D R A F T
MAG 1998 SERIOUS AREA CARBON MONOXIDE PLAN FOR THE MARICOPA COUNTY NONATTAINMENT AREA

MARICOPA ASSOCIATION of GOVERNMENTS

MAG 1998 SERIOUS AREA CARBON MONOXIDE PLAN FOR THE MARICOPA COUNTY NONATTAINMENT AREA

TABLE OF CONTENTS

CHAPTER		PAGE
ONE	**INTRODUCTION**	1-1
	HISTORICAL BACKGROUND	1-1
	1991 FEDERAL IMPLEMENTATION PLAN FOR CARBON MONOXIDE	1-2
	MAG 1998 SERIOUS AREA CARBON MONOXIDE PLAN	1-3
TWO	**DESCRIPTION OF THE NONATTAINMENT AREA**	2-1
	NONATTAINMENT AREA GEOGRAPHY	2-1
	POPULATION	2-3
	HIGHWAY SYSTEM	2-3
	DEMAND AND SYSTEM MANAGEMENT	2-9
	PUBLIC TRANSIT SYSTEM	2-13
THREE	**VEHICLE MILES OF TRAVEL FORECASTING AND TRACKING**	3-1
	PERIOD AND GEOGRAPHIC COVERAGE	3-1
	VEHICLE MILES OF TRAVEL ESTIMATES	3-4
	NETWORK-BASED TRAVEL DEMAND MODELING METHODOLOGY	3-6
	DESCRIPTION OF TRAVEL DEMAND MODELS	3-6
	ANNUAL REPORTING PROCEDURES	3-7
FOUR	**ASSESSMENT OF AIR QUALITY CONDITIONS**	4-1
	INVERSION CONDITIONS	4-1
	SOURCES OF CARBON MONOXIDE EMISSIONS	4-2

TABLE OF CONTENTS (Continued)

CHAPTER		PAGE
	AIR QUALITY MONITORING DATA AND TREND ANALYSIS	4-6
FIVE	**OVERVIEW OF EXISTING CONTROL MEASURES**	5-1
	EXISTING CONTROL MEASURES	5-1
	BASIC TRANSPORTATION NEEDS	5-22
SIX	**EVALUATION OF CARBON MONOXIDE STRATEGIES**	6-1
	DRAFT COMPREHENSIVE LIST OF MEASURES	6-1
	EMISSIONS REDUCTIONS OF INDIVIDUAL CONTROL MEASURES	6-14
	DESCRIPTION OF NEW MEASURES IN THE DRAFT COMPREHENSIVE LIST	6-17
SEVEN	**SUGGESTED MEASURES FOR THE PLAN**	7-1
	MAG AIR QUALITY TECHNICAL ADVISORY COMMITTEE RECOMMENDATION FOR THE SUGGESTED LIST OF MEASURES	7-1
	MAG AIR QUALITY POLICY COMMITTEE RECOMMENDATION FOR THE SUGGESTED LIST OF MEASURES	7-5
	MAG REGIONAL COUNCIL APPROVAL OF THE SUGGESTED LIST OF MEASURES	7-5
	COMPARISON OF THE SUGGESTED LIST OF MEASURES WITH THE MEASURES FOR CONSIDERATION IN THE CLEAN AIR ACT AND ARIZONA REVISED STATUTES	7-21
	THE NEXT STEP IN THE PROCESS	7-21

TABLE OF CONTENTS (Continued)

CHAPTER		PAGE
EIGHT	**THE ADOPTED PLAN AND IMPLEMENTATION SCHEDULE FOR THE MAG 1998 CARBON MONOXIDE PLAN**	8-1
	COMMITTED MEASURES AND IMPLEMENTATION SCHEDULES	8-2
	TRACKING PLAN IMPLEMENTATION	8-129
	ASSURANCES THAT THE STATE HAS THE AUTHORITY TO IMPLEMENT THE MEASURES IN THE PLAN	8-130
NINE	**DEMONSTRATION OF ATTAINMENT STATUS**	9-1
	COMMITTED MEASURE DESCRIPTIONS	9-1
	SUMMARY OF MEASURES FROM THE SUGGESTED LIST OF MEASURES WHICH DID NOT RECEIVE FIRM COMMITMENTS FOR IMPLEMENTATION	9-35
	STATUS OF CONTINGENCY MEASURES	9-37
	COMMITMENTS FOR IMPLEMENTATION	9-37
	FUTURE AIR QUALITY CONDITIONS	9-37
	PROJECTED 2000 ATTAINMENT STATUS (WITH CONTROL MEASURES COMMITMENTS)	9-40
	REASONABLE FURTHER PROGRESS	9-41
	CONFORMITY OF TRANSPORTATION ACTIVITIES WITH AIR QUALITY PLANS AND EMISSIONS BUDGETS	9-42

TABLE OF CONTENTS (Continued)

CHAPTER		PAGE
TEN	**PUBLIC PARTICIPATION**	10-1
	DECISION MAKING STRUCTURE	10-1
	PUBLIC PARTICIPATION IN THE PREPARATION OF THE MAG 1998 CARBON MONOXIDE PLAN	10-3
	PUBLIC INVOLVEMENT PROCESS FOR TRANSPORTATION AND AIR QUALITY	10-11
	TITLE VI CONSIDERATIONS	10-13
ELEVEN	**COMMITMENTS FOR IMPLEMENTATION OF THE MAG 1998 SERIOUS AREA CARBON MONOXIDE PLAN**	11-1

APPENDICES A THROUGH C

MAG 1998 SERIOUS AREA CARBON MONOXIDE PLAN FOR THE MARICOPA COUNTY NONATTAINMENT AREA

LIST OF TABLES

TABLE		PAGE
Table 2-1	Total Resident Population by Municipal Planning Area (MPA) 1995-2050	2-4
Table 2-2	1993 VMT Based on HPMS Annual Average Daily Traffic for the Carbon Monoxide Nonattainment Area	2-5
Table 3-1	VMT Forecasts	3-3
Table 3-2	Derivation of Actual VMT for the CO Nonattainment Area	3-5
Table 4-1	Carbon Monoxide (CO) Emitted from All Source Categories Included in the 1993 Base Year CO Inventory	4-5
Table 4-2	Air Quality Monitoring Stations	4-8
Table 4-3	Carbon Monoxide Exceedance Days in the Maricopa Nonattainment Area, 1992-1997	4-11
Table 5-1	Transit Fare Structure	5-11
Table 5-2	Park-And Ride Lots in the Regional Planning Area	5-13
Table 5-3	Valley Metro Fixed Route Transit Service Standards	5-18
Table 5-4	Transit Service Performance Statistics By System: FY 1996-1997	5-20
Table 5-5	Forecast of Operating Funds City of Phoenix Transit System and RPTA	5-26
Table 6-1	Draft Comprehensive List of Measures for Particulate Matter and Carbon Monoxide	6-2
Table 6-2	Effectiveness of Air Pollution Control Measures in Reducing Carbon Monoxide Emissions for 2000 for Measures Which Were Modeled	6-15

MAG 1998 SERIOUS AREA CARBON MONOXIDE PLAN FOR THE MARICOPA COUNTY NONATTAINMENT AREA

LIST OF TABLES (Continued)

Table 7-1 Suggested List of Measures For Particulate Matter and Carbon Monoxide 7-6

Table 7-2 Comparison of the Suggested List of Measures With Measures in Section 108(f) of the Clean Air Act 7-22

Table 7-3 Comparison of the Suggested List of Measures With Measures in State Law Required for Consideration 7-23

Table 9-1 Estimated Baseline Properties for Gasoline Starting With the Winter 2000-2001 Season 9-3

MAG 1998 SERIOUS AREA CARBON MONOXIDE PLAN FOR THE MARICOPA COUNTY NONATTAINMENT AREA

LIST OF FIGURES

FIGURE		PAGE
Figure 2-1	Carbon Monoxide Nonattainment Area	2-2
Figure 2-2	Regional Average Weekday Travel Projections by Facility Type	2-6
Figure 2-3	1995 PM Peak Hour Congestion	2-7
Figure 2-4	2017 PM Peak Hour Congestion	2-8
Figure 2-5	Freeway/Expressway Plan	2-10
Figure 2-6	Planned Arterial Street Improvements	2-11
Figure 2-7	Regional Transit Plan	2-16
Figure 3-1	HPMS Areas for VMT Estimation	3-2
Figure 4-1	Sources of Carbon Monoxide Emissions	4-1
Figure 4-2	Carbon Monoxide Monitoring Sites	4-7
Figure 5-1	Regional Park-N-Ride Locations	5-12
Figure 5-2	Five Year Forecast of Funding City of Phoenix Transit System and RPTA	5-27
Figure 7-1	Measure Selection Process for MAG Air Quality Plans	7-2
Figure 8-1	Ozone and Carbon Monoxide Nonattainment Area and New Area A Boundaries	8-51
Figure 8-2	PM-10 Nonattainment Area and New Area A Boundaries	8-52
Figure 9-1	2000 Carbon Monoxide Emission Reductions from Individual Measures	9-2
Figure 9-2	Reasonable Further Progress Line for Carbon Monoxide	9-43
Figure 10-1	MAG Regional Air Quality Planning Technical Process	10-2
Figure 10-2	MAG Regional Air Quality Planning Process	10-4

CHAPTER ONE

INTRODUCTION

Within the Maricopa County nonattainment area, the national ambient air quality standards have not yet been attained for three pollutants: carbon monoxide, particulates, and ozone. On February 7, 1978, the Governor of Arizona designated the Maricopa Association of Governments (MAG) as the lead planning organization for Maricopa County that, together with the State, is responsible for determining which elements of the State Implementation Plan revision will be planned, implemented, and enforced by State and local governments in Arizona. This designation was made in accordance with the Clean Air Act Section 174 (a) (see Appendix A, Exhibit 1). In 1992, the Arizona Legislature recertified MAG as the regional planning agency in accordance with Section 174 of the 1990 Clean Air Act Amendments (A.R.S. Section 49-406 A.). This designation is described in the 1992 Air Quality Memorandum of Agreement in Appendix A, Exhibit 2.

In accordance with the 1990 Clean Air Act Amendments, the Maricopa County nonattainment area was initially classified as Moderate for carbon monoxide pollution. However, on July 29, 1996, the nonattainment area was reclassified to Serious due to failure to attain the carbon monoxide standard by December 31, 1995. The Serious Area reclassification was effective on August 28, 1996.

The Clean Air Act requires that a Serious Area Carbon Monoxide Plan be submitted within eighteen months of the reclassification date. The plan is required to include a forecast of vehicle miles traveled, transportation control measures, contingency provisions, enhanced vehicle inspection and maintenance program, attainment demonstration and specific annual emission reductions, employer trip reduction program, and oxygenated gasoline. The attainment date for Serious Areas is December 31, 2000.

Consequently, the MAG 1998 Serious Area Carbon Monoxide Plan has been prepared to meet the requirements in the Clean Air Act and improve air quality in the Maricopa County nonattainment area. The following narrative describes the historical background preceding the preparation of the Serious Area Plan.

HISTORICAL BACKGROUND

In order to meet the Moderate Area requirements, the MAG 1993 Carbon Monoxide Plan was submitted to the Environmental Protection Agency by November 15, 1993. It was followed by an Addendum in March 1994. Collectively, the MAG 1993 Carbon Monoxide Plan included a broad range of commitments from the State and local governments. The measures included Transit Improvements; Traffic Signal Coordination; Strengthened Countywide Travel Reduction Program (Ordinance); Alternative Fuels for Federal, State, and Local Government Fleet Vehicles; Tax Deduction for Alternative Fueled Vehicles;

Reduction in Gasoline Volatility; Increased Oxygen Content of Ethanol Gasoline Blends; Enhanced Vehicle Emissions Inspection Maintenance Program (includes I/M 240); Increased Waiver Repair Limits and Anti-Tampering Modifications for the Vehicle Emissions Inspection Maintenance Program; Enforcement of the Vehicle Inspection Program Through the Travel Reduction; Remote Sensing; and Residential Wood Burning Restrictions.

Based upon the air quality modeling data, the impact of the State and local government committed measures was an estimated 22.6 percent reduction in emissions by 1995. The impact of the committed measures resulted in a maximum 8-hour average carbon monoxide concentration of 8.81 parts per million (ppm) in 1995. Therefore, the 1993 Carbon Monoxide Plan demonstrated attainment of the standard by December 31, 1995, which was the attainment date for Moderate Areas.

However, on July 29, 1996, the Maricopa County nonattainment area was reclassified from Moderate to Serious due to exceedances of the carbon monoxide. In 1994, there were three exceedances of the standard. In 1995, there were three exceedances, resulting in two violations of the standard. The highest reading recorded in 1995 was 10.2 parts per million.

1991 FEDERAL IMPLEMENTATION PLAN FOR CARBON MONOXIDE

On January 29, 1991, the Environmental Protection Agency had promulgated the 1991 Federal Implementation Plan for Carbon Monoxide, as ordered by the U.S. Ninth Circuit Court of Appeals. The 1991 Federal Implementation Plan restored the measures in the MAG 1987 Carbon Monoxide Plan and 1988 Addendum; increased the minimum oxygen content in gasoline to 2.7 percent during the winter months; reduced the wintertime fuel volatility for gasoline to 10 pounds per square inch, with an exemption for ethanol blends; included a modeling demonstration for a December 31, 1991, attainment date and maintenance of the standard through 2001; included contingency provisions based upon 1982 EPA guidance; and conformity procedures. In the plan, EPA indicated that December 1991 was the earliest date possible that attainment could be achieved. The Federal Implementation Plan was effective on February 28, 1991.

Following the imposition of the federal plan, there have been efforts at the state and local levels to replace the federal plan provisions with state provisions. In 1991, the Arizona Legislature passed a bill to take over the two fuel measures in the Federal Implementation Plan (approved by EPA in August 1991).

At the federal level, the U.S. Congress passed Public Law 105-174 which specified that no requirements set forth in any carbon monoxide Federal Implementation Plan that are based on the Clean Air Act as in effect prior to the 1990 amendments to such Act may be imposed in the State of Arizona. The effective data of Public Law 105-174 was May 1, 1998 (see Appendix A, Exhibit 3).

MAG 1998 SERIOUS AREA CARBON MONOXIDE PLAN

The purpose of this document is to present the MAG 1998 Serious Area Carbon Monoxide Plan for the Maricopa County nonattainment area, with commitments to implement the various measures contained in the plan. The measure selection process is described in Figure 1-1. The document is composed of the following major sections:

1. Description of the Nonattainment Area - Includes a description of geographical location, population data, climate conditions, wind patterns, land uses, and the existing transportation system.

2. Vehicle Miles of Travel Forecasting and Tracking - Includes a description of periodic and geographic coverage, vehicle miles of travel estimates, network- based travel demand modeling methodology, description of travel demand models, and annual reporting procedures.

3. Assessment of Air Quality Conditions - Includes a discussion of inversion conditions, sources of carbon monoxide emissions, and air quality monitoring data and trend analysis.

4. Overview of Existing Control Measures - Includes a brief review of existing measures in place and basic transportation needs.

5. Evaluation of Carbon Monoxide Strategies - Includes a discussion of the draft comprehensive list of measures, emissions reductions of individual control measures, and description of new measures in the draft comprehensive list.

6. Suggested Measures for the Plan - Describes the process used by the MAG air quality committees in recommending the List of Suggested Measures for the Plan.

7. The Adopted Plan and Implementation Schedule - Includes a description of the committed measures and implementation schedules, tracking plan implementation, and assurances that the State has the authority to implement the measures in the Plan.

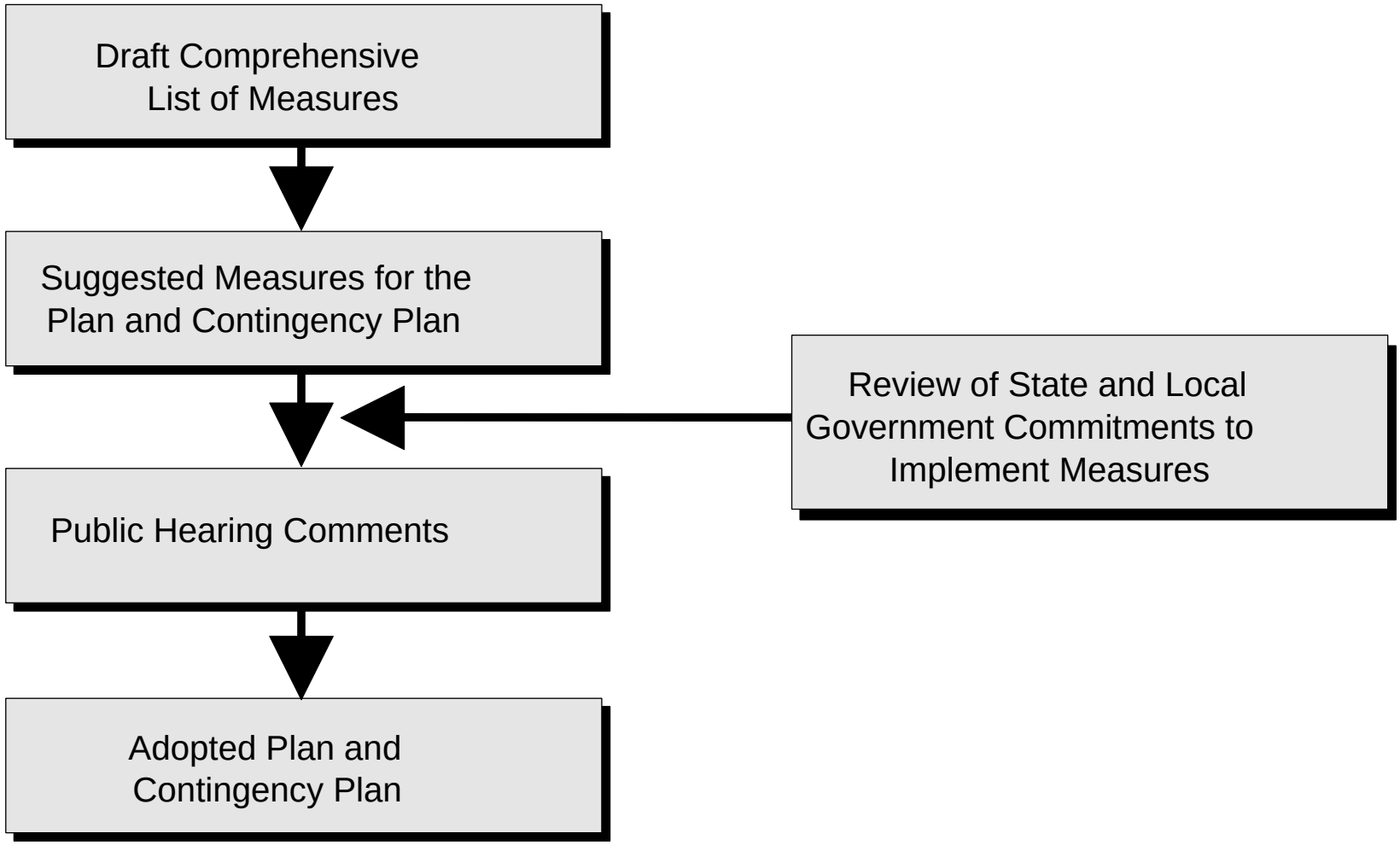
8. Demonstration of Attainment Status - Includes an assessment of the attainment status, reasonable further progress, and conformity of transportation activities with the air quality plans and emissions budgets.

9. Public Participation - Includes a description of the MAG decision making structure, public participation process, and Title VI considerations.

10. Commitments for Implementation of the MAG 1998 Serious Area Carbon Monoxide Plan - Includes commitments from the State, local governments, and other implementing entities.

Figure 1-1

Measure Selection Process for MAG Air Quality Plans



CHAPTER TWO

DESCRIPTION OF THE NONATTAINMENT AREA

The Maricopa County nonattainment area for carbon monoxide was formally designated in April, 1974. As defined in the 1977 Clean Air Act, the term nonattainment area refers to locations which exceed any national ambient air quality standard for any pollutant based upon the data collected through air quality monitoring. A general description of the carbon monoxide nonattainment area, including a discussion of the geographical location of the area, climatic conditions, population, land uses, and the existing transportation system, is provided below.

NONATTAINMENT AREA GEOGRAPHY

The Maricopa County carbon monoxide nonattainment area is located within the Salt River Valley in the central portion of Arizona. The northern boundary of the area is located approximately six miles north of the Carefree Highway and the southern boundary is located generally along Hunt Highway. On the east, the area is bounded approximately by the Pinal County Line and the Tonto National Forest; and on the west by Jackrabbit Trail and Beardsley Canal. The area contains portions of twenty-two cities and towns, and the Fort McDowell, Gila River and Salt River Pima-Maricopa Indian Communities, as well as unincorporated areas under the jurisdiction of Maricopa County (see Figure 2-1).

Due to its valley location, the nonattainment area has an elevation of 1,105 feet above mean sea level (MSL) and is almost completely surrounded by mountains. The Salt River Mountains are located on the southern border of the area and rise to an elevation of 2,507 feet above MSL. To the northwest, the Phoenix Mountains rise to an elevation of 2,310 feet above MSL. The Estrella Mountains are located to the southwest of the area and have an elevation of 3,320 feet above MSL. On the western boundary, the White Tank Mountains rise to an elevation of 4,026 feet above MSL.

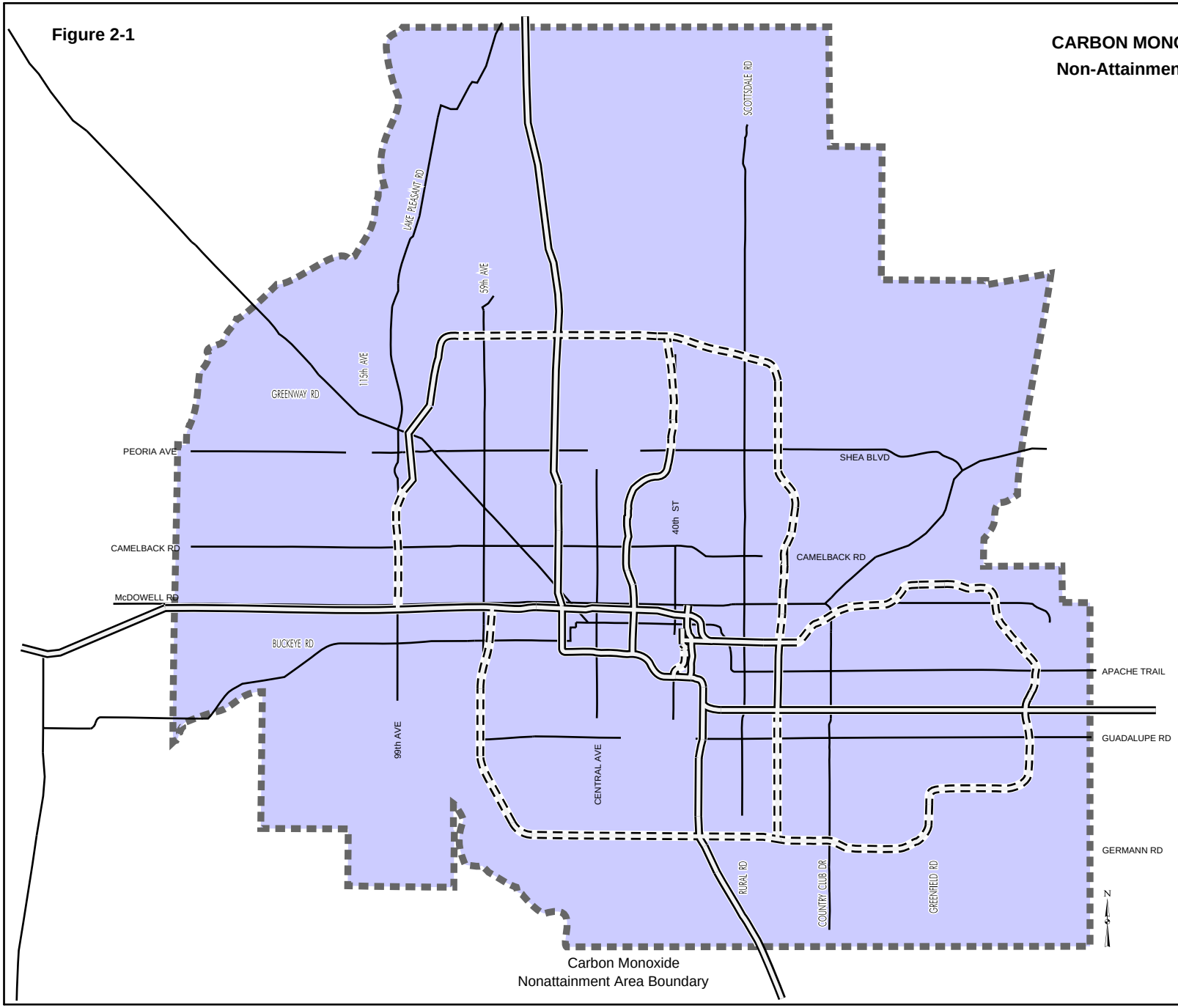
There are five main rivers that run through the nonattainment area. These rivers are: the Salt River, Agua Fria River, Gila River, New River, and Verde River.

The climate in the nonattainment area is arid continental, indicative of extreme ranges in daily temperatures. In this area, temperatures range from a mean of 51.7°F in January to a mean of 91°F in July; the annual average temperature is 70.4°F. The sun shines approximately 86 percent of the time and the annual average rainfall is 7.44 inches. Most of the rainfall occurs from November through March and during the months of July and August. (Source: Unibook, Inc. The Encyclopedia of American Cities. New York, New York. 1980.)

In general, the morning direction for the prevailing winds in the study area is from east (southeast) to west (southwest). However, wind direction can change in the afternoon to a more westerly direction.

Figure 2-1

CARBON MONOXIDE
Non-Attainment Area



Carbon Monoxide
Nonattainment Area Boundary

POPULATION

Based on official estimates of the U.S. Bureau of the Census, the population of Maricopa County was 2,528,700 on July 1, 1995. A comparison of the 1995 Special Census population with the 1985 population estimate of 1,837,956 reveals an increase of thirty-eight percent over the ten year period. This area has experienced a high rate of population growth, which is characteristic of metropolitan areas located in the sunbelt.

According to projections adopted by the MAG Regional Council on June 25, 1997, the population of Maricopa County is expected to increase to 3.7 million by 2010 (see Table 2-1). This represents an increase of forty-seven percent over the 1995-2010 interval.

HIGHWAY SYSTEM

The highway system in the nonattainment area is comprised of freeways, arterials, collectors, and local streets. Collectively, these comprise nearly 12,000 miles of roadway in the nonattainment area. Table 2-2 illustrates the breakdown of travel by facility type within the carbon monoxide nonattainment area for an annual average day in 1993. These annual average daily travel estimates were derived from 1993 Highway Performance Monitoring System (HPMS) data.

As estimated by MAG travel demand models, the total regional vehicle miles traveled (VMT) per average weekday will grow from 57.1 million in 1995 to 89.9 million in 2010, an increase of fifty-seven percent over the 15 year period (see Figure 2-2). As indicated in Table 2-2 and Figure 2-2, facilities classified as arterials carry the greatest share of travel, more than half of all VMT. Limited access facilities, such as interstates and freeways, accommodate another 23-31 percent of total travel. The remaining 17-22 percent of VMT is carried by collector and local streets.

Increases in population and vehicle miles traveled have contributed to traffic congestion at a number of intersections throughout the MAG area. At the same time, additional roadway capacity has helped to mitigate the impacts of growth in travel demand. Locations of current and future congestion are illustrated in Figures 2-3 and 2-4.

The major freeways presently located in the study area are: Interstate 17 (Black Canyon Freeway), Interstate 10 (Maricopa Freeway), and State Route 360 (Superstition Freeway). Other partly completed freeways include the Squaw Peak, Red Mountain, Agua Fria and Pima Freeways. The Maricopa and Superstition Freeways are designed to facilitate travel in an east-west direction, while the Black Canyon facilitates movement in a north-south direction. Other freeways help accommodate radial and circumferential traffic flow.

TABLE 2-1

TOTAL RESIDENT POPULATION
BY MUNICIPAL PLANNING AREA (MPA)
1995-2050

Municipal Planning Area	July 1, 1995	July 1, 2000	July 1, 2005	July 1, 2010	July 1, 2015	July 1, 2020	July 1, 2025	July 1, 2030	July 1, 2035	July 1, 2040	July 1, 2045	July 1, 2050
Avondale	23,580	29,080	32,543	37,499	51,809	84,788	94,899	104,007	112,914	123,682	138,811	157,403
Buckeye	11,094	18,052	22,353	28,144	81,414	82,384	102,223	124,072	155,197	210,263	323,077	438,897
Carefree	2,265	2,930	3,431	4,611	5,019	5,384	5,409	5,434	5,434	5,448	5,448	5,448
Cave Creek	3,065	4,181	6,259	8,981	11,163	12,579	13,682	14,705	15,599	16,538	16,615	16,615
Chandler	135,382	169,395	198,252	221,664	240,787	258,915	271,877	285,067	298,402	305,265	315,615	322,164
County Areas	78,685	90,806	101,414	110,057	124,977	154,685	194,598	236,387	292,137	369,188	486,745	641,574
El Mirage	5,690	5,846	5,914	5,927	6,078	7,273	7,855	9,141	10,815	13,304	17,836	24,026
Fountain Hills	14,015	18,661	25,764	34,585	52,499	54,632	54,941	54,941	54,941	54,941	54,941	54,941
Gila Bend	1,985	2,118	2,243	2,387	2,542	2,695	3,049	3,675	4,351	5,243	6,798	8,657
Gila River	2,624	2,680	2,736	2,804	2,891	3,073	3,125	3,201	3,260	3,326	3,393	3,451
Gilbert	65,460	108,534	132,812	174,690	201,393	244,842	268,219	291,578	315,261	326,601	335,613	339,556
Glendale	188,610	216,843	237,178	260,561	288,225	305,164	336,382	339,219	339,809	340,320	340,759	341,189
Goodyear	11,527	19,640	28,204	38,082	58,031	92,579	128,809	172,400	214,989	263,047	282,663	293,050
Guadalupe	5,319	5,502	5,661	5,720	5,727	5,732	5,742	5,753	5,764	5,773	5,781	5,789
Litchfield Park	3,705	4,876	6,517	8,452	12,561	14,688	15,038	15,267	15,406	15,581	16,475	17,109
Mesa	372,378	425,238	480,164	540,608	567,741	593,962	621,618	635,668	644,053	652,461	660,662	664,700
Paradise Valley	12,638	13,309	13,344	13,375	13,397	13,418	13,435	13,454	13,473	13,489	13,503	13,517
Peoria	76,058	93,675	126,408	141,185	167,355	183,815	197,363	213,030	234,073	258,608	294,045	358,317
Phoenix	1,154,139	1,298,121	1,415,330	1,544,093	1,641,489	1,795,539	1,958,470	2,132,808	2,287,269	2,439,219	2,519,765	2,567,878
Queen Creek	5,108	7,376	10,659	13,965	17,205	20,505	31,882	52,756	89,291	106,358	117,742	122,312
Salt R Pima-Mari	5,855	5,957	6,075	6,112	6,231	6,519	7,333	8,657	8,718	8,728	8,736	8,744
Scottsdale	168,615	204,892	242,179	270,763	294,181	306,713	330,308	356,656	372,141	374,032	374,293	374,482
Surprise	13,462	26,506	37,245	41,278	47,338	60,955	70,963	95,964	123,859	156,667	191,379	235,977
Tempe	152,738	164,256	170,399	174,769	181,177	183,466	184,699	186,084	187,463	188,647	189,665	190,665
Tolleson	4,220	4,467	4,725	6,897	7,544	8,207	10,723	10,907	10,907	10,907	10,907	10,907
Wickenburg	7,812	8,470	8,942	9,491	10,044	10,556	12,238	15,366	19,006	23,889	32,130	42,601
Youngtown	2,671	2,739	2,799	2,875	2,957	3,032	3,546	4,577	4,668	4,700	4,727	4,754
Maricopa County Total	2,528,700	2,954,150	3,329,550	3,709,575	4,101,775	4,516,100	4,948,426	5,390,775	5,839,200	6,296,225	6,768,125	7,264,725

Note: Numbers may not add due to rounding.

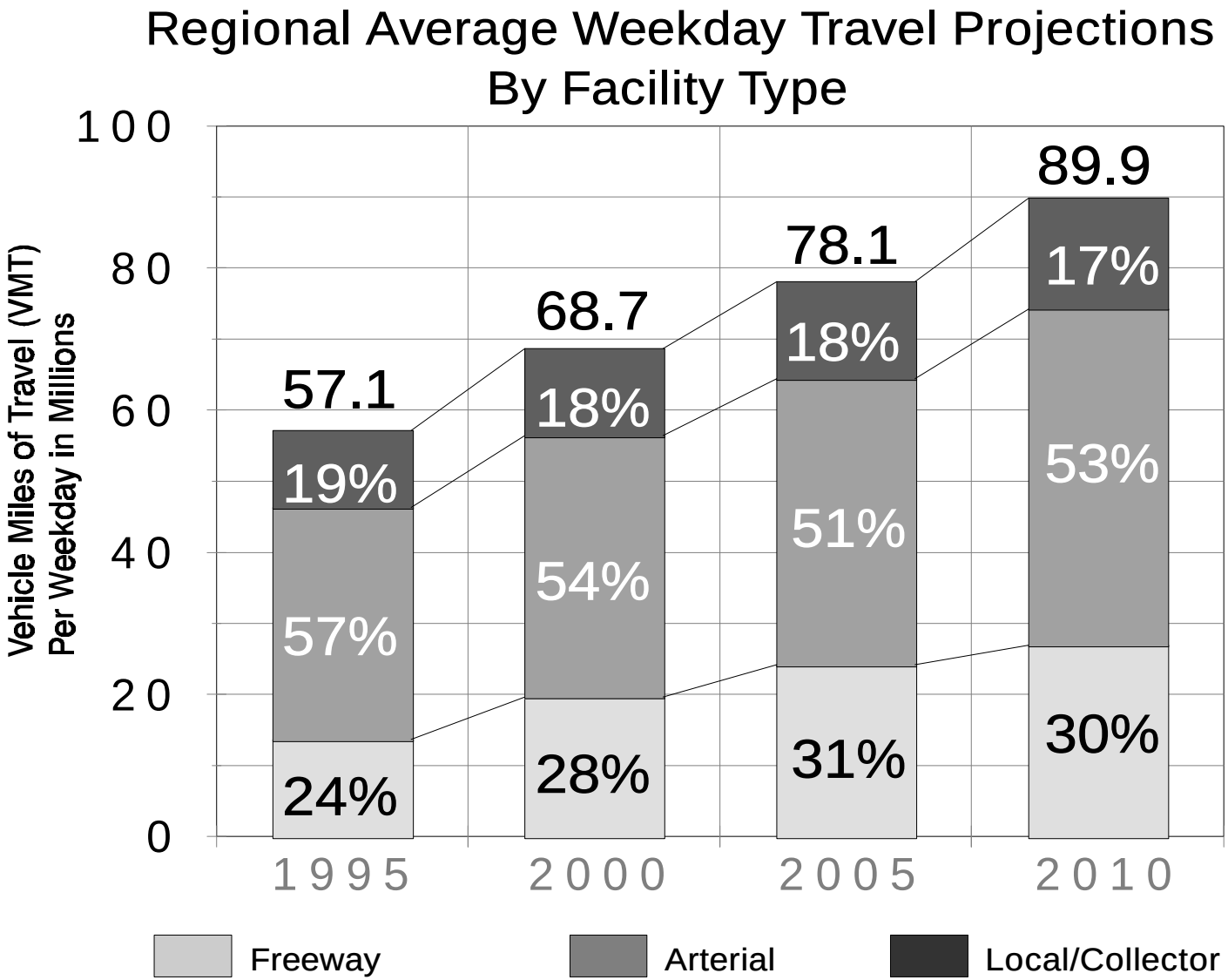
Total resident population through 2020 and resident population in households for 2025 - 2050 were approved by the MAG Regional Council on June 25, 1997.

