0.12	0.00	0.00	0.16
Start Ex	0.34	9.61	0.00	9.95	0.28	8.12	0.00	8.40	0.16	2.94	0.00	3.10	0.79	2.03	2.81	0.00	2.81	0.05	0.10	24.42
Total Ex	1.91	26.37	0.01	28.30	3.22	27.11	0.03	30.36	1.14	7.81	0.12	9.07	1.73	4.67	6.40	1.08	7.48	0.94	2.34	78.49
Oxides of Nitrogen Emissions																				
Run Exh	0.10	1.91	0.01	2.03	0.19	2.61	0.06	2.85	0.06	0.99	0.42	1.46	0.03	0.62	0.64	4.43	5.08	0.60	0.09	12.10
Idle Exh	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.30	0.30	0.00	0.00	0.31
Start Ex	0.02	0.63	0.00	0.65	0.01	0.60	0.00	0.61	0.00	0.48	0.00	0.48	0.01	0.27	0.29	0.00	0.29	0.00	0.00	2.03
Total Ex	0.12	2.54	0.01	2.67	0.20	3.21	0.06	3.46	0.06	1.47	0.42	1.95	0.04	0.89	0.93	4.74	5.67	0.60	0.09	14.44
Carbon Dioxide Emissions (000)																				
Run Exh	0.01	2.43	0.00	2.45	0.02	1.79	0.01	1.83	0.01	0.80	0.05	0.86	0.00	0.09	0.09	0.96	1.06	0.07	0.01	6.27
Idle Exh	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.02	0.00	0.00	0.02
Start Ex	0.00	0.10	0.00	0.11	0.00	0.08	0.00	0.08	0.00	0.03	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.22
Total Ex	0.01	2.53	0.00	2.55	0.02	1.87	0.01	1.91	0.01	0.83	0.05	0.89	0.01	0.09	0.10	0.98	1.08	0.07	0.01	6.51
PM10 Emissions																				
Run Exh	0.00	0.08	0.00	0.08	0.00	0.08	0.00	0.08	0.00	0.03	0.01	0.03	0.00	0.00	0.00	0.11	0.11	0.01	0.00	0.32
Idle Exh	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.01
Start Ex	0.00	0.01	0.00	0.01	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02
Total Ex	0.00	0.09	0.00	0.09	0.00	0.09	0.00	0.09	0.00	0.03	0.01	0.04	0.00	0.00	0.00	0.11	0.11	0.01	0.00	0.35
TireWear	0.00	0.05	0.00	0.05	0.00	0.03	0.00	0.03	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.01	0.02	0.00	0.00	0.11
BrakeWr	0.00	0.08	0.00	0.08	0.00	0.05	0.00	0.05	0.00	0.01	0.00	0.02	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.16
Total	0.00	0.22	0.00	0.22	0.00	0.17	0.00	0.17	0.00	0.06	0.01	0.06	0.00	0.00	0.00	0.13	0.14	0.01	0.00	0.61
Lead	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SOx	0.00	0.02	0.00	0.02	0.00	0.02	0.00	0.02	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.06
Fuel Consumption (000 gallons)																				
Gasoline	1.78	264.22	0.00	266.00	2.93	196.52	0.00	199.45	0.83	86.58	0.00	87.41	0.86	10.13	10.99	0.00	10.99	1.69	1.44	566.98
Diesel	0.00	0.00	0.32	0.32	0.00	0.00	1.28	1.28	0.00	0.00	4.60	4.60	0.00	0.00	0.00	88.16	88.16	5.38	0.00	99.74

Title : Santa Barbara County Avg 2015 Summer Chg Vehs & Starts
Version : Emfac2002 V2.2 Sept 23 2002 ** WIS Enabled **
Run Date : 10/15/02 12:28:56
Scen Year: 2015 -- Model Years: 1970 to 2015
Season : Summer
Area : Santa Barbara County Average
I/M Stat : I and M program in effect
Emissions: Tons Per Day

	--- Light Duty Passenger Cars ---				--- Light Duty Trucks ---				--- Medium Duty Trucks ---				--- Heavy Duty Trucks ---				Urban Buses	Motor- cycles	All Vehicles	
	Non-cat	Cat	Diesel	Total	Non-cat	Cat	Diesel	Total	Non-cat	Cat	Diesel	Total	Non-cat	Cat	Total	Diesel Trucks				Total HD Trucks
Vehicles	674.	187809.	260.	188743.	680.	115985.	890.	117555.	181.	30334.	1847.	32362.	140.	5720.	5860.	5213.	11073.	313.	7474.	357520.
VMT/1000	5.	6274.	4.	6283.	14.	3757.	24.	3795.	4.	1055.	88.	1146.	2.	116.	118.	522.	639.	40.	63.	11967.
Trips	2966.	1332530.	1452.	1336940.	3019.	815021.	5802.	823842.	1199.	337358.	22325.	360882.	2859.	47529.	50388.	80218.	130606.	1252.	10016.	2663540.
Reactive Organic Gas Emissions																				
Run Exh	0.03	0.36	0.00	0.40	0.09	0.49	0.00	0.58	0.03	0.18	0.03	0.23	0.01	0.08	0.09	0.16	0.25	0.12	0.19	1.78
Idle Exh	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.02	0.02	0.00	0.00	0.03
Start Ex	0.02	0.52	0.00	0.54	0.02	0.46	0.00	0.47	0.01	0.22	0.00	0.23	0.03	0.10	0.13	0.00	0.13	0.00	0.02	1.39
Total Ex	0.05	0.88	0.00	0.94	0.11	0.94	0.00	1.05	0.04	0.40	0.03	0.47	0.04	0.18	0.23	0.18	0.40	0.13	0.22	3.20
Diurnal	0.00	0.13	0.00	0.13	0.00	0.11	0.00	0.11	0.00	0.03	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.28
Hot Soak	0.01	0.10	0.00	0.11	0.01	0.09	0.00	0.10	0.00	0.03	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.24
Running	0.05	0.55	0.00	0.59	0.02	0.85	0.00	0.87	0.01	0.33	0.00	0.34	0.01	0.16	0.17	0.00	0.17	0.00	0.01	1.99
Resting	0.00	0.09	0.00	0.09	0.00	0.07	0.00	0.08	0.00	0.02	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.19
Total	0.11	1.75	0.00	1.86	0.14	2.07	0.00	2.21	0.05	0.80	0.03	0.88	0.06	0.35	0.40	0.18	0.58	0.13	0.25	5.90
Carbon Monoxide Emissions																				
Run Exh	0.41	10.87	0.00	11.28	1.12	13.85	0.02	14.99	0.49	3.70	0.11	4.30	0.31	1.45	1.76	0.84	2.60	0.75	1.82	35.73
Idle Exh	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.04	0.00	0.02	0.02	0.11	0.13	0.00	0.00	0.17
Start Ex	0.09	6.36	0.00	6.45	0.10	5.76	0.00	5.87	0.06	2.25	0.00	2.32	0.30	1.47	1.78	0.00	1.78	0.05	0.11	16.56
Total Ex	0.50	17.22	0.00	17.73	1.23	19.61	0.02	20.85	0.55	6.00	0.11	6.66	0.61	2.94	3.55	0.95	4.50	0.80	1.92	52.46
Oxides of Nitrogen Emissions																				
Run Exh	0.03	1.16	0.01	1.20	0.07	1.85	0.04	1.96	0.03	0.72	0.27	1.02	0.01	0.33	0.34	2.70	3.04	0.57	0.09	7.87
Idle Exh	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.34	0.34	0.00	0.00	0.35
Start Ex	0.00	0.42	0.00	0.43	0.00	0.44	0.00	0.45	0.00	0.45	0.00	0.45	0.00	0.20	0.20	0.00	0.20	0.00	0.00	1.53
Total Ex	0.03	1.59	0.01	1.62	0.07	2.29	0.04	2.40	0.03	1.18	0.27	1.48	0.01	0.53	0.54	3.05	3.59	0.58	0.09	9.75
Carbon Dioxide Emissions (000)																				
Run Exh	0.00	2.57	0.00	2.57	0.01	1.93	0.01	1.95	0.00	0.83	0.05	0.88	0.00	0.09	0.09	1.13	1.22	0.08	0.01	6.71
Idle Exh	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.02	0.00	0.00	0.02
Start Ex	0.00	0.11	0.00	0.11	0.00	0.08	0.00	0.08	0.00	0.03	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.22
Total Ex	0.00	2.67	0.00	2.68	0.01	2.01	0.01	2.03	0.00	0.86	0.05	0.91	0.00	0.09	0.09	1.15	1.24	0.08	0.01	6.95
PM10 Emissions																				
Run Exh	0.00	0.09	0.00	0.09	0.00	0.09	0.00	0.09	0.00	0.03	0.00	0.04	0.00	0.00	0.00	0.08	0.08	0.01	0.00	0.31
Idle Exh	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.01
Start Ex	0.00	0.01	0.00	0.01	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02
Total Ex	0.00	0.10	0.00	0.10	0.00	0.10	0.00	0.10	0.00	0.04	0.00	0.04	0.00	0.00	0.00	0.09	0.09	0.01	0.00	0.34
TireWear	0.00	0.06	0.00	0.06	0.00	0.03	0.00	0.03	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.02	0.02	0.00	0.00	0.12
BrakeWr	0.00	0.09	0.00	0.09	0.00	0.05	0.00	0.05	0.00	0.01	0.00	0.02	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.17
Total	0.00	0.24	0.00	0.24	0.00	0.19	0.00	0.19	0.00	0.06	0.01	0.07	0.00	0.00	0.00	0.11	0.11	0.01	0.00	0.62
Lead	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SOx	0.00	0.03	0.00	0.03	0.00	0.02	0.00	0.02	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.07
Fuel Consumption (000 gallons)																				
Gasoline	0.47	276.85	0.00	277.32	1.11	209.61	0.00	210.72	0.38	89.34	0.00	89.73	0.31	9.63	9.93	0.00	9.93	1.74	1.57	591.01
Diesel	0.00	0.00	0.14	0.14	0.00	0.00	0.83	0.83	0.00	0.00	4.35	4.35	0.00	0.00	0.00	103.40	103.40	5.56	0.00	114.28