TABLE 2-2

1993 VMT Based on HPMS Annual Average Daily Traffic
for the Carbon Monoxide Nonattainment Area

Facility Type	Urban	Percent	Rural	Percent	Total	Percent
Interstate	7,109,989	15.4%	421,882	17.8%	7,531,871	15.5%
Freeway/Expressway	3,629,638	7.9%	-	-	3,629,638	7.5%
Principal Arterial	17,302,376	37.5%	471,645	19.9%	17,774,021	36.7%
Minor Arterial	8,545,905	18.5%	337,728	14.3%	8,883,633	18.3%
Collector	5,248,985	11.4%	966,077	40.9%	6,215,062	12.8%
Local	4,277,318	9.3%	168,451	7.1%	4,445,769	9.2%
Total	46,114,211	100.0%	2,365,783	100.0%	48,479,994	100.0%

Figure 2-2



SOURCE: MAG Traffic Assignments: 1995I2, 2000I2, 2005I2, 2010I2

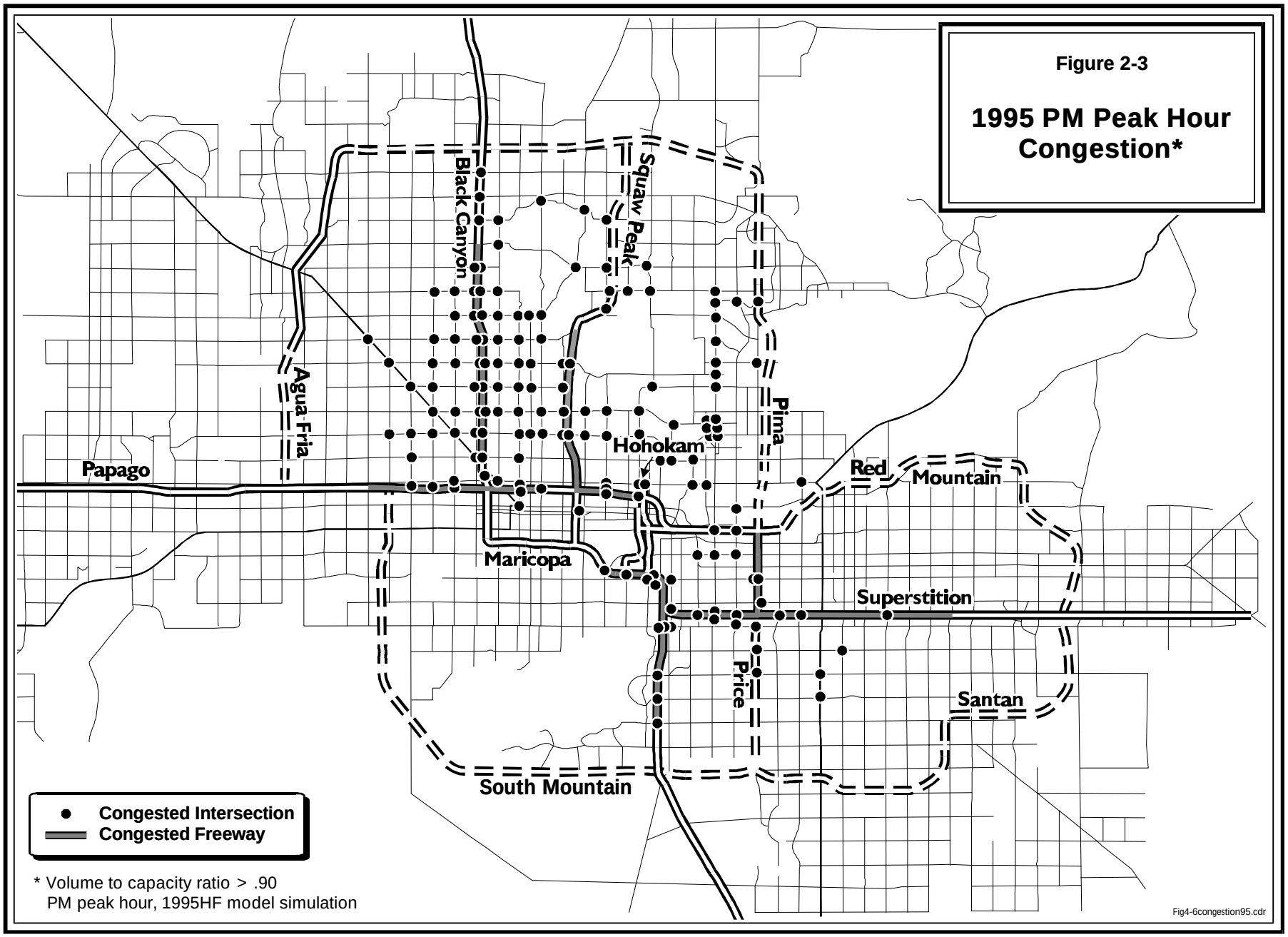


Figure 2-3
1995 PM Peak Hour Congestion*
Black Canyon
Squaw Peak
Agua Fria
Pima
Papago
Hohokam
Red Mountain
Maricopa
Superstition
Price
Santan
South Mountain
Congested Intersection
Congested Freeway
* Volume to capacity ratio > .90
PM peak hour, 1995HF model simulation
Fig4-6congestion95.cdr

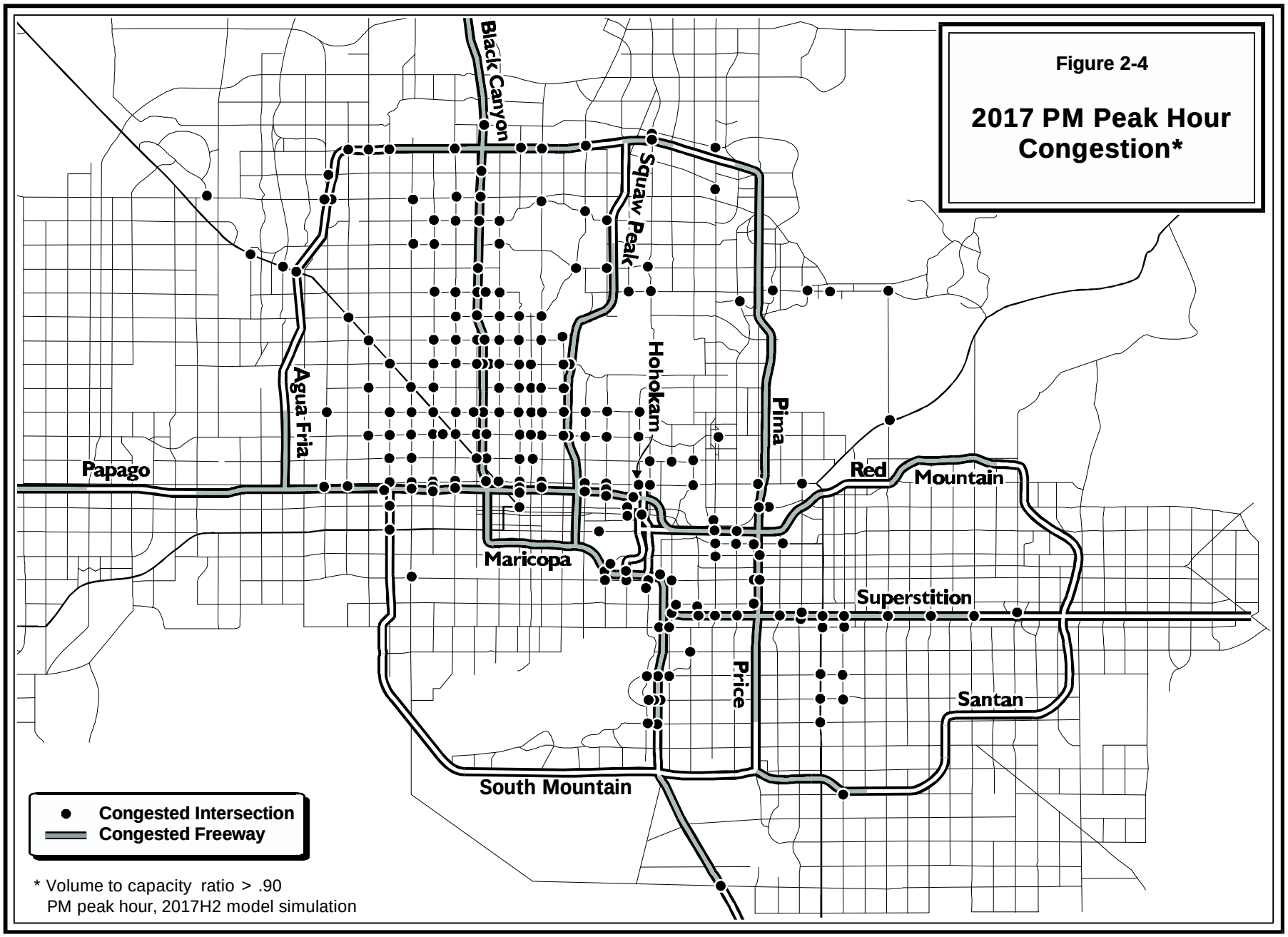


Figure 2-4

2017 PM Peak Hour Congestion*

Over the next two decades the existing freeway system will undergo significant expansion as shown in Figure 2-5. These increases in mileage have been made possible largely by funding sources at the State and local levels. The most significant of these involves the earmarking of certain state highway revenues (15 percent funds) for use on MAG area freeways and a one-half cent sales tax which is being applied in Maricopa County. The one-half cent sales tax expires at the end of 2005.

The arterial street network is also a major component of the regional highway system. This element carries more than half of the vehicle miles of travel in the region and provides access to adjacent land uses. Like the freeway system, the arterial network will be undergoing a number of capacity improvements in the future (see Figure 2-6).

DEMAND AND SYSTEM MANAGEMENT

Transportation Demand Management (TDM) Programs encourage reductions in travel demand, while Transportation System Management (TSM) programs improve management of existing traffic flows within the transportation system. These programs also promote alternative modes of travel including carpooling, vanpooling, transit usage, walking and bicycling, and alternative work schedules including telecommuting and compressed work schedules. A number of the ongoing TDM and TSM programs in the region are described below.

Transportation funds from MAG support the Regional Ridesharing Program. The Regional Ridesharing Program provides efforts to share an automobile ride and to use alternative modes of transportation throughout the MAG area. This program is administered by the Regional Public Transportation Authority (RPTA), or Valley Metro. The state rideshare program (Capitol Rideshare) offers carpool matching and other rideshare services to all state employees.

The Clean Air Campaign, an area wide public awareness program, is designed to reduce unnecessary vehicle use and has been ongoing since 1987, when it was initiated by the Phoenix Chamber of Commerce. The Clean Air Campaign is a public/private partnership with sponsors that include the Phoenix Chamber of Commerce, the Arizona Departments of Environmental Quality and Transportation, Maricopa County, MAG and the RPTA. A working group of sponsors which provides direction to the campaign was expanded in 1996 to include additional community organizations such as the Arizona Chapter of the American Lung Association and Valley businesses.

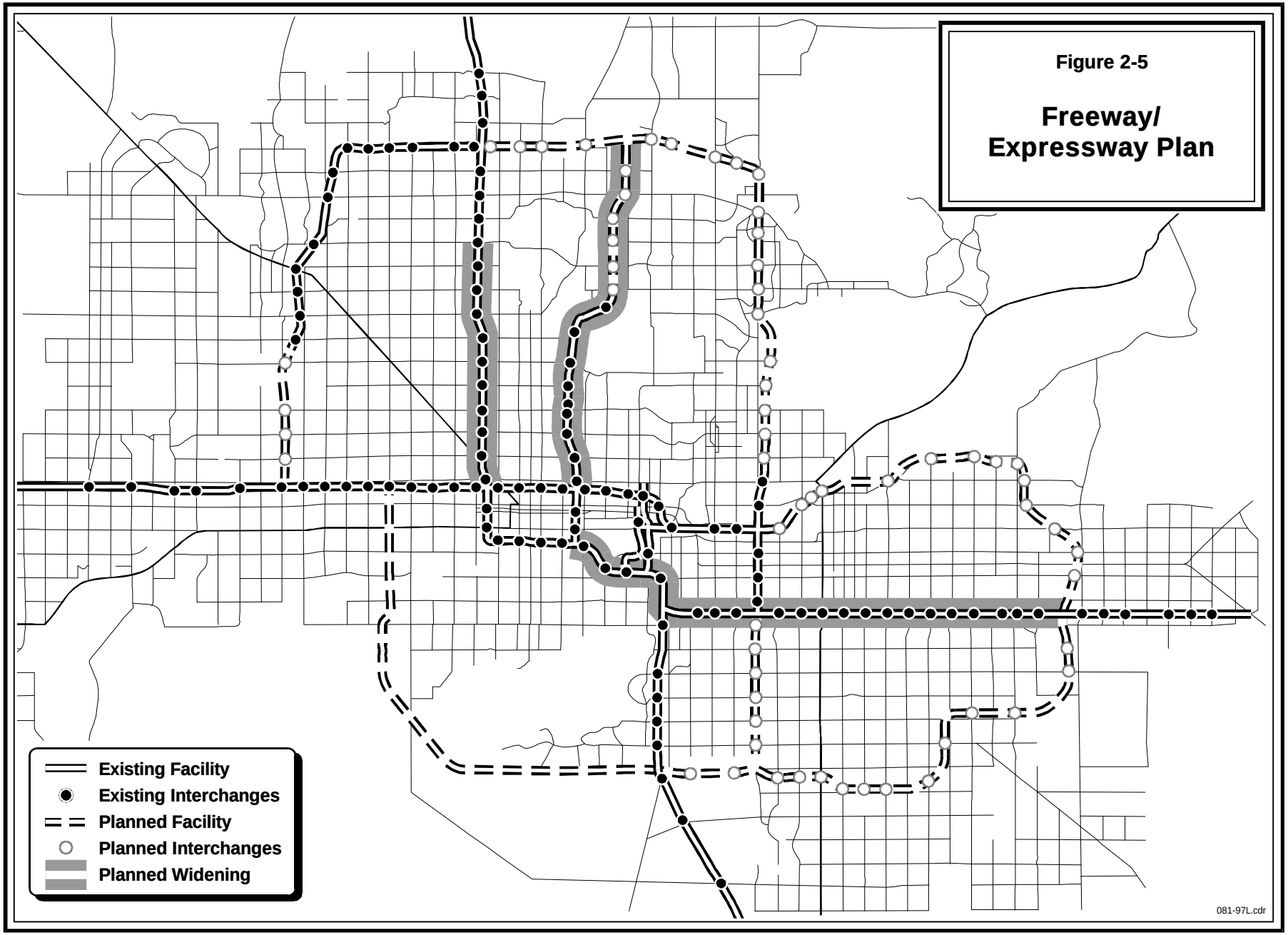


Figure 2-5
Freeway/
Expressway Plan
Existing Facility
Existing Interchanges
Planned Facility
Planned Interchanges
Planned Widening
081-97L.cdr

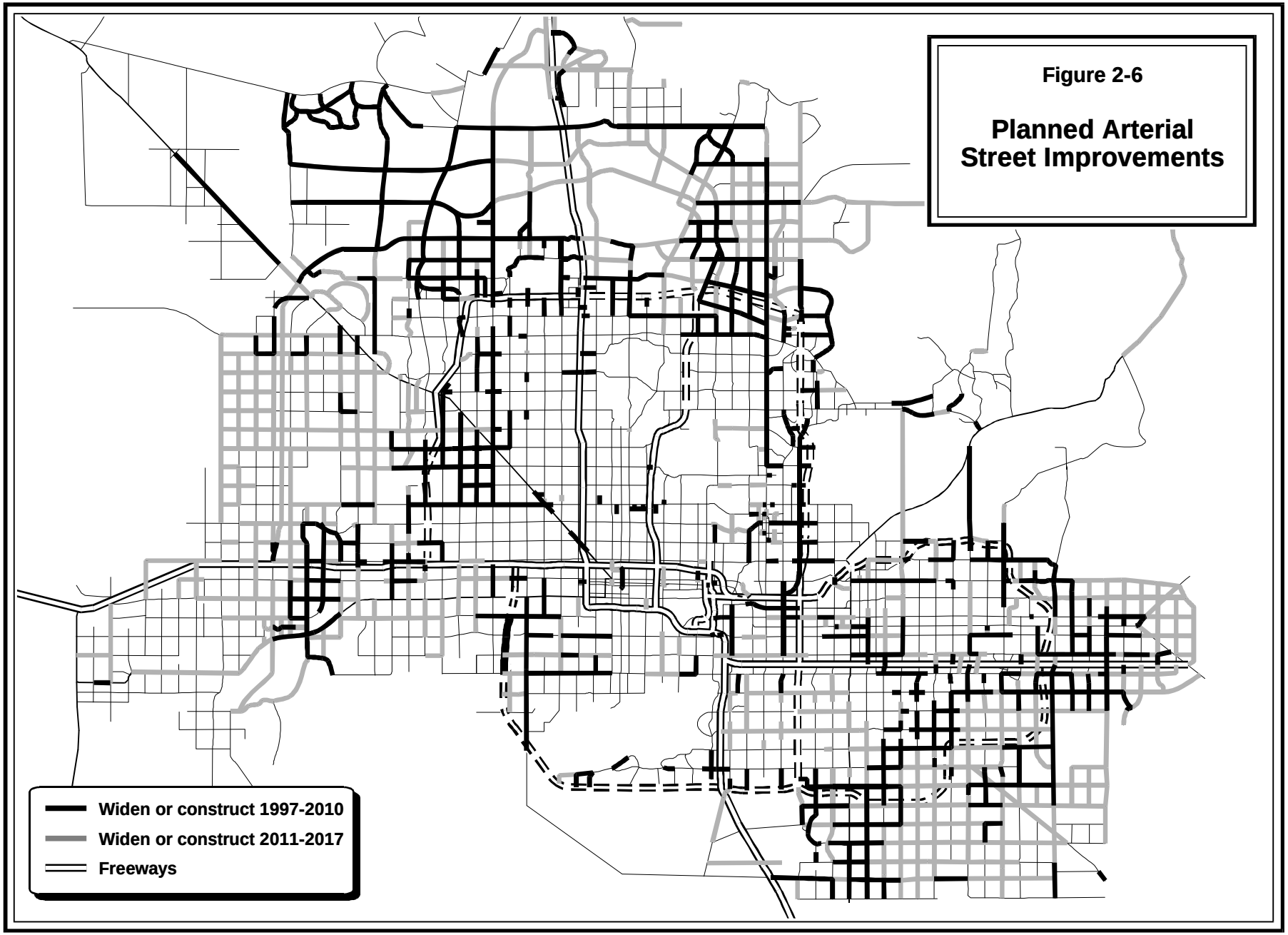


Figure 2-6
Planned Arterial Street Improvements
Widen or construct 1997-2010
Widen or construct 2011-2017
Freeways

Air quality improvement was the primary factor leading to the establishment of the Maricopa County Trip Reduction Program (TRP). Mandated by Arizona legislation in 1988, employers with 100 or more workers at a site began participating in this program in 1989. Participating employers are required to conduct an annual survey of the commuting modes of their employees, and prepare and implement a travel reduction plan to reduce the number of single occupant vehicle (SOV) trips and vehicle miles traveled (VMT). In November 1993, a special session of the state legislature passed an air quality bill that further expanded the TRP to include employers of 50 or more employees and increased the goals. Currently, over 1,250 employers are participating in the program representing about 480,000 students and employees.

The RPTA has provided a third party vanpool service to interested commuters since 1987. The number of vanpools has increased 57 percent over the past two years, from 69 to 108 vanpools in operation (as of December 1996). Over 515,000 passenger trips per year will be made by vanpool. RPTA contracts with a third party private vanpool firm to provide vehicles, insurance, fleet services and billing.

Another approach to travel demand management is the formation of Transportation Management Associations (TMAs) and employer transportation networking groups. Through these formal and informal associations, employers share resources to promote alternative mode use, improve mobility, or implement trip reduction programs in their local areas. TMAs are formally organized and incorporated with elected officers, bylaws and dues-paying members. The networking groups are less formal in their organization and are not incorporated.

As of December 1996, there were two formal TMAs and twelve transportation networking groups in the MAG region. Together, these employer groups involve over 240 employers and about 110,000 employees.

With the advent of new technological devices and the change to a service/information-based economy, a growing number of employers are allowing their employees to work in a location other than the central office. With telecommuting, employees can be linked to the central office by a personal computer, or fax machine. Potential opportunities to reduce trip making in this category would appear to be substantial. A random survey of Valley residents in 1996 indicated that most jobs could accommodate telecommuting at least one day per week. Also, according to Maricopa County TRP data, the number of employers with telecommuting programs increased more that 400 percent between 1994 and 1996, with over 280 Valley employers indicating that some form of telecommuting is allowed.

Intelligent Transportation Systems (ITS) is the application of advanced information processing and communications, as well as sensing and control technologies, to surface transportation. The objective of ITS is to promote more efficient use of the existing highway and transportation network, increase safety and mobility, and decrease the environmental costs of travel. In 1996 the MAG Regional Council adopted a strategic plan

for ITS in the MAG region. The ITS strategic plan identifies a set of incremental projects to achieve the required ITS services and recommended system architecture. Needs of transportation system users have been identified utilizing a public outreach program and a range of alternative methods of developing and maintaining an ITS have been evaluated and recommended.

The Arizona Department of Transportation (ADOT) Freeway Management System (FMS) is an important element of ITS. Phase I of the FMS is on-line, covering 29 miles of I-10 and I-17. The initial phase includes 19 variable message signs, 39 ramp meters, 29 CCTV cameras, 1,036 loop detectors, 403,000 linear feet of fiber optic cable, and 810,000 linear feet of electrical conduit. Ultimately, 55 miles of freeway are programmed to be covered by the FMS. Phase II will cover 11 miles, followed by implementation of the remaining 15 miles. Scheduled technologies include an incident detection system routed to the Traffic Operations Center. In addition, many municipalities in the region are currently involved in efforts to improve and coordinate traffic signalization to more effectively manage the flow of traffic within and across jurisdictional boundaries.

Several efforts are underway throughout the region to improve existing intersections and interchanges. Nine interchanges have been identified by ADOT as needing reconstruction in the metropolitan area. ADOT is also completing high occupancy vehicle studies on the major freeways and programming decisions will be made on the basis of the results. The MAG Regional Council has directed staff to examine problematic portions of the completed freeway system and identify low cost methods to improve traffic flow.

PUBLIC TRANSIT SYSTEM

Publicly-funded fixed route transit service is provided in 16 communities in the MAG Regional Planning Area. The services are provided by seven private operators: Arnett Transportation Services, Inc. (Arnett); ATE Management and Service Company (ATE); DAVE Transportation Services, Inc. (DAVE); Forsythe and Associates; Mayflower/Laidlaw Contract Services (Mayflower/Laidlaw); Phoenix Transit System, a division of ATC/VANCOM Management Services, Inc. (Phoenix Transit); and Valley Coach, a separate division of ATC/VANCOM Management Services, Inc. Funding for these services are provided by the cities of Avondale, Chandler, Gilbert, Glendale, Mesa, Phoenix, Scottsdale, Tempe and the Regional Public Transportation Authority (RPTA).

Fifty-two local routes and 20 express routes are operated throughout the region each weekday. Transit service is operated weekdays for approximately 15 hours from 5 a.m. to 8 p.m. The exact hours vary by route, with some service beginning the first trip as early as 5 a.m. and the last trip at 9:30 p.m. On Saturdays service hours are from 6 a.m. to 8 p.m., with variations by route. At the present time the only Sunday service is provided by the City of Tempe, although this service extends to some Scottsdale and Mesa locations.

Today nine dial-a-ride systems operate within Maricopa County including Glendale Dial-a-Ride, Maricopa County/Red Cross Special Transportation Services, Mesa/Chandler/Gilbert Dial-a-Ride operated by Arnett Transportation Services, Inc., Peoria Dial-a-Ride, El Mirage Dial-a-Ride, Phoenix Dial-a-Ride operated by Arnett Transportation Services, Inc., Sun Cities Area Transit System (SCAT), Surprise Dial-a-Ride, and Tempe/Scottsdale Dial-a-Ride operated by Mayflower Contract Services. Seven of these dial-a-rides operate within the area in which fixed route bus service is also offered. These dial-a-rides, with scheduled modifications, fully comply with all Americans with Disabilities Act complementary paratransit provisions for eligible persons. All dial-a-ride systems plan to continue demand response service to existing passengers, in addition to serving persons certified as ADA paratransit eligible.

The exact hours of dial-a-ride operation vary by system. However, most systems operate weekday service between 7 a.m. and 5 p.m., with some service being provided as early as 6 a.m. and as late as 7 p.m. Saturday service is provided by four of the dial-a-ride systems, while service on Sundays and holidays is limited to Mesa/Chandler/Gilbert Dial-a-Ride (Mesa service only), Phoenix Dial-a-Ride, and Sun Cities Area Transit System (SCAT). In addition, ADA complementary paratransit is provided by six dial-a-ride systems, with days and hours of operation parallel to fixed route service.

The Maricopa County/American Red Cross Special Transportation Services operates a prescheduled service. Transportation is provided for qualified persons for specific trip purposes in portions of Maricopa County unserved by other systems. This provides outlying areas of the region with needed transportation services.

The Valley Metro Vanpool Program offers commuters an alternative to driving alone. Valley Metro Rideshare provides vans to groups of 7-15 commuters. Commuters share a ride in the van driven by one of the vanpool members. Passengers share the cost of operating the van by paying an equitable monthly fare.

Valley Metro has provided a third-party vanpool program to residents and employers in Maricopa County for eight years. Currently, Vanpool Services Incorporated (VPSI) serves as the vanpool contractor. VPSI is under contract with the Regional Public Transportation Authority to provide regional vanpool services including: billing administration, insurance for the vans, vehicle maintenance and supply of capital equipment.

Fixed route, scheduled service is provided to an area of approximately 568 square miles within the MAG Regional Planning Area by Valley Metro-Mesa, City of Phoenix Transit System, Scottsdale Connection, Tempe FLASH, and the RPTA. In FY 1995-96, a total of 35,028,406 passengers rode these systems. During this period, 13,664,992 miles were driven for a total of 889,139 hours by fixed route service vehicles.

Valley Metro fixed route service is provided by five different entities:

During FY 1995-96, the City of Phoenix Transit System carried a total of 30,812,249 passengers. The system logged 10,422,780 miles and a total of 676,303 hours were spent in service during the year.

Valley Metro-Mesa transported 718,600 passengers during FY 1995-96. Mesa's buses traveled 975,140 miles in 65,183 hours during FY 1995-96.

The Scottsdale Connection carried 211,965 passengers in FY 1995-96. The Connection provided 503,109 miles of service in 25,366 hours during FY 1995-96.

Tempe FLASH reported 793,107 passenger boardings in FY 1995-96. The FLASH provided 102,965 miles of service in 11,780 hours during FY 1995-96.

RPTA provided service carrying 2,492,485 passengers during FY 1995-96. RPTA's buses traveled 1,660,998 miles in 110,507 hours to deliver this service.

Demand response and ADA paratransit service is provided in the MAG Regional Planning Area by Glendale Dial-a-Ride, Maricopa County/American Red Cross, Mesa/Chandler/Gilbert Dial-a-Ride, Peoria Dial-a-Ride, Phoenix Dial-a-Ride, Sun Cities Area Transit System (SCAT), Surprise Dial-a-Ride and Tempe/Scottsdale Dial-a-Ride. In FY 1995-96, 795,019 passengers boarded these systems. In this same fiscal year, 351,911 hours of service was provided.

The Valley Metro Vanpool Program grew significantly from FY 94-95 to FY 95-96. At the end of FY 95-96, 102 vanpools were being operated, compared to only 88 at the end of FY 94-95. During FY 95-96 the average vanpool traveled 64.5 miles round trip with 9.37 passengers, including the driver. As a result of the vanpool program, it is estimated that 328,516 single-occupant vehicle-trips were not taken during FY 95-96.

Beginning in the summer of 1989, local communities and various community groups throughout the region worked to develop local transit plans based on the needs and preferences expressed by their citizens. In May of 1990, a regional citizens committee was established and charged with integrating these diverse local plans into a single comprehensive regional transit plan. This Plan was scaled back to the revenue estimated from a one-quarter percent sales tax and was adopted by the RPTA Board of Directors and the MAG Regional Council in July 1992 (see Figure 2-7). In general, the MAG Long Range Plan for Transit includes a doubling of bus service and a tripling of dial-a-ride service by 2005. After 2005, this service is projected to increase at the rate of population growth.

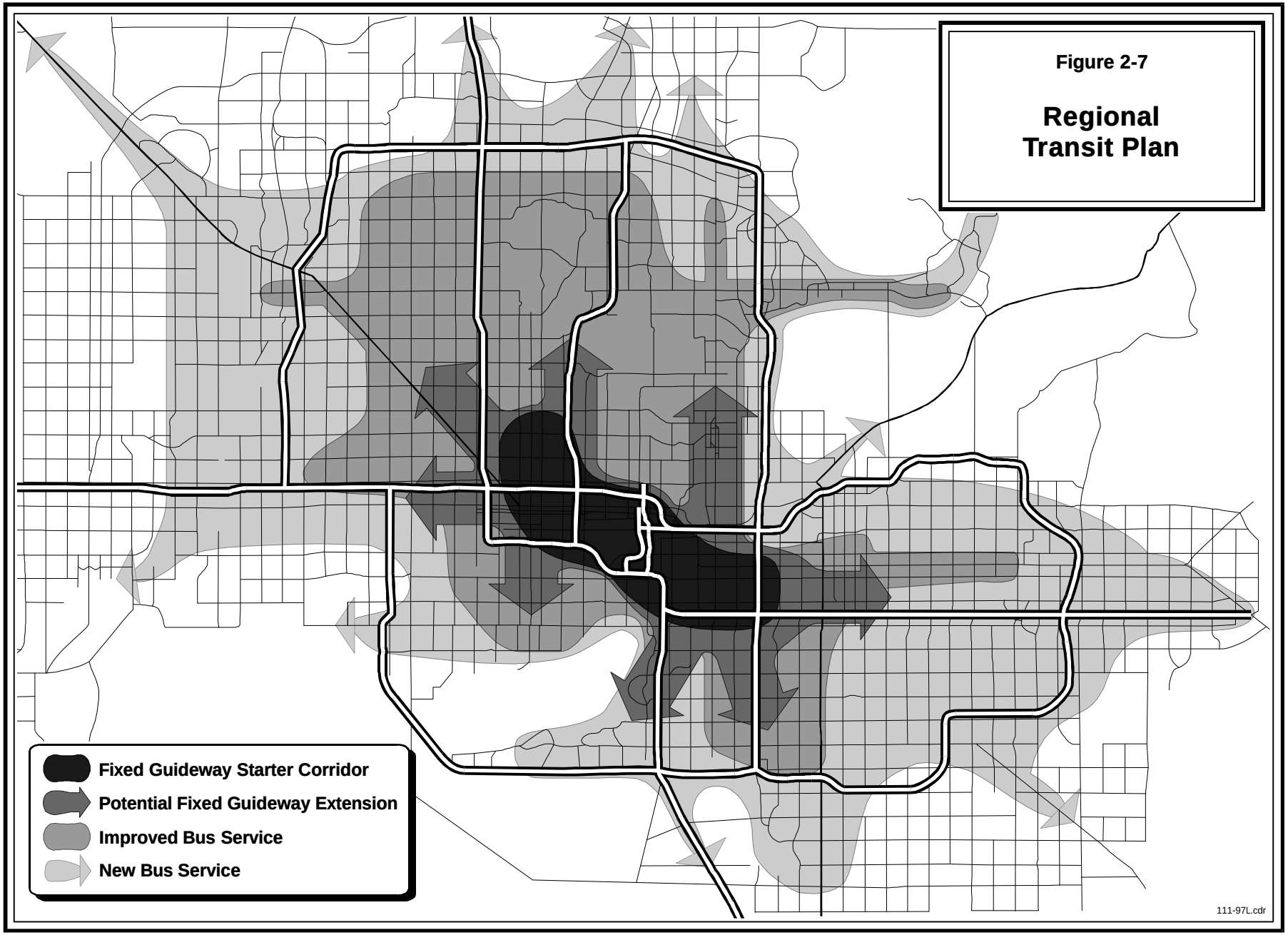


Figure 2-7
Regional Transit Plan
Fixed Guideway Starter Corridor
Potential Fixed Guideway Extension
Improved Bus Service
New Bus Service
111-97L.cdr

CHAPTER THREE

VEHICLE MILES OF TRAVEL FORECASTING AND TRACKING

Section 187(a) of the Clean Air Act Amendments of 1990 requires that states containing a Moderate and/or Serious CO nonattainment area with a design value greater than 12.7 ppm at the time of classification must forecast vehicle miles of travel (VMT) in the nonattainment area for each year before the attainment year. EPA has prepared guidance dated January 1992 regarding compliance with this requirement. For Moderate areas reclassified as Serious, such as the Maricopa County area, EPA is to issue new SIP guidance pertaining to implementation of the Section 187 forecasting and tracking provisions at the time of reclassification.

Upon reclassification of the Maricopa County area to Serious, MAG consulted with EPA and was advised to apply the January 1992 VMT guidance in preparing the Serious Area SIP. Accordingly, the vehicle miles of travel estimation procedures used in this plan are consistent with Section 187 guidance for Serious CO nonattainment areas.[1] Details of the forecasts and procedures are presented in this chapter.

The VMT tracking area is the CO Nonattainment Area,[2] as shown in Figure 3-1. The 1997 VMT reported by the Highway Performance Monitoring System (HPMS)[3] is the actual VMT estimate. VMT forecasts for 1998 through 2000 have been prepared, using a network-based travel demand modeling approach, and are presented in Table 3-1. Specific Section 187 requirements related to these forecasts and procedures are discussed below.

PERIOD AND GEOGRAPHIC COVERAGE

The actual and forecasted VMTs in Table 3-1 are expressed in terms of average annual daily vehicle travel, as reported by HPMS. Actual VMT represents a combination of data on HPMS Template 2, which reports VMT for the Federal Aid Urbanized Area (FAUA), and HPMS Template 3, which reports VMT for the donut area of individual NAAQS nonattainment areas.[4]

The FAUA plus the donut area is equivalent to the PM-10 nonattainment area, shown in Figure 3-1. The VMT reported by HPMS for the PM-10 nonattainment area is higher than for the VMT tracking area, which is the smaller CO nonattainment area. To estimate VMT

---

[1]EPA, Section 187 VMT Forecasting and Tracking Guidance, January 1992.

[2]Federal Register, "Designation of Areas for Air Quality Planning Purposes," November 6, 1991.

[3]FHWA, HPMS Field Manual, August 30, 1993, and Traffic Monitoring Guide, December 1992.

[4]"Donut" is an HPMS term defining the area outside the FAUA, but inside a designated NAAQS nonattainment area; in this case, the Phoenix PM-10 Nonattainment Area.

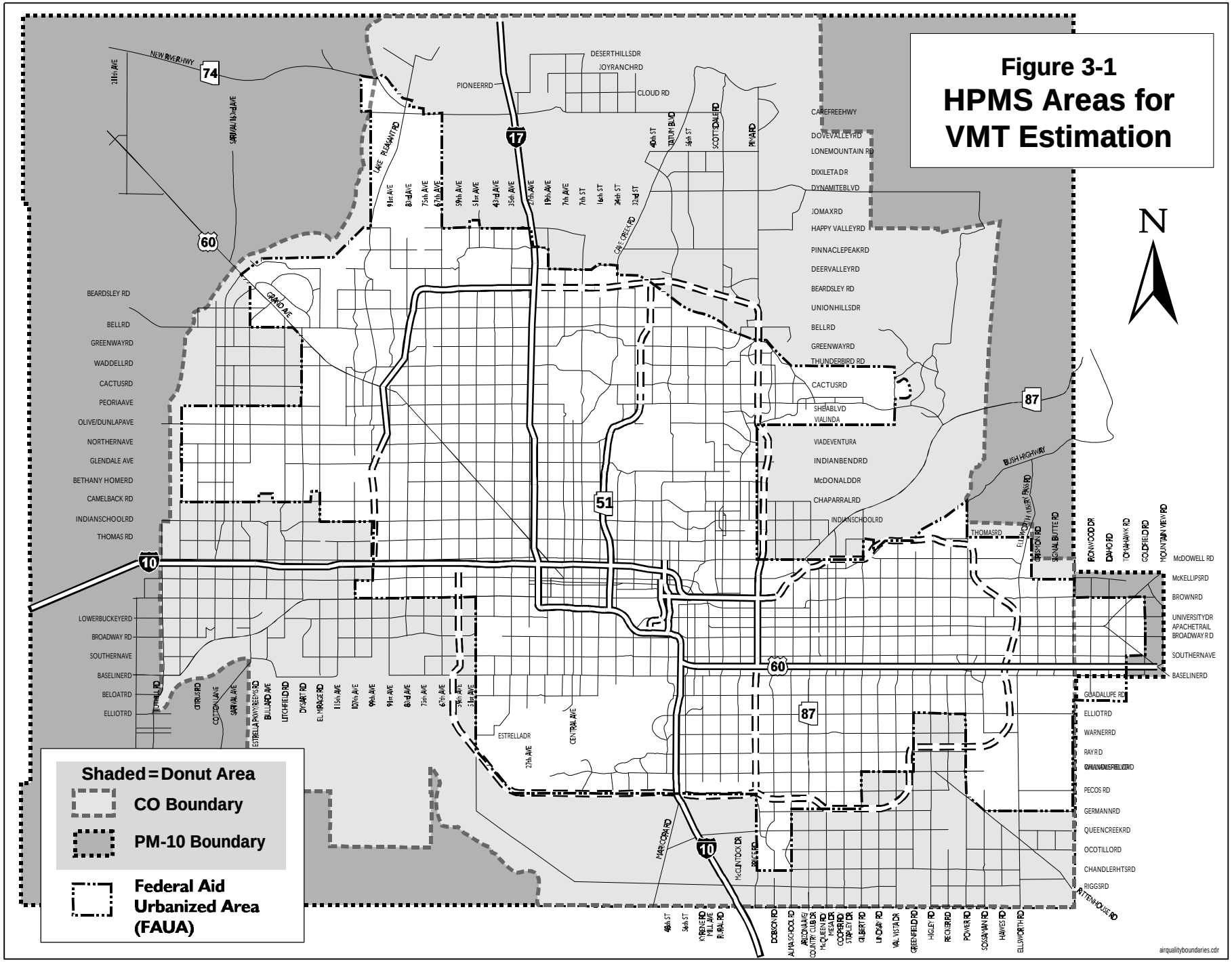


Figure 3-1
HPMS Areas for VMT Estimation
N
Shaded = Donut Area
CO Boundary
PM-10 Boundary
Federal Aid Urbanized Area (FAUA)
airqualityboundaries.cdr
NEW RIVER HWY
74
60
10
17
51
87
DESERTHILLSDR
JOYRANCHRD
PIONEERRD
CLOUD RD
CAREFREEHWY
DOVEVALLEYRD
LONEMOUNTAIN RD
DIXILETA DR
DYNAMITEBLVD
JOMAXRD
HAPPY VALLEYRD
PINNACLEPEAKRD
DEERVALLEYRD
BEARDSLEY RD
UNIONHILLSDR
BELLRD
GREENWAYRD
THUNDERBIRD RD
CACTUSRD
SHEABLVD
VIALINDA
VIADEVENTURA
INDIANBENDRD
McDONALDDR
CHAPARRALRD
INDIANSCHOOLRD
THOMASRD
BUSH HIGHWAY
McDOWELL RD
McKELLIPSRD
BROWNRD
UNIVERSITYDR
APACHETRAIL
BROADWAY RD
SOUTHERNAVE
BASELINERD
GUADALUPE RD
ELLIOTRD
WARNERRD
RAYRD
CHANDLERBLVD
PECOS RD
GERMANNRD
QUEENCREEKRD
OCOTILLORD
CHANDLERHTSRD
RIGGSRD
RITTENHOUSE RD
BEARDSLEY RD
BELLRD
GREENWAYRD
WADDELLRD
CACTUSRD
PEORIAAVE
OLIVE/DUNLAPAVE
NORTHERNAVE
GLENDALE AVE
BETHANY HOMERD
CAMELBACK RD
INDIANSCHOOLRD
THOMAS RD
LOWERBUCKEYERD
BROADWAY RD
SOUTHERNAVE
BASELINERD
BELOATRD
ELLIOTRD
LAKE PLEASANT RD
CAVE CREEK RD
GRAND AVE
ESTRELLA DR
CENTRAL AVE
27th AVE
MARICOPA RD
McCLINTOCK DR
DOBSON RD
ALMA SCHOOL RD
ARIZONA AVE/COUNTRY CLUB DR
McQUEEN RD
MESA DR
COOPER RD
STAPLEY DR
GILBERT RD
LINDSAY RD
VAL VISTA DR
GREENFIELD RD
HIGLEY RD
RECKER RD
POWER RD
SOSSAMAN RD
HAWES RD
ELLSWORTH RD

TABLE 3-1 VMT FORECASTS

Year	Travel Demand Model VMT (000)[1]	Growth Factor[2]	Actual HPMS VMT (000)[3]	VMT Forecasts (000)[4]
1997	61,852		53,892	
1998	64,121	103.67%		55,870
1999	66,391	107.34%		57,848
2000	68,660	111.01%		59,826

[1]*Travel Demand Model VMT* represents average weekday traffic from the 1997I2 and 2000I2 traffic assignments; 1998 & 1999 VMT values are interpolated.

[2]The *Growth Factor* is calculated as follows:

$$\frac{\text{Travel Demand Model VMT}_i}{\text{Travel Demand Model VMT}_{1997}}, \quad \text{where: } i = 1998, 1999, 2000.$$

[3]*Actual HPMS VMT* represents average annual daily traffic and is derived from Templates 2 and 3 of the 1997 HPMS Submittal; See Table 3-2 for details.

[4]*VMT Forecasts = Actual HPMS VMT* multiplied by the *Growth Factor*.

for tracking purposes, areas outside the CO boundary were removed from the FAUA and the donut area was reduced by the difference between the CO and PM-10 nonattainment areas. The factors needed to perform this adjustment were derived from the 1993 HPMS universe database[5] and are presented in Table 3-2. Table 3-2 also demonstrates how the factors were applied to estimate 1997 actual VMT for the CO nonattainment area.

VEHICLE MILES OF TRAVEL ESTIMATES

HPMS data is collected annually by the Arizona Department of Transportation (ADOT) and submitted to the Federal Highway Administration (FHWA). Since 1994, this data has been collected and reported in accordance with FHWA guidance in the HPMS Field Manual, August 30, 1993, and The Traffic Monitoring Guide, December 1992. ADOT submitted the 1997 HPMS data for Arizona to FHWA on July 16, 1998.

HPMS VMT estimates for local streets in the FAUA are based on traffic counts collected on 50 local streets in June-July 1994 by a MAG contractor. These samples were randomly-selected from the HPMS universe database of local streets. The average annual daily traffic (AADT) derived from the 50 samples was 587[6]. The AADT assumed on local streets in the donut area was 150 in 1994; this value is updated each year to reflect estimated increases in donut area population, as discussed below.

HPMS estimates the change in AADT on local streets over time on the basis of regional population growth. The population growth between 1996 and 1997 was estimated to be three percent for the FAUA and seven percent for the donut area. These growth factors were applied to 1996 local AADT to obtain 1997 local AADT.

The miles of local streets in the HPMS database are updated annually by local traffic engineers. The product of the miles of local streets and the AADT produces the HPMS local street VMT estimate. Local street VMT is included in the 1997 VMT for the FAUA and donut area, reported in Table 3-2.

HPMS sample panels have been carefully selected to represent all volume groups and facility types in the FAUA and the donut area. VMT estimates for the donut area are derived using the same count-based sample expansion methodology used for the FAUA. Therefore, no change in the existing HPMS methodology is needed to accommodate Section 187 requirements. The adjustments to donut area VMT required to approximate the CO nonattainment area are described in Table 3-2.

Future VMT is projected for the years 1998, 1999, and 2000. These forecasts are based on actual HPMS estimates of 1997 VMT for the FAUA and donut areas.

---

[5]MAG, Highway Performance Monitoring System Update Study, January 1995.

[6]MAG, Highway Performance Monitoring System Update Study, January 1995.

TABLE 3-2

DERIVATION OF ACTUAL VMT FOR THE CO NONATTAINMENT AREA[1]

FAUA Factor:

1993 VMT in Pinal County portion of FAUA, but not in CO Area	367,152[2]
1993 VMT in Maricopa County portion of FAUA, but not in CO Area	4,596[2]
Total VMT in FAUA, but not in CO Nonattainment Area	371,748
1993 HPMS VMT Estimate for FAUA	45,433,000[3]
Factor to reduce FAUA to CO Nonattainment Area = (45433 - 372)/45433=	99%

Donut Factor:

1993 VMT for PM-10 Nonattainment Area	49,848,667[2]
1993 VMT for CO Nonattainment Area	48,682,519[4]
Difference in VMT between PM-10 and CO areas	1,166,148
1993 HPMS VMT Estimate for Donut Area	4,163,000[5]
Factor to reduce Donut to CO Nonattainment Area = (4163 - 1166)/4163 =	72%

Application of Factors to 1997 HPMS VMT

1997 HPMS VMT for FAUA (Template 2)	50,977,000[6] X 99% = 50,467,230
1997 HPMS VMT for Donut Area (Template 3)	4,756,000[7] X 72% = 3,424,320
1997 Actual VMT for CO Nonattainment Area	53,891,550

[1]All VMT estimates in this Table represent Average Annual Daily Traffic (AADT).
[2]Table 18, MAG Highway Performance Monitoring System Update Study, January 1995.
[3]HPMS Template 2, 1993 System Length and Daily Vehicle Travel, Submittal #4, June 5, 1995.
[4]Table 19, MAG Highway Performance Monitoring System Update Study, January 1995.
[5]HPMS Template 3, 1993 System Length and Daily Vehicle Travel, Submittal #4, June 5, 1995.
[6]HPMS Template 2, 1997 System Length and Daily Vehicle Travel, Submittal #97-1, July 16, 1998.
[7]HPMS Template 3, 1997 System Length and Daily Vehicle Travel, Submittal #97-1, July 16. 1998.

NETWORK-BASED TRAVEL DEMAND MODELING METHODOLOGY

The MAG travel demand models were applied to forecast regional VMT. These models have been validated against thirteen-hundred 1993 traffic counts and forty-three hundred 1995 traffic counts. The 1272 traffic analysis zones (TAZ) in the travel demand modeling domain cover a 2,300 square-mile area which includes all of the FAUA and most of the donut area.

The MAG travel demand models were applied to forecast average weekday VMT. Full travel demand simulations were run for the years 1997 and 2000. VMT estimates for the intermediate years (i.e., 1998 and 1999) were interpolated. The resultant VMT estimates are shown in the first column of Table 3-1. These travel demand model estimates incorporate the latest population and employment projections based on the 1995 Special Census. The projections were adopted by the MAG Regional Council in July 1997.

The following equation was used to derive the VMT forecasts shown in Table 3-1:

Equation (1): $$\text{Forecast VMT}_i = \text{Actual VMT}_{1997} \times \frac{\text{Travel Demand Model VMT}_i}{\text{Travel Demand Model VMT}_{1997}}$$

where: i = 1998-2000.

DESCRIPTION OF TRAVEL DEMAND MODELS

MAG travel demand models are run in a UNIX operating environment, using the EMME/2 software package. The full modeling chain includes land use, trip generation, trip distribution, mode choice, peak spreading, and transit and traffic assignment models. The trip distribution through assignment models are executed five times in order to achieve equilibrium speeds. The MAG models are continuously being improved to employ new data and integrate features considered to be “best practice” in this country.

Demographic inputs to the trip generation model are projected by five year intervals, i.e., 1995-2020, using County control totals provided by the Arizona Department of Economic Security under Executive Order 95-2. Allocation of these control totals to TAZs is performed using the DRAM/EMPAL land use model and supplemental subarea allocation techniques. The TAZ projections were officially adopted by the MAG Regional Council in July, 1997.

The peak and off-peak speeds input to the first iteration of trip distribution are derived from the most recent MAG travel speed study.[7] On subsequent iterations trip distribution speeds are derived from the previous peak and off-peak assignments. Travel impedances used in trip distribution and assignment are a composite of highway and transit travel times and costs.

---

[7]MAG, 1993 Study of Travel Speed and Delay in the MAG Region, March 1995.

The MAG mode choice model is a multinomial logit relationship which apportions home-based work trips to buses, drive-alone vehicles, two-occupant carpools, three-occupant carpools, and four-plus occupant carpools. Other trip purposes are allocated to buses, drive-alone and two-plus occupant modes. Bus trips are also divided into walk access and drive access. An update for the mode choice model is currently underway based on a 1996 on-board bus survey.

The MAG travel demand models perform both transit and traffic assignments. The transit assignment model allocates passenger trips to bus routes and potentially, to future rail lines. The peak period model apportions vehicle travel to the AM peak, PM peak, mid-day, and night-time periods. The traffic assignment model assigns peak period or daily vehicles to the highway network using an equilibrium capacity-restraint procedure, which ensures that no link is loaded beyond its practical capacity. The peak spreading model determines the percent of peak period traffic occurring during the peak hour, based on the assigned volume to capacity ratio for each link. This is used to develop AM and PM peak hour performance measures.

Because of the five-iteration speed feedback mechanism, a travel demand simulation for a single scenario (i.e., one network for one year) takes more than thirty-six hours to execute on an HP 9000, Model C110, running at 125 MHZ, and requires over 600 MB of disk space. One highway assignment estimates traffic volumes for more than 30,000 one-way links.

The link-level traffic volumes output by a 24-hour traffic assignment are multiplied by the length of each link and summed to produce a daily VMT forecast for the modeling domain. This is the value which is shown as Travel Demand Model VMT in Equation (1). Model output represents average weekday traffic, which means 24-hour volumes on a typical mid-week day (i.e., Tuesday, Wednesday, or Thursday) in a typical month (i.e., April or May). In contrast, HPMS VMT is based on average annual daily traffic, which includes all seven days of the week (i.e., Monday-Sunday). This inconsistency does not pose a problem, however, because Section 187 specifies that model output be used to develop growth factors for HPMS VMT. Therefore, the difference in definitions is irrelevant.[8]

ANNUAL REPORTING PROCEDURES

Annual VMT tracking reports will be submitted to EPA by September 30, or within 105 days of the date ADOT submits HPMS to FHWA, whichever occurs later. Reporting will commence in the year following submission of the Serious Area Carbon Monoxide Plan, and will continue through the attainment year 2000. MAG will be responsible for submitting annual reports to EPA after providing for consultation among all affected agencies. The contents of the report will comply with Paragraph 7.4 of Section 187 guidance.

[8]The difference between the modeling domain and tracking area is also reconciled by Equation (1).

CHAPTER FOUR

ASSESSMENT OF AIR QUALITY CONDITIONS

Within the Maricopa County Nonattainment Area, carbon monoxide (CO) can be an air pollution problem during the winter months. CO is a colorless, odorless, tasteless, and poisonous gas. It is formed as a by-product of incomplete combustion, when fuel containing carbon is not completely converted to carbon dioxide. Mobile sources produce most of the carbon monoxide emissions.

From a health perspective, CO is a poisonous gas. Normally, the hemoglobin molecule in the bloodstream carries oxygen to the various parts of the body. When CO is inhaled, it replaces the oxygen in the red blood cells and reduces the amount of oxygen reaching the parts of the body. Consequently, the health effects of CO include the slowing of reflexes, headaches, drowsiness, and heart problems.

In order to effectively reduce CO, it is important to assess air quality conditions in the Maricopa County Nonattainment Area. This chapter presents a discussion of air quality factors impacting carbon monoxide, including inversion conditions, the sources of emissions, and air quality monitoring data.

INVERSION CONDITIONS

The nature of the surrounding atmosphere is an important element in assessing air quality conditions. In the Salt River Valley encompassing the Maricopa County Nonattainment Area, the air shed is relatively stable with minimal wind and air movement. The air is also extremely dry because of the desert climate. The nonattainment area is situated in the middle of this airshed, on a broad, flat, oval plain, almost completely surrounded by mountain ranges. This location subjects the nonattainment area to the meteorological phenomenon known as radiative or nocturnal temperature inversions.

Under normal lapse rate conditions (vertical temperature differentiation), warmer air is located near the ground surface and as altitude increases, the air becomes colder. A natural mixing occurs as the warm air rises and displaces the colder air. The air movement created by natural mixing enables air pollutants to disperse into the atmosphere rather than concentrate at the ground level.

Under temperature inversion conditions, however, the normal lapse rate is inverted. As the sun sets, the surface of the earth rapidly loses heat and cools the lower atmosphere. The air immediately above the lower layer cools more slowly and consequently remains warmer. The warmer air aloft forms a lid across the valley, trapping the cold air near the ground surface and effectively eliminating convective circulation. As a result of the inversion conditions, the pollutants normally dispersed by mixing accumulate beneath the

lid of warm air. After sunrise, the ground surface is reheated and the inversion rapidly breaks down. The temperature of the lower atmosphere increases as the warm air rises and the pollutants are then dispersed through natural vertical mixing.

While the radiative temperature inversions occur throughout the year, the most severe inversions occur during the winter months between October and February. Inversion conditions sometimes extend over multi-day episodes. The time of day that inversions typically occur is between 5:00 p.m. and 9:00 a.m.

High CO concentrations in the urban area result from periods of high emissions (typically the late afternoon and early evening traffic peak) coinciding with stagnant meteorological conditions (light and variable winds with little vertical dispersion). Under these circumstances, concentrations can increase rapidly in a few hours near heavy traffic areas. Within ten to 100 meters of heavy traffic areas, significant microscale concentrations of vehicle exhausts contribute to early evening and morning peak CO concentrations.

Under meteorological conditions conducive to high microscale concentrations, neighborhood-scale CO emissions become trapped in a shallow, stable surface layer caused by the radiative cooling of the air near the ground. A highly concentrated air mass several miles across may develop and remain relatively stationary in the stagnant flow, resulting in high neighborhood-scale CO concentrations throughout the night and into the following morning. Maximum eight-hour average CO concentrations result from the combined effects of microscale and neighborhood-scale processes.

SOURCES OF CARBON MONOXIDE EMISSIONS

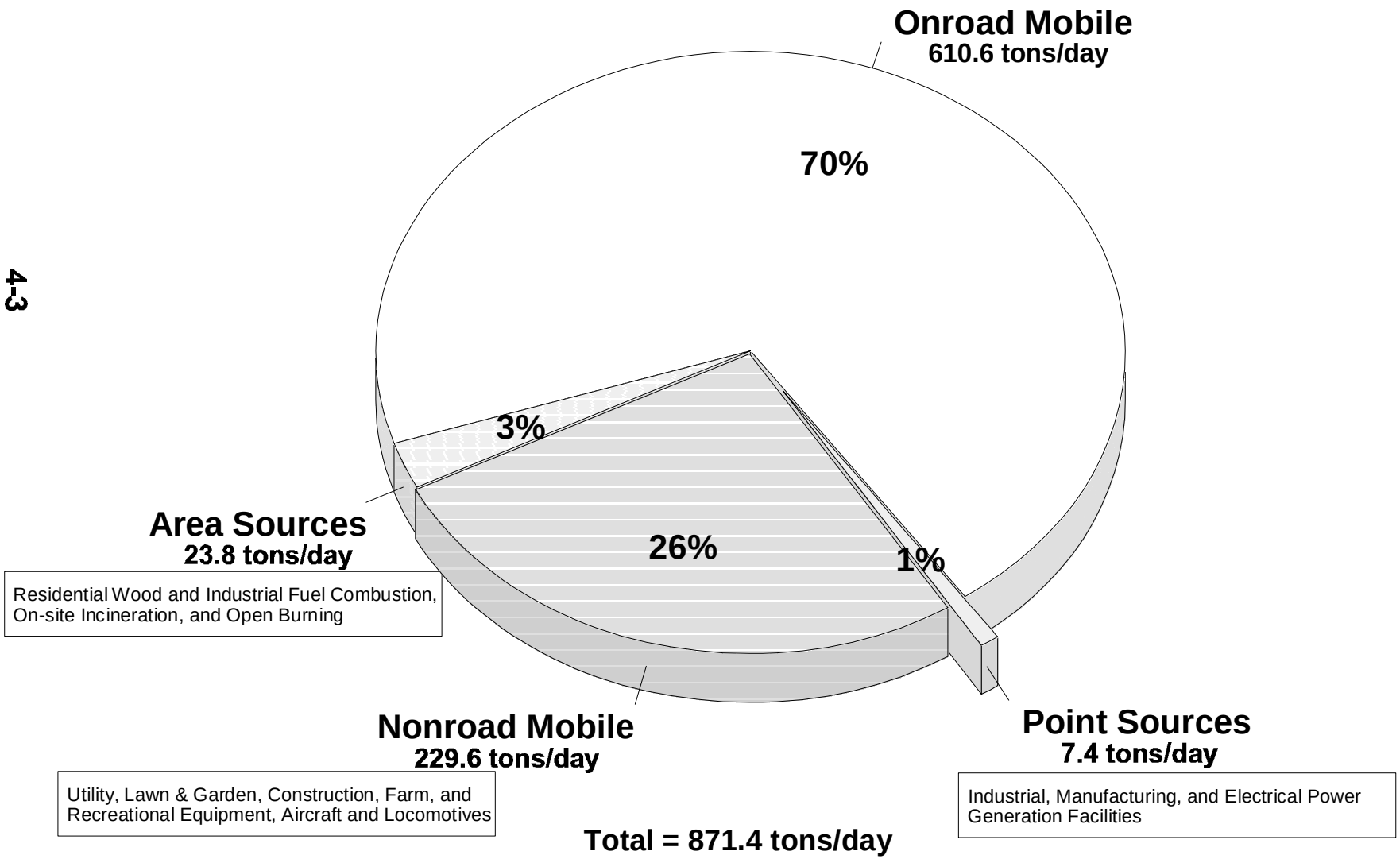
The Clean Air Act requires a comprehensive, accurate, and current inventory of actual emissions from all sources. The Maricopa County Environmental Services Department has compiled a 1993 base year emission inventory to determine the sources of carbon monoxide (CO) for the nonattainment area. The 1993 base year CO emissions inventory provides average daily CO season emissions, calculated for a typical day during the three month period from November 1992 through January 1993. The inventory also provides annual CO emissions for the twelve-month period beginning January 1 and ending December 31, 1993, for all categories, except onroad mobile sources.

The sources of emissions can be grouped into four major categories: onroad mobile, nonroad mobile, stationary area, and stationary point. Collectively, these four sources contributed a total of 871.5 tons of CO per day to the nonattainment area during the 1993 winter season. Figure 4-1 shows the relative contribution of each category. A complete description of these sources and the corresponding methodology used to calculate CO emissions for the 1993 base year are included in the Maricopa County 1993 Base Year Carbon Monoxide Emissions Inventory, September 5, 1996. (Appendix A, Exhibit 4)

Figure 4-1

Sources of Carbon Monoxide Emissions

1993 Base Year Inventory (Average Daily CO Season Emissions)



It should be noted that the residential wood combustion estimates in the 1993 emissions inventory were based on data from Reno, Nevada. MAG has updated these estimates with data from a study of wood combustion specific to the Maricopa County Nonattainment Area. Therefore, the emissions for residential wood combustion presented in this plan differ from the 1993 periodic inventory.

The onroad mobile source category consists of eight vehicle types. This category is estimated to contribute 610.6 tons of CO per day, which accounts for 70.1 percent of the total average daily CO season emissions. Table 4-1 includes a breakdown of the eight onroad vehicle types and their respective contributions. Analysis of the emissions inventory indicates that onroad mobile sources are the primary source of carbon monoxide in the Maricopa County Nonattainment Area. Consequently, strategies to reduce carbon monoxide are directed primarily to control these sources.

Nonroad mobile sources include aircraft, locomotives, and nonroad equipment (lawnmowers and construction equipment, etc.). The estimated 1993 CO season nonroad mobile source emissions are 229.6 tons per day, which accounts for 26.3 percent of the total average daily CO season emissions. Table 4-1 includes a more detailed breakdown of the nonroad mobile source category.

Area sources include numerous small stationary sources which, when added together, emit sizable amounts of CO. Examples of area sources include structure and vehicle fires and residential wood combustion. Residential wood combustion devices are the major contributor to the area source category, contributing 18.9 tons of CO per day, or 78.6 percent of the entire area source category. The estimated 1993 CO season area source emissions are 23.8 tons per day, or 2.7 percent of the total average daily CO season emissions. Table 4-1 includes a more detailed breakdown of the area source category.

Stationary point sources include sources which emit a significant amount of pollution, such as power plants and large manufacturing facilities. The estimated 1993 CO season stationary point source emissions are 7.4 tons per day, which accounts for 0.8 percent of the total average daily CO season emissions. Table 4-1 includes a more detailed breakdown of the stationary point source category.

TABLE 4-1

CARBON MONOXIDE (CO) EMITTED FROM ALL SOURCE CATEGORIES INCLUDED IN THE 1993 BASE YEAR CO INVENTORY

	Tons per CO Season Day	Annual CO Tons
INDUSTRIAL PROCESSES		
Point Sources	0.13	33.4
EXTERNAL COMBUSTION SOURCES		
Point Sources	1.71	109.93
Area Sources	1.53	339.90
STATIONARY INTERNAL COMBUSTION		
Point Sources	5.59	727.85
Area Sources	0.69	273.10
WASTE DISPOSAL, TREATMENT AND RECOVERY		
Area Sources	0.10	749.60
MISCELLANEOUS		
Point Sources	0.01	2.65
Area Sources*	21.50	3,498.83
TOTAL POINT SOURCES	**7.44**	**873.83**
TOTAL AREA SOURCES	**23.82**	**4,861.43**
TOTAL POINT AND AREA SOURCES	**31.26**	**5,735.26**
NON-ROAD MOBILE		
Aircraft	15.60	5,711.00
Locomotives	2.51	915.40
Non-road Equipment	211.50	159,710.00
TOTAL NON-ROAD MOBILE SOURCES	**229.61**	**166,336.40**
ON-ROAD MOBILE **		
Light Duty Gasoline Vehicles (LDGV)	349.16	---
Light Duty Gasoline Trucks; GVW < 6000 lbs (LDGT1)	110.46	---
Light Duty Gasoline Trucks; 6000 lbs< GVW <8500 lbs (LDGT2)	61.16	---
Heavy Duty Gasoline Vehicles; GVW > 8500 lbs (HDGV)	60.00	---
Light Duty Diesel Vehicles (LDDV)	0.29	---
Light Duty Diesel Trucks (LDDT)	0.14	---
Heavy Duty Diesel Vehicles (HDDV)	25.47	---
Motorcycles (MC)	3.93	---
TOTAL ON-ROAD MOBILE SOURCES	**610.62**	---
TOTAL ALL SOURCES	**871.49**	**---**

* Residential Wood Combustion emission estimates from Maricopa County Nonattainment Area study
**1993 base year inventory guidance does not require annual emissions estimates for on-road mobile sources.

Source: 1993 Base Year Carbon Monoxide Emission Inventory for Maricopa County, Arizona, Nonattainment Area, Final Submittal, Maricopa County Environmental Services Department, September 5, 1996.

AIR QUALITY MONITORING DATA AND TREND ANALYSIS

In addition to identifying the sources of carbon monoxide emissions, it is important to examine the impact of these emissions on the ambient concentrations. This section includes discussions of the National Ambient Air Quality Standards (NAAQS) and the air quality data recorded by the areawide monitoring network.

At the national level, the Clean Air Act of 1970 established the standard for carbon monoxide at 9.0 parts per million (ppm) for an eight-hour average. The Federal Clean Air Act Amendments of 1990 reiterated this standard. The Arizona standard for carbon monoxide is consistent with the national standard. In 1980, an Arizona state law was enacted which specifies that the State standard for carbon monoxide cannot exceed the Federal standard.

In order to determine the extent of the regional carbon monoxide pollution problem, it is necessary to examine the air quality data collected by the areawide monitoring network. A total of 29 air quality monitoring stations are currently operated by the Maricopa County Environmental Services Department and the Arizona Department of Environmental Quality (five additional monitoring sites operated between the beginning of 1994 and the end of 1996, but were discontinued during that period.) Sixteen of these sites monitor carbon monoxide. The network is dispersed geographically so as to monitor air quality in the many diverse physical environments in the region. Many of the monitoring stations are concentrated in the urbanized area, where air pollution is produced primarily by motorized transportation and related activities. The name and geographic location of each carbon monoxide monitoring site is indicated in Figure 4-2. The locations, operating agencies, and pollutants monitored are listed in Table 4-2.

Fourteen of the stations which monitor carbon monoxide levels are neighborhood-scale sites. These stations record the ambient carbon monoxide level present in the neighborhood-scale air mass surrounding the monitor. A typical neighborhood-scale air mass extends from one-quarter to one-half mile in all directions from the monitor. In contrast, the Thomas Road and West Indian School Road monitoring stations are microscale sites. The monitors at these two stations are located close to congested intersections and are designed to record the direct contribution of motor vehicle traffic to air pollution. The West Indian School Road monitor, for example, is located approximately 16 feet from the nearest vehicular traffic lane at an elevation of ten feet.

All carbon monoxide monitors within the network operate continuously (24 hours per day) throughout the year, with periodic brief shutdowns for maintenance and calibration. Each monitoring station is also linked electronically to computers at the Maricopa County Environmental Services Department and the Arizona Department of Environmental Quality. This allows continuous assessment of regional air quality to be performed throughout the Valley.

The NAAQS for carbon monoxide allow no more than one recorded exceedance of the 9.0 ppm standard at the same monitoring station within the same calendar year. Because of the rounding criteria used by the U.S. Environmental Protection Agency, a recorded eight-hour average carbon monoxide concentration must be 9.5 ppm or higher to be considered an exceedance. If a second exceedance is recorded at any monitoring site within the same year, the region is considered in violation of the carbon monoxide standard.

Figure 4-7

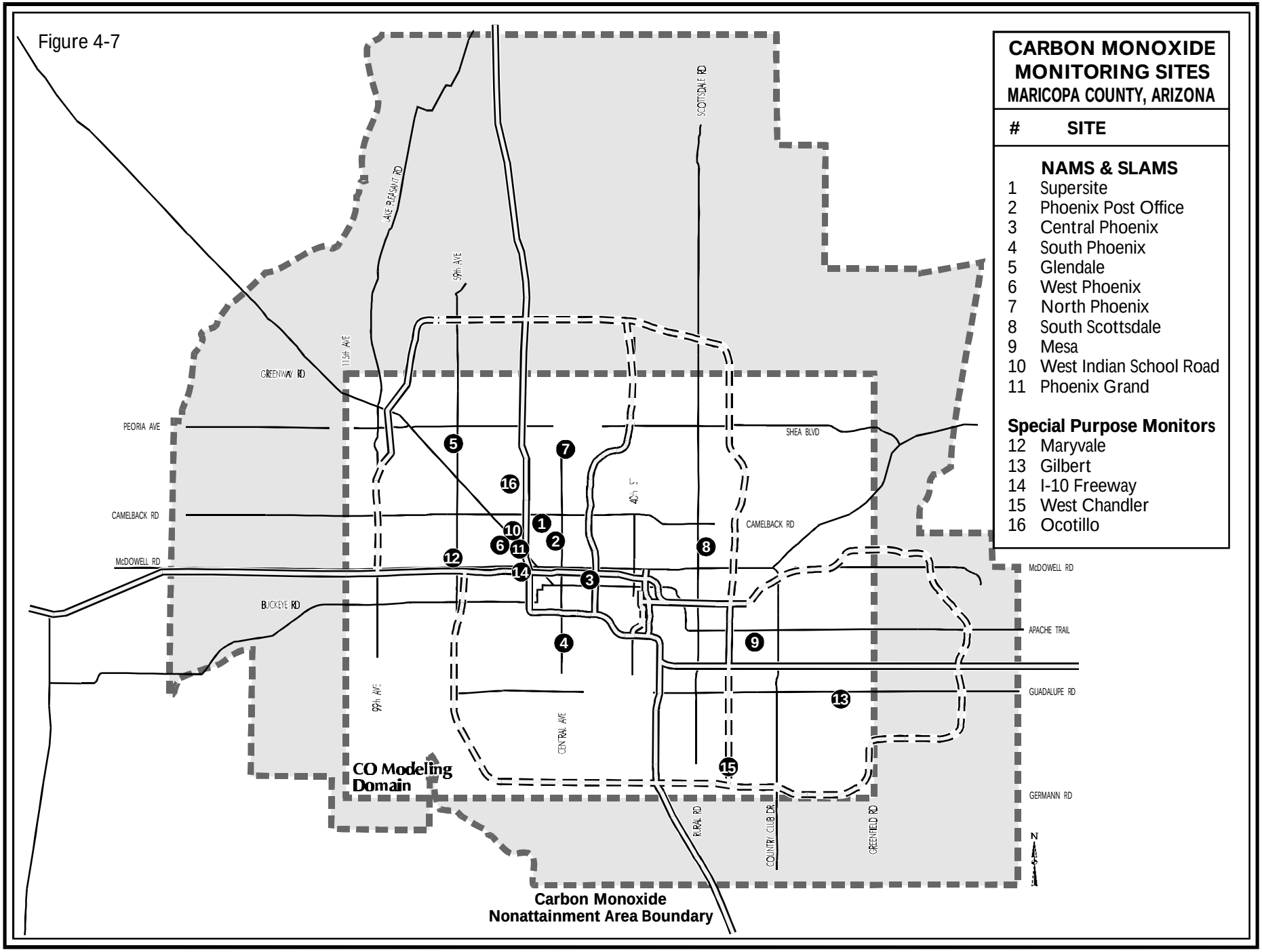

CARBON MONOXIDE MONITORING SITES
MARICOPA COUNTY, ARIZONA
SITE
NAMS & SLAMS
1 Supersite
2 Phoenix Post Office
3 Central Phoenix
4 South Phoenix
5 Glendale
6 West Phoenix
7 North Phoenix
8 South Scottsdale
9 Mesa
10 West Indian School Road
11 Phoenix Grand
Special Purpose Monitors
12 Maryvale
13 Gilbert
14 I-10 Freeway
15 West Chandler
16 Ocotillo
LAKE PLEASANT RD
SCOTTSDALE RD
59th AVE
115th AVE
GREENWAY RD
PEORIA AVE
SHEA BLVD
CAMELBACK RD
McDOWELL RD
BUCKEYE RD
40th ST
99th AVE
CENTRAL AVE
RURAL RD
COUNTRY CLUB DR
GREENFIELD RD
APACHE TRAIL
GUADALUPE RD
GERMANN RD
N
CO Modeling Domain
Carbon Monoxide Nonattainment Area Boundary

TABLE 4-2

AIR QUALITY MONITORING STATIONS

FIGURE 4-2 MAP INDEX	SITE	ADDRESS	OPERATING AGENCY	POLLUTANTS MONITORED
1	Supersite	4530 N. 17th Ave.	ADEQ	CO, VOCs, carbonyls, NO_x
2	Phoenix Post Office	3905 N. 7th Ave.	ADEQ	CO
3	Central Phoenix	1845 E. Roosevelt St.	Maricopa County / ADEQ	CO, O_3, VOCs, carbonyls, NO_x, PM_{10}
4	South Phoenix	4732 S. Central Ave.	Maricopa County	CO, O_3, PM_{10}
5	Glendale	6000 W. Olive Ave.	Maricopa County	CO, O_3, PM_{10}
6	West Phoenix	3847 W. Earll Dr.	Maricopa County	CO, O_3, NO_x, PM_{10}
7	North Phoenix	601 E. Butler Ave.	Maricopa County	CO, O_3, PM_{10}
8	South Scottsdale	2857 N. Miller Rd.	Maricopa County / ADEQ	CO, O_3, VOCs, carbonyls, NO_x, PM_{10}
9	Mesa	310 S. Brooks Cir.	Maricopa County	CO, O_3, PM_{10}
10	West Indian School Road	2750 W. Indian School Rd.	Maricopa County	CO (microscale)
11	Phoenix Grand Ave	27th Ave./Grand Ave./Thomas Rd.	ADEQ	CO (microscale)
12	Maryvale	6180 W. Encanto Blvd.	Maricopa County	CO, O_3
13	Gilbert	525 N. Lindsay Rd.	Maricopa County	CO
14	I-10 Freeway	Southwest Corner I-10/27th Ave.	Maricopa County	CO
15	West Chandler	163 S. Price Rd.	Maricopa County	CO, O_3
16	Ocotillo	3225 W. Ocotillo Rd.	Maricopa County	CO

One method for assessing the overall air quality of a region is to determine the total number of exceedance days recorded in a year. Any day on which an exceedance is recorded at one of more monitoring stations is considered an exceedance day. Exceedances recorded at more than one station on the same day count as a single exceedance day. Annual exceedance day totals recorded over successive years can be used to gauge regional air quality trends and monitor progress toward attainment of the standard. Due to fluctuations in meteorological conditions from year to year, long-term trends are generally more valid than short-term (e.g. year-to-year) comparisons. Table 4-3 lists all carbon monoxide exceedance days recorded in the Maricopa Nonattainment Area since January, 1992. The monitoring station at which each exceedance occurred is also noted.

The data for the region show two exceedance days in 1996. In contrast, fifty-four exceedance days were recorded in 1975 and nineteen in 1988. This difference represents reductions of 96 and 89 percent, respectively, in the annual number of exceedance days, relative to 1996. There was also a marked decline in exceedance days from 1989 to 1990, with twenty-two exceedance days in 1989 and four in 1990. The mandatory wintertime oxygenated fuels program, initiated in the nonattainment area in 1990, was at least partially responsible for this sharp decrease. It is important to note, however, that in each year indicated in Table 4-3 and in all prior years for which monitoring data exist, multiple exceedances have occurred at one or more monitoring stations, except for 1993 and 1997, when there were no exceedances. Until there are at least two consecutive years with no violations, Maricopa County will remain in nonattainment of the NAAQS for carbon monoxide.

The CO concentration data collected by the monitoring network provide an indication of the progress toward attainment made by the MAG region. In recent years, the two microscale monitors have recorded the highest carbon monoxide concentrations and experienced most of the exceedance days in the Nonattainment Area. In 1981, the West Indian School Road microscale monitor was established near the intersection of 35th Avenue, Grand Avenue, and Indian School Road. This station recorded 69 exceedance days in its first year of operation. The number of observed exceedance days at the site has decreased steadily in subsequent years, to the point where only three exceedance days were recorded in 1994, one in 1995, and none in 1996 or 1997. Over this same period, the annual maximum concentration at the West Indian School Road monitor decreased by more than 50 percent, from 20.3 ppm in 1981 to 10.1 ppm in 1995.

During the 1994 to 1996 period, there were a total of eight exceedance days, three each in 1994 and 1995, and two in 1996. There were two violation sites in 1994 (West Indian School Road and West Phoenix sites), and one each in 1995 and 1996 (both at the Thomas Road site). Although there were no violations in 1993 or 1997, the lack of two consecutive years of “clean” data has kept Maricopa County in nonattainment status.

It is important to examine the data from sites exceeding the standard for spatial and temporal trends, in order to gain a better sense of the conditions which result in an exceedance. All of the exceedances during the 1994 to 1996 period were recorded at four of the 16 monitoring sites, which are located in the west-central portion of the nonattainment area. Three of the four sites are within 1.5 miles of one another. The

majority of the exceedance days have been in December, with occasional exceedances in November and January. In the 1994 to 1996 period, half of the exceedance days occurred on Saturday (four out of eight), with one each on Wednesday, Thursday, Friday, and Sunday. All recorded eight-hour exceedance periods ended between 0100 and 0400 hours. The highest hourly monitor concentrations were between 2100 and 2400 hours on the days prior to the recorded exceedances.

In summary, data from the regional monitoring network and two microscale monitoring sites indicate that the Maricopa County Nonattainment Area remains in violation of the National Ambient Air Quality Standard for carbon monoxide. However, both the frequency of exceedance days and the magnitude of observed CO concentrations have decreased dramatically since regional air quality monitoring began in late 1960's. This trend is due to the implementation of transportation and air quality control measures, including improved vehicle technology and the wintertime oxygenated fuels program. The trend data show decreases in carbon monoxide levels on both the regional level and at localized “hot spot” areas.

TABLE 4-3

CARBON MONOXIDE EXCEEDANCE DAYS IN THE MARICOPA NONATTAINMENT AREA, 1992-1997

1992					1993					1994				
Date	Day	Time	Location	Reading	Date	Day	Time	Location	Reading	Date	Day	Time	Location	Reading
Dec 2	Wed	0200	THOM	9.5						Dec 2	Fri	0100	THOM	10.0
Dec 2	Wed	0200	WISR	10.1	(no recorded exceedences)					Dec 2	Fri	0200	WISR	9.7
Dec 3	Thu	0200	POST	9.6						Dec 3	Sat	0300	WISR	10.4
Dec 11	Fri	0100	THOM	9.8						Dec 3	Sat	0300	WPHX	9.6
Dec 24	Thu	1000	THOM	9.7						Dec 17	Sat	0300	WISR	10.5
										Dec 17	Sat	0400	WPHX	10.0
										Dec 17	Sat	0400	CPHX	9.7
Exceedance Days				4	Exceedance Days				0	Exceedance Days				3
Violation Sites				1	Violation Sites				0	Violation Sites				2

1995					1996					1997				
Date	Day	Time	Location	Reading	Date	Day	Time	Location	Reading	Date	Day	Time	Location	Reading
Nov 23	Thu	0200	THOM	9.9	Jan 10	Wed	0100	THOM	10.0					
Dec 2	Sat	0100	THOM	10.2	Jan 13	Sat	0100	THOM	10.0	(no recorded exceedences)				
Dec 2	Sat	0200	WISR	10.1										
Dec 3	Sun	0200	THOM	9.5										
Exceedance Days				3	Exceedance Days				2	Exceedance Days				0
Violation Sites				1	Violation Sites				1	Violation Sites				0

Key to Site Location Abbreviations

Abbre	Name
CPHX	Central Phoenix
POST	Phoenix Post Office
THO	Thomas/27th Ave/Grand
WISR	Indian School/35th
WPH	West Phoenix

CHAPTER FIVE

OVERVIEW OF EXISTING CONTROL MEASURES

Within the Maricopa County nonattainment area, there are numerous air quality control measures currently in place to reduce carbon monoxide pollution. These measures have been implemented over the last several years in accordance with the MAG 1993 Carbon Monoxide Plan. The MAG 1993 air quality plan for ozone also included measures that impact carbon monoxide.

This Chapter provides a summary of the existing measures in place to reduce carbon monoxide pollution. The existing measures provide the foundation upon which to evaluate and implement additional control strategies. A discussion of the need for additional control strategies and basic transportation needs is also provided.

EXISTING CONTROL MEASURES

As a result of the documented air quality conditions and recommendations presented in previous air quality plans, a number of control measures have already been implemented to reduce carbon monoxide. Some of these measures have also been implemented to improve area traffic conditions and other air pollution problems as well.

The committed control measures from the MAG 1993 Carbon Monoxide Plan are now considered to be existing measures in place. A description of the implementation of these existing measures is contained in Appendix B, Exhibit 1. A selection of key control measures is provided below.

Reduced Gasoline Volatility

In 1993, the Arizona Legislature passed House Bill 2001 which reduced the maximum winter vapor pressure of gasoline fuel sold in Maricopa County from 10 to 9 pounds per square inch beginning October 1, 1994 through March 31, 1994. The requirement is in effect from October 1 through March 31 of each year thereafter.

Increased Oxygen Content of Ethanol Blends

The Arizona Legislature passed H.B. 2001 in 1993 which required that the oxygen content of all winter gasoline ethanol blends sold in Maricopa County be increased from 7.3 to 10 percent ethanol by volume. Unleaded gasoline - ethanol blends will not contain more than the maximum percentage of oxygen allowed by EPA fuel waiver provisions. The increased oxygen content provisions begin October 1, 1994 through March 31, 1994. This requirement is in effect from October 1 through March 31 of each year thereafter.

Residential Wood Burning Restrictions

In 1993, the Arizona Legislature passed H.B. 2001 which required Maricopa County to develop, implement, and enforce an ordinance which contains residential wood burning restrictions by September 30, 1994. The ordinance was required to have a no burn restriction when monitoring or forecasting indicates that the carbon monoxide standard is likely to be exceeded.

This ordinance was passed by Maricopa County in 1994. The ordinance provides an exemption for the use of residential wood stoves and wood or gas fireplaces that provide the sole or primary source of heat or fuel for cooking for a residence; meet the performance standards for Phase II new residential wood heaters; burn natural gas including gas logs; and meet the rules adopted by the County Air Pollution Control Officer for burning wood in approved appliances. The ordinance also requires a civil penalty of $100 for a person who violates the ordinance, in addition, the H.B. 2001 provided a State income tax deduction of up to $500 for the purchase or conversion of qualified wood stoves and wood or gas fireplaces or related equipment. The tax deduction began in the 1994 taxable year.

Enhanced Vehicle Emissions Inspection Maintenance Program (I/M)

The Vehicle Emissions Inspection Maintenance Program was significantly enhanced and strengthened by the Arizona Legislature in 1993 (H.B. 2001). The Legislature established a biennial, transient loaded (I/M 240) emissions test for gasoline powered vehicles model year 1981 or newer with a gross vehicle weight of up to 8,500 pounds, beginning January 1, 1995. A purge and pressure check is also to be performed on these vehicles and the current tampering check is eliminated for these vehicles. The I/M 240 test also has a fast pass component. The fee for the I/M 240 test is paid annually at the time of registration. The current $10 emissions inspection fee limit is an annual fee.

Gasoline powered vehicles model years 1967-1974 are required to pass a loaded test in addition to the current I/M test requirements. A motorcycle or constant four-wheel drive vehicle is required to take and pass an idle emissions test.

A snap idle test for diesel powered vehicles was required by January 1, 1995. The rules for snap idle testing cannot be more stringent than the EPA rules for snap idle tests.

Vehicle fleet operators are required to comply with the new emission inspection requirements except that new and used vehicles sold by a licensed motor vehicle dealer must comply only with the curb idle tests. Fleet operators are allowed to contract for emissions testing.

An exemption was provided from the vehicle emissions testing requirement for new vehicles that are sold by a motor vehicle dealer which are due for registration during the

year the vehicle was manufactured. The exemption also applies to vehicles which are due for registration within one year after the year the vehicle was manufactured.

To enhance compliance, H.B. 2001 increased the civil penalty from $50 to $100 for commuters who reside outside the nonattainment area or college students attending school in the nonattainment area who fail to comply with I/M test requirements. This penalty increase applies only to first-time violations.

The Arizona Department of Environmental Quality was required to establish a Vehicle Repair Loan Program for qualified applicants (food stamp recipients) who fail an emissions test. The qualified owner must pay up to 50 percent of the threshold repair limit and the State will pay the rest. To further assist those who fail the test, each emissions station must employ at least one mechanic to provide technical advice and assistance to the motorists. A special performance audit by a Committee of Reference was required for the Vehicle Repair Loan Program after the program has been in effect for two years.

As specified in the bill, the Emissions Inspection Fund was established in the State Treasury to finance the costs to the State for administering the Vehicle Emissions Inspection Maintenance Program services performed by the independent contractor, including inspection station auditing, contractor training and certification, and motorist assistance; enforcement of fleet emissions inspections, exemptions, and certificates of waiver; payment of contractual services to independent contractors; funding of the State's portion of the Catalytic Converter Program costs; funding of the Vehicle Repair Grant Program costs; funding costs in excess of $10 per year for the transient loaded emissions test; and other costs of administering and enforcing the program.

Monies collected from the State Underground Storage Tank (UST) Fund were added as a funding source for the Emissions Inspection Fund. The Underground Storage Tank Revolving Fund accounts were required to be separated into two portions, one for monies generated and collected in Maricopa County and the remainder in the other portion. The bill required the transfer of $2 million for fiscal year (FY) 1994 and $8 million for FY 1995 and FY 1996 from the Underground Storage Tank Fund to the Emissions Inspection Fund. The bill further specified that beginning in FY 1996-1997, 50 percent of the monies received from the UST Tax and 50 percent of the interest income earned by the UST Fund (Maricopa County's share of the UST Fund) must be deposited by the State Treasurer into the Emissions Inspection Fund.

Increased Waiver Limits for the Vehicle Inspection Maintenance Program

In 1993, the Arizona Legislature passed H.B. 2001 which increased the repair threshold limits for gasoline powered vehicles in order to be eligible for a waiver through the Vehicle Emissions Inspection Maintenance Program. The repair limits were increased in the following manner: 1967-1974 from $50 to $100; 1975-1980 from $200 to $300; and 1981 and newer from $300 to $450. The bill also increased the repair threshold limits from $300

to $500 for diesel powered vehicles with tandem axles or a gross vehicle weight in excess of 26,000 pounds.

Remote Sensing

A Random On-Road Testing Program (Remote Sensing) was established by the Legislature in 1993 for the Maricopa County nonattainment area as a supplement to the periodic inspection requirement through the Vehicle Emissions Inspection Program. A minimum of six on-road testing units were required throughout the nonattainment area. For the first time identification, a letter containing the date, time, location, test results, brief description of the emissions control program, and benefits derived by the testing and repair procedures is sent to the registered owner.

For a second notification within a 12 month period, a letter containing the test results and notification that an emissions test is required within 30 days of the date of the letter is sent to the vehicle owner. The registration of the vehicle will be suspended if the registered owner fails to comply with this requirement. If the owner does not comply, the Arizona Department of Environmental Quality will notify the Arizona Department of Transportation by electronic means and the registered owner will be notified by letter of the registration suspension. The registered vehicle owner may apply for reinstatement of the vehicle registration after compliance with the testing requirements and payment of the applicable fees. Commercial diesel powered vehicles are exempted from these provisions.

The Legislature also enacted a strengthened version of remote sensing as a contingency measure, which is now in effect. For the first identification of a vehicle, a notification letter is sent to the vehicle owner reporting the test results. The letter also indicates that an emissions test is required within 30 days of the letter.

Alternative Fuels for Local Government Fleets and Buses

In 1993 and 1994, the Arizona Legislature passed legislation H.B. 2001 which require Maricopa County and the cities, towns and school districts with an average daily membership greater than 3,000 within the county to develop and implement a vehicle fleet plan designed to encourage and progressively increase the use of alternative fuels in vehicles owned by the jurisdiction. The alternative fuels include liquified petroleum gas, natural gas, hydrogen, alcohol fuels that contain not less than 85 percent alcohol by volume, electricity, and solar energy. The plan must contain a timetable for increasing the use of alternative fuels in fleet vehicles through purchase or conversion. The timetable is required to reflect the following schedule and percentage of vehicles which operate on alternative fuels:

a. Not less than 18 percent of the total fleet by December 31, 1995.
b. Not less than 25 percent of the total fleet by December 31, 1996.
c. Not less than 50 percent of the total fleet by December 31, 1998.
d. Not less than 75 percent of the total fleet by December 31, 2000 and each year thereafter.

These requirements may be waived if the cost differential when compared to traditional gasoline or diesel fuel use is greater than 10 percent. The costs include the equipment or refueling facilities necessary to operate the vehicles on alternative fuels over the expected useful life of the equipment or facilities supplied.

To assist the school districts with compliance, the Arizona Department of Commerce (DOC) was required to distribute a $2.9 million appropriation from the Oil Overcharge Fund in FY 1993-1994 for the conversion of school vehicles to alternative fuels. Interested school districts in Area A (Maricopa nonattainment area) were required to submit a plan to the DOC for converting nondiesel power vehicles to alternative fuels. The school districts are required to complete the conversions by September 1, 1994 and submit a report on implementation to the DOC by January 31 in the year following the conversion.

To further enhance the implementation of this measure, the Legislature required a state agency or political subdivision that operates a clean burning alternative fuel refueling station to permit other state agencies and political subdivisions to refuel their alternative fuel vehicles at these refueling stations.

For buses, the vehicle fleet plan of the city, town, or Regional Public Transportation Planning Agency is required to include provisions for the use of alternative fuels in buses, except that all newly purchases buses must be alternative fuel vehicles. The bus fleet timetable is the same as for local government fleet vehicles. The requirements for buses may be waived if the cost differential when compared to traditional fuel use is greater than 20 percent.

Alternative Fuels for State and Federal Fleets

In 1993 and 1994, the Arizona Legislature required the Arizona Department of Administration and the Energy Office of the Arizona Department of Commerce to develop and implement a vehicle fleet plan to reduce fuel consumption and to encourage and progressively increase the use of alternative fuels in state owned vehicles. The alternative fuels include liquified petroleum gas, natural gas, hydrogen, alcohol fuels that contain not less than 85 percent alcohol by volume, electricity, and solar energy. The timetable for the plan is required to reflect the following schedule and percentage of vehicles which operate on alternative fuels:

a. Not less than 40 percent of the total fleet by December 31, 1995.
b. Not less than 90 percent of the total fleet operating in Maricopa County by December 31, 1997.

In order to assist the State with compliance, an appropriation of $2 million was to be used for the conversion of the Arizona Department of Administration's vehicles to alternative fuels. Priority must be given to convert state vehicles in the Maricopa nonattainment area. The Arizona Department of Administration was also required to submit a status report to the President of the Senate and the Speaker of the House by March 1, 1994.

The Legislation also required a state agency or political subdivision that operates a clean burning alternative fuel refueling station to permit other state agencies and political subdivisions to refuel at these stations, to the extent feasible.

For federal vehicles, the legislation required the operator of a federal government owned vehicle fleet in the state to develop and implement a vehicle fleet plan to encourage and progressively increase the use of alternative fuels in federal government vehicles. The timetable for purchase or conversion is the same as for the state vehicle fleet.

For both state and federal vehicle fleets, these requirements may be waived if the cost differential when compared to traditional gasoline or diesel fuel use is greater than 30 percent. The costs include the equipment or refueling facilities necessary to operate the vehicles on alternative fuels over the useful life of the equipment or facilities supplied.

Tax Deductions for Alternative Fueled Vehicles

In 1993 and 1994, the Arizona Legislature provided individual and corporate state income tax deductions to further promote the purchase or conversion of vehicles to alternative fuels. Tax incentives apply beginning with taxable years from and after December 31, 1993. The alternative fuels include liquified petroleum gas, compressed or liquified gas, hydrogen, electricity, solar energy, and alcohol fuels that contain at least 85 percent alcohol by volume.

The maximum individual income tax deduction of 25 percent of the price for purchasing a new alternative fuel vehicle in this state is increased from $5,000 to $10,000 over a three year period and from $3,000 to $5,000 over a three year period for each vehicle conversion to alternative fuel. Limited partnership and sole proprietorship business operations are now included in this program.

Corporations are allowed an income tax deduction of 25 percent of the price of purchasing a new alternative fuel vehicle in this state with a maximum of $5,000 over a three year period. An income tax deduction of $3,000 is also allowed for each vehicle conversion to alternative fuel over a three year period. The refueling equipment deduction is $5,000 over a three year period.

In 1994, the Legislature authorized nonrefundable individual and corporate income tax credits for the purchase or conversion of alternative fuel vehicles or the purchase of a public fuel delivery system. The amount of credit ranges from $250 to $1,000 for taxable years from 1994 through 1998. The credit may be carried forward for 5 consecutive tax years.

In addition, the Arizona Department of Commerce was required to establish a certification program for new alternative fuel vehicles. Tax credits or subtractions will only be allowed for certified vehicles and equipment.

Strengthened Trip Reduction Program

In 1993, the Arizona Legislature passed H.B. 2001 which required Maricopa County to adopt and enforce a strengthened Travel Reduction Program Ordinance by May 31, 1994. The strengthened ordinance was to apply to employers with 50 or more employees at a worksite throughout the Maricopa County area. The annual goals are increased from a five percent to a ten percent reduction in employee single occupant vehicle trips or commuter vehicle miles of travel. The ordinance will contain annual goals for five years.

Traffic Signal Coordination

The Arizona Legislature passed H.B. 2001 in 1993 which required that in consultation with the metropolitan planning organization, Maricopa County and the cities and towns in the vehicle emissions control area (Maricopa nonattainment area) synchronize traffic control signals on all roadways, within and across jurisdictional boundaries, which have a traffic flow exceeding 15,000 motor vehicles per day.

Freeway Incident Detection

Recent technological advances in communications, computers, and video surveillance enable freeway management systems to be implemented, allowing for freeways to be monitored and controlled for optimal traffic flow. During normal operations, ramp metering signals are controlled from a central computer complex to optimize vehicle flow and increase average travel speeds. When a vehicle collision or other major incident occurs, the event is detected by computer and verified by video surveillance. Upstream traffic is warned with electronic variable message signs and entrance ramp may be closed to avoid major traffic jams. The installation of Freeway Management System equipment has been ongoing and a 29 mile component was scheduled for completion in 1995. The central Freeway Operation Control Center is now on-line.

High Occupancy Vehicle Ramps

Freeway ramp metering signals are stop lights on freeway on-ramps which control the flow of traffic onto the freeway. These devices are designed to facilitate the smooth flow of freeway mainline traffic and reduce air pollution. During peak congestion, the line of traffic waiting to enter the freeway can lengthen. The implementation of bypass ramps reserved for use by high occupancy vehicles can afford a significant savings of travel time under these conditions. The exact configuration of these bypass ramps at a specific location will vary depending upon traffic volumes and roadway geometry.

The Arizona Department of Transportation indicates that current Freeway Management System (FMS) construction projects on I-10 and I-17 will incorporate nine HOV bypass ramps at 67th, 59th, 43rd, 35th and 27th Avenues, as well as Jefferson Street, Sky Harbor and Lower Buckeye and Broadway Roads. These locations were assumed for both 1995-1996 and 2005.

Funding for Transit Improvements

The Arizona Legislature passed H.B. 2001 in 1993 which established two new funding sources for transit improvements. The first funding source was a new multistate lottery game. A maximum of $18 million per year will be deposited into the statewide Local Transportation Assistance Fund (LRAF). The proceeds from the multistate game are allocated according to the proportion of ticket sales in each county. The monies are further distributed within each county to the county and cities based upon population. For the Maricopa County area, the bill requires that the share for the county be given to the Regional Public Transportation Authority for public transportation operating and related capital purposes. If the Lottery Director determines that lottery monies available to the general fund may not equal $45 million in a fiscal year, deposits to the LTAF from the multistate lottery game will be suspended until the general fund receives $45 million. The effective date of these provisions was July 1, 1994.

The second new funding source for transit improvements was a one time appropriation of $6 million from the State Underground Storage Tank (UST) Revolving Fund. The bill required that the $6 million UST appropriation be repaid in installments of no more that $2 million annually from the lottery funds, when the lottery revenues provided to the Maricopa County area exceed $2 million annually.

Public Transit

Publicly-funded, ATE Management & Service Company (ATE); Mayflower/Laidlow Contract Service (Mayflower/Laidlow) fixed route transit service is now provided in 15 communities in the MAG Regional Planning Area. The services are provided by seven private operators: Phoenix Transit System, a division of ATC Management Corporation (Phoenix Transit); Valley Coach, a division of ATC Management Corporation (Valley Coach); Arnett Transportation Services, Inc. (Arnett); and DAVE Transportation Services, Inc. (DAVE). Funding for these services is provided by the Cities of Avondale, Chandler, Glendale, Mesa, Phoenix, Scottsdale, Tempe, Tolleson, Gilbert and the Regional Public Transportation Authority (RPTA). The following is a detailed description of fixed route transit service by jurisdiction.

The City of Avondale and Tolleson contract with the RPTA for Express Routes 560 and 561. The express routes operate during peak commute hours, both morning and evening.

The City of Chandler contracts with the RPTA, with funding shared by the City of Chandler and the RPTA, to provide service on regional Route 4 (Alma School), 72 (Scottsdale/Rural), 81 (McClintock/Hayden) and 156 (Chandler Blvd). The City of Chandler is also served by RPTA funded service on Route 540 (Chandler Express) and Route 541 (Chandler Express).

The City of Glendale contracts with the City of Phoenix for service on Yellow Line, Route 59 (59th Avenue), Route 80 (Northern) and Route 90 (Dunlap). The RPTA contracts with

the City of Phoenix for service in Glendale on Route 24 (Glendale), Route 59 (59th Avenue), Route 106 (Peoria/Shea), Route 170 (Bell), Route 67 (67th Avenue), Route 186 (Union Hills), Express Route 570 (Glendale Express) and Express Route 581 (Thunderbird). The City of Glendale also operates a dial-a-ride service discussed later in this Chapter.

The Town of Guadalupe has RPTA-funded service on regional Route 66 (Mill/Priest), Monday through Saturday.

Gilbert contracts with RPTA for Route 108 (Elliot), Route 136 (Gilbert) and Express Route 531 (Mesa/Gilbert Express).

The City of Mesa contracts with the RPTA to partially fund service on Route 72 (Scottsdale/Rural). The City of Mesa is served by RPTA-funded Redline, Express Routes 531, 532, and 533; Route 4 (Country Club/Alma School), Route 61 (Southern). The City of Mesa provides fixed route public transportation service in Mesa through a contract with DAVE Transportation Services, Inc. Mesa service is provided on five routes at 30-minute frequencies for approximately twelve hours each weekday.

The City of Scottsdale contracts with the City of Phoenix for Route 17 (McDowell), Greenline (Thomas), Route 41 (Indian School), Route 50 (Camelback), and Scottsdale Express Route 510. Route 72 (Scottsdale) is operated by ATE under contract to the RPTA with funding shared by the RPTA and the City of Scottsdale. RPTA funds are also used to increase the frequency on Route 50 (Camelback) and Route 106 (Peoria/Shea). Express Route 512 is provided by the RPTA through its contract with the City of Phoenix. The City of Scottsdale also provides a special events shuttle through contract with private providers. This shuttle provides convenient parking alternatives for baseball fans attending spring training, summer Firebirds games, and special events held on the Mall. The City of Scottsdale also contracts with FORSYTHE to provide the Scottsdale Connection's Route 76 (Granite Reef/Miller), Route 81 (Hayden), Route 68 (68th Street) and Route 94 (94th Street). Scottsdale Connection service is provided Monday through Saturday from approximately 6:00 a.m. to 7:00 p.m.

The City of Tempe contracts with Phoenix for service on local Route Red, Yellow and Route 3 (Van Buren). Tempe is also served by RPTA-funded Route Red, Yellow (Grand), Route 61 (Southern), Route 72 (Scottsdale/Rural), 44 (44th Street) and Tempe Express Route 520, 521 and 540. FLASH Route 56 (Priest/University) and 66 (Mill) are funded by the City of Tempe. This service is funded by the City of Tempe.

The City of Tolleson is served by Express Route 560 and 561, which is funded by Tolleson, Avondale and RPTA.

In addition, the RPTA provides the following regional fixed route service in other communities in the MAG Regional Planning Area:

Fountain Hills	Route 512 (Scottsdale Express)
Paradise Valley	Route 44 (44th Street)
	Route 512 (Scottsdale Express)
Peoria	Route Yellow (Grand)
	Route 106 (Peoria/Shea)
	NWV/Grand
Sun City/Youngtown	Route 106 (Peoria/Shea)
Surprise/El Mirage	NWV/Grand

Overall, the RPTA fully or partially funds 26 routes throughout the region. During FY 1996-1997, the RPTA-funded 7,996 miles of fixed route transit service each weekday. Of these miles, 1,615 (or 20 percent) are express service designed to attract the region's peak hour commuters.

In August 1995, modifications were made to the City of Phoenix Transit System fare structure, which had not changed since 1990. The RPTA and other cities have also adopted the revised fare structure. Cash fares for discount, local, and express were increased 10 cents, 25 cents, and 25 cents respectively. There is a new blind passenger fare which now charges a fare to passengers who are legally blind. Tokens are now available for all riders. These fare changes are reflected in the fare structure shown in Table 5-1.

There are approximately 5,805 bus stops throughout the Regional Planning Area. A total of 966 shelters and 1,138 benches are installed at various bus stops. Bus stop improvements are achieved through a combination of local funds together with Federal Transit Administration (FTA) funds, advertising and bench contracts. Advertising shelter and bench locations are developed, improved, and maintained by the individual contractors.

Regionwide, there are a total 64 park-and-ride facilities providing approximately 2,606 vehicle spaces and 44 bicycle spaces. Figure 5-1 shows the locations of these lots and Table 5-2 provides information on the parking capacities of these lots and their access to transit service. Of the listed facilities, Shadow Mountain Park-and-Ride is owned by the City of Phoenix and 79th Avenue Park-and-Ride is leased land. The remaining park-and-ride facilities are joint-use facilities in which informal agreements with private property owners are established for shared parking arrangements.

Throughout the Regional Planning Area, there are a total of eight permanent transit passenger facilities, all of which are located within the City of Phoenix. These facilities include six transit centers and two park-and-ride lots.

During the peak periods, a maximum of 385 buses were required to provide service in FY 1995-1996. Vehicle requirements depend on the length of the route, frequency of service, time of day, and whether it is a weekday or a Saturday.

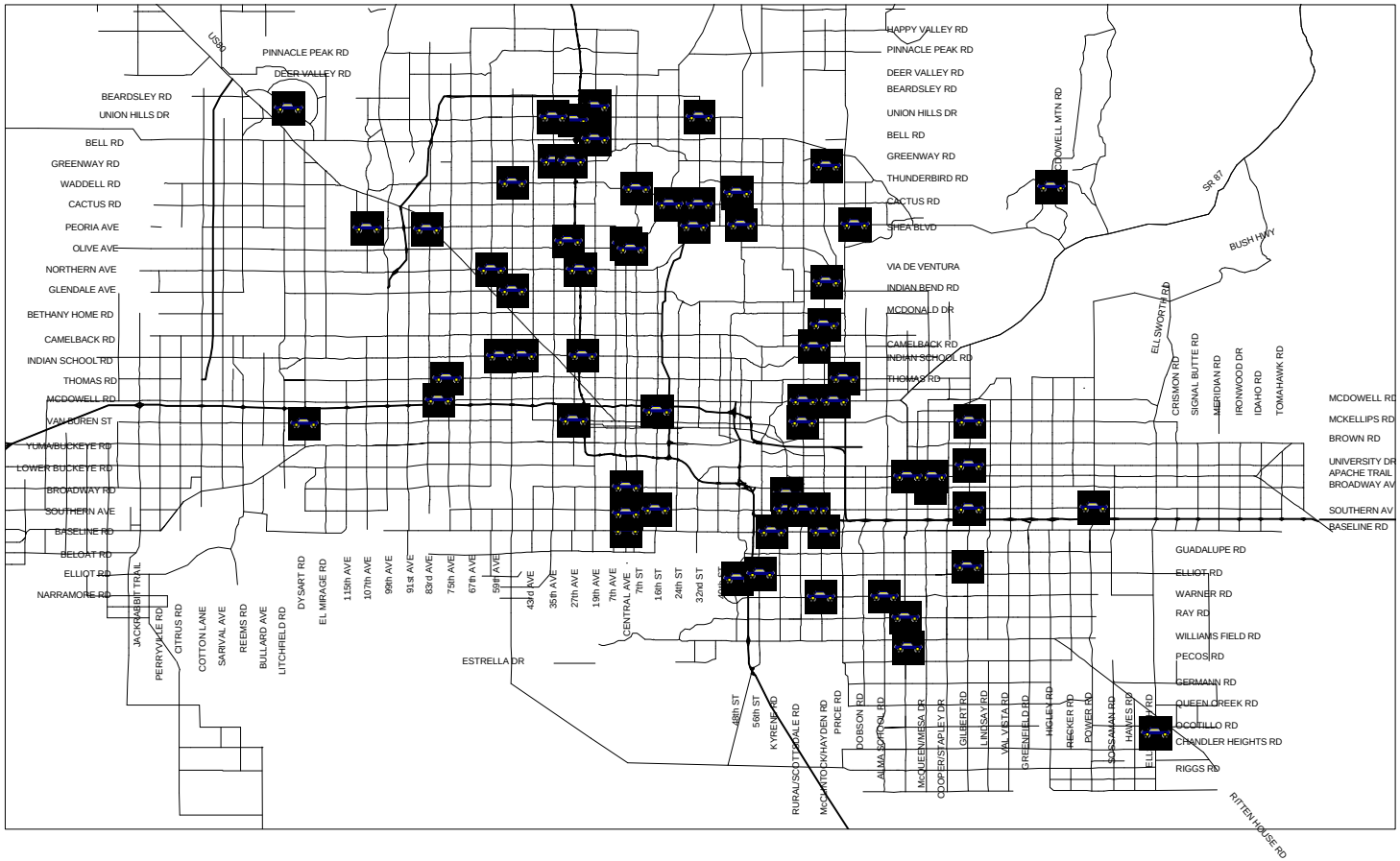
TABLE 5-1

TRANSIT FARE STRUCTURE

	FARE STRUCTURE
	VALLEY METRO
LOCAL SERVICE	
Full Fare	
Cash	$1.25
Tokens	2 Tokens
All Day Pass	$3.60
Monthly Pass	$12.00
Semester Pass	$34.00
Discount Fare (Youths 6-18 Seniors 65 and Older, Disabled Persons and Central Area).	$120.00
Cash	$0.60
Tokens	1 Token
All Day Pass	$1.80
10-Ride Tickets	$6.00
Monthly Pass	$17.00
EXPRESS SERVICE	
Full Fare	
Cash Fare	$1.75
Tokens	3 Tokens
10-Ride Tickets	$18.00
Monthly Pass	$51.00
*DIAL-A-RIDE SERVICE	
Full Fare	
Cash	$2.40
Tokens	4 Tokens
Added Fare Per Zone	$1.20
Discount Fare (Children and Youths 0-18, Seniors 65 and Older, disabled Persons).	
Cash	$1.20
Tokens	2 Tokens
Added Fare Per Zone	$0.60
Tokens	1 Token
FREE FARE	
Bus DASH - Downtown Area Shuttle	$0.30
FLASH - Tempe/ASU Shuttle	
Local and Express - Children under six years of age accompanied by a responsible fare - paying adult	
Dial-A-Ride	
Free Fares do not apply to dial-a-ride service.	
*FARE Policy Differs Greatly Among Systems, FARES shown are Phoenix only.	

Source: Regional Public transportation Authority, 1997.

FIGURE 5-1
REGIONAL PARK-N-RIDE LOCATIONS



Source: City of Phoenix and RPTA, September 1997

TABLE 5-2

PARK-AND-RIDE LOTS IN THE REGIONAL PLANNING AREA

TOWN/CITY	LOCATION	ROUTES	AUTO SPACES	BIKE SPACES
AVONDALE	Van Buren St. & Dysart Rd., ABCO Shopping Plaza - S.W. Corner	560, 561	15	0
CHANDLER	Arizona Ave. & Ray Rd., Safeway - N.E. Corner	4, 541	20	0
	Chicago St. & Colorado St., Vacant Lot - N.E. Corner	540, 541	25	0
	Warner Rd. & Alma School Rd., Carl's Jr - S.W. Corner	4, 541	20	0
FOUNTAIN HILLS	Palisades Blvd. & La Montana Dr., M.C.O. Corporation - N.E. Corner	512	35	0
GILBERT	Gilbert Rd. & Page Ave., Vacant Lot - N.W. Corner	533	25	0
GLENDALE	59th Ave. & Northern Ave., Valley west Mall - S.E. Corner	59, 80, 570	35	0
	Glendale Ave. & 51st Ave., Southwest Supermarkets - S.W. Corner	24	10	0
	Thunderbird Rd. & 51st Ave., ABCO Shopping Center - N.W. Corner	138, 581	20	0
MESA	Broadway Rd. & Lesuer St.., Temple Beth Shalom - N.W. Corner	45, 531	25	0
	Gilbert Rd. & Southern Ave., South Center Shopping Center - S.W. Corner	136, 531	30	0
	Main St. & Hobson St.., Pioneer Park - N.W. Corner	Red	25	0
	McKellips Rd. & Gilbert Rd., Orange Tree Plaza - N.W. Corner	136, 532	20	0
	Morris St. & Main St.., Best Western Mezona -N.E. Corner	4, Red	20	0
	University Dr. & Gilbert Rd., Riveria Plaza - N.W. Corner	Red, 30, 136	20	0
	Southern Ave. & Power Rd., Superstition Springs Center - S.W. of Mall, Outer Loop	30, 46, 108, 184, 533	50	0
PEORIA	Jefferson St. & 84th Ave., Peoria Community Center - S.E. Corner	NWV/Grand, Yellow	25	0
PHOENIX	19th Ave. & Utopia Rd., Deer Valley Park - N.E. Corner	19, 591	25	0
	27th Ave. 2 blocks south of Union Hills Dr., Leon's Furniture U.S. Inc. - N.E. Corner	*	25	0
	32nd St. & Cactus Rd., K-Mart/ABCO Shopping Center - S.E. Corner	106, 138, 500	20	0
	32nd St. & Union Hills Dr., Paradise Valley Community College - S.E. Corner, West end of Parking Lot.	90, 186, 500	35	0

Source: Regional Public Transportation Authority, 1997.

TABLE 5-2 (Continued)

PARK-AND-RIDE LOTS IN THE REGIONAL PLANNING AREA

TOWN/CITY	LOCATION	ROUTES	AUTO SPACES	BIKE SPACES
PHOENIX cont.	35th Ave. & Greenway Rd., K-Mart Shopping Center - S.E. Corner	Red, 35, 580	20	0
	35th Ave. & Union Hills Dr., Fair Lanes Union Hills - N.E. Corner	580, 590	25	0
	48th St. & Cheyenne St., Mountain View Lutheran Church - S.W. Corner	66	15	0
	7th St. & Thunderbird Rd., ABCO Shopping Center - N.W. Corner	7, 138, 592	20	0
	Bell Rd. & 19th Ave., Smith's Food and Drug - N.W. Corner	19, 170, 591	10	0
	Cave Creek Rd. & Cactus Rd., Hayden Plaza North - N.W. Corner	90, 106, 138, 592	15	0
	Central Ave. & Baseline Rd., Smitty's Plaza - N.E. Corner, far west end adjacent to Central Ave.	0, 7	25	0
	Central Ave. & Broadway Rd., True Value Hardware - N.E. Corner	Blue, 0, 45	10	0
	Central Ave. & Lynne Ln., St Catherine's Church - S.W. Corner	Blue, 0, 61	20	0
	Central Ave. & Sunnyslope Ln., Family Dentistry - N.E. Corner	106	30	0
	Greenway Rd. & 29th Ave., Lifegate Baptist Church - S.W. Corner	27, 590, 591	15	0
	Indian School Rd. & 53rd Ave., Maryvale Commercial Center - N.E. Corner	41	50	0
	Indian School Rd. & 24th Ave., Thunderbird Fairlanes - N.W. Corner	41	10	0
	Indian School Rd. & 51st Ave., Maricopa County License Bureau - S.E. Corner	17, 41	25	0
	McDowell Rd. & 79th Ave., 79th Avenue Park-n-Ride, at Interstate 10 - S.E. Corner	17, 560, 561	619	10
	Northern Ave. & I-17, K-Mart shopping Center - N.W. Corner	80, 570	20	0
	Roosevelt St. & 16th St., K-Mart Shopping Center - N.E. Corner	10, 16	50	0

TABLE 5-2 (Continued)

PARK-AND-RIDE LOTS IN THE REGIONAL PLANNING AREA

TOWN/CITY	LOCATION	ROUTES	AUTO SPACES	BIKE SPACES
PHOENIX cont.	Shea Blvd. & 30th St., Shadow Mountain Park-n-Ride - N.E. Corner	500, 502, 592	298	6
	Shea Blvd. & Tatum Blvd., Smitty's - S.W. Corner	Blue, 44, 512	25	0
	Southern Ave. & 16th St.., Southern Business Park - N.W. Corner	16, 61	20	0
	Van Buren St. & 27th Ave., IGA Plaza - S.W. Corner	3, 27	10	0
QUEEN CREEK	Ellsworth Rd. 1/3 mile south of Ocotillo Ave., Queen Creek City Town Hall, W. Side of Ellsworth Rd.	*	25	0
SCOTTSDALE	Camelback Rd. & Miller Rd., Miller Plaza - S.W. Corner	50, 76, 510	15	0
	Hayden Rd. & 83rd Pl., Price Club - N.E. Corner	81	20	0
	Hayden Rd. & Jackrabbit Rd., Chaparral Park - N.E. Corner	81, 510	10	0
	Hayden Rd. & McCormick Parkway, Trinity Church - 7800 Paseo Del Sur, south end of parking lot	81, 510	20	0
	McDowell rd. & Granite Reef Rd., Smitty's - N.W. Corner	17, 76	20	0
	Scottsdale Rd. & McDowell Rd., Los Arcos Mall - S.E. Corner	17, 66, 68, 72, 76, 510	25	0
	Shea Blvd. & 92nd St., McDonald's - S.E. Corner	94, 106, 512	20	0
	Thomas Rd. & 87th St., Micro Semi Corporation - N.E. Corner	Green	25	0
SUN CITY	107th Ave. & Peoria Ave., Sun Bowl Amphitheater - N.W. Corner	106	25	0
TEMPE	2424 S. Mill Ave., Tempe Church of Christ - N. of Alameda on West Side	66, 520	20	0
	Baseline Rd. & Hardy Dr., Pepper Ridge Plaza - S.E. Corner	56, 66	15	0
	McClintock Dr. & Baseline Rd., Target Shopping Center - N.E. Corner	72, 81, 521	20	0
	McKellips Rd. & Scottsdale Rd., ABCO Shopping Center - S.E. Corner	72, 532	20	0
	Priest Dr. & Elliot Rd., Price Club - S.E. Corner	66	10	0

TABLE 5-2 (Continued)

PARK-AND-RIDE LOTS
IN THE REGIONAL PLANNING AREA

TOWN/CITY	LOCATION	ROUTES	AUTO SPACES	BIKE SPACES
TEMPE cont.	Southern Ave. & Dorsey Ln., Grace Community Church - N.W. Corner	61, 520	30	0
	Southern Ave. & Mill Ave., Danelle Plaza - S.W. Corner	61, 66, 520	10	0
	Southern Ave. & Rural Rd., Mervyns - N.W. Corner	61, 72, 520	20	0
	Warner Rd. & McClintock Dr., Cobblestone Village - S.W. Corner	540	20	0
PHOENIX Transit Centers with Parking	4623 E. Paradise Village Pkwy N., Paradise Valley Transit Center, N.E. Corner of Mall Parking Lot	Blue, 44, 106, 138, 170, 186, 501	100	10
	7611 W. Thomas Rd., Westridge Transit Center - North Side of Mall	Green, 17, 41, 560, 561	94	4
	8927 N. 3rd St., Sunnyslope Transit Center - South of Dunlap	0, 7, 8, 12, 16, 80, 90, 106	45	8
	9415 N. Metro Pkwy., Metrocenter Transit Center - S.W. Corner of Mall Parking Lot	Red, 3, 27, 35, 90, 106, 122, 580, 581, 582	115	6

* This is a vanpool park-and-ride. No bus stops at this location.

During FY 1995-1996, Regional Fixed Route Service had an operating fleet of 462 standard buses. The average age of the standard bus fleet was 9.48 years. In 1996, approximately 475 square miles are served with 52 local and 19 express routes with a fleet of 462 buses.

The regional fixed route fleet includes 340 wheelchair-accessible buses. Of the 3,115 total trips each weekday, 2,383 trips are equipped with wheelchair-accessible buses, which is 77 percent of all daily trips. All Saturday service is wheelchair accessible.

During 1993, the City of Phoenix Transit System became the first transit system in the nation to have installed bike racks on all of the buses in the fleet. Already more that 600 bicycles are loaded on buses each weekday. The estimated cost of $150,000 to equip the entire fleet with racks was funded by the City of Phoenix, the Federal Transit Administration, and Arizona Department of Transportation.

The City of Phoenix Transit System also introduced the nation's first transit credit card. Distributed through major employers, the magnetically encoded cards are read by the farebox, and employees are billed through payroll deduction only for the number of transit trips taken each month.

Information about all public transportation in the region (fixed route and dial-a-ride) is available in the bus book, through the Customer Service Center, and Transitions which is a monthly publication to patrons distributed on the bus.

Service standards represent desired levels of transit service which relate to the following components of transit system:

1. Frequency - minimum acceptable headway.
2. Passengers loads - acceptable maximum number of passengers as a percent of vehicle capacity.
3. Route layout/spacing - minimum acceptable distances between routes depending upon population or employment densities.
4. Transfers - as they relate to coordination of routings and convenience of passenger travel.
5. Hours of operation - goals for weekday, Saturday, and Sunday transit service.
6. Passenger stops - minimum and maximum distances between passenger stops and placement of bus bays.
7. Passenger stop treatments - minimum treatments at stop inclusive of sign, benches, shelters, and trash receptacles.

The full listing of service standards that have been adopted for the fixed route transit system is presented in Table 5-3. It should be noted that some, like the desirable hours of coverage, cannot be achieved with present resources.

TABLE 5-3

VALLEY METRO FIXED ROUTE TRANSIT SERVICE STANDARDS

1. Frequency (Headways)

	Peak	Base	Saturday	Sunday/Holiday/Night
Local	≤15 min.	≤30 min.	≤30 min.	≤60 min.
Express	≤15 min.	_____	_____	_____

2. Passenger Load Standards

	Peak	Base	Saturday	Sunday/Holiday/Night
Local	125%	100%	100%	100%
Express	100%	_____	_____	_____

3. Route Layout/Spacing

Less than or equal to one-mile spacing, as development warrants.

Route alignment will be direct as possible, avoiding circuity, and minimizing deviations from the basic alignment except to serve major activity centers.

Exceptions to the above standard may be required to accommodate special demands for service and the availability and configuration of streets.

4. Transfers

Scheduled arrival and departure times for routes having common transfer points will be coordinated to the maximum extent possible, with special attention given to locations with high transfer activity. Extra care will also be exercised to coordinate connections at transfer points located in areas with less service coverage in order to compensate for the lower number of transfer possibilities.

5. Hours of Operation

Weekdays	5:00 am - 12 midnight
Saturday	5:00 am - 12 midnight
Sunday	6:00 am - 8:00 pm

6. Passenger Stops

Between two-blocks and 1/4 mile spacing, as necessary.

Wherever possible, stops should be located to allow protection from the sun and provide lighting levels conducive to passenger safety.

Bus stops should be located as close to the corner as possible to facilitate transfers and promote safe pedestrian crossings. Location on the far side of intersections is the standard.

Exceptions to the above standards may be required to accommodate special demands for services, safety, and convenience.

7. Bus Stop Treatments

The minimum treatment levels for bus stop amenities are based on the following elements:

- High Boarding count or transfer location
- Special Needs (senior centers, medical offices, etc.)
- Activity Location
- Exposure to elements
- Long waiting time for bus
- Distribution of improvements
- Request for improvement

Bus stop signs should be double-faced and visible at all hours from both directions of travel. All stops should be accessible.
Bus stop signs and accompanying shelters or benches should be placed at the actual bus stopping points to minimize walking distance and reduce boarding time.

Fixed route scheduled service is provided to an area of approximately 475 square miles within the Maricopa Association of Governments Regional Planning Area by the City of Phoenix Transit System, Valley Metro Mesa, Scottsdale Connection, Tempe FLASH and the RPTA. A total of nearly 33,335,072 boardings were recorded on these systems in 1996-1997. Table 5-4 shows total boardings, vehicle miles, and vehicle hours for each component of the fixed route systems.

The Regional Public Transportation Authority was created on October 8, 1985 with the passage of Proposition 300 which authorized a one-half cent sales tax to fund freeway construction and provided $5 million annually for regional transit planning and operations. The RPTA began receiving the sales tax proceeds on July 6, 1986.

The RPTA is a political subdivision of the State of Arizona, overseen by a board of elected officials. Membership in RPTA is open to all municipalities in Maricopa County and to the County government. Municipalities and the County may join RPTA by resolution of their governing body.

As a member of the RPTA, municipalities must commit to spend Local Transportation Assistance Funds, which they receive through the State Lottery, on public transportation. Cities with a population of 300,000 or more must spend all of their LTAF money on public transportation. Cities with a population greater than 60,000 must commit at least one-third of their LTAF money to transit, and cities under 60,000 in population must commit at least three-quarters.

To date, ten cities and Maricopa County have become RPTA members. All votes taken by the board to date have been based upon one vote per member. However, at any time, a member may call for a weighted vote base upon each community's population, but no one community may carry more than 40 percent of the votes.

While the majority of funds disbursed by the RPTA have covered the local share of various regional transit service, significant efforts and resources have been allocated to planning. The original RPTA legislation called for the preparation of a regional rapid transit plan and the RPTA fulfilled that mandate with the creation of the Valtrans Plan. This was subsequently put before Maricopa County voters along with a proposal to fund the plan by increasing the sales tax by one-half percent. The measure was defeated.

Since that time, the RPTA has worked to create a new regional transit plan. Working first in a supporting role, the RPTA helped the various Valley communities to create locally generated and adopted plans. Each local plan, to a greater or lesser extent, included the following topics: local planning process, modes of service, geographic service area, days and hours of service, service frequency, bicycle and pedestrian considerations, passenger waiting facilities and cost.

TABLE 5-4

TRANSIT SERVICE PERFORMANCE STATISTICS BY SYSTEM: FY 1996-1997

FIXED ROUTE SYSTEM	TOTAL BOARDINGS	REVENUE MILES	REVENUE HOURS
Valley Metro Mesa	779,650	994,610	63,656
Valley Metro Phoenix	28,826,866	9,568,689	618,714
Regional Public Transportation Authority	2,647,490	2,147,608	143,958
Scottsdale Connection	132,369	300,730	18,536
Tempe Flash	948,697	154,775	16,198
Total	33,335,072	13,166,412	861,062

PARATRANSIT SYSTEM	ELIGIBILITY	TOTAL BOARDINGS	REVENUE MILES	REVENUE HOURS
El Mirage Dial-a-Ride	General Public	5,595	14,360	1,920
Glendale Dial-a-Ride	General public	68,622	272,909	19,079
Maricopa County/American Red Cross	Seniors, persons with disabilities and low income	137,001	676,324	61,087
Mesa/Chandler Dial-a-Ride	Seniors and persons with disabilities	167,494	849,602	59,310
Peoria Dial-a-Ride	General public	36,847	130,866	9,021
Phoenix Dial-a-Ride	Seniors, persons with disabilities on weekdays. General Public on Sundays and Holidays	169,555	2,215,208	141,428
Phoenix Reserve-a-Ride	Seniors	196,587	603,577	46,486
Sun Cities Area Transit System (SCAT)	General Public	80,639	275,530	24,168
Surprise Dial-a-Ride	General Public	4,553	27,125	2,067
Tempe/Scottsdale Dial-a-Ride	Seniors and persons with disabilities	87,507	442,164	36,189
Total		954,400	5,507,665	400,755

Then, in June 1990, a Citizens Advisory Committee (CAC) was formed to begin the process of blending the local plans together into a comprehensive transit plan for Maricopa County. The CAC, made up of 118 members representing the various jurisdictions and community-based organizations, met on Saturdays throughout the summer and fall. The plan they eventually crafted was finally adopted by the CAC on January 5, 1991, and by the Board of Directors in July 1992. This plan is described later in this document. The plan was defeated by voters in 1994.

Regional Rideshare Program

The Maricopa Association of Governments Regional Ridesharing Program is designated to provide a wide range of rideshare assistance services in response to public needs. The regional ridesharing program is administered by the Regional Public Transportation Authority in order to enhance the regional perspective of the rideshare program. The annual budget for the MAG Regional Ridesharing Program is approximately $943,000.

The Maricopa Association of Governments has increased the annual allocation of federal funding for the program from $250,000 in FY 1988 to $420,000 in FY 1991 and 1992 and $460,000 in FY 1993. For FY 1994, MAG has again programmed $460,000 in federal Congestion Mitigation and Air Quality (CMAQ) Improvement funds for the Regional Rideshare Program.

The MAG Regional Ridesharing Program provides an outreach program to the general public and major employers. Information and assistance are provided for carpooling, vanpooling, public transit, park and ride lots, park and pool lots, and dial-a-ride services. The ridesharing program also coordinates with various social service agencies to provide transportation for the elderly and handicapped and coordinates with the private sector in developing public/private transportation partnerships.

The MAG Regional Ridesharing Program utilizes a microcomputer system to provide carpool matching lists, transit, dial-a-ride, and park and ride information. The program has two remote on-line terminals at Arizona State University and the State Capitol Complex and a portable unit which can be used at employment locations. The Regional ridesharing Program has coordinated with the following major employers: Opus Southwest, Mountain States Technical Institute, U-Haul International, Maricopa County Government, and AT&T Communications. The Rideshare Program has also been instrumental in planning Project Easy Ride which is a demonstration project designed to match the transportation needs of elderly and handicapped persons with volunteer drivers.

The marketing and promotion program for the MAG Regional Ridesharing effort includes posters, brochures; and customized ridesharing messages tailored to individual companies. A two-pronged registration approach is used for new customers. This approach includes a field specialist who begins to register people by computer immediately

upon request and then provides a carpool matchlist. The second element of this approach is the paper application of customized rideshare messages; a saturation technique is utilized for wider contact as opposed to the visual display technique.

Since 1987, the Regional Ridesharing Program has significantly expanded its staff and its scope of operations. The Regional Ridesharing Program includes ten staff people. The employer database for the program expanded from 65 in June 1987 to 420 in March 1989. Together, the Regional Public Transportation Authority and the Rideshare Program provided technical assistance to more than 500 employers during FY 1990. The Rideshare staff also facilitates the development of Transportation Management Associations, with twelve Transportation Management Associations currently operating in the region.

The Rideshare staff has played an important role in the success of the Voluntary No Drive Days Program and the Maricopa County Travel Reduction Program. In addition, the Rideshare Program has been actively involved in establishing vanpools and Transportation Management Associations.

Other Measures Which Reduce Particulate Pollution

This Chapter contains a discussion of key or select control measures to reduce carbon monoxide. There are also several other measures which are being implemented in the Maricopa County nonattainment area. Many are described in the MAG Air Quality Plan 1996 Annual Progress report prepared by the Maricopa County Environmental Services Department (see Appendix B, Exhibit 2).

Need for Additional Control Strategies

Although existing control measures have contributed to the reduction of air pollution overtime, they have not been sufficient to result in attainment of the carbon monoxide standard in the Maricopa nonattainment area.

Recognizing the need for additional control measures, the Maricopa Association of Governments complied a Draft Comprehensive List of Measures for Particulate Matter and Carbon Monoxide. Measures for both pollutants were considered together since many of the measures impact both carbon monoxide and particulates. Also, Serious Area plans for both pollutants were due in the same general time frame. The Draft Comprehensive List is described in Chapter Six.

BASIC TRANSPORTATION NEEDS

Several of the carbon monoxide strategies contained in the MAG list are either directly or indirectly related to public transit. The Environmental Protection Agency requires the

funding and implementation of public transportation measures to serve “Basic Transportation Needs” in areas where transportation control strategies are implemented.

Public transportation in the MAG Regional Planning Area is funded through a combination of sources. Passenger fares from the City of Phoenix Transit System, Scottsdale Connection and Valley Metro Mesa and from the regional service operated by ATE for RPTA cover approximately one-third of the operating expenses for each of these systems. Federal, state and local funding offset the remaining expenses. Capital needs are also covered by federal, state, and local monies.

Dial-a-ride systems in the region are also funded through a variety of sources. Farebox revenues for these services are generally lower than those of fixed route systems, and the necessary subsidies are also funded with federal, state, and local resources.

The City of Phoenix Transit System recovered a systemwide total 40.0 percent of its operating costs from the farebox during 1996-1997. Farebox revenues totaled $16,467,005, a decrease of 3.85 percent over FY 1995-1996. Regional service on the routes provided by RPTA generated $1,757,441 in farebox revenues which represented 31.6 percent of their operating cost. The Scottsdale Connection farebox revenues during FY 1996-1997 were $90,542, which represented 12.8 percent of their operating costs and the Valley Metro Mesa generated $372,162 (14.1 percent farebox recovery) in revenue during FY 1996-1997.

In order to develop the Transportation Improvement Program and the Short Range Transit Plan, it is assumed that the Federal Transit Administration (FTA) Section 9 funding levels for FY 1997-1998 through FY 2001-2002 will be equivalent to FY 1996-1997 funding levels. It is also assumed that capital operating and planning funds will remain combined in a single block grant in FY 1997-1998. In FY 1997-1998, it is expected that federal grants will offset about six percent or less of the operating costs.

FTA Section 8 planning funds are used to support regional transit planning efforts. Each year the Unified Planning Work Program is prepared for the upcoming fiscal year to guide all of the federally funded transit planning activity.

Capitol costs can also be funded through the FTA Section 3 program. Section 3 funds continue to be distributed on a discretionary basis, and the percentage of federal participation in a project has been set at 80 percent with local resources required for the remaining 20 percent. Programmed projects could require Section 3 funds if the actual Section 9 allocation is less than anticipated.

In 1981, the Arizona State Legislature established the Local Transportation Assistance Fund (LTAF) consisting of earmarked revenues from the Arizona State Lottery. The law limited the amount of the LTAF to $184 million from 1983 through 1991 and placed a

ceiling of $23 million for allocation in any given fiscal year. In 1991, the Arizona State Legislature extended the LTAF indefinitely. Disbursements of LTAF money to all of the various Arizona cities and towns are made on a monthly basis.

Incorporated cities and towns can receive an amount based on the proportion of their population to the total population of all cities and towns requesting LTAF monies in any fiscal year. The law further states that no city or town will receive less than $10,000. Cities and towns with populations of 300,000 or less may use their LTAF revenues for general transportation purposes, while cities with populations of greater than 300,000 (currently only Phoenix, Mesa and Tucson) are obligated by law to apply LTAF monies to public transportation programs. The cities in the MAG Regional Planning Area receive a combined total of $15 to $16 million each year; approximately half goes to the City of Phoenix.

In 1985, Maricopa County voters approved Proposition 300, which increased the County's sales tax by a half percent for twenty years in order to fund highway system improvements and transit system planning. While construction began on the first legs of a 230-mile freeway system, the newly-formed Regional Public Transportation Authority (RPTA) began a planning program to provide transit improvements resulting in a more balanced regional transportation system.

The RPTA receives $5 million, inflated annually, from the dedicated local one-half cent sales tax. These funds are earmarked for regional transit planning, regional bus service, and community funded transportation including dial-a-ride and special needs transportation. During FY 1996-1997 the RPTA received $6.75 million of dedicated funding.

Of the approximately $6.75 million, $1 million is designated for Community Transportation Services. This amount has been allocated each year to member jurisdictions based on a formula using demographic data. In FY 1996-1997, the funds were allocated as follows:

Chandler	$51,643
Glendale	$72,095
Mesa	$133,347
Peoria	$29,548
Phoenix	$450,344
Scottsdale	$64,471
Tempe	$60,677
Maricopa County	$137,875

The remaining $5.75 million was used in the provision of regional transit service.

Local funds are used to match federal funds, pay for contractual service arrangements or to finance transit routes or systems outright. General funds provide the majority of local transit resources, although bond proceeds have been used to fund some capital projects by the City of Phoenix.

Table 5-5 and Figure 5-2 illustrate the Five-Year Financing Plan for the RPTA's and City of Phoenix Transit System's operating costs. The plan represents a commitment of resources by the City of Phoenix and RPTA for the fixed route transit system as well as Dial-A-Ride services. Local shares from other communities are dedicated toward funding those service miles operated within their borders, and the RPTA funds are committed to continuing the regional transit services implemented since FY 1986-1987. This Five-Year Financing Plan is revised at least annually to reflect changing resources and priorities.

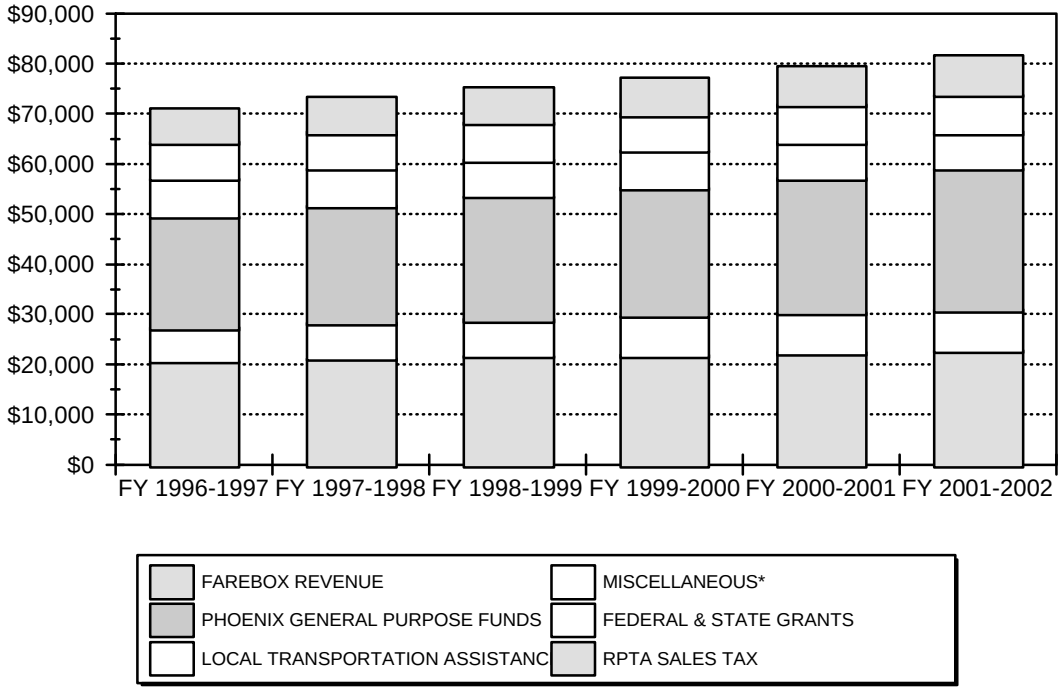
TABLE 5-5

FORECAST OF OPERATING FUNDS
CITY OF PHOENIX TRANSIT SYSTEM AND RPTA

		1996/97 Budget	1997/98 Forecast	1998/99 Forecast	1999/00 Forecast	2000/01 Forecast	2001/02 Forecast
Operating Revenue ($000)							
Farebox and other system revenue							
Fixed route systems	$	19,962	20,401	20,829	21,215	21,634	22,037
Dial-a-ride systems		691	706	722	739	757	772
City of Phoenix DASH system		22	23	24	25	26	27
		20,675	21,130	21,575	21,979	22,417	22,836
City of Phoenix General Fund		22,107	23,344	24,487	25,665	26,884	28,141
Transit service reimbursements		5,798	5,911	6,087	6,295	6,529	6,812
Federal and state grants		7,475	7,444	7,431	7,406	7,381	7,356
City of Phoenix Local Transportation Assistance Fund		7,480	7,362	7,347	7,332	7,317	7,302
RPTA sales tax		6,699	6,833	7,038	7,284	7,576	7,879
Interest and other revenue		923	1,311	1,311	1,311	1,311	1,311
Total operating revenue	$	71,157	73,335	75,276	77,272	79,415	81,637
Operating Expenditures ($000)							
Phoenix Transit System Operations							
Fixed route service	$	39,834	41,146	42,459	43,801	45,187	46,637
Dial-a-ride		3,611	3,719	3,831	3,946	4,065	4,187
DASH		228	235	242	249	256	264
Insurance		2,322	2,350	2,350	2,350	2,350	2,350
Bus stop maintenance		664	684	705	726	748	770
Fuel		2,993	3,083	3,175	3,270	3,368	3,469
Lease purchase		2,575	2,575	2,575	2,575	2,575	2,575
		52,227	53,792	55,337	56,917	58,549	60,252
RPTA Transit System Operations							
Fixed route service		9,872	10,061	10,202	10,393	10,702	11,132
Dial-a-ride		2,747	2,802	2,866	2,932	3,006	3,078
Vanpool service		525	650	750	800	800	800
Community funded transportation		1,000	1,000	1,000	1,000	1,000	1,000
Principal and interest		678	836	836	836	836	836
		14,822	15,349	15,654	15,961	16,344	16,846
City of Phoenix Administration and Planning							
Public transit department		1,173	1,209	1,245	1,282	1,321	1,361
Planning (FTA Urban Area Formula)		316	325	335	345	355	366
Employed disabled program		45	45	45	45	45	45
		1,534	1,579	1,625	1,672	1,721	1,772
RPTA Administration and Planning							
Operations administration		262	281	290	307	324	238
General administrative		1,094	1,104	1,117	1,135	1,164	1,181
Planning		247	250	250	250	250	250
		1,603	1,635	1,657	1,692	1,738	1,669
RPTA Transportation Demand Management		971	980	1,003	1,030	1,063	1,098
Total operating expenditures	$	71,157	73,335	75,276	77,272	79,415	81,637

Source: Regional Public Transportation Authority, 1997.

FIGURE 5-2
FIVE YEAR FORECAST OF FUNDING
CITY OF PHOENIX TRANSIT SYSTEM AND RPTA



MISCELLANEOUS Includes: Other Agencies Local Share, Other Grants and Debt/Support Services

Source: Regional Public Transportation Authority, 1997.

CHAPTER SIX

EVALUATION OF CARBON MONOXIDE CONTROL STRATEGIES

In preparation for the identification of Suggested Measures for the MAG 1998 Carbon Monoxide Plan, the Maricopa Association of Governments conducted a thorough evaluation of various control measures. A variety of information was developed and assembled for use in conducting the evaluation. The information included the basis for considering the measures; the data from the preliminary air quality modeling analysis; application of the measures; implementation responsibilities; costs associated with the measures; and other benefits which may result from using the measures. A description of the information used to evaluate the control strategies is provided in this Chapter.

DRAFT COMPREHENSIVE LIST OF MEASURES

A Draft Comprehensive List of Measures was compiled to initiate the consideration of measures for the Carbon Monoxide Plan and is shown in Table 6-1. In compiling the Draft Comprehensive List, potential air pollution control measures were identified from several sources. One key source was the Clean Air Act, which identifies numerous potential measures, including specific transportation control measures as listed in Section 108(f) of the Act. Arizona law (A.R.S. 49-402) identifies additional measures required to be considered in an air quality plan. The list also includes other potential measures identified in previous MAG plans or derived from air quality plans from other U.S. nonattainment areas. Finally, the list includes various measures based on preliminary suggestions from the 1996 Governor's Air Quality Task Force (Appendix B, Exhibit 3).

The Draft Comprehensive List is divided into two sections — Part 1: New Measures, and Part 2: Existing Measures Which Could be Considered for Strengthening. The major groupings of measures in both parts of the list are as follows:

- Vehicle Emissions Testing
- Clean Fuels for Conventional Vehicles
- Cleaner Vehicle Technologies
- Reduced Vehicle Use and Traffic Congestion
- Reduced Emissions from Nonroad Equipment
- Reduced Emissions from Industrial Sources
- Fugitive Dust Control
- Reduced Emissions from Agricultural Activities
- Fireplace and Other Burning Restrictions
- Reduction of Vehicle Idling

Table 6-1

DRAFT COMPREHENSIVE LIST OF MEASURES
FOR PARTICULATE MATTER AND CARBON MONOXIDE

PART 1: NEW MEASURES

MEASURE	POLLUTANT IMPACT P = Primary, S = Secondary N = Not Significant			Potential Implementing Entity
	PM-10	Carbon Monoxide	Ozone	
VEHICLE EMISSIONS TESTING				
1. Phased-In Emission Test Cutpoints (Governor's Air Quality Strategies Task Force)	S	P	P	State
2. Transient Loaded Mode Test for 1967-1980 Vehicles and Heavy-Duty Gasoline Trucks 1981 and Newer (Governor's Air Quality Strategies Task Force)	INCREASES EMISSIONS			State
3. Enhanced Emission Testing of Constant Four-Wheel Drive Vehicles (Governor's Air Quality Strategies Task Force)	S	P	P	State
4. Geographic Expansion of the Emissions Testing Program (Governor's Air Quality Strategies Task Force)	S	P	P	State
5. One-Time Waiver from Vehicle Emissions Test	S	P	P	Adopted by State in 1996
6. No-Waiver or Increased Waiver Repair Limit Options (Limits were increased by H.B. 2001 in 1993)	S	P	P	State
7. Tougher Enforcement of Vehicle Registration and Emissions Test Compliance (Governor's Air Quality Strategies Task Force)	S	P	P	State
8. Vehicle Pollution Charge (Governor's Alternative Transportation System Task Force)	S	P	P	State
9. Require Pre-1988 Heavy-Duty Diesel Commercial Vehicles Registered in the Nonattainment Area to Meet 1988 Federal Emission Standards	P	N	N	Adopted by State in 1996
10. Snap Acceleration Test for Heavy-Duty Diesel Vehicles (Governor's Air Quality Strategies Task Force)	P	N	N	Adopted by State in 1996

Table 6-1 (Continued)

MEASURE	POLLUTANT IMPACT P = Primary, S = Secondary N = Not Significant			Potential Implementing Entity
	PM-10	Carbon Monoxide	Ozone	
CLEAN FUEL FOR CONVENTIONAL VEHICLES				
11. Opt into Federal Reformulated Fuel Program (Governor's Air Quality Strategies Task Force)	N	S	P	State
12. California Phase 2 Fuel Specifications (Governor's Air Quality Strategies Task Force)	N	S	P	State
13. Performance-Based Standards for Motor Vehicle Fuel (Governor's Air Quality Strategies Task Force)	S	S	P	State
14. Tighter Limits on Sulphur Content in Gasoline	N	P	S	State
15. Use of Clean Fuels on a Statewide Basis	N	P	P	State
16. Measures to Encourage the Construction and Operation of Fueling Stations for Alternative Fuel Vehicles (Governor's Air Quality Strategies Task Force)	N	P	P	State
17. California Reformulated Diesel Fuel or Other Clean Diesel Fuel (Governor's Air Quality Strategies Task Force)	P	N	N	State
18. Limit Sulphur Content of Diesel Fuel Oil to 500 ppm	P	N	N	Adopted by State in 1996
CLEANER VEHICLE TECHNOLOGIES				
19. Adoption of the California Low-Emission Vehicle Program	S	P	P	State
20. Voluntary Gasoline Vehicle Retirement Programs, Including Enhanced Notification For Older Vehicles and in High Pollution Areas (Governor's Air Quality Task Force; also, Ventura, CA)	S	P	P	State
21. Voluntary Diesel Vehicle Retirement (Governor's Air Quality Task Force)	P	N	N	State
22. Heavy-Duty Diesel Engine Replacement or Overhaul at Recommended Intervals	P	N	N	State

Table 6-1 (Continued)

MEASURE	POLLUTANT IMPACT P = Primary, S = Secondary N = Not Significant			Potential Implementing Entity
	PM-10	Carbon Monoxide	Ozone	
23. Retrofit Existing Diesel Vehicles - e.g. with Oxidation Catalyst (Governor's Air Quality Strategies Task Force)	P	N	N	State
Other Innovative Emission Control Technologies	Varies			State
REDUCED VEHICLE USE AND TRAFFIC CONGESTION				
24. Mass Transit Alternatives (Governor's Alternative Transportation System Task Force)	S	P	P	State, Local
25. High Occupancy Vehicle Lane Pricing (Governor's Alternative Transportation System Task Force)	N	P	S	State
26. Fuel Tax Increase (Governor's Alternative Transportation System Task Force)	S	P	P	State
27. Develop Intelligent Transportation Systems (Governor's Alternative Transportation System Task Force)	N	P	S	State, Local
28. Special Event Controls - Required Implementation from List of Approved Strategies (South Coast Area, CA)	N	P	S	State, Local
REDUCED EMISSIONS FROM NON-ROAD EQUIPMENT				
29. Voluntary Retirement Program for Gasoline-Powered Lawn and Garden Equipment (Governor's Air Quality Strategies Task Force)	S	P	P	State
30. Require Government Agencies to Minimize Use of Gasoline-Powered Lawn and Maintenance Equipment (Governor's Air Quality Strategies Task Force)	S	P	P	State
31. Ban Sale/Use of Gasoline-Powered Lawn and Garden Equipment	S	P	P	State
32. Emissions Standards for New Heavy-Duty Construction Equipment. Note: Adopting California standards would provide PM-10 reductions beginning in 2001.	P	N	N	Adopted by EPA in 1994

Table 6-1 (Continued)

MEASURE	POLLUTANT IMPACT P = Primary, S = Secondary N = Not Significant			Potential Implementing Entity
	PM-10	Carbon Monoxide	Ozone	
33. Emissions Standards for Utility Equipment	S	P	P	State
34. Emission Standards for Off Road Vehicles - Motorcycles and Recreational Vehicles (Governor's Air Quality Task Force; also, Ventura, CA)	N	P	P	State
35. Encourage the Use of Temporary Electrical Power Lines Rather than Portable Generators at Construction Sites (Governor's Air Quality Strategies Task Force)	S	P	P	Local
36. Defer Emissions Associated with Governmental Activities (Governor's Air Quality Strategies Task Force)	S	P	P	State, Local
REDUCED EMISSIONS FROM INDUSTRIAL SOURCES				
37. PM-10 Best Available Control Technology (BACT)Determinations for Stationary Sources	P	N	N	County
FUGITIVE DUST CONTROL				
38. Strengthening and Better Enforcement of Fugitive Dust Control Rules (Governor's Air Quality Strategies Task Force)	P	N	N	County
39. Dust Control Plans for Construction/Land Clearing and Industrial Sites (Including Active Landfills), with Elements Addressing Trackout Prevention, Site and Material Maintenance, Construction Staging, and High Wind Operating Restrictions	P	N	N	County
40. Mitigation Bond Requirement for Construction and Development Projects To Provide Funding for Agencies to Control Project Emissions in the Event of Contractor Noncompliance (EPA PM-10 Sourcebook)	P	N	N	Local
41. Require Dust Mitigation Plan Submission and Implementation by Property Owner for Vacant Parcels Greater Than 10 Acres	P	N	N	County

Table 6-1 (Continued)

MEASURE	POLLUTANT IMPACT P = Primary, S = Secondary N = Not Significant			Potential Implementing Entity
	PM-10	Carbon Monoxide	Ozone	
REDUCED EMISSIONS FROM AGRICULTURAL ACTIVITIES				
42. Cover Crops - planting alternative crops during fallow period (Governor's Air Quality Strategies Task Force)	P	N	N	State
43. Vegetation Establishment - conversion of crops to grassland or trees on land not suitable for continuous cropping (Governor's Air Quality Strategies Task Force)	P	N	N	State
44. Windbreaks - plant trees or grass perpendicular to the prevailing wind (Governor's Air Quality Strategies Task Force)	P	N	N	State
45. Restrictions on Tilling or Soil Mulching During High Wind Events	P	N	N	State
46. Reduce Emissions of Ammonia and Nitrates from Agricultural Operations	P	N	N	State
47. Provide for Burial of Whole Stalks During Plowdown - If research documents no increase in spread of plant disease or pests from this practice (Governor's Arizona Air Quality Strategies Task Force)	P	N	N	State
48. Require Comprehensive Dust Control Plans for Farms Larger Than 640 Acres (including windbreaks, maintenance of crop residues on non-irrigated fields, mowing for weed control)	P	N	N	State
FIREPLACE AND OTHER BURNING RESTRICTIONS				
49. Clean Burning Fireplace Construction (Governor's Air Quality Strategies Task Force)	P	P	N	County
50. Public Information Program on Wood Stoves and Wood Heat	P	P	N	County
51. Enforce Opacity Limit on Residential Wood Smoke	P	P	N	County
52. Require Change-Out of Uncertified Wood Stoves Upon Sale of Home	P	P	N	County
53. Tradeable Permits for Wood Stoves	P	P	N	County

Table 6-1 (Continued)

MEASURE	POLLUTANT IMPACT P = Primary, S = Secondary N = Not Significant			Potential Implementing Entity
	PM-10	Carbon Monoxide	Ozone	
54. Improved Performance/Maintenance of Woodburning Devices, including Weatherization Programs	P	P	N	County
55. Inducements/Requirements to Eliminate or Upgrade Existing Wood Stoves and Fireplaces	P	P	N	State, County
56. Restrict the Number or Design of New Wood Stoves and Fireplaces	P	P	N	County
57. Ban on Fireplace Installation in New Homes	P	P	N	County
58. Episode Curtailment Program for Residential Wood Combustion (Removes Current Exemptions)	P	P	N	County
REDUCTION OF VEHICLE IDLING				
59. Limit Excessive Car Dealership Vehicle Starts (South Coast Area, CA)	N	P	P	County
60. Limit Idling Time to Three Minutes (New York; San Francisco; South Coast Area, CA)	S	P	S	County
61. Truck Stop Electrification (South Coast Area, CA)	P	N	N	County

Table 6-1 (Continued)

MEASURE	POLLUTANT IMPACT P = Primary, S = Secondary N = Not Significant			Potential Implementing Entity
	PM-10	Carbon Monoxide	Ozone	
62. Vehicle Emissions Testing Program	S	P	P	State
63. Loaded Mode Vehicle Emissions Test	S	P	P	State
64. Enhanced Light-Duty Vehicle Emissions Test	S	P	P	State
65. Remote Sensing	S	P	P	State
66. Enhanced Heavy-Duty Diesel Emissions Testing Program	P	N	N	State
67. Toll-Free Number to Report Gross Emitting Vehicles	P	P	P	State
68. Catalyst Retrofit/Replacement Program, Including Enhanced Notification For Older Vehicles and in High Pollution Areas	N	P	P	State
CLEAN FUELS FOR CONVENTIONAL VEHICLES				
69. Reduced Gasoline Volatility	N	P	P	State
70. Mandatory Oxygenated Fuels Program	N	P	N	State
71. Increased Oxygen Content of Ethanol Blends	N	P	N	State
72. Reporting Requirements for Fleets Using Oxygenated Fuels	N	P	N	State
73. Public Education Program for Oxygenated Fuels	N	P	N	State
74. Use of Number One Diesel Fuel or Other Clean Burning Diesel Fuel with Equal or Greater Impacts	P	N	N	State

Table 6-1 (Continued)

MEASURE	POLLUTANT IMPACT P = Primary, S = Secondary N = Not Significant			Potential Implementing Entity
	PM-10	Carbon Monoxide	Ozone	
CLEANER VEHICLE TECHNOLOGIES				
75. Alternative Fuels for Fleets	N	P	P	State
76. Conversion of Buses to Alternative Fuels	P	P	P	Local
77. Incentive for the Use of Compressed Natural Gas in Fleets	N	P	P	State
78. Alternative Fuels for General Vehicle Use - Includes Addendum measure 6, Tax Deductions for Alternative Fueled Vehicles	N	P	P	State
REDUCED VEHICLE USE AND TRAFFIC CONGESTION				
79. Expansion of Public Transportation Systems	S	P	P	State, Local
80. Transit Service Improvements in Combination with Park and-Ride Lots and Parking Management	S	P	P	Local
81. Fixed Lanes for Buses and Carpools on Arterials	S	P	P	Local
82. Fixed Lanes for Buses and Carpools on Freeways	S	P	P	State
83. High Occupancy Vehicle Ramps which By-Pass Freeway Ramp Meter Signals	S	P	P	State
84. Employer Rideshare Program Incentives	S	P	P	Local
85. Mandatory Employee Parking Fees	S	P	P	State, Local
86. Preferential Parking for Carpools and Vanpools	S	P	P	State, Local
87. Encouragement of Vanpools for County and State Employees	S	P	P	State, County

Table 6-1 (Continued)

MEASURE	POLLUTANT IMPACT P = Primary, S = Secondary N = Not Significant			Potential Implementing Entity
	PM-10	Carbon Monoxide	Ozone	
88. Vanpool Purchase Incentives	S	P	P	State
89. Merchant Transportation Incentives	S	P	P	County
90. Modified Business Hours for Private and Public Sector During High Pollution Season to Reduce Cold Start Emissions	N	P	N	State, Local
91. Trip Reduction Ordinances	S	P	P	County
92. Removal of On-Street Parking	N	P	S	Local
93. Optimize Freeway Ramp Meters	N	P	S	State
94. Coordinate Traffic Signal Systems	N	P	S	State, Local
95. Reduce Traffic Congestion at Major Intersections	N	P	S	State, Local
96. Site-Specific Transportation Control Measures	N	P	S	State, Local
97. Reversible Lanes	N	P	S	Local
98. Freeway Incident Detection and Response Management along with Motorist Information Systems	N	P	S	State
99. Mitigation of Freeway Construction Impacts	P	P	S	State
100. One Way Streets	N	P	S	Local
101. On-Street Parking Restrictions	N	P	S	Local
102. Bus Pullouts in Curbs for Passenger Loading	N	P	S	Local
103. Fringe and Transportation Corridor Parking Facilities Serving Multiple Occupancy Vehicle Programs or Transit Service (e.g. Park-and-Ride Lots)	S	P	P	Local

Table 6-1 (Continued)

MEASURE	POLLUTANT IMPACT P = Primary, S = Secondary N = Not Significant			Potential Implementing Entity
	PM-10	Carbon Monoxide	Ozone	
104. Off-Peak Goods Movement	N	P	S	Local
105. Truck Restrictions During Peak Periods	N	P	S	Local
106. Park-and-Ride Programs	S	P	P	Local
107. Rideshare Programs	S	P	P	MAG
108. Financial Incentives, Including Zero Bus Fares	S	P	P	State, Local
109. Programs to Limit Portions of Road Surfaces or Certain Sections of the Metropolitan Area to the Use of Non-Motorized Vehicles or Pedestrian Use, Both as to Time and Place	S	P	P	Local
110. Encouragement of Bicycle Travel	S	P	P	Local
111. Development of Bicycle Travel Facilities	S	P	P	Local
112. Programs to Control Extended Idling of Vehicles	S	P	S	Local
113. Modification of Work Schedules	N	P	S	State, Local
114. Telecommunications-Telecommuting	S	P	P	State, Local
115. Telecommunications-Teleconferencing	S	P	P	State, Local
116. Alternative Work Schedules	S	P	P	State, Local
117. Land Use/Development Alternatives	S	P	P	Local
118. Voluntary No Drive Days Program	S	P	P	RPTA
119. Areawide Public Awareness Programs	S	P	P	RPTA
120. Evaluation of the Air Quality Impacts of New Development and Mitigation of Adverse Impacts	S	P	P	Local
121. Encouragement of Pedestrian Travel	S	P	P	Local
122. Pedestrian and Bicycle Overpasses Where Safety Dictates	S	P	P	State, Local

Table 6-1 (Continued)

MEASURE	POLLUTANT IMPACT P = Primary, S = Secondary N = Not Significant			Potential Implementing Entity
	PM-10	Carbon Monoxide	Ozone	
123. Enforcement of Traffic, Parking, and Air Pollution Regulations	N	P	S	State, County, Local
124. Air Pollution Emergency	S	P	P	State
125. Traffic Diversion (Contingency Measure)	S	P	P	State
FUGITIVE DUST CONTROL				
126. Paving, Vegetating, and Chemically Stabilizing Unpaved Access Points onto Paved Roads (Especially Adjacent to Construction/Industrial Sites)	P	N	N	State, Local
127. Curbing, Paving, or Stabilizing Shoulders on Paved Roads (Includes Painting Stripe on Outside of Travel Lane)	P	N	N	State, Local
128. Control of Emissions Due to Material Transport (e.g. Truck Covers, Freeboard Requirements, Material Dampening, Responsibility for Clean Up of Spills)	P	N	N	County
129. Frequent Routine Sweeping or Cleaning of Paved Roads	P	N	N	State, Local
130. Intensive Street Cleaning Requirements for Industrial Paved Roads and Streets Providing Access to Industrial/Construction Sites	P	N	N	County
131. Traffic Rerouting or Rapid Clean Up of Temporary Sources of Dust on Paved Roads (e.g. Due to Spills or Runoff)	P	N	N	County
132. Storm Water Drainage to Prevent Water Erosion Onto Paved Roads (Includes Vegetative Stabilization)	P	N	N	County
133. Improved Material Specification for and Reduction of Usage of Skid Control Sand or Salt	Not applicable in this desert region			
134. Surface Treatment to Reduce Dust from Unpaved Roads and Alleys (e.g. Paving, Chemically Stabilizing, or Watering)	P	N	N	Local
135. Traffic Reduction/Speed Control Plans for Unpaved Roads	P	N	N	Local
136. Prohibition of Unpaved Haul Roads, and Parking or Staging Areas	P	N	N	County

Table 6-1 (Continued)

MEASURE	POLLUTANT IMPACT P = Primary, S = Secondary N = Not Significant			Potential Implementing Entity
	PM-10	Carbon Monoxide	Ozone	
137. Surface Treatment to Reduce Dust from Unpaved Driveways and Parking Lots	P	N	N	County
138. Limit Off-Road Use of Recreational Vehicles on Open Land	P	N	N	County
139. Dust Control Measures for Material Storage Piles	P	N	N	County
140. Require Dust Control Plans for All Grading Permit Activities	P	N	N	County
141. Require Vegetative and Chemical Stabilization and Construction of Windbreaks on Public Property Adjacent to Open Land or Lots	P	N	N	County
142. Restrictions on the Use of Blowers for Landscaping Maintenance	P	N	N	Local
REDUCED EMISSIONS FROM AGRICULTURAL ACTIVITIES				
143. Soil Conservation Requirements of the U.S. Food Security Act	Not applicable in this region due to lack of participating acreage			
FIREPLACE AND OTHER BURNING RESTRICTIONS				
144. Fireplace Restrictions	P	P	N	County
REDUCTION OF VEHICLE IDLING				
145. Programs to Reduce Motor Vehicle Emissions, Consistent with Title II, which are Caused by Extreme Cold Start Conditions	Not applicable in this desert region, since the definition of an "extreme cold start" specifies temperatures of sub-20 degrees Fahrenheit.			

The Draft Comprehensive List provides a general indication of the pollution targeted by each measure. The focus is on particulates and carbon monoxide since new Serious Area plans are due for these pollutants. The effects on ozone pollution are also indicated since the region is an ozone nonattainment area as well. For example, the pollutant impact of a measure to relieve traffic congestion would be indicated in the list as follows: an "N" for "Not Significant" in PM-10 column, a "P" for "Primary" in the carbon monoxide column, and an "S" for "Secondary" in the ozone column.

As will be described in Chapter Seven, modifications to the Draft Comprehensive List were made by the MAG Air Quality Technical Advisory Committee and the MAG Air Quality Policy Committee. Subsequently, the MAG Regional Council took action on January 29, 1997 and March 26, 1997 to approve a Suggested List of Measures for consideration by implementing entities.

EMISSIONS REDUCTIONS OF INDIVIDUAL CONTROL MEASURES

Table 6-2 presents a summary of the modeling results for the individual control measures for which modeling was performed for the year 2000. The data are presented in terms of the percent reduction in total carbon monoxide emissions. This percentage was calculated on the basis of the difference between total regional emissions without the measure (base case) minus emissions with the measure, divided by the total carbon monoxide emissions for the base case. The emissions were those modeled for the design day in 2000.

Subsequent to analysis of the suggested control measures, the following changes were made to the emissions inventory: growth factors were recalculated using new socioeconomic data, onroad mobile emissions were recalculated using an updated vehicle registration distribution, new assumptions were developed for the fuel oxygenate market share for the future year base case modeling, and emissions from wood burning were temporally reallocated based on survey data. Therefore, the percent reduction associated with the measures in Table 6-2 do not represent percent reductions with regard to the updated 2000 base case modeling inventory used for Chapter Nine.

Projections for 2000

Table 6-2 depicts the percent emission reductions modeled for control measure scenarios in 2000. Only measures in Part 1 (New Measures) of the Draft Comprehensive List were modeled, as existing measures have been addressed in previous MAG air quality plans. In addition, certain new measures were not modeled due to the limitations of available modeling methodologies.

It should be recognized that one of the major objectives of the air quality planning effort is to reduce peak carbon monoxide concentrations to less than the standard of 9.0 parts per million. However, the use of emission reductions generally is a more convenient method for evaluating control measures on an individual basis. The absolute change in emissions may be more directly estimated than changes in peak hot spot concentrations. At the same time, the percent change in regional emissions is a good indicator of the ultimate effect that a measure will have on concentrations.

TABLE 6-2

EFFECTIVENESS OF AIR POLLUTION CONTROL MEASURES
IN REDUCING CARBON MONOXIDE EMISSIONS FOR 2000
FOR MEASURES WHICH WERE MODELED

Control Measure	CO Emission Reduction
Phased-In Emission Test Cutpoints (1)	12.0%
California Phase 2 Fuel Specifications (12)	6.6%
Tighter Limits on Sulphur Content in Gasoline (14)	5.3%
California Low-Emission Vehicle Program (19)	3.5% (Statewide)
	1.3% (Countyside)
Federal Reformulated Fuel (11)	2.2%
Vehicle Pollution Charge (8)	1.9%
Emissions Standards for Utility Equipment (32)	1.9%
Geographic Expansion of the Emission Testing Program (4)	1.6% (Statewide)
	0.2% (Countywide)
High Occupancy Vehicle Lane Pricing (25)	0.8%
Develop Intelligent Transportation Systems (27)	0.7%
No-Waiver or Increased Waiver Repair Limit Options (6)	0.6%
One-Time Waiver from Vehicle Emission Testing (5)	0.4%
Tougher Vehicle Registration and Emission Test (7)	0.4%
Voluntary Gasoline Vehicle Retirement Programs (20)	0.3%
Temporary Electrical Power Lines (35)	0.1%
Ban on Fireplace Installation in New Homes (57)	0.1%
Pre-1988 Diesel Standards (9)	Less than 0.1%
California Reformulated Diesel Fuel or Other Clean Diesel Fuel (17)	Less than 0.1%
Voluntary Diesel Vehicle Retirement (21)	Less than 0.1%
Heavy-Duty Diesel Engine Replacement (22)	Less than 0.1%
Diesel Vehicles Retrofit (23)	Less than 0.1%
Lawn and Garden Equipment Retirement (29)	Less than 0.1%
Government Lawn Equipment (30)	Less than 0.1%
Ban Sale/Use of Gasoline-Powered Lawn and Garden Equipment (31)	Less than 0.1%
Emissions Standards for Off Road Vehicles (34)	Less than 0.1%
Clean Burning Fireplace Construction (49)	Less than 0.1%
Woodburning Device Maintenance (54)	Less than 0.1%

In general, each measure addresses the task of reducing emissions from one of ten approaches. These approaches are: (1) vehicle emissions testing; (2) clean fuels for conventional vehicles; (3) cleaner vehicle technologies; (4) reduced vehicle use and traffic congestion; (5) reduced emissions from non-road equipment; (6) reduced emissions from industrial sources; (7) fugitive dust control; (8) reduced emissions from agricultural activities; (9) fireplace and other burning restrictions; and (10) reduction of vehicle idling. Measures directed at fugitive dust and agricultural activities were not modeled for carbon monoxide since they are intended to control particulate matter.

Measures affecting vehicle emissions testing tend to be highly effective because they involve the entire fleet and associated travel in the nonattainment area. The scenario modeled for Phased-in emission test cutpoints resulted in a 12 percent reduction in carbon monoxide emissions in 2000, the largest reduction of all the measures modeled. This measure is intended to enhance the existing Vehicle Inspection/Maintenance Program by more accurately simulating vehicle emissions under actual driving conditions. This measure and the other measures affecting vehicle emissions testing promote more efficient vehicle operation by increasing the scope and effectiveness of the existing programs.

Measures addressing fuel for conventional vehicles are also highly effective because they affect all travel in the nonattainment area. The scenarios modeled for California phase 2 fuel specifications and tighter limits on sulphur content in gasoline resulted in a 6.6 percent and 5.3 percent reduction in carbon monoxide emissions in 2000, respectively. Opting into the Federal Reformulated Fuel Program was also modeled and resulted in a significant reduction of carbon monoxide emissions. Reformulated fuels, such as the three mentioned above, are advantageous since they can be used by both new and old vehicles without prior engine modifications.

The effectiveness of measures directed at cleaner vehicle technologies varies. The modeling of two scenarios of the California Low-Emission Vehicle Program resulted in 3.5 percent and 1.3 percent reduction of carbon monoxide emissions in 2000. The California Low-Emission Vehicle Program reduces emissions by establishing emission standards for new vehicles, promising continued air quality improvements as new vehicles replace older vehicles. Many of the cleaner vehicle technology measures target Diesel fuel which does not have a significant impact on carbon monoxide emissions.

Measures directed at vehicle use and traffic congestion, such as high occupancy lane pricing, affect only a portion of total travel. Granting permits to vehicles that do not qualify as HOV's to use the lanes was estimated to result in a 0.8 percent reduction of carbon monoxide emissions. Another traffic congestion measure, intelligent transportation systems, was estimated to reduce carbon monoxide emissions by 0.7 percent. This measure reduces the idling emissions and unnecessary fuel consumption which result from traffic congestion.

Measures addressing reduced emissions from non-road equipment have a limited effect on reducing carbon monoxide emissions. One of the more effective measures in the group, emissions standards for utility equipment, would produce a 1.9 percent reduction in carbon monoxide emissions in 2000. This measure assumes the replacement of utility equipment engines with engines meeting new standards at a turnover rate of 14 percent per year for spark ignition engines and four percent for compression-ignition (Diesel) engines.

Industrial sources, fireplaces, and vehicle idling are not major sources of improvement for carbon monoxide emissions. Modeling the measures associated with these sources resulted in at most a 0.1 percent emission reduction in carbon monoxide. Certain measures were not modeled due to a lack of data or absence of modeling methodologies, some measures, such as limiting excessive car dealership vehicle starts and limiting idling time to three minutes, would produce an emission benefit.

Chapter Nine, Demonstration of Attainment Status, addresses the evaluation of measures which received commitments. These measures have specific commitments for implementation by the appropriate agency or governmental entity, as discussed in Chapter Eight.

DESCRIPTION OF NEW MEASURES IN THE DRAFT COMPREHENSIVE LIST

The Draft Comprehensive List was compiled in November-December 1996 to identify and evaluate potential control measures for particulate matter and carbon monoxide. As noted earlier, the measures in the Draft Comprehensive List are split into new measures and existing measures. Only the new measures in the Draft Comprehensive List have been described in detail in this document. Descriptions and modeling information for existing measures can be found in the MAG 1991 Particulate Plan for PM-10 for the Maricopa County Area and 1993 Revisions and MAG 1993 Carbon Monoxide Plan for the Maricopa County Area.

The modeled scenarios of the measures described in the following section represent new or strengthened versions of pollution control strategies - beyond what has already been implemented by local and state jurisdictions. These scenarios can be used as examples of the impact that the measures may have on air quality. If the control measure commitments which are included in this plan are lesser or greater in magnitude than the scenarios modeled, the impact numbers will be adjusted accordingly to accurately reflect the impact of the measures which will be implemented. A detailed description of the assumptions and procedures used in the modeling of the individual control measures is presented in the Draft Technical Support Document contained in Appendix B, Exhibit 4.

DRAFT COMPREHENSIVE LIST OF MEASURES FOR PARTICULATE MATTER AND CARBON MONOXIDE

VEHICLE EMISSIONS TESTING

1. Phased-In Emission Test Cutpoints

Pursuant to Arizona Administrative Code (AAC), R18-2-1006, more stringent I/M 240 pass/fail standards (final standards) are mandated to be effective on January 1, 1997. Adoption of final standards would increase the effectiveness of I/M 240 by increasing the identification of vehicles with high emissions. Studies conducted in the Arizona emissions testing lanes during 1995 and 1996 demonstrated, however, that without adequate preconditioning 50 percent or more of the vehicles failing under final standards will be false failures. A false failure rate of such magnitude would quickly erode public and repair industry confidence in the program.

A. Suggested Implementing Entity. Enhancements to the existing Vehicle Inspection/Maintenance Program could be enacted by the Arizona Legislature. The program is administered by the Arizona Department of Environmental Quality.

B. Cost. The current budget for operation and maintenance of the inspection/maintenance program is approximately $8 million. This includes a $4 million subsidy for the I/M 240 test which currently costs $24.30 per vehicle. In order to cover increased costs associated with enhanced or expanded testing, it may be necessary to increase the cost to the individual. In a 1993 report prepared for MAG by Sierra Research, the cost effectiveness on I/M 240 was estimated to be approximately $1,300 per ton reduced.

C. Basis for Consideration. The vehicle I/M program for nonattainment areas within the state is established under Arizona Revised Statutes §36-1772. The program has been in effect within the Maricopa County Nonattainment Area since 1976. In addition, A.R.S. Title 49, Section 402-E as amended by S.B. 1430 in 1992 requires enhanced I/M programs to be considered in regional air quality plan revisions.

D. Benefits and Other Considerations. Enhanced testing procedures more accurately simulate vehicle emissions under actual driving conditions. They are therefore able to detect increased emissions that might not be present during simpler or less stringent testing. Enhanced inspection procedures promote more efficient vehicle operation. However, more extensive testing procedures add time and expense to the vehicle inspection process.

This measure was modeled by modification of MOBILE5a input files. According to the ADEQ Draft VEOP, this measure provides for implementation of the final emission test cutpoints by the year 1999.

It was assumed in the base case that the final cutpoints for the I/M 240 program (0.80 g/mi HC, 15.0 g/mi CO, 2.00 g/mi NOx) will be in place by 2010 and that the cutpoints in the year 2000 will be 2.00, 30.0, 3.00. The measure assumes that the final cutpoints will be implemented by 2000.

Estimated Reduction in Emissions in 2000 12.0%

2. Transient Loaded Mode Test for 1967-1980 Vehicles and Heavy Duty Gasoline Trucks 1981 and Newer

State law established the Vehicle Inspection/Maintenance Program in 1976. The law requires periodic emissions inspection of motor vehicles registered or regularly operated within the Maricopa County Nonattainment Area. In 1988, State of Arizona Air Quality Legislation added a loaded mode test for all 1981 model year and newer non-fleet vehicles. In 1993, Arizona legislation further enhanced the inspection/maintenance program, requiring a biennial, transient loaded emission test for gasoline-powered vehicles model year 1981 or newer with a gross vehicle weight of up to 8,500 pounds. Also, gasoline-powered vehicles model years 1967-1976 were required to pass a loaded test and fleet vehicles were required to comply with the new inspection/maintenance requirements.

The proposed measure would require the biennial transient loaded mode test for light duty vehicle model years 1967-1980, in addition to the 1981 and newer vehicles currently tested. Also, heavy duty gasoline vehicle model years 1981 and newer would be required to take the transient loaded mode test.

A. Suggested Implementing Entity. Enhancements to the existing Vehicle Inspection/Maintenance Program could be enacted by the Arizona Legislature. The program is administered by the Arizona Department of Environmental Quality.

B. Cost. The current budget for operation and maintenance of the inspection/maintenance program is approximately $8 million. This includes a $4 million subsidy for the I/M 240 test which currently costs $24.30 per vehicle. In order to cover increased costs associated with enhanced or expanded testing it likely would be necessary to increase the cost to the individual.

C. Basis for Consideration. The vehicle I/M program for nonattainment areas within the state is established under Arizona Revised Statutes §36-1772. The program has been in effect within the Maricopa County Nonattainment Area since 1976. In addition, A.R.S. Title 49, Section 402-E as amended by S.B. 1430 in 1992 requires enhanced I/M programs to be considered in regional air quality plan revisions.

D. Benefits and Other Considerations. Enhanced testing procedures more accurately simulate vehicle emissions under actual driving conditions. They are therefore able to detect increased emissions that might not be present during simpler or less stringent testing. Enhanced inspection procedures promote more efficient vehicle operation. However, more extensive testing procedures add time and expense to the vehicle inspection process.

Modeling conducted by ADEQ in connection with the 1996 Governor's Air Quality Strategies Task Force found a slight increase in carbon monoxide and hydrocarbon emissions, when the current I/M program was replaced by a biennial transient loaded program for all vehicles.

3. Enhanced Vehicle Emission Testing of Constant Four-Wheel Drive Vehicles

This measure would require that full-time four-wheel drive vehicles and vehicles equipped with traction control receive the transient loaded emissions test (i.e., I/M 240). Implementation of this measure would require the installation of dual-axle dynamometers in several locations throughout the inspection station network in metropolitan Phoenix.

A. Suggested Implementing Entity. The I/M program is administered by the Arizona Department of Environmental Quality (ADEQ). ADEQ would be required to amend rules to add full-time, four-wheel drive vehicles and those with traction control to the vehicles require to received transient loaded mode testing.

B. Cost. In the 1996 report from Governor's Air Quality Strategies Task Force, the cost of implementing this measure was estimated by the emissions testing contractor at approximately 15 cents per vehicle, based on the total fleet. Through a contract amendment, the direct cost of installing the necessary equipment will be borne by the contractor. The cost transfer to the program, and ultimately to the vehicle owner, will be through the increased test fees.

C. Basis for Consideration. The vehicle I/M program for nonattainment areas within the state is established under Arizona Revised Statutes §36-1772. The program has been in effect within the Maricopa County Nonattainment Area since 1976. In addition, A.R.S. Title 49, Section 402-E as amended by S.B. 1430 in 1992 requires enhanced I/M programs to be considered in regional air quality plan revisions.

D. Benefits and Other Considerations. This measure would allow the transient testing of that portion of the fleet which cannot now be tested under load. Transient loaded testing has proved to be superior to either steady state loaded or unloaded (idle) testing in the ability to identify problematic conditions in a vehicle in as used conditions. The population of constant four-wheel drive vehicles and those with traction control, which are currently tested at idle, is four percent but is expected to grow significantly during upcoming years.

This measure was not modeled. No credit was identified. MOBILE5a does not distinguish between four-wheel drive vehicles, vehicles with traction control, and two-wheel drive vehicles without traction control. Since MOBILE5a does not recognize these vehicles as separate categories, these vehicles cannot be modeled as subject to different forms of I/M. Although no modeling credit was estimated for this measure, the measure would be helpful to achieve the emission reductions incorporated in the I/M programs.

4. Geographic Expansion of the Emissions Testing Program

The Governor's Air Quality Strategies Task Force recently recommended that a study be conducted to assess the impacts of expanding the boundaries ("Area A") within which vehicle emissions testing is required in the Maricopa County area. Currently, emission inspection/maintenance (I/M) testing is required for vehicles registered within the Maricopa and Pima County Nonattainment Areas, and for vehicles operated regularly within these areas by commuters and students. Vehicles registered elsewhere in Arizona are not required to be tested. This measure would expand the geographic coverage of the I/M program requirements to encompass all of Maricopa County or the entire state, reducing the emissions generated by these vehicles on occasions when they are operated within the Nonattainment Area.

A. Suggested Implementing Entity. Enhancements to the existing Vehicle Inspection/Maintenance Program could be enacted by the Arizona Legislature. The program is administered by the Arizona Department of Environmental Quality.

B. Cost. The current budget for operation and maintenance of the inspection/maintenance program is approximately $8 million. This includes a $4 million subsidy for the I/M 240 test which currently costs $24.30 per vehicle. The vehicle fee for testing is $10.00 for annual test and $20.00 for the biennial test. In order to cover increased costs associated with enhanced or expanded testing it could be necessary to increase the cost to the individual.

C. Basis for Consideration. The vehicle I/M program for nonattainment areas within the state is established under Arizona Revised Statutes §36-1772. The program has been in effect within the Maricopa County Nonattainment Area since 1976. In addition, A.R.S. Title 49, Section 402-E as amended by S.B. 1430 in 1992 requires enhanced I/M programs to be considered in regional air quality plan revisions.

D. Benefits and Other Considerations. An expanded vehicle inspection program would reduce pollution generated from vehicles registered outside of the nonattainment area but in the State of Arizona. A statewide program may also discourage false registrations. The creation of new testing facilities at lower program efficiencies in rural areas could result in considerably higher per vehicle costs.

This measure was modeled by adjustment of the weighting between I/M and non-I/M emission factors. The current future year base case weightings are 89.6 percent I/M and 10.4 percent non-I/M. Countywide expansion of the emissions testing program could change the weighting to 90.5 percent I/M and 9.5 percent non-I/M. Statewide expansion of the emissions testing program could change the weighting to 97.4 percent I/M and 2.6 percent non-I/M.

Estimated Reduction in Total CO Emissions in 2000	1.6% (Statewide) 0.2% (Countywide)

5. One-Time Waiver From Vehicle Emission Test

In 1993, H.B. 2001 increased the repair threshold for gasoline-powered vehicles in order to be eligible for a waiver from $50 to $100 for vehicle model years 1967-1974; from $200 to $300 for vehicle model years 1975-1980; and from $300 to $450 for vehicle model year 1981 and newer. In 1996, S.B. 1002 limited the issuance of a waiver for failure to comply with the emission testing requirements to one-time only, beginning January 1, 1997.

A. Suggested Implementing Entity. The program is administered by the Arizona Department of Environmental Quality.

B. Cost. There would be no significant capital cost associated with repeated testing of vehicles until emissions standards are met. However, a testing fee is not charged for second and subsequent tests, so there are costs due to additional operation and maintenance of testing facilities. The cost of required repairs is paid by the vehicle owner.

C. Basis for Consideration. The Vehicle Inspection/Maintenance Program for nonattainment areas within the state is established under Arizona Revised Statutes §36-1772. The program has been in effect within the Maricopa Nonattainment Area since 1976. In addition, A.R.S. Title 49, Section 402-E as amended by S.B. 1430 in 1992 requires enhanced inspection/maintenance programs to be considered in regional air quality plan revisions.

D. Benefits and Other Considerations. The elimination of waivers will require a greater number of vehicles to meet emissions requirements, particularly older-model vehicles which tend to be more polluting. This will reduce the overall mobile source contribution to air pollution. Enhanced inspection procedures also promote more efficient vehicle operation and reduce fuel consumption.

MOBILE5a was run with zero waivers allowed in order to determine the resulting decrease in Carbon Monoxide emission rates in 2000. It was assumed that the base case run included the three year life after waiver implicitly through MOBILE5a. This measure would effectively reduce that three year life to one year, and result in approximately two thirds of the reductions of a change to zero waivers. This measure was modeled through an across-the-board reduction of two thirds of the reduction from a change to zero waivers.

Estimated Reduction in Total CO Emissions in 2000 0.4%

6. No-Waiver or Increased Waiver Repair Limit Options

This measure would modify the vehicle inspection maintenance program to allow no waivers from passing the emissions test, or further increase the amount of money which a motorist must spend for repairs in order to obtain a waiver. In 1993, H.B. 2001 increased the repair threshold for gasoline-powered vehicles in order to be eligible for a waiver from $50 to $100 for vehicle model years 1967-1974; from $200

to $300 for vehicle model years 1975-1980; and from $300 to $450 for vehicle model year 1981 and newer. In 1996, S.B. 1002 limited the issuance of a waiver for failure to comply with the emission testing requirements to one-time only, beginning January 1, 1997.

A. Suggested Implementing Entity. Enhancements to the existing Vehicle Inspection/Maintenance Program would be enacted by the State Legislature. The program is administered by the Arizona Department of Environmental Quality.

B. Cost. There is no capital cost associated with repeated testing of vehicles until emissions standards are met. However, a testing fee is not charged for second and subsequent tests, so there are costs due to additional operation and maintenance of testing facilities. The cost of required repairs is borne by the vehicle owner.

C. Basis for Consideration. The Vehicle Inspection/Maintenance Program for nonattainment areas within the state is established under Arizona Revised Statutes §36-1772. The program has been in effect within the Maricopa Nonattainment Area since 1976. In addition, A.R.S. Title 49, Section 402-E as amended by S.B. 1430 in 1992 requires enhanced inspection/maintenance programs to be considered in regional air quality plan revisions.

D. Benefits and Other Considerations. The elimination of waivers will require a greater number of vehicles to meet emissions requirements, particularly older-model vehicles which tend to be more polluting. This will reduce the overall mobile source contribution to air pollution. Enhanced inspection procedures also promote more efficient vehicle operation and reduce fuel consumption.

More extensive testing procedures add time and expense to the vehicle inspection process. This may discourage drivers from testing and registering their vehicles, particularly older vehicles with greater tailpipe emissions.

This measure was modeled by modification of MOBILE5a input files. MOBILE5a has the option of changing the percentage of vehicles receiving waivers to zero. That percentage was set to zero in the MOBILE5a input file. This adjustment assumes that cars that do not pass the emissions test are taken off the road or are repaired to pass the emissions test.

Estimated Reduction in Total CO Emissions in 2000 0.6%

7. Tougher Enforcement of Vehicle Registration and Emission Test Compliance

This measure is similar to the "MVD Registration and Mandatory Insurance Tracking" measure recommended by the Governor's Air Quality Strategies Task Force. Based on past surveys and adopted control measures, current air quality planning utilizes the assumption that in 1996, 89.6 percent of the vehicles operating in the Maricopa County nonattainment areas participate in the Arizona Vehicle Inspection/Maintenance I/M Program. The remaining 10.4 percent are assumed not be tested due to their age or lack of registration in Maricopa County. This includes vehicles passing through the region or in the region for a brief period. This measure would use additional methods to increase the registration compliance of residents. Also, it would address compliance with I/M test requirements by commuters residing outside the nonattainment area or college students attending school in the nonattainment area.

A. Suggested Implementing Entity. Enhancements to the existing Vehicle Inspection/ Maintenance Program or vehicle registration requirements could be enacted by the Arizona Legislature. The program is administered by the Arizona Department of Environmental Quality. The Arizona Department of Transportation administers vehicle registration.

B. Cost. The current budget for operation and maintenance of the inspection/maintenance program is approximately $8 million. This includes a $4 million subsidy for the I/M 240 test which currently costs $24.30 per vehicle. The vehicle fee for testing is $10.00 for annual test and $20.00 for the biennial test. In a 1993 study for MAG, Sierra Research estimated a cost effectiveness of approximately $1,500 per ton of carbon monoxide reduced for a similar measure addressing nonresident testing.

C. Basis for Consideration. The vehicle I/M program for nonattainment areas within the state is established under Arizona Revised Statutes §36-1772. The program has been in effect within the Maricopa County Nonattainment Area since 1976. In addition, A.R.S. Title 49, Section 402-E as amended by S.B. 1430 in 1992 requires enhanced I/M programs to be considered in regional air quality plan revisions.

D. Benefits and Other Considerations. Enhanced enforcement of registration and emissions testing would bring more vehicles into the I/M program and reduce the noncompliance rate. The emission rate of vehicles added to the program would be reduced as a result of participating in the program, reducing overall emissions. Effectively identifying nonparticipants could be difficult and costly.

This measure was modeled by adjustment of the weighting between I/M and non-I/M emission factors from MOBILE5a. The motor vehicles division of ADOT estimates that 41,000 additional vehicles in Maricopa County will participate in the I/M program as a result of implementing the components of this measure.

The number of vehicles registered in Maricopa County is approximately two million. The inspection of an additional 41,000 vehicles would be an additional 1.8 percent of the vehicles being emissions tested. The number of vehicles which participate in the I/M program will be increased by 1.8 percent, changing the weighting ratio from 89.6/10.4 to 91.4/8.6.

Estimated Reduction in Total CO Emissions in 2000 0.4%

8. Vehicle Pollution Charge

Establishment of emissions fees was recommended by the Governor's Alternative Transportation Systems Task Force. This concept entails modification of the existing structure of motor vehicle registration charges by linking the fees to the results of the existing Vehicle Inspection/Maintenance Program. A base emissions fee would be charged for all vehicles at registration. In addition, an incrementally higher fee would be added depending upon how much the tailpipe emission of the individual vehicle exceed those of the average vehicle. This would encourage owners of older high-emitting vehicles to scrap their vehicles, while owners of newer vehicles would tend to affect repairs beyond those required by the current I/M program cost waivers. An alternative to emission-based registration fees would be to impose a tax on annual vehicle miles of travel (VMT). The individual tax would likely be determined through a vehicle odometer reading during annual emissions inspection. A VMT tax is an approach intended to discourage vehicle use by increasing operating cost.

A. Suggested Implementing Entity. The Arizona Legislature could impose an emission-based registration fee as an enhancement to the existing Vehicle Inspection/Maintenance Program. A tax on vehicle miles of travel would also require State Legislature approval.

B. Cost. In a 1993 report prepared for MAG by Sierra Research, the annual cost of a VMT tax was estimated at $1.13 million for 1995 and $1.6 million for 2005. To an average motorist, the one cent per mile charge would be equivalent to about a 20 cent per gallon increase in the price of gasoline.

The emission-based fee scenario could be revenue-neutral to the state; alternatively, higher fees could be set to generate revenue for other air quality programs. The costs of the modeled program $26.2 million in 1995 and $39.2 million in 2005, would be borne by persons who register or regularly operate a motor vehicle in the Maricopa County Nonattainment Area. In the Sierra report, the cost effectiveness of the VMT tax for carbon monoxide was estimated to be approximately $170 per ton and that for the emission-based fee was estimated to be $1,300 per ton.

C. Basis for Consideration. The federal Clean Air Act Amendments of 1990 allow moderate nonattainment areas to implement an enhanced inspection/maintenance program. An emissions-based vehicle registration program might be considered an enhanced form of the current I/M program.

D. Benefits and Other Considerations. An emissions-based registration fee program would effectively target gross-emitting vehicles, which produce a disproportionate share of the total on-road emissions inventory. The measure might be perceived as regressive, however, if it is found that a large proportion of lower-income people drive higher emitting vehicles. Similarly, VMT tax might adversely affect small businesses because commercial vehicles typically log more annual mileage than private vehicles.

This measure was modeled by modification of MOBILE5a input files. It is assumed that this measure would reduce the number of old vehicles in the Maricopa County area. These vehicles would be replaced with newer vehicles. Newer vehicles would be bought because the relative cost of registration fees for new vehicles decreases and the relative cost of old vehicles increases.

Estimated Reduction in Total CO Emissions in 2000 1.9%

9. Require Pre-1988 Heavy-Duty Diesel Commercial Vehicles Registered in the Nonattainment Area to Meet 1988 Federal Emission Standards

In 1996, S.B. 1002 was passed by the Arizona Legislature requiring that after January 1, 2004 all commercial Diesel vehicles operating in Area A that weigh more than 26,000 pounds and are registered in Area A must meet or surpass the 1988 federal emission standards unless they were built in or after 1988. This prohibition does not apply to vehicles subject to proportional registration. (ARS 49-542)

A. Suggested Implementing Entity. These requirements were enacted by the Arizona Legislature. The program is administered by the Arizona Department of Environmental Quality.

B. Cost. In a 1996 report prepared for MAG by Sierra Research, the cost differential between an engine overhaul and engine replacement for heavy duty Diesels was estimated to be $15,000 per vehicle.

C. Basis for Consideration. The vehicle I/M program for nonattainment areas within the state is established under Arizona Revised Statutes §36-1772. The program has been in effect within the Maricopa County Nonattainment Area since 1976. In addition, A.R.S. Title 49, Section 402-E as amended by S.B. 1430 in 1992 requires enhanced I/M programs to be considered in regional air quality plan revisions.

D. Benefits and Other Considerations. Replacing older, high-emitting engines with new engines will result in a net decrease in emissions. An added advantage associated with this program would be an increase in fuel economy.

To estimate the effect of incentives encouraging accelerated replacement by 2001, it was assumed that 15 percent of the pre-1988 heavy-duty Diesel commercial vehicles would be replaced with vehicles meeting 1988 emission standards. The registration distribution was adjusted to replace 15 percent of the pre-1988 heavy-duty Diesel vehicles with 1988 heavy-duty Diesel vehicles to provide a conservative estimate. This may have provided a conservative estimate of benefits, because some vehicles may be replaced with newer than 1988 model year vehicles.

Estimated Reduction in Total CO Emissions in 2000 less than 0.1%

10. Snap Acceleration Test for Heavy-Duty Diesel Vehicles

In 1996, S.B. 1002 was passed by the Arizona Legislature requiring that beginning March 1, 1997, medium and heavy-duty Diesel vehicles registered or re-registered in Area A that are more than 33 months beyond the initial date of registration, to take the snap acceleration test (SAE J1667). It also eliminates the restriction on ADEQ preventing the agency from adopting a snap acceleration test until the EPA adopts a rule for the test (ARS 49-542 and Section 54). The existing Arizona Vehicle Inspection/Maintenance (I/M) Program requires a “lug-down” test for heavy-duty Diesel trucks registered within the Maricopa County Nonattainment Area. The snap

acceleration test procedure is designed to measure the transient acceleration peak opacity level while the vehicle is stationary in neutral.

A. Suggested Implementing Entity. These enhancements to the existing Vehicle Inspection/Maintenance Program were enacted by the Arizona Legislature. The program is administered by the Arizona Department of Environmental Quality.

B. Cost. In the Draft Particulate Control Measure Feasibility Study prepared for MAG by Sierra Research in 1996, the annual cost for inspection and repairs associated with the snap idle test was estimated at $91 per vehicle in 2001.

C. Basis for Consideration. The vehicle I/M program for nonattainment areas within the state is established under Arizona Revised Statutes §36-1772. The program has been in effect within the Maricopa County Nonattainment Area since 1976. In addition, A.R.S. Title 49, Section 402-E as amended by S.B. 1430 in 1992 requires enhanced I/M programs to be considered in regional air quality plan revisions.

D. Benefits and Other Considerations. Enhanced testing procedures more accurately simulate vehicle emissions under actual driving conditions. They are therefore able to detect increased emissions which might not be present during simpler or less stringent testing. Enhanced inspection procedures promote more efficient vehicle operation. More extensive testing procedures add time and expense to the vehicle inspection process. This may discourage some truck owners and companies from testing and registering their vehicles.

This measure was not modeled. MOBILE5a does not estimate benefits from either a snap idle or a snap acceleration test.

CLEAN FUELS FOR CONVENTIONAL VEHICLES

11. Opt Into Federal Reformulated Fuel Program

Under the federal Clean Air Act Amendments of 1990, the use of reformulated gasoline is required in the nine most ozone-polluted metropolitan areas of the country. Reformulated gasoline meets strict standards for vapor pressure, oxygen content, and levels of various toxic substances. The Clean Air Act allows other less-polluted regions, such as the Maricopa Nonattainment Area, to opt into this reformulated fuels program, upon request by the Governor of the State. This

measure would require federal reformulated gasoline to be sold in the Maricopa Nonattainment Area year-round. Compliance surveys among gasoline refineries and distributors would be used to verify that the federal standards are being met.

A. Suggested Implementing Entity. A formal request from the governor to the U.S. Environmental protection Agency would be required to initiate the program.

B. Cost. All costs of a federal reformulated fuels program in Arizona would be borne by the consumers of vehicle fuels. In a 1996 report prepared for ADEQ by Math Pro Inc., the additional cost of federal reformulated gasoline was estimated at 7.4 cents per gallon for Phase I. A second phase of the Federal Reformulated Gasoline program is required under the Clean Air Act to begin in the year 2000. Math Pro estimated a cost of 9.3 cents per gallon for Phase II fuel.

C. Basis for Consideration. Under the federal Clean Air Act Amendments of 1990, regions with moderate ozone pollution problems may opt into the federal reformulated fuels program. This measure was recommended by the Governor's Air Quality Strategies Task Force.

D. Benefits and Other Considerations. An advantage of reformulated fuels is that they can be used in both new and old vehicles without prior engine modifications. Reduced emissions are therefore realized almost immediately after introducing the reformulated fuel.

Some modifications of petroleum refining facilities may be required in order to produce reformulated gasoline. These capital costs are ultimately passed on to the consumer in the form of higher retail gasoline prices.

The current Arizona requirements for oxygen content of winter fuels exceeds that of federal reformulated fuel.

The CO COMPLEX model provided an estimate of the benefits of different fuel formulations on CO emissions from gasoline-powered onroad vehicles. The Federal Reformulated Fuel (RFG) Phase 2 was examined assuming the same oxygen content as in the 2000 base case.

Estimated Reduction in Total CO Emissions in 2000	2.2%

12. California Phase 2 Fuel Specifications

Under the federal Clean Air Act Amendments of 1990, the use of reformulated gasoline is required in the most ozone-polluted metropolitan areas of the country. Because of its extreme nonattainment status, the State of California has adopted even stricter fuel standards than are required by federal law. California's Phase II fuel standards, implemented in 1996, set strict limits on vapor pressure, oxygen content, and levels of various toxic substances. The Clean Air Act allows other less-polluted regions, such as the Maricopa Nonattainment Area, to opt into this reformulated fuels program.

A. Suggested Implementing Entity. The California RFG program has standing in California, but not in other states. The "California RFG" would be simply a low-emission gasoline formulation. Arizona could adopt the California RFG formulation for ozone control in the Summer gasoline season by action of the Arizona Legislature.

B. Cost. All costs of a California Phase 2 fuels program in Arizona would be borne by the consumers of vehicle fuels. In a 1996 report prepared for ADEQ by Math Pro Inc., the additional cost of California Phase 2 gasoline was estimated at 17.3 cents per gallon.

C. Basis for Consideration. Under the federal Clean Air Act Amendments of 1990, regions with moderate ozone pollution problems may opt into the federal reformulated fuels program or adopt even more stringent fuel standards.

D. Benefits and Other Considerations. An advantage of reformulated fuels is that they can be used in both new and old vehicles without prior engine modifications. Reduced emissions are therefore realized almost immediately after introducing the reformulated fuel.

Some modifications of petroleum refining facilities may be required in order to produce reformulated gasoline. These capital costs are ultimately passed on to the consumer in the form of higher retail gasoline prices.

The current Arizona requirements for oxygen content of winter fuels exceeds that of federal reformulated fuel.

The CO COMPLEX model provided an estimate of the benefits of different fuel formulations on CO emissions from gasoline-powered onroad vehicles. CARB Phase 2 fuel was examined assuming the same oxygen content as in the 2000 base case.

Estimated Reduction in Total CO Emissions in 2000	6.6%

13. Performance-Based Standard for Motor Vehicle Fuel

As an alternative to specifying a specific type of reformulated fuel (e.g. Federal Reformulated Gasoline or California Reformulated Gasoline), the State of Arizona could establish performance-based standards which allow refiners the flexibility to provide any type of reformulated gasoline that accomplishes an overall emissions reduction target. This approach has been recommended by the Fuels Subcommittee of the Governor's Air Quality Strategies Task Force for consideration by the Legislature, with respect to selection of summertime fuel requirements to address ozone pollution. If implemented only during summer time for ozone, this measure would have no impact on winter carbon monoxide emissions, and minimal impacts on particulate matter.

Potentially, the same approach could be used in establishing performance based standards for carbon monoxide emission reductions in winter. It is important to note that the Governor's Air Quality Strategies Task Force recommended that the Arizona Department of Environmental Quality study the feasibility of providing cleaner burning gasoline during the wintertime.

A. Suggested Implementing Entity. The State of Arizona is responsible for establishing performance specifications for motor vehicle fuel. Ordinarily, fuel specifications are established by State legislation, but the Clean Air Act enables States to opt into the Federal Reformulated Fuel program by a letter from the Governor. Monitoring of fuel composition is the responsibility of the Arizona Department of Weights and Measures.

B. Cost. The increased production costs associated with reformulated fuels is generally passed along to consumers to the extent that market competition will allow. More than one billion gallons of gasoline are sold in Maricopa County annually, so each one-cent increase in the price at the pump costs consumers $10 million per year. Additionally, specification of performance based standards may result in additional costs to the state for testing of fuel samples to monitor compliance.

C. Basis for Consideration. This approach is based on the ozone-specific measure recommended by the Governor's Air Quality Strategies Task Force.

D. Benefits and Other Considerations. Specifying a performance based fuel program could provide for greater competition than other approaches. The flexibility allowed to the refiners may also help to minimize the additional costs of reformulated fuel. For example, the Governor's Task Force report estimated that a ten percent reduction standard for volatile organic

compounds would result in a production cost of 4.6 cents per gallon. This cost was estimated to be less than the additional costs of specifying either Federal or California Reformulated Fuel requirements.

14. Tighter Limits on Sulphur Content in Gasoline

Exhaust carbon monoxide emission are affected by fuel oxygen, sulphur content, RVP, distillation characteristics, and olefins. Sulphur influences carbon monoxide emissions due to its effect on catalyst function, with lower sulphur levels resulting in better catalyst performance. Statistical work done by EPA on summer emissions data has resulted in a CO exhaust model similar to the complex model for VOC's and NO_x. The model is described as a first attempt to relate fuel parameters to exhaust CO emissions from gasoline light-duty vehicles and is noted as having a number of limitations. These limitations include: (1) The model is valid only for 1990 technology vehicles. Thus, emission effects predicted by this model cannot be used to assess earlier than 1990 technology nor for post-1990 technology vehicles. (2) The model is based on summer emissions data and thus cannot be used directly to predict winter emission effects since it is possible that some of the emission effects seen with the summer data may not be representative of what actually occurs during cooler ambient temperatures. (3) The model is based on emissions data collected at sea-level. (4) Due to the complex nature of the database, is difficult to estimate uncertainty (or compute confidence intervals) in model predictions.

A. Suggested Implementing Entity. Arizona could adopt revised fuel formulations for carbon monoxide control. This action would be accomplished by the Arizona Legislature.

B. Cost. Modifications of petroleum refining facilities may be required in order to produce reformulated fuel. These capital costs are ultimately passed on to the consumer in the form of higher retail prices.

C. Basis for Consideration. An advantage of reformulated fuels is that they can be used in both new and old vehicles without prior engine modifications. Reduced emissions are therefore realized almost immediately after introducing the reformulated fuel.

D. Benefits and Other Considerations. The CO COMPLEX provides an estimate of the benefits of different fuel formulations on CO emissions from gasoline-powered onroad vehicles. This measure considers the use of a low sulphur fuel formulation. The Federal Reformulated Fuel (RFG) Phase 2 was

examined assuming the sulphur content was reduced from 130 parts per million to 30 parts per million.

Estimated Reduction in Total CO Emissions in 2000 5.3%

15. Use of Clean Fuels on a Statewide Basis

Currently, the wintertime mandatory oxygenated fuels applies only to gasoline purchases within the Maricopa County Nonattainment Area. This measure would expand the oxygenated fuels program statewide during the carbon monoxide season, October 1 to March 31. This would decrease the vehicle emissions of motorists entering the Maricopa County Nonattainment Area using fuel purchased elsewhere in the state.

A. Suggested Implementing Entity. State of Arizona air quality legislation passed in 1988 established the mandatory oxygenated fuels program for the Maricopa County Nonattainment Area. The program was strengthened by action of the state legislature in 1991 and 1993. Further increases in the scope or stringency of the program would likely come through state legislation.

B. Cost. The purchase of oxygenating compounds (ethanol or MTBE) and blending with conventional gasoline to achieve the required oxygen content represents an additional cost to gasoline suppliers. These costs are subsequently passed on to the consumer and manifested as a two to ten cent increase in the per-gallon cost of oxygenated over conventional gasoline.

C. Basis for Consideration. Arizona air quality legislation passed in 1988 (H.B. 2206) established the mandatory oxygenated fuels program for the Maricopa County Nonattainment Area. The program was strengthened by action of the state legislature in 1991 and 1993.

D. Benefits and Other Considerations. When applied to all motorists within the Maricopa County area, this measure represents a means of achieving a substantial decrease in pollutant emissions at a relatively low cost to both producers and consumers. However, motorists from outside the nonattainment area represent a relatively small contribution to regional pollutant emissions. In addition, the distances between most population centers in Arizona is large, meaning that most outside travelers will be unable to venture far into the Maricopa County Nonattainment Area without refueling.

The estimated emissions impact of this measure were evaluated by the U.S. Environmental Protection Agency during the preparation of the 1991 Federal Implementation Plan for the Maricopa County Nonattainment Area. This analysis concluded that the benefits of this measure would be negligible; therefore, this measure was not modeled.

16. Measures to Encourage the Construction and Operation of Fueling Stations for Alternative Fuel Vehicles

This measure was recommended by the Governor's Air Quality Strategies Task Force. The measure is aimed at encouraging the development of a fueling infrastructure for alternative fuels. Through actions of the Arizona Legislature, the goal would be to develop an alternative fueling network for public/governmental agencies through a statewide credit/debit fuel card system. Also, provisions would be made to encourage private sector development of alternative fueling stations through fuel tax credits.

A. Suggested Implementing Entity. This measure would be implemented through action of the Arizona Legislature.

B. Cost. The development of alternative fueling sites would require private investment. The impacts of tax credits on state fuel revenue funds would require thorough assessment prior to legislative action. In a 1993 report for MAG prepared by Sierra Research, the cost effectiveness of alternative fuel fleets was estimated to be approximately $5,000 per ton of carbon monoxide reduced.

C. Basis for Consideration. One of the significant impediments to increased use of alternative fuel vehicles is the lack of availability of fueling stations. To address this deficiency, actions to authorize and promote a fueling infrastructure for alternate fuels would be beneficial.

D. Benefits and Other Considerations. The Governor's Air Quality Strategies Task Force report of 1996 indicated that according to a 1993 study by ADEQ, each vehicle converted to compressed natural gas in the State Fleet experienced a greater than 50% reduction in CO, VOCs, and HAP emissions. The Clean Fleet Vehicle Emissions Statistical Analysis Report #6, June 1996, shows about a 70% decrease in CO emissions compared to a gasoline-powered control group. The actual impact of this measure on air quality would be evaluated by measuring the actual gallon equivalents of alternative fuels sold.

This measure was not modeled. Emission credits for alternative fuel vehicles are a function of the miles traveled by the vehicles themselves rather than the number of fueling stations. While greater availability of fueling stations will encourage alternative fuel use, data is not available to quantify any relationship. Although no credit was identified for this measure, it would result in some future emission reduction.

17. California Reformulated Diesel Fuel or Other Clean Diesel Fuel

The majority of the Diesel fuel currently used in Maricopa County is Diesel #2, because of its lower cost and better fuel economy. This measure could require the use of Diesel #1 in Maricopa County. Diesel #1 is generally used in cold-weather areas because of its lower viscosity; however, it may also be used in warm climates. Because, on average, Diesel #1 has a lower aromatic content and a slightly lower sulfur content, PM-10 emissions are reduced relative to Diesel #2. However, the American Society for Testing Materials (ASTM) specifications for Diesel #1 do not guarantee that sulfur and aromatics will be lower than Diesel #2. The ASTM specifications for Diesel #1 and Diesel #2 differ for flash point, 90 percent distillation temperature, 10 percent distillation residue, and viscosity.

An alternative to Diesel #1 is CARB "clean" Diesel, which was required in California beginning in the fall of 1993. The regulation requiring "clean" Diesel specifies and aromatic content of 10 percent (for large refiners) and a sulfur content of 0.05 percent. However, refiners can use alternative formulations if they can demonstrate that the same emission reductions achieved with their formulation.

A. Suggested Implementing Entity. The Arizona Legislature could require the use of Diesel #1 fuel or CARB "clean" Diesel for Diesel-powered vehicles in Maricopa County.

B. Cost. Based on data published by the Department of Energy, the national average cost differential between Diesel #1 and Diesel #2 is approximately $0.10 per gallon, with Diesel #1 being more expensive than Diesel #2. The differential for CARB "Clean" Diesel has been estimated by CARB to be $0.06 per gallon relative to conventional Diesel #2.

C. Basis for Consideration. The use of Diesel #1 or CARB "clean" Diesel will reduce tailpipe PM-10 emissions from Diesel Vehicles. Arizona Revised Statutes Section 49-571, passed in 1992, requires newly purchased transit vehicles used in the MAG region to operate on clean-burning alternative fuels, which includes reformulated Diesel and gasoline.

D. Benefits and Other Considerations. While the use of Diesel #1 or CARB "clean" Diesel is more expensive than the use of Diesel #2, it should be somewhat effective in reducing PM-10 emissions. The cost differential between Diesel #2 and Diesel #1 or CARB "clean" Diesel would be approximately $0.06 to $0.10 per gallon.

One drawback to requiring CARB "clean" Diesel is the controversy likely to surround its introduction due to problems encountered during the initial California introduction in 1993. It is possible that these problems, which were linked to hydroprocessing to reduce aromatics and sulfur, could also occur with the introduction of Diesel #1. In addition, it is unclear that there is an adequate supply of CARB Diesel for the Arizona market.

A MOBILE5a run was performed which estimated the percent of diesel emissions from pre-1991 vehicles. The portion of diesel emissions which come from pre-1991 diesel vehicles was reduced by five percent. This reduction was applied to the CO onroad mobile emissions total by post-processing.

Estimated Reduction in Total CO Emissions in 2000 less than 0.1%

18. Limit Sulphur Content of Diesel Fuel Oil to 500 Parts Per Million (ppm)

The regulation of Diesel fuel to control emissions of air pollutants began on October 1, 1993. On that date, federal regulations required that Diesel fuel sold throughout the contiguous U.S., have a maximum sulphur content of 0.05 percent by weight (500 ppm). Regulation of Diesel fuel has been done primarily as a means of controlling emissions of particulate matter (PM) and nitrogen oxides (NO_x). Sulphur content was reduced from an average of about 0.25 percent to 0.05 percent to reduce the emissions of sulfate aerosol (a type of particle) and to enable the use of catalytic converters to meet the 1994 PM standard for heavy-duty Diesel engines. If the sulphur content of the fuel were not reduced, the effectiveness of the catalytic converters would be compromised.

A. Suggested Implementing Entity. In 1996, S.B. 1002 prohibited the sale of certain grades of Diesel fuel oil that contain sulphur in excess of 500 parts per million for use in Area A. This prohibition includes Diesel fuel grades 1, 2 or 4 as defined by ASTM D-975. (ARS 41-2083)

B. Cost. Modifications of petroleum refining facilities may be required in order to produce reformulated fuel. These capital costs are ultimately passed on to the consumer in the form of higher retail prices.

C. Basis for Consideration. An advantage of reformulated fuels is that they can be used in both new and old vehicles without prior engine modifications. Reduced emissions are therefore realized almost immediately after introducing the reformulated fuel.

D. Benefits and Other Considerations. This measure was not modeled. A November 22, 1994 EPA frequently asked questions document states "At the time that MOBILE5 was being prepared, EPA had determined that the effect of the rulemaking to lower the sulphur content of diesel fuel would have a negligible effect on the exhaust emissions of hydrocarbons (HC), carbon monoxide (CO) and oxides of nitrogen (NOx). As a result, there is no effect calculated in the MOBILE5 model from the use of lower sulphur levels for diesel fuel."

CLEANER VEHICLE TECHNOLOGIES

19. Adoption of the California Low-Emission Vehicle Program

Due to its unique atmospheric conditions and air quality problems, the State of California is authorized under the Clean Air Act Amendments of 1990 to adopt tailpipe emissions standards even more stringent than the national standards established under the act. Other states are allowed to adopt the stricter California emissions standards.

The California Low-Emission Vehicle Program establishes tailpipe emissions standards for a series of vehicle classes ranging from Transitional Low-Emission Vehicles (TLEVs) to Zero-Emission Vehicles (ZEVs). The program allows manufactures to use any combination of emission control technology and alternative fuels to meet the standards. This approach provides flexibility and encourages cooperation among the fuel and automotive industries in meeting air quality standards.

A. Suggested Implementing Entity. Adoption of the California Low-Emission Vehicle Program would require action by the Arizona Legislature. The program could be adopted exclusively within nonattainment areas, but would be more effective if applied statewide.

B. Cost. The increase in vehicle cost associated with meeting low-emission vehicle standards depends on the type of vehicle and has been the subject of debate. Estimates range from $170 to over $1,000 per vehicle. Costs to all Maricopa County residents in 2005 for a statewide low-emission vehicle program have been estimated at $50 million to $250 million, including the

cost of federal reformulated and California Phase II gasoline. These data were provided by Sierra Research in its June 1993 report to MAG on the feasibility and cost-effectiveness of transportation control measures. In this report, cost effectiveness for carbon monoxide was estimated to be approximately $9,200 per ton reduced.

C. Basis for Consideration. Under the federal Clean Air Act Amendments of 1990, states other than California are allowed to adopt the stricter California emissions standards and low-emission vehicle program.

D. Benefits and Other Considerations. Introduction of stricter emissions standards for new vehicles promises continuing air quality improvements as older vehicles are retired and replaced with the new vehicles. However, meeting the more stringent standards could result in vehicle manufacturers raising prices.

MOBILE5a has the ability to model the effect of the California Low Emission Vehicle (LEV) Program internally. Two scenarios were examined: statewide adoption of the program and adoption only in Maricopa County.

Estimated Reduction in Total CO Emissions in 2000	3.5% (Statewide)
	1.3% (Countywide)

20. Voluntary Gasoline Vehicle Retirement Programs, Including Enhanced Notification for Older Vehicles and in High Pollution Areas

This measure would institute a program to purchase and scrap vehicles which produce excessive emissions, particularly pre-1980 model year light duty automobiles and trucks. A vehicle scrappage program might be implemented as an enhancement to the existing inspection/maintenance program; this would involve scrapping vehicles which fail the emissions test and require repairs more costly than the waiver limit. This measure might also be implemented as a separate, stand-alone program available to all owners of older vehicles. The number of vehicles offered for sale and eventually retired would depend upon the bounty price and program budget limitations. In administering the program, particular emphasis would be placed on developing an effective public information program.

A. Suggested Implementing Entity. A vehicle scrappage program, whether enacted in a stand-alone fashion or as an enhancement to the existing vehicle inspection/maintenance program, would be implemented by action of the Arizona Legislature.

B. Cost. In a 1993 report for MAG prepared by Sierra Research, the administrative cost of a scrappage program was estimated at $100 per vehicle. It was also estimated that a program offering a $450 bounty would cost $11.4 million the first year, increasing to $12.7 million by 2005. In the 1993 study, the cost effectiveness for carbon monoxide was estimated to be approximately $3,000 per ton.

C. Basis for Consideration. Section 108(f) of the federal Clean Air Act lists voluntary removal of older cars from the fleet as a measure for possible consideration in air clean-up plans. In addition, a voluntary vehicle retirement program has been recommended by the Governor's Air Quality Strategies Task Force.

D. Benefits and Other Considerations. A vehicle scrappage program would effectively target older, gross-emitting vehicles which produce a disproportionate share of the total on-road emissions inventory. The most important enforcement issue is to ensure that vehicles purchased under the program are, in fact, permanently removed from service. Other enforcement requirements include a means of ensuring that the vehicles being purchased are operable and actually registered in the program area. Steps would also need to be taken to minimize the importation of older vehicles from other areas for sale as replacement vehicles.

This measure was modeled by modification of MOBILE5a input files. The measure calls for the purchase and retirement of light duty vehicles and trucks which fail the emissions test and require repairs that exceed the waiver limit. It is estimated that 3,562 vehicles would be retired in 1998, 3,696 in 1999, and 3,830 vehicles in 2000. Assuming that a waived vehicle has an average life of three years, the registration distribution input to MOBILE5a would be adjusted to reflect the retirement of 11,088 pre-1980 model year vehicles by the end of 2000. The vehicles would be replaced by model year 1981 and newer vehicles. It is assumed that this program would not affect the total amount of VMT in the region.

Estimated Reduction in Total CO Emissions in 2000 0.3%

21. Voluntary Diesel Vehicle Retirement

This measure would institute a program to purchase and scrap heavy-duty Diesel vehicles. This measure is focused on the heavier weight classes because they have the highest emissions rates and are driven the most. A vehicle scrappage program could be implemented as an enhancement to the existing inspection/maintenance

program; this would involve scrapping vehicles that fail the emissions test and require repairs more costly than the waiver limit. This measure could also be implemented as a separate, stand-alone program available to all owners of older heavy-duty Diesel vehicles. The analysis performed for this study assumed a bounty (plus administration fee) of $10,000 for each scrapped vehicle. Only pre-1991 model year vehicles were subject to the scrappage program. Finally, the program was assumed to begin in 1999 and run through the end of 2001.

A. Suggested Implementing Entity. A vehicle scrappage program, whether enacted in a stand-alone fashion or as an enhancement to the existing vehicle inspection/maintenance program, could be implemented by action of the Arizona Legislature.

B. Cost. In the Draft Particulate Control Measure Feasibility Study prepared for MAG by Sierra Research in 1996, it was assumed that each scrapped heavy-duty Diesel vehicle would cost $10,000 in bounty plus administrative fees. This cost estimate has been used in previous studies of heavy-duty Diesel vehicle scrappage programs.

C. Basis for Consideration. Removing older, high-emitting heavy-duty Diesel vehicles from service would result in a net decrease in emissions.

D. Benefits and Other Considerations. A vehicle scrappage program would effectively target older, high-emitting heavy-duty Diesel vehicles, which produce a disproportionate share of the total on-road emissions inventory. Because of the logistics involved in shipping vehicles to scrap yards and ensuring they are permanently removed from service, administration of a large scrappage program may prove cumbersome. It has been suggested that scrapped vehicles cold be sold overseas, thereby reducing the total cost of the program.

This measure was modeled by modification of MOBILE5a input files. It was assumed that 15 percent of the pre-1991 heavy-duty diesel vehicles would be replaced with 1991 heavy-duty diesel vehicles. The registration distribution was adjusted to replace 15 percent of the pre-1991 heavy-duty diesel vehicles with 1991 heavy-duty diesel vehicles to provide a conservative estimate. This provides a conservative estimate of benefits, because some vehicles are likely to be replaced with newer than 1991 model year vehicles.

Estimated Reduction in Total CO Emissions in 2000 less than 0.1%

22. Heavy-Duty Diesel Engine Replacement or Overhaul at Recommended Intervals

Heavy-duty Diesel engines are typically overhauled several times before being scrapped. This measure would offer incentives to heavy-duty Diesel vehicle owners to replace the existing engine with a new (i.e., 1994 or later model year) engine at the time of overhaul. The focus of this measure is on pre-1991 model year heavy-duty Diesel trucks, since 1991 and subsequent model year vehicles were certified to more stringent PM emission standards and the benefit of engine replacement is diminished. The cost-effectiveness estimate assumes that the program begins in 1999 and runs through the end of 2001.

A. Suggested Implementing Entity. An engine replacement program, whether enacted in a stand alone fashion or as an enhancement to the existing vehicle inspection/maintenance program, could be implemented by action of the Arizona Legislature.

B. Cost. In the Draft Particulate Control Measure Feasibility Study prepared for MAG by Sierra Research in 1996, the cost differential between an engine overhaul and a new engine was estimated to be approximately $14,750. For this analysis, an administrative fee of $250 was assumed for each engine replaced.

C. Basis for Consideration. Replacing older, high-emitting engines with new engines will result in a net decrease in emissions. An added advantage associated with this program would be an increase in fuel economy.

D. Benefits and Other Considerations. This program would reduce emissions at a moderate cost-effectiveness ratio. Because the engine replacement would occur at a standard overhaul period, unexpected loss of use of the vehicle would not occur. Additionally, the cost of the new engine would be partially offset by the amount normally spent on an engine overhaul.

This measure was modeled by modification of MOBILE5a input files. It was assumed that 15 percent of the pre-1991 heavy-duty diesel vehicles (engines) would be replaced with 1994 heavy-duty diesel vehicles (engines). The registration distribution was adjusted to replace 15 percent of the pre-1991 heavy-duty diesel vehicles (engines) with 1994 heavy-duty diesel vehicles (engines) to provide a conservative estimate. This provides a conservative estimate of benefits, as some engines are likely to be replaced with newer than 1994 model year engines.

Estimated Reduction in Total CO Emissions in 2000 less than 0.1%

23. Retrofit Existing Diesel Vehicles -- e.g., with Oxidation Catalyst

This measure would involve the use of emission control devices on Diesel-powered vehicles. In existing vehicles, the installation of particulate traps or related devices could be encouraged at the time of engine overhaul. Pre-1991 model years could be targeted. A related measure addressing only government-owned vehicles, a recommended by the Governor's Air Quality Strategies Task Force, would instead target model years 1993 and older.

A. Suggested Implementing Entity. A required retrofit program, whether enacted in a stand alone fashion or as an enhancement to the existing vehicle inspection/maintenance program, could be implemented by action of the Arizona Legislature.

B. Cost. In its urban bus retrofit rule, EPA has estimated the cost of a catalyst system capable of decreasing PM emissions by 25 percent to be as much as $2,000. These costs are for systems designed for use in transit buses, which are already subject to the above-referenced retrofit rule.

C. Basis for Consideration. Retrofitting older, high-emitting engines with catalysts would result in a net decrease in emissions.

D. Benefits and Other Considerations. This program would reduce emissions at a moderate cost-effectiveness ratio. Equipment for the general heavy-duty Diesel population may be subject to deterioration and tampering at a higher rate than in public transit fleets.

This measure was modeled by assuming that oxidation catalysts are as effective on diesel vehicles as they are on gasoline vehicles. It was estimated that 15 percent of the pre-1991 diesel vehicles would be retrofitted with oxidation catalysts. The effect of the reduction in emissions from heavy-duty diesel vehicles on the onroad mobile fleet was estimated.

Estimated Reduction in Total CO Emissions in 2000 less than 0.1%

REDUCED VEHICLE USE AND TRAFFIC CONGESTION

24. Mass Transit Alternatives

This measure is envisioned as a major change to the scope and service levels offered by the existing public transit system in the region. Small or moderate incremental improvements to the existing regional transit system would be considered as strengthening of an existing measure ("Expansion of Public Transportation Systems") previously adopted as part of MAG air quality plans. Discussion of the specific light rail transit scenario described below is not intended to rule out alternative technologies or different sized systems. It is important to note that the current Long Range Transportation Plan for the region calls for a doubling of the regional bus system after the year 2005, based on the assumption that a funding mechanism will be available. As a short-term measure, the Governor's Alternative Transportation Task Force has recommended a Bus and Dial-A-Ride Moderate Option, representing an approximately 50 percent increase in existing bus service.

The November 15, 1996 report of the Governor's Alternative Transportation System Task Force recommended pursuit of a 20-mile light rail transit system. The report notes that a Major Investment Study (MIS), currently underway for the City of Phoenix and the East Valley communities, is beginning to evaluate the potential for fixed-guideway transit along the corridor linking central Phoenix, downtown Tempe, and downtown Mesa. The study will also look at the potential for fixed-guideway transit to serve the Scottsdale resort corridor and downtown Tempe.

A. Suggested Implementing Entity. This measure could be implemented by the local governments which are currently involved in the Major Investment Studies, with coordination through the Regional Public Transportation Authority. A critical factor to implementing the system is the need for a funding source, which could be provided through action of the Arizona Legislature.

B. Cost. The capital cost of development for the light rail system described above was estimated to be between $300 million and $600 million, and the annual operating cost was estimated to be approximately $15 million. The Governor's Alternative Transportation System Task Force recommended that the State allocate $10 million "to assist municipalities in furthering ongoing efforts, future studies, and the potential design and construction of an initial fixed-guideway transit segment."

C. Basis for Consideration. Consideration of "mass transit alternatives" as part of air quality plan development is required under Arizona law (A.R.S. 49-402E). Section 108(f) of the Clean Air Act identifies "programs for improved public transit" as a transportation control measure for consideration. The November 15, 1996 report of the Governor's Alternative Transportation System Task Force recommended pursuit of a 20-mile light rail transit system.

D. Benefits and Other Considerations. This measure was not modeled.

25. High Occupancy Vehicle Lane Pricing

According to the November 1996 report of the Governor's Alternative Transportation System Task Force, the pricing of High Occupancy Vehicle (HOV) lanes for peak hour use by non-HOVs offers a mechanism for taking advantage of underused roadway capacity. This concept would result in higher overall average speeds in the general traffic lanes, which would produce a reduction in air pollution. Precautions would be needed to ensure that HOVs retain priority and that smooth traffic flow be maintained in the HOV lanes.

This measure is directed at improving the efficiency of general freeway lanes and using more effectively the capacity of the existing HOV lane system. The HOV lane system would be converted to operate as a joint use facility, with HOVs sharing the lanes with "authorized vehicles". The measure would involve the granting of permits to vehicles that do not qualify as HOVs to use the lanes and automatically be charged a toll or fee.

The simplest manner of implementing this concept is to issue permits on a monthly or annual basis. The permits would be displayed prominently in the vehicle for enforcement purposes. Extra funding may be necessary to ensure an adequate level of enforcement and minimize violations.

In its ultimate form, this measure would involve the installation of Electronic Toll and Traffic Management technology. The tolling system would include equipment to read on-board transponders ("smart cards") as the vehicle passes by various check points. Billing can be arranged on a pre-paid debit basis or on a credit card basis. The traffic management element of the system would involve lane surveillance, operating controls and motorist information systems related to those currently in use in the existing Freeway Management System.

A. Suggested Implementing Entity. This measure could be required by the Arizona Legislature, and would be implemented by the Arizona Department of Transportation.

B. Cost. This measure would be expected to generate revenues from non-HOV users of the lane pricing facility. Nevertheless, the costs of construction, system operation and enforcement may be substantial. The estimated total annual public cost of this program was estimated at approximately $6.5 million in the November 15, 1996 Final Report of the Governor's Alternative Transportation System Task Force.

C. Basis for Consideration. This approach was recommended as a short-term improvement measure by the Alternative Transportation System Task Force in 1996.

D. Benefits and Other Considerations. Based on data in the Final Report of the Governor's Alternative Transportation System Task Force, November 1996, it was assumed that a change in freeway speed from 23.9 mph to 33.3 mph on non-HOV lanes adjacent to HOV lanes during the two hour peak commute period occurred as a result of HOV lane pricing. Also, from the same source, a change in HOV lane speed from 50.1 mph to 47.5 mph was used. The emission rate change was applied to VMT levels forecasted to occur in 2000 on the corresponding facility type (i.e., HOV and adjacent non-HOV) to estimate the change in CO emissions.

Estimated Reduction in Total CO Emissions in 2000	0.8%

26. Fuel Tax Increase

The following description is provided in the November 15, 1996 Final Report of the Governor's Alternative Transportation Task Force:

> An increase in the existing per-gallon gas tax could be instituted. This tax would be viewed as a direct increase in the cost of vehicle operations, designed to stimulate a reduction in travel. Viewed as user fees, the revenue from the tax would be applied to the costs of the construction, maintenance and operation of travel network improvements, including actions to decrease air pollution. It is expected that a significant increase in the at-the-pump price of gasoline ($1.00 or more) would induce some travelers to combine or reduce trips, use public transit, or buy more fuel-efficient cars that are also less polluting. It is important to note that the Arizona State Constitution prohibits the use of fuel tax proceeds for the development or operations of public transit.

The Report indicates that this measure would, "in effect, create a 'user fee' for vehicles operating in Maricopa County." This implies that the tax increase would apply in a limited area (e.g. Maricopa County), rather than statewide.

A. Suggested Implementing Entity. This measure could be required by the Arizona Legislature. Enactment of a tax increase requires a two-thirds majority vote in the Legislature.

B. Cost. Tax records from the Arizona Department of Transportation indicate that a daily average of approximately 300,000 gallons of gasoline are sold in Maricopa County. This amounts to nearly one million gallons monthly, or more than one billion gallons per year. A tax of twenty cents per gallon (equal to a penny per mile, for an average vehicle) would generate up to $200 million annually. An individual driving 15,000 miles annually in a vehicle achieving 20 miles per gallon would buy 750 gallons and pay $150 over the course of the year, in addition to existing taxes.

C. Basis for Consideration. This measure was considered, but ***not*** recommended, by the Governor's Alternative Transportation System Task Force. It is not an option required for evaluation under federal or state law.

D. Benefits and Other Considerations. This measure was not modeled. According to the 1996 Governor's Alternative Transportation System Task Force report (page 5-2), a fuel tax increase is considered to rank low in public acceptance, community impact, and mobility impacts, medium with regard to air quality benefits, and high in regard to implementation requirements. The report notes that a fuel tax increase would be a heavy burden on low-income households.

27. Develop Intelligent Transportation Systems

The term "Intelligent Transportation Systems" includes a variety of technological applications intended to produce more efficient use of existing transportation corridors. The primary application currently implemented in the Maricopa County area is the Freeway Management System (FMS) operated by the Arizona Department of Transportation. The FMS combines the use of in-road sensors, surveillance cameras, ramp metering controls, and variable message signs to detect and respond to freeway incidents. The system is managed from the ADOT Traffic Operations Center located on Durango Street just west of Interstate 17. In October 1996, the U.S. Department of Transportation awarded to Arizona a $7.5 million grant to provide for Intelligent Transportation Systems technology. The grant requires local public and private sector funds to match every federal dollar. The federal funds will be used as follows:

Approximately $2 million will be used to implement an advanced traveler information system, which will expand on the existing use of variable freeway message signs and the ADOT Internet page (of real-time freeway camera views) and set up kiosks showing up-to-date travel information at shopping centers, bus terminals, and the airport.

Approximately $1.8 million will be used to standardize and link traffic signal synchronization systems used by the state and seven cities, including Phoenix, Tempe, Scottsdale, Glendale, and Mesa.

Approximately $1.7 million will be used to install cameras and sensors (as currently used on freeways) onto seven of the busiest streets in the Valley. This improvement will help traffic flow, especially during special events.

Approximately $700,000 will be used to install automatic vehicle locators on buses.

Approximately $100,000 will be used for public outreach and education to facilitate public understanding and use of the technology.

A. Suggested Implementing Entity. The consortium which will implement the ITS grant program as described above consists of the Arizona Department of Transportation, Maricopa County Department of Transportation, local municipalities, and private sector partners.

B. Cost. The $7.5 million federal grant will be matched with at least $7.5 million in public and private funds to yield a total project cost of $15 million or more.

C. Basis for Consideration. Section 108(f) of the Clean Air Act identifies a list of 16 transportation control measures for consideration by Federal, State, and local agencies. One of the 16 listed TCMs is “traffic flow improvement programs that achieve emission reductions.” In addition, Arizona statutes (ARS 49-402) require the regional planning agency to consider 24 specific measures including “optimizing freeway ramp metering” and “coordinating traffic signal systems.”

D. Benefits and Other Considerations. The national initiative to implement Intelligent Transportation Systems is called “Operation Timesaver.” It has the goal of reducing traffic congestion by at least 15 percent in 75 of the largest U.S. metropolitan areas over the next ten years. Improved traffic flow reduces the idling emissions and unnecessary fuel consumption which result from traffic congestion. In addition, improved incident response times will benefit injured motorists through faster provision of emergency care.

In the Final Report of the Governor's Alternative Transportation System Task Force, November 1996, a CO reduction per incident per day per arterial that would be achieved with an expanded ITS in place was estimated. This methodology was adjusted to reflect year 2000 wintertime CO emission rates in the MAG area, yielding 114 kg/incident. To develop a regional total emission reduction, the adjusted rate per incident was applied to a daily incident rate of 39.9 per day as estimated in the Task Force Report.

Estimated Reduction in Total CO Emissions in 2000 0.7%

28. Special Event Controls

Studies have shown that special events and activity centers can result in adverse air quality impacts. Special events typically generate a substantial amount of localized traffic congestion that contributes additional emissions from idling vehicles. Typically special events occur at stadiums, auditoriums, amphitheaters, performance arts centers, and outdoor concert centers.

This measure would require new and existing owners/operators of the special event centers to reduce mobile source emissions generated by their events. A list of optional strategies would be available that reduce mobile source emissions. The definition of "special event center" would be developed through the rule development process.

A recent study conducted at stadiums across the nation analyzed the mode split at special events and the impacts on air quality. The study conducted from Denver, Colorado illustrates that inadequate circulation around a special event center can cause congestion on the surrounding roadway networks, adversely affecting air quality in the region, as well as in the immediate area. The study found that a Denver Broncos football game attended by 75,000 people on a Sunday can generate automobile traffic that emits over 4 tons of CO and over 800 pounds of HC within a one-mile area of the stadium.

The Denver study also suggests that transit mode share can have a large impact on air quality. According to the study, if 5% of the 75,000 people used transit, 1,300 fewer automobiles would travel to the event. The study suggests that transit priority measures should be in place, such as bus-only lanes on approaches to the center, and close-in bus parking (or a transit stop) at the center.

The recent National Football League Super Bowl event in Tempe is a good example of how transit can reduce numbers of individual automobiles. The transit companies

brought into the area about 1,000 buses to improve the traffic congestion problems associated with the event.

A. Suggested Implementing Entity. Maricopa County or the Arizona Department of Environmental Quality as an indirect source rule.

B. Cost. To be determined based on strategies selected.

C. Basis for Consideration. Section 108(f) of the Clean Air Act identifies programs and ordinances to reduce the need for single-occupant vehicle travel, especially at shopping centers, special events and other activity centers, as a transportation control measure for consideration in air quality plans.

D. Benefits and Other Considerations. Southern California targets a 12.5% reduction in vehicle trips to the special event centers or equivalent mobile source emissions.

This measure was not modeled. Base case modeling assumes typical CO season exceedance conditions, and does not consider special events. A change in the control of special events would have no effect on modeling, although it would produce emission reductions on specific event days.

REDUCED EMISSIONS FROM NON-ROAD EQUIPMENT

29. Voluntary Retirement Program for Gasoline-Powered Lawn and Garden Equipment

According to the South Coast Air Quality Management District, some older lawn mowers are bigger polluters than the family car. A dirty mower operated for 20 hours a year produces the same amount of ozone-forming volatile organic compounds as a 1996 passenger car driven for 26,000 miles.

The South Coast Air Quality District has adopted Rule 1623 which allows businesses to earn emission reduction credits by voluntarily replacing high-emitting lawn and garden equipment with zero-emitting models. The lawn-equipment scrappage program is modeled after the vehicle scrapping program which has taken more than 7,000 highly polluting vehicles off the road in the South Coast Area since 1994.

To ensure that the proposed program is successful, four criteria would have to be met:

- Lawn mowers targeted for scrapping should be in actual use prior to scrapping;

- Lawn mowers targeted for scrapping should be operable;

- Non-polluting lawn mowers should replace the scrapped mowers;

- Lawn mowers should not be imported in the area.

There must also be a program in place to render the scrapped lawn equipment inoperable to prevent its reuse.

A. Suggested Implementing Entity. State of Arizona.

B. Cost. The cost effectiveness of the voluntary retirement is based on the assumption of a replacement cost of $350 per gasoline-powered lawn mower. The cost effectiveness would be more beneficial when replacing mowers or other lawn equipment with less expensive substitutes.

C. Basis for Consideration. The merits of this measure are being considered as a means of reducing emissions from nonroad sources. The California Clean Air Act requires nonattainment areas to consider measures to control off-road emission sources. This has resulted in California adopting Rule 1623 to issue emission reduction credits for voluntary scrappage of gasoline-powered lawn and garden equipment.

The Governor's Air Quality Strategies Task Force has recommended a Voluntary Lawn Mower Replacement Program.

D. Benefits and Other Considerations. It is assumed that this measure will result in the retirement of 10,000 gasoline-powered lawn mowers, replaced by electric mowers, in the year 2000.

Estimated Reduction in Total CO Emissions in 2000 less than 0.1%

30. Require Government Agencies to Minimize Use of Gasoline-Powered Lawn and Maintenance Equipment

According to the South Coast Air Quality Management District in California, some older lawn mowers are bigger polluters than the family car. The South Coast Air Quality District has adopted Rule 1623 which allows businesses to earn emission

reduction credits by voluntarily replacing high-emitting lawn and garden equipment with zero-emitting models.

As a result of the large number of public parks and government operated facilities in the nonattainment area, a significant portion of the gasoline-powered lawn and maintenance equipment in the nonattainment area is operated under the jurisdiction of government agencies. Therefore, instead of placing the full burden of emissions reductions from this class of nonroad equipment upon the public, a policy minimizing use of gasoline-powered lawn and maintenance equipment by government agencies is likely to have a substantial impact on the emissions from this class of nonroad equipment.

A. Suggested Implementing Entity. State of Arizona.

B. Cost. The cost effectiveness of the voluntary retirement is based on the assumption of a replacement cost of $350 per gasoline-powered lawn mower. The cost effectiveness would be more beneficial when replacing mowers or other lawn equipment with less expensive substitutes.

C. Basis for Consideration. The merits of this measure are being considered as a means of reducing emissions from nonroad sources. The California Clean Air Act requires nonattainment areas to consider measures to control off-road emission sources. This has resulted in California adopting Rule 1623 to issue emission reduction credits for voluntary scrappage of gasoline-powered lawn and garden equipment.

D. Benefits and Other Considerations. It is assumed that this measure will result in a one percent (based on 18 percent of emissions from governmental agency activity and five percent reduction in government usage) reduction in gasoline-powered lawn and garden equipment usage.

Estimated Reduction in Total CO Emissions in 2000 less than 0.1%

31. Ban Sale/Use of Gasoline-Powered Lawn and Garden Equipment

According to the South Coast Air Quality Management District, some older lawn mowers are bigger polluters than the family car. A dirty mower operated for 20 hours a year produces the same amount of ozone-forming volatile organic compounds as a 1996 passenger car driven for 26,000 miles. The emissions from gasoline-powered lawn and garden equipment is particularly a problem because they are used most during the summertime ozone season.

A. Suggested Implementing Entity. State of Arizona.

B. Cost. The cost effectiveness of banning the sale of gasoline-powered lawn and garden equipment is based on the assumption that the average difference in price between a base model electric and gasoline-powered lawn mower is $50. The cost effectiveness of banning the use of gasoline-powered lawn and garden equipment is based on the assumption of a replacement cost of $350 per gasoline-powered lawn mower. The cost effectiveness would be more beneficial when replacing mowers or other lawn equipment with less expensive substitutes.

C. Basis for Consideration. The California Clean Air Act requires nonattainment areas to consider measures to control off-road emission sources. This has resulted in California adopting Rule 1623 to issue emission reduction credits for voluntary scrappage of gasoline-powered lawn and garden equipment.

D. Benefits and Other Considerations. House Bill 2237 requires Maricopa and Pima counties to establish a Voluntary Lawn Mower Emissions Reduction Program to begin no later than July 1, 1998. A lawn mower owner may participate in the program if the lawn mower starts and is used for residential or commercial purposes. It is assumed that this measure will result in the retirement of 7,500 gasoline-powered lawn mowers, replaced by electric mowers, in the year 2000. This assumption, with the "Nonroad Engine and Vehicle Emission Study" (NEVES) (EPA, July, 1992) two-stroke lawn mower population projected to 2000, provides a 1.5 percent reduction in emissions from this source.

Estimated Reduction in Total CO Emissions in 2000 less than 0.1%

32. Emissions Standards for Utility Equipment

This measure would establish emissions standards for newly manufactured utility engines. The types of equipment affected by this measure include lawn and garden equipment (e.g. lawn mowers, leaf blowers, and edge trimmers) as well as general utility equipment such as pumps, generators, grinders, and compressors. Equipment manufacturers would be required to test engine emissions through a quality audit program and certify that their engines meet the new standards. Effects from this measure would begin in 1999.

A. Suggested Implementing Entity. The State of Arizona has the authority to regulate new utility equipment through passage of appropriate laws by the legislature.

B. Cost. The cost of meeting the proposed California emissions standards has been estimated at $35 per engine. These costs would likely be passed from the manufacturer to the consumer. Since this class represents a wide range of engines, costs could vary considerably.

C. Basis for Consideration. The merits of this measure are being considered as a means of reducing emissions from nonroad sources. The California Clean Air Act requires nonattainment areas to consider measures to control off-road emission sources. This requirement has resulted in new proposed emissions for utility engines sold in California.

D. Benefits and Other Considerations. It is assumed that this measure will result in the replacement of utility equipment engines with engines meeting new standards at a turnover rate of 14 percent per year for spark-ignition (i.e. two- and four-stroke gasoline) engines and four percent for compression-ignition (i.e. Diesel) engines. It is assumed that the measure takes effect in 1999.

Estimated Reduction in Total CO Emissions in 2000 1.9%

33. Emissions Standards for New Heavy-Duty Construction Equipment

This measure was originally proposed to establish emissions standards and test procedures for heavy-duty construction equipment with engines rated over 175 horsepower. (The 1990 Clean Air Act Amendments prohibit states from adopting emissions standards for nonroad farm and construction equipment under 175 horsepower.) However, EPA finalized emissions standards for compression-ignition engines over 50 horsepower in June 1994. For compression-ignition engines over 175 horsepower, the standards were aligned with those already adopted by the California Air Resources Board (CARB) through the year 2000.

The adoption of California's standards would only affect off-road heavy-duty diesel engines between 175 and 750 horsepower. Starting with the year 1996 the national standard for these engines is: hydrocarbons 1.0 g/bhp-hr, carbon monoxide 8.5 g/bhp-hr, oxides of nitrogen 6.9 g/bhp-hr, and PM-10 0.4 g/bhp-hr. In 2001, the California standards will be: hydrocarbons 1.0 g/bhp-hr, carbon monoxide 8.5 g/bhp-hr, oxides of nitrogen 5.8 g/bhp-hr, and PM-10 0.16 g/bhp-hr.

A. Suggested Implementing Entity. The State of Arizona has the authority to regulate new heavy-duty construction equipment through passage of appropriate laws by the legislature.

B. Cost. CARB estimated a cost of $3,000 per engine to meet the new standards.

C. Basis for Consideration. This measure was originally submitted by the Arizona Center for Law in the Public Interest in response to the draft MAG 1991 Particulate Plan for PM-10. The California Clean Air Act requires nonattainment areas to consider measures to control off-road mobile emissions sources. This has resulted in new emissions standards for Diesel construction equipment for sale in California after January 1, 1996.

D. Benefits and Other Considerations. This measure was not modeled for CO impacts because it was intended to control particulate matter. In addition, the proposed standards do not reduce CO from the current Federal Standard.

34. Emissions Standards for Off Road Vehicles - Motorcycles and Recreational Vehicles

This measure would establish emissions standards for new off-road motorcycles and recreational vehicles sold within the state. Manufacturers would be required to test engine emissions through a quality-audit program and certify that their engines meet emissions standards. Starting in 1999, the California emissions standards for all speciality recreational vehicle engines and go-karts will be 3.2, 100, and 0.25 grams per brake-horsepower hour (g/bhp-hr) for HC, CO, and PM-10, respectively. For off-road motorcycles and all-terrain vehicles, the standards for HC and CO are 1.2 and 15.0 g/km, respectively. All golf carts must have zero emissions for HC, CO, and PM-10. The zero-emission golf cart standard is applicable in federal ozone nonattainment areas only.

A. Suggested Implementing Entity. The State of Arizona has the authority to regulate new off-road motorcycles and recreational vehicles through passage of appropriate laws by the legislature.

B. Cost. The cost of engine redesign to meet new emissions standards has been estimated at one to two percent, which is less than $100 for most engines. This cost will be passed from the manufacturer to the consumer. The difference in price between a base model electric and gasoline-powered golf cart is approximately $30.

C. Basis for Consideration. This measure was originally submitted by the Arizona Center for Law in the Public Interest in response to the draft MAG 1991 Particulate Plan for PM-10. The California Clean Air Act requires

nonattainment areas to consider measures to control off-road mobile emission sources.

D. Benefits and Other Considerations. It is assumed that this measure will result in new off-road motorcycle, all-terrain vehicle, minibike, and specialty vehicle engines meeting new standards, and all new golf carts having electric motors at a turnover rate of 14 percent per year for spark-ignition engines and four percent per year for compression-ignition engines. It is assumed that this measure takes effect in 1999.

Estimated Reduction in Total CO Emissions in 2000 < 0.1%

35. Encourage the Use of Temporary Electrical Power Lines Rather Than Portable Generators at Construction Sites

During the recent years of fast growth, approximately 30,000 new homes were built annually in the metro area. The use of generators at construction sites leads to the release of 26,000 tons/year and 506 tons/year of CO and HC, respectively. This activity also results in the release of 38 tons/year and 32 tons/year of PM-10 and PM-2.5, respectively. These emissions could be reduced substantially by the use of temporary electrical power rather than generators. Electrical service can usually be established within 30 days of the request. This is a voluntary measure that would reduce noise as well as air pollution.

A. Suggested Implementing Entity. This is proposed as a voluntary measure. Local governments may encourage homebuilders to arrange for installation of temporary power at construction sites by the local utility company.

B. Cost. The cost of a temporary power unit and power usage is estimated at less than $100 per home. The overall cost per home is estimated to be reduced by 50%.

C. Basis for Consideration. This measure was recommended by the Governor's Air Quality Strategies Task Force.

D. Benefits and Other Considerations. It is assumed that this measure will result in the replacement of 1,000 portable generators with temporary electrical power lines. The estimated population of generator sets (both spark- and compression-ignition engines) from the EPA NEVES inventory was projected to the year 2000 (32,209 units). The percent emission reduction will be calculated by subtracting 1,000 units from the population in the future year.

Estimated Reduction in Total CO Emissions in 2000 0.1%

36. Defer Emissions Associated with Governmental Activities

This measure is aimed at reducing activities by State agencies and local governments in the Nonattainment Area that may contribute to seasonal air quality problems. This would involve a shift in the timing of activities or postponement altogether, until after critical air pollution periods. Examples of steps that might be taken include:

- Prioritizing and rescheduling of painting, metal coating, refinishing, and other VOC emitting activities to occur outside the summer ozone season;

- Minimizing use of two-cycle gasoline-powered lawn and garden maintenance equipment, or defer landscaping activities as well as painting, metal coating, refinishing and other VOC emitting activities until after 4:00 pm during the ozone season;

- Including in all procurement solicitations for VOC-containing commodities a request for substitute products with lower or no VOC content;

- Scheduling street and highway construction and maintenance projects that may disrupt traffic flow to occur outside the winter carbon monoxide season;

- Limiting use or idling of vehicles or utility equipment during the winter carbon monoxide season;

- Minimize use of two-cycle gasoline-powered lawn and garden maintenance equipment to prior to 2:00 pm during the winter carbon monoxide season.

A. Suggested Implementing Entity. State and local government agencies.

B. Cost. Costs associated with specific activities may include less efficient time utilization of manpower and equipment and increased cost of materials. In addition, the expense of training personnel to deal with revised scheduling and procurement methods could be significant.

C. Basis for Consideration. The process of ozone formation and build-up of carbon monoxide concentrations can be significantly affected by the timing of pollutant emissions. In addition, elimination of certain activities during

critical periods can contribute to reduced air pollution levels. This measure was recommended by the Governor's Air Quality Strategies Task Force.

D. Benefits and Other Considerations. Effectiveness would depend on the specific steps implemented. An important part of the measure commitment process would be identification of specific actions to be taken, schedules and resource requirements.

It is assumed that this measure will result in the elimination of the use of two-stroke gasoline engine equipment by governmental agencies in the afternoon during the winter CO season. It is further assumed that governmental agency activity accounts for 18 percent of the emissions in this source category based on census employment figures.

Estimated Reduction in Total CO Emissions in 2000	Temporal Shift

REDUCED EMISSIONS FROM INDUSTRIAL SOURCES

37. PM-10 Best Available Control Technology (BACT) Determinations for Point Sources

For PM-10 Serious Nonattainment Areas, Section 189(b)(3) of the Clean Air Act defines a major point source as a stationary source with emissions or potential emissions greater than or equal to 70 tons per year. The latest draft regional emissions inventory for Maricopa County identified four sources which met this criterion in 1994. Collectively, these major point sources produce approximately 2.4 tons of PM-10 per day. As a potential control measure, the Maricopa County Environmental Services Department could make an industry-by-industry study of the major point sources to determine the best types of control technologies that are available to yield emission reductions. Subsequently, Maricopa County could require the use of the Best Available Control Technology.

Ongoing identification of new major point sources occurs through the Maricopa County permitting process. A review of point sources with five or more tons of annual PM-10 emissions indicates that more than 75 percent of these emissions are attributable to five types of industrial activity: seed handling and processing; electricity generation using natural gas turbines; cotton gin operations; steel production; and sand and gravel operations.

A. Suggested Implementing Entity. Stationary sources are regulated by the Maricopa County Environmental Services Department.

B. Cost. Administrative costs would be incurred by Maricopa County to perform BACT determination studies and develop control requirements for the affected industries. Control technology costs would be incurred by the affected industries and potentially passed through to consumers, depending upon the degree of competition in the market. If control costs placed a firm at a serious competitive disadvantage, the firm could be forced to downsize, cease, or relocate its operations. Prior to performing the BACT determinations, it is not feasible to estimate the costs of the control technology.

C. Basis for Consideration. Implementation of Best Available Control Measures (BACM) is required in a region that is reclassified as a Serious Nonattainment Area for PM-10.

D. Benefits and Other Considerations. This measure was not modeled for CO impacts because it is intended to control particulate matter.

FUGITIVE DUST CONTROL

38. Strengthening and Better Enforcement of Fugitive Dust Control Rules

Maricopa County has enacted a comprehensive set of fugitive dust control rules under Air Pollution Control Regulation III (Control of Air Contaminants), Rule 310 Open Fugitive Dust Sources. Rule 310 was last amended on September 20, 1994. The general categories of fugitive dust sources addressed in Rule 310 include the following: Vehicle Use in Open Areas and Vacant Parcels; Unpaved Parking Areas/Staging Areas; Unpaved Haul/Access Roads; Disturbed Surface Areas; Vacant Areas; Material Handling; Material Transport; Roadways, Streets, and Alleys; Erosion, Sedimentation, and Deposition of Bulk Materials onto Paved Surfaces; and Cattle Feedlots and Livestock Areas.

It may be possible to achieve improved compliance with existing air pollution control regulations through the provision of additional inspection and enforcement personnel. The effectiveness of enacting tougher regulations would also depend upon the level of enforcement provided.

A. Suggested Implementing Entity. An implementation strategy described in the Governor's Air Quality Strategies Task Force Report (December 2, 1996) indicates that Maricopa County will work with cities and towns to improve interagency communication and training regarding comprehensive dust control enforcement. In addition, Maricopa County will initiate partnerships

with various industrial associations or industrial sectors to develop industry-specific information materials and outreach techniques.

B. Cost. According to the December 2, 1996 Air Quality Strategies Task Force Report, funding for this measure has already been budgeted by the Arizona Department of Environmental Quality (ADEQ). The measure would involve "a shift in current resources" of the Maricopa County Environmental Services Department and the ADEQ. The report also indicates that affected sources will face higher costs for enhanced fugitive dust controls.

C. Basis for Consideration. In the Best Available Control Measures guidance dated September 1992, EPA identified preventative and mitigative measures as controls for fugitive dust from construction/demolition activities. Also, this measure would represent a strengthening of various measures from the MAG 1991 Particulate Plan for PM-10 for the Maricopa County Area and 1993 Revisions.

D. Benefits and Other Considerations. This measure was not modeled for CO impacts because it is intended to control particulate matter.

39. Dust Control Plans for Construction, Demolition, Land Clearing, and Industrial Sites (Including Active Landfills), with Elements Addressing Trackout Prevention, Site and Material Maintenance, Construction Staging, and High Wind Operating Restrictions

The EPA document entitled Fugitive Dust Background Document and Technical Information Document for Best Available Control Measures, September 1992, indicates that work practice controls that reduce emissions potential and/or source extent may be employed at construction, demolition, land clearing, and industrial sites. Activities at these types of sites are temporary but important sources of PM-10 in urban areas. The activities involve a number of separate dust-generating operations such as drilling and blasting, excavation, cut-and-fill operations (i.e., earthmoving), materials storage and handling, and associated truck traffic on unpaved surfaces. Additional impacts involve mud and dirt carryout onto paved surfaces.

This measure would involve requiring dust control plans for construction, demolition, land clearing, and industrial projects. The dust control plan could include a variety of site-specific preventative and mitigative measures such as the following: paving of roads and access points early in the project, compaction or stabilization (chemical and vegetation) of disturbed soil, phasing of earthmoving activities to reduce source

extent, reduction of mud and dirt carryout onto paved streets, installation of a truck wash and grizzlies at access points to remove dirt from the vehicles prior to exiting the site, and periodic cleaning of the street near site entrances.

In addition to the work practices mentioned above, other traditional open source controls identified in the EPA document include watering unpaved surfaces; wet suppression for materials storage, handling, and transfer operations; and use of wind fences for control of windblown dust.

It is important to note that permitting and inspection systems are currently in place for construction, demolition, land clearing, and industrial activities. Furthermore, each site is associated with a party who could be held responsible for dust control.

In July 1993, Maricopa County revised Rule 310 to control air contaminants from Open Fugitive Dust Sources regionwide. Under Rule 310, Section 303, one of the requirements for obtaining a permit to commence any dust-generating operation is submittal of a dust control plan. This plan must describe all reasonably available control measures to be implemented at a worksite and/or in transit to or from a worksite for any earthmoving and/or dust-generating operation.

A. Suggested Implementing Entity. The Maricopa County Environmental Services Department administers and enforces existing dust control plan requirements.

B. Cost. Based on emission inventory data collected by Engineering Science, the costs of implementation for a typical 300-acre residential construction project would be $2,700 per project. The cost of preparing a dust control plan for such a project is estimated to be $5,000. The plan review and enforcement costs are estimated to be $1,106 and $387, respectively.

C. Basis for Consideration. In the Best Available Control Measures guidance dated September 1992, EPA identified these preventative and mitigative measures as controls for fugitive dust from construction/demolition activities. This measure is related to three measures from the MAG 1991 Particulate Plan for PM-10 for the Maricopa County Area and 1993 Revisions: Dust Control Plans for Construction or Land Clearing (Areawide Strategy); Watering, Vehicle and Street Washings at Construction Sites; and Maintaining Land After Zoning is Given but Not Developed.

D. Benefits and Other Considerations. This measure was not modeled for CO impacts because it is intended to control particulate matter.

40. Mitigation Bond Requirement for Construction and Development Projects to Provide Funding for Agencies to Control Project Emissions in the Event of Contractor Noncompliance

In Rancho Mirage, California, all construction and development projects are required to submit a dust control plan to the City. Beginning in 1993, the City required that all dust control plans be accompanied by a letter of credit to ensure their adequacy. The letters of credit are intended to pass the full costs of particulate mitigation measures to the responsible construction company. In this way, if a company fails to adequately control particulates, and the City is required to perform mitigation activities, the City will be assured of a means for reimbursement.

This measure allows the City to legally enter private property to control particulates and to act as an agent on a construction company contract to hire a third party to implement the desired control. The program affects all projects that move more than 50 cubic yards of dirt. The letter of credit is based on the combination of a flat fee and a per acre charge. The full amount posted plus interest is refunded at the completion of the project if the City incurs no costs in controlling emissions from the project. The measure is enforced through inspections performed by the Public Works Department.

A. Suggested Implementing Entity. Bond requirements could be enacted by Maricopa County and/or municipalities, and administered through existing Planning Departments, which are generally responsible for issuing land development permits. This measure would become a critical component of a dust control plan requirement described as a separate measure in this draft comprehensive list.

B. Cost. No information is available to quantify the cost of this measure at this time.

C. Basis for Consideration. In PM-10 Serious Area SIP Guidance: Final Staff Work Product, September 1993, EPA requires serious PM-10 nonattainment areas to review and consider the control measures identified in all BACM guidance documents. This measure has been implemented in Rancho Mirage, California.

D. Benefits and Other Considerations. This measure was not modeled for CO impacts because it is intended to control particulate matter.

41. Require Dust Mitigation Plan Submission and Implementation by Property Owner for Vacant Parcels Greater Than 10 Acres

The EPA document entitled Fugitive Dust Background Document and Technical Information Document for Best Available Control Measures, September 1992, indicates that dust emissions may be generated by wind erosion of open agricultural land or exposed ground areas on public property or within an industrial facility. The two basic conditions for wind erosion are that the surface be dry and exposed to wind. This measure would involve requiring property owners of vacant parcels greater than ten acres to submit dust mitigation plans to demonstrate methods of controlling wind erosion.

In July 1993, Maricopa County revised Rule 310 to control air contaminants from Open Fugitive Dust Sources regionwide. This rule contains sections requiring implementation of reasonably available control measures to prevent or minimize fugitive dust from disturbed surface areas (Section 308), as well as vacant areas (Section 309).

A. Suggested Implementing Entity. Perhaps Maricopa County Rule 310 could be strengthened through stricter requirements and/or more aggressive enforcement.

B. Cost. Cost information has been developed for the use of revegetation programs to mitigate emissions from vacant parcels. The PM-10 BACM analysis prepared by the South Coast Air Quality Management District indicates that revegetation can cost up to $1,900 per acre. Replanting of vegetation is expected to occur every three years and annual maintenance costs (i.e., rodent control) are estimated to be $76 per acre. The cost of developing a dust control plan for a 10-acre vacant parcel is estimated to be $2,500. Dust control plan review and enforcement costs are estimated to total $304. The cost effectiveness for this measure was estimated at $106 per pound of PM-10 and $903 per pound of PM-2.5.

C. Basis for Consideration. In the Best Available Control Measures guidance dated September 1992, EPA identified these measures as control methods for open area wind erosion. In addition, this measure is related to several measures included in the MAG 1991 Particulate Plan for PM-10 for the Maricopa County Area and 1993 Revisions: Revegetation, Chemical Stabilization, or Other Abatement of Wind Erodible Soil (Areawide Strategy); and Vegetation and Windbreaks to Control Windblown Dust.

D. Benefits and Other Considerations. This measure was not modeled for CO impacts because it is intended to control particulate matter.

REDUCED EMISSIONS FROM AGRICULTURAL ACTIVITIES

42. Cover Crops - Planting Alternative Crops During Fallow Period

The EPA document entitled, Fugitive Dust Background Document and Technical Information Document for Best Available Control Measures, September 1992, indicates that dust emissions may be generated by wind erosion of open agricultural land. The two basic conditions for wind erosion are that the surface be dry and exposed to wind. This measure would involve requiring revegetation, maintenance of crop residue on non-irrigated fields, mowing for weed control, or other abatement of wind-generated soil erosion on fallow fields and abandoned farmland.

The EPA document maintains that natural vegetative cover is the most effective, easiest, and most economical way to control wind erosion. According to the December 2, 1996 Air Quality Strategies Task Force Report, the guidance indicated that maintaining ground cover could remove from five percent to 99 percent of the direct wind force from the soil surface. As described in the report, this measure could provide that non-irrigated fields would retain existing annual cover or be allowed to establish and maintain cover. Tillage for noxious weed control would be avoided until adequate soil moisture is present. Mowing to control vegetation and weed heights may be used to meet local weed control ordinances.

In July 1993, Maricopa County revised Rule 310 to control air contaminants from Open Fugitive Dust Sources regionwide. This rule contains sections requiring implementation of reasonably available control measures to prevent or minimize fugitive dust from disturbed surface areas (Section 308), as well as vacant areas (Section 309).

A. Suggested Implementing Entity. The Maricopa County Environmental Services Department is responsible for administration and enforcement of Rule 310. Involvement by the Arizona Department of Agriculture and Arizona Department of Environmental Quality may be needed to secure emission reductions from agricultural activities. According to the December 2, 1996 Air Quality Strategies Task Force Report, this measure could also involve the Arizona Department of Water Resources.

B. Cost. A 1996 analysis prepared for MAG by Sierra Research evaluated the cultivation of a cover crop as a mitigation for windblown dust emissions from fallow agricultural fields. The cost of planting a cover crop is estimated to be $152 per acre, based on the costs of alfalfa establishment as reported by the University of Arizona Cooperative Extension for the Maricopa County area.

C. Basis for Consideration. In the Best Available Control Measures guidance dated September 1992, EPA identified this measure as a method for controlling wind erosion from fallow fields. In addition, the measure was recommended in December 1996 by the Governor's Air Quality Strategies Task Force.

This measure is related to two other measures from the MAG 1991 Particulate Plan for PM-10 for the Maricopa County Area and 1993 Revisions: Revegetation, Chemical Stabilization, or Other Abatement of Wind Erodible Soil (Areawide Strategy); and Vegetation and Windbreaks to Control Windblown Dust.

D. Benefits and Other Considerations. This measure was not modeled for CO impacts because it is intended to control particulate matter.

43. Vegetation Establishment - Conversion of Crops to Grassland or Trees on Land Not Suitable for Continuous Cropping

In some cases, it may be uneconomical for landowners to comply with the Cover Crops measure described elsewhere as a measure on this draft comprehensive list. For land not suitable for continuous cropping, conversion of crops to grassland or trees has been suggested as one of four agricultural practices recommended in the December 2, 1996 Air Quality Strategies Task Force Report. Potential drawbacks for the measure are the costs of maintaining non-economic vegetation and potential buildup of flammable vegetative material in urban areas.

A. Suggested Implementing Entity. According to the December 2, 1996 Air Quality Strategies Task Force Report, this measure could be implemented through the U.S. Natural Resources Conservation Service. State coordination for this measure could be provided by the Arizona Department of Agriculture.

B. Cost. The Air Quality Strategies Task Force Report indicates that potential costs for site preparation (e.g. discing) would depend on the need to eliminate all competitive vegetative growth. Also, costs would be incurred for watering, particularly during the first year of vegetative establishment.

Revegetation costs were calculated by Sierra Research, Inc., for a related measure to mitigate dust on vacant parcels larger than ten acres. The estimated cost was approximately $1,900 per acre.

C. Basis for Consideration. This measure was identified as one of four recommended practices to reduce PM-10 emissions from agriculture, as described in the December 2, 1996 Alternative Air Quality Strategies Task Force Report.

D. Benefits and Other Considerations. This measure was not modeled for CO impacts because it is intended to control particulate matter.

44. Windbreaks - Plant Trees or Grass Perpendicular to the Prevailing Wind

Windbreaks reduce the wind force at the ground surface and consequently reduce the potential for particulate emissions.

A. Suggested Implementing Entity. This voluntary measure could become part of a list of agricultural Best Available Control Measures developed through the coordination of the U.S. Natural Resources Conservation Service, Arizona Department of Environmental Quality, and Arizona Department of Agriculture.

B. Cost. Implementation of this measure may be precluded by cost considerations in cases where established irrigation systems dictate the orientation of crop rows. Implementation costs could be incurred for irrigation system changes, tree planting, and watering of windbreak vegetation, especially during the first year of establishment.

Sierra Research, Inc., estimated the cost for establishing windbreaks consisting of two rows of trees along the upwind edge of a square parcel with an area of one acre. The scenario analyzed assumed the use of fast-growing five-gallon trees each costing $35. The calculations yielded a cost effectiveness of $672 per pound of PM-10 reduced.

C. Basis for Consideration. This potential measure received consideration by the Particulate Matter Subcommittee of the Arizona Air Quality Strategies Task Force in 1996.

D. Benefits and Other Considerations. This measure was not modeled for CO impacts because it is intended to control particulate matter.

45. Restrictions on Tilling or Soil Mulching During High-Wind Events

The moisture control measure controls the timing of tillage and land shaping operations to utilize to the extent possible moisture from irrigation to reduce dryness

and dust in preparation for harvest of fruit, nut, and vine crops. The tillage measure is focused on fallow land. Normal tillage on cropped fields produces minimal amounts of dust and control measures are not needed. Tillage during the summer and fall period on fallow fields when the soil is too dry creates dust and an erosion hazard by leaving the soil in a dry, pulverized condition. Fallow fields should have adequate moisture levels present before tillage to allow stable aggregates to form that protect the soil from wind erosion.

Agricultural dust emissions recently have been estimated for 1994 in a Maricopa County emissions inventory for PM-10. Data from the draft inventory indicate that 286,835 acres were planted, resulting in 8.9 metric tons per day due to tillage and harvesting. This daily emissions figure may understate typical emissions on a windy day, since it was calculated by dividing estimated annual emissions by 365.

A. Suggested Implementing Entity. The most likely candidate to implement this measure is the State of Arizona, through either the Department of Agriculture or the Department of Environmental Quality.

B. Cost. High-wind events that would delay tilling typically extend for one or two days only. Contacts with the U.S. Natural Resources Conservation Service in Maricopa County have indicated that the assessment of costs to farmers resulting from tilling delays is difficult to estimate. Administrative costs for predicting and announcing high wind days were estimated at $10,400 annually, plus $4,000 in enforcement costs.

C. Basis for Consideration. In the September 1993 guidance for Serious Area PM-10 Plans, EPA indicates that States are required to consider “the control measures discussed in the BACM guidance documents *and other relevant materials* for all source categories impacting the nonattainment area”. To address this requirement, the SIP submissions from other serious PM-10 nonattainment areas were reviewed to assess control measure commitments. This measure was identified in air quality plans of the San Joaquin Valley Air Quality Management District.

D. Benefits and Other Considerations. This measure was not modeled for CO impacts because it is intended to control particulate matter.

46. Reduce Emissions of Ammonia and Nitrates from Agricultural Operations

While nitrates are used in agricultural operations, the emission of these nitrates into the atmosphere is not considered to be significant. Instead, the primary mechanism of nitrate formation in the atmosphere is through ammonia conversion. Ammonia is

released through the decomposition of animal waste. The ammonia combines with NOx and SOx emissions to form ammonium nitrate and ammonium sulfate particulate salts, respectively.

Quick incorporation of manure into soils will reduce the quantity of ammonia produced by minimizing exposure to the atmosphere. Ammonia emission rates were estimated from information from a recent EPA report entitled "Development and Selection of Ammonia Emission Factors." The measure assumes that quick incorporation of manure into soils can be accomplished by simultaneously spreading and tilling the manure in a single operation. Based upon information presented in the EPA report, it is estimated that this measure will reduce ammonia emissions from field application by 75 percent. The relationship of ammonia emissions to the production of secondary particulate was reported, by the Desert Research Institute in studies of Maricopa County nitrate capacity, to be ten parts of ammonia to form one part of PM-10.

A. Suggested Implementing Entity. The most likely candidate to implement this measure is the State of Arizona, through either the Department of Agriculture or the Department of Environmental Quality.

B. Cost. While no studies of the cost of implementing this measure could be identified, an estimate was developed by assuming that quick incorporation of manure into soils can be accomplished by simultaneously spreading and tilling the manure in a single operation. The increased cost of simultaneous tilling is estimated to be $6.18 per acre (according to the 1994-95 Field Crop Budgets developed by the University of Arizona for Maricopa County crops).

C. Basis for Consideration. In the September 1993 guidance for Serious Area PM-10 Plans, EPA indicates that States are required to consider "the control measures discussed in the BACM guidance documents *and other relevant materials* for all source categories impacting the nonattainment area". To address this requirement, the SIP submissions from other serious PM-10 nonattainment areas were reviewed to assess control measure commitments. This measure was identified in air quality plans of the San Joaquin Valley Air Quality Management District.

D. Benefits and Other Considerations. This measure was not modeled for CO impacts because it is intended to control particulate matter.

47. Provide for Burial of Whole Stalks During Plowdown - if research documents no increase in spread of plant disease or pests from this practice

To control disease and pests, Arizona Department of Agriculture rules currently require farmers to plowdown or shred and bury plant stalks after harvest and before new planting can begin. The shredding process contributes to particulate emissions. According to research, if whole stalks could be buried instead of being shredded, the number of tills could decline. The Arizona Department of Agriculture currently is revising plowdown requirements for cotton to not require the burial of shredded stalks; shredding is still required. Revised rules were anticipated to be completed and filed with the Secretary of State in November 1996.

A. Suggested Implementing Entity. This measure could be required by the Arizona Department of Agriculture.

B. Cost. This measure involves a change in regulations to reduce the amount of plowing required of farmers. Administrative costs for the rulemaking change would be minor and one-time only. Assuming that the change would have no impact on crop production, the main economic impact would be a cost savings to farmers in the form of reduced tilling costs.

C. Basis for Consideration. This potential control measure was recommended by the Governor's Air Quality Strategies Task Force in 1996.

D. Benefits and Other Considerations. This measure was not modeled for CO impacts because it is intended to control particulate matter.

48. Require Comprehensive Dust Control Plans for Farms Larger Than 640 Acres (Including Surface Treatment, Vegetative Cover, and Windbreaks)

This measure would involve the development and implementation of comprehensive dust control plans for farms larger than 640 acres. The dust control plan could include a variety of measures such as surface treatment (paving, chemical stabilization, or vegetative stabilization) of frequently traveled farm roads and access points, revegetation of fallow fields, construction of windbreaks to control fugitive dust generated from agricultural activities, and use of modified agricultural techniques for tilling, planting, and harvesting.

The U.S. Natural Resources Conservation Service (NRCS), formerly the Soil Conservation Service, is working with California air quality organizations and the agricultural industry on development of specialized dust control plans for agricultural practices. It is anticipated that the plans will be compiled from a series of modules

that address specific activities (e.g., discing, harvesting, etc.). Under a draft California plan, the farmers would voluntarily assist NRCS staff in development of the plans, and agree to implement the recommended procedures. In the event of noncompliance, a default fugitive dust regulation would go into effect.

A. Suggested Implementing Entity. This measure could be required by the Arizona Legislature or Maricopa County. Perhaps Maricopa County Rule 310 could be strengthened through stricter requirements or enhanced enforcement.

B. Cost. Since surface treatment of farm land relies principally on the use of moisture application and because water availability to agriculture operations is restricted, this method of control was deemed to be infeasible. The cost of vegetative cover was addressed in measure 25(d). Therefore, this analysis focused on the cost of installing windbreaks. The methodology used to assess the cost and effectiveness of control measure 24(c), windbreaks on public property adjacent to open land, was employed here. The cost of developing a dust control plan is estimated to be $3,000 for a 640-acre farm.

C. Basis for Consideration. In the Best Available Control Measures guidance dated September 1992, EPA identified several measures for controlling fugitive dust from agricultural operations. Ongoing discussions between NRCS, EPA, agricultural industry representatives, and California air quality regulatory agencies have indicated that comprehensive dust control plans are viable for controlling fugitive dust from agricultural activities.

This measure is related to several measures adopted as part of the MAG 1991 Particulate Plan for PM-10 for the Maricopa County Area and 1993 Revisions: Revegetation, Chemical Stabilization, or Other Abatement of Wind Erodible Soil (Areawide Strategy); and Windbreaks for Controlling Particulates from Agricultural Activities.

D. Benefits and Other Considerations. This measure was not modeled for CO impacts because it is intended to control particulate matter.

FIREPLACE AND OTHER BURNING RESTRICTIONS

49. Clean Burning Fireplace Construction

The Arizona Department of Environmental Quality has indicated that wood burning may cause up to 40 percent of the pollution in neighborhoods during temperature inversions. As recommended by the Governor's Air Quality Strategies Task Force, this measure would involve the adoption of legislation to require the construction of clean burning fireplaces and woodburning devices as defined by the Environmental Protection Agency for all newly constructed residential fireplaces, including "add-ons" to existing homes. These products would meet EPA Phase II standards which include EPA certified appliances, natural gas appliances, and fireplaces that have been designated "as clean as" EPA certified appliances by a certified air pollution control agency.

In addition, the Governor's Air Quality Strategies Task Force recommended an income tax credit to homeowners for converting existing residential fireplaces and woodburning devices. Presently, there is a one-time $500 subtraction from gross income for citizens who purchase and install an EPA certified woodstove, pellet stove, or gas fireplace rather than a conventional woodburning fireplace. Based upon the highest state tax rate of 5.6 percent, the actual value of this incentive is $28.00.

A. Suggested Implementing Entity. The Arizona Legislature could implement this measure through legislation. The legislation could also authorize the County to adopt an ordinance/regulation to implement the measure.

B. Cost. According to the Governor's Air Quality Strategies Task Force, the requirement for new fireplaces to be clean burning would require no new tax dollars to be appropriated by the State, County, or cities. The cost to the consumer varies from $50.00 to over $1,000.00 depending on the product selected.

Costs of the tax credit measure essentially would be the difference between the costs of the current tax subtraction and a proposed tax credit program. However, tax benefits would not apply to newly constructed EPA approved devices. Assuming the tax credit becomes effective for taxable year 1997, cost to the State General Fund would be $1.1 million in FY 1998 and $1.8 million in FY 1999, according to the Joint Legislative Budget Committee (JLBC) staff. Assuming more public awareness of the tax credit program, JLBC estimates 1 percent of an estimated existing 375,000 traditional woodburning fireplaces Statewide would be converted the first year and 1.5

percent the second year. The conversion rate generally agrees with a similar program implemented in Idaho.

C. Basis for Consideration. This measure was recommended by the Governor's Air Quality Strategies Task Force on December 2, 1996.

D. Benefits and Other Considerations. It is assumed that this measure will be implemented in the modeled year (2000 for CO). It is further assumed that all newly constructed residential fireplaces will be cleaner burning natural gas fireplaces, and that all newly installed residential wood stoves will be "low-emitters" or EPA-certified Phase II or equivalent stoves.

Estimated Reduction in Total CO Emissions in 2000 less than 0.1%

50. Public Information Program on Wood Stoves and Wood Heat

According to the EPA guidance entitled, Technical Information Document for Residential Wood Combustion Best Available Control Measures, September 1992, a public information program on wood stoves serves two main purposes; (1) it acquaints citizens with details of control regulations or ordinances, their responsibilities under the ordinance, and the justification for the ordinance; and (2) provides persuasion and reinforcement of the issues and principles behind the ordinance. The program should address three main topics: program effectiveness and tracking; key program elements; and the communication strategy. Generally, this measure involves establishing a public information and education program to inform and educate citizens about relevant State, local and EPA regulations; general health risks of wood smoke; proper woodburning operation and maintenance; heating fuels and practices; new technology stoves; and alternatives to wood heating.

Since 1993, Maricopa County has pursued a Public Information Program to inform and educate citizens about effective wood stove and wood heat operations and equipment. This program has also addressed the general health concerns about wood smoke. In October 1994, Maricopa County adopted the Residential Woodburning Restriction Ordinance to restrict residential woodburning in a non-approved device when monitoring or forecasting indicates that the carbon monoxide standard and/or the particulate matter standard are likely to be exceeded. Section 3 (D) of the ordinance requires that (1) a restricted-burn period declaration is distributed over the wire service to electronic and print media, and/or (2) a restricted-burn period declaration is announced to the general public in the form of recorded telephone message. Both the ordinance and information program are regionwide

measures that apply to both the incorporated and unincorporated areas within Maricopa County.

A. Suggested Implementing Entity. The public information program currently operated by Maricopa County could be expanded. Alternatively, the program could be undertaken by the Arizona Department of Environmental Quality or the Arizona Department of Commerce Energy Office.

B. Cost. The principal cost of expanding the current program would be to increase the staff time committed to developing the information presented in public service announcements. The cost of increased staff time is estimated to be $3,400 per year, based on Maricopa County personnel cost data. The program is expected to principally affect the 11,305 residences that rely on wood for primary space heating as reported in the 1980 census (Note: new data will soon be available from a 1995 survey). As emissions from this activity occur only during the winter heating season, all daily cost data in the analysis are reported on a heating day basis.

C. Basis for Consideration. In the Best Available Control Measures guidance dated September 1992, EPA identified this measure as an integral measure for residential wood combustion. This measure is related to the Public Information Program on Wood Stoves and Wood Heat (Areawide Strategy) from the MAG 1991 Particulate Plan for PM-10 for the Maricopa County Area and 1993 Revisions.

D. Benefits and Other Considerations. A well-organized and well-advertised public awareness campaign would promote a good awareness of the contribution of wood stoves to the particulate pollution problem. It would also promote the actions that may be taken by the general public to reduce the problem. This measure was not modeled. Data to quantify the effects of this program are not available.

51. Enforce Opacity Limit on Residential Wood Smoke

The EPA guidance entitled, Technical Information Document for Residential Wood Combustion Best Available Control Measures, September 1992, indicates that improved combustion of wood in residential units could be achieved through improved operation and maintenance practices, including establishing an opacity limit program. This measure would involve enforcing the opacity limit established by an educational opacity program. The educational program should identify homes with high opacity emissions and educate the households on ways to reduce the

visible emissions from their devices. The EPA guidance document recommends that repeat opacity violators who do not correct the source of the high visible emissions should attend a class on how to properly operate and maintain a woodburning device.

Many communities have implemented episodic curtailment programs to reduce PM-10 emissions from residential wood combustion. One method of curtailment is to establish opacity limits. These limits are in place in Boise, Idaho; Butte, Montana; Lewis & Clark County, Montana; Washington State and Washoe County, Nevada. The San Joaquin Valley Serious Area PM-10 Plan contains a commitment to establish opacity limits on wood smoke.

During a curtailment period, the Maricopa County Residential Woodburning Restriction Ordinance, restricts the operation of woodstoves to those granted an exemption (e.g., the basis of sole source of heat, emergency, etc.) or those meeting the requirements of Rule 318 of Maricopa County Air Pollution Control Regulations. Such operation is limited to "no visible emissions to the atmosphere . . . after the period of 20 consecutive minutes immediately following an ignition of or a refueling of such residential woodburning device." An additional opacity restriction is "visible emissions to the atmosphere from a chimney, flue or exhaust duct shall constitute prima facie evidence of unlawful operation of a residential woodburning device." These limits could be expanded to other incorporated jurisdictions within the nonattainment area.

A. Suggested Implementing Entity. The enforcement of the existing opacity restriction falls under Maricopa County.

B. Cost. Maricopa County Residential Woodburning Restriction Ordinance currently limits woodburning devices to zero percent opacity during winter curtailment periods. No practical amendment of this ordinance will produce lower emissions from woodburning devices. Thus, ordinance amendment and enforcement costs are effectively $0 for this control measure.

C. Basis for Consideration. In the Best Available Control Measures guidance dated September 1992, EPA identified this measure as an integral measure for residential wood combustion.

D. Benefits and Other Considerations. No practical amendment of this ordinance will produce lower emissions from woodburning devices.

52. Require Change-Out of Uncertified Wood Stoves or Existing Fireplaces Upon Sale of Home

The EPA guidance entitled, Technical Information Document for Residential Wood Combustion Best Available Control Measures, September 1992, indicates that the implementing agency should establish a conversion deadline and publicize the requirement to the community. The conversion process should be accelerated by requiring conversion upon transfer of real estate or re-leasing of rental units. This measure involves requiring change-out of uncertified wood stoves or existing fireplaces upon sale or re-lease of property.

For property with a woodburning fireplace, the homeowner or landlord should file a form with the implementing agency indicating whether a woodburning fireplace is located in the home. Submittal of such a form would be required before the new homeowner or renter could obtain municipal services. If the home does have a woodburning fireplace, the implementing agency should perform an inspection to verify, within a certain period of time after the property transfer or re-lease, that the fireplace has been converted to a gas-log-type fireplace or has the flue sealed.

If the property is not transferred or re-leased prior to the conversion deadline, the implementing agency should encourage the property owner to file for an exemption stating that no woodburning fireplace is present or to have the premises inspected to verify conversion or seal of the flue. As an incentive to file for an exemption or submit to an inspection, a “noncompliance fee” could be added to a municipal service bill. Compliance with the conversion requirement would cancel the fee. After a reasonable period of time, the fee should expire and a notice of violation of the law should be issued. Homes required to convert should be inventoried by the implementing agency and a zero percent opacity limit should be enforced.

For property with a wood stove, an inspection to verify either removal of the conventional stove and sealing of the flue, or installation of an EPA certified, Phase II stove or equivalent should be performed by the implementing agency. The conventional stove should be surrendered to the implementing agency to be properly destroyed. In lieu of an inspection, the property owner could file a sworn affidavit with the implementing agency indicating that no wood stoves are located in the home. The requirements for property that is not transferred or re-leased prior to the conversion deadline are stated above.

A. Suggested Implementing Entity. This measure could be undertaken by the Arizona Legislature and Maricopa County.

B. Cost. In this analysis, it is assumed that a new ordinance is enacted requiring that uncertified wood stoves be replaced by certified units upon

residential change of ownership. In general, the cost to enact an ordinance is estimated to be up to $9,300 based on personnel cost data provided by Maricopa County. The enforcement costs of this measure are estimated to be zero, because building departments are already enforcing similar regulations for new home construction. The installed price of a certified wood stove is $1,050 per residence. It is assumed that the uncertified stoves are scrapped for a loss of $100 as they will have no market value (i.e., regulations will prohibit their reuse) in Maricopa County. All daily cost data in the analysis are reported on a heating day basis.

C. Basis for Consideration. In the Best Available Control Measures guidance dated September 1992, EPA identified this measure as a flexible measure designed to provide permanent control of residential woodburning emissions.

D. Benefits and Other Considerations. During non-curtailment days, the emissions of PM-10 in upgraded residences would be lower than in residences in which uncertified wood stoves have not been replaced. On non-curtailment days, upgraded residences would burn slightly less firewood than residences in which uncertified wood stoves have not been replaced because of the generally higher combustion efficiencies of certified wood stoves. This measure was not modeled for CO impacts.

53. Tradeable Permits for Wood Stoves

The EPA document entitled, PM-10 Innovative Strategies: A Sourcebook for PM-10 Control Programs, December 1993, examines 22 categories of creative particulate control measures that have been implemented in State and local programs. One category reviews alternative tradeable permit programs. These are programs that cap permissible emission levels while allowing sources the flexibility to trade the right to emit. Frequently, trading schemes are limited to one source category (e.g., power plants, industrial boilers, residential wood stoves, etc.).

Telluride, Colorado requires that all woodburning devices be registered with the Town Clerk. The program only allows changeouts with EPA certified devices. The Town established a cap of 545 wood stove permits, which are freely marketable between town residents. The permits are deed restricted to ensure that once a permit is sold, the home is prohibited from installing a new wood stove. In addition, to reduce the number of wood stoves over time, installers of each new wood stove are required to purchase two permits at the current market price.

A. Suggested Implementing Entity. This measure could be undertaken by the Arizona Legislature and Maricopa County.

B. Cost. This analysis assumes that only certified woodburning devices would be installed in new housing, and that one uncertified device would be replaced by a certified device in an existing residence for each unit of new housing constructed with a woodburning device. The installed price of a certified wood stove is $1,050 per residence. The control measure would require the purchaser of a new residence burning wood to effectively fund the installation of two certified wood heaters as a condition of being permitted to use wood as an energy source for space heating.

C. Basis for Consideration. In the PM-10 Serious Area SIP Guidance: Final Staff Work Product, September 1993, EPA specifies that States must "evaluate the technological and economic feasibility of the control measures discussed in the BACM guidance documents and other relevant materials for all source categories impacting the nonattainment area." The review of the innovative strategies document referenced above satisfies this requirement.

D. Benefits and Other Considerations. During non-curtailment days, the emissions of PM-10 in upgraded residences would be lower than in residences in which uncertified wood stoves have not been replaced because of the generally higher combustion efficiencies of certified wood stoves. This measure was not modeled for CO impacts.

54. Improved Performance/Maintenance of Woodburning Devices, Including Weatherization Programs

The EPA guidance entitled, Technical Information Document for Residential Wood Combustion Best Available Control Measures, September 1992, indicates that improved combustion of wood in residential units can be achieved through improved operation and maintenance practices, and modified woodburning conditions. This measure would involve encouraging improved performance of woodburning devices by the following:

- Educating the public that energy-efficient homes require less wood to be burned; therefore, fuel costs and woodsmoke pollution may be reduced. Energy audits could be arranged by the implementing agency and a financial incentive program developed, especially for low-income homes. Financial incentives include low-interest loans, cash grants, and tax credits.

- Establishing an educational opacity program to identify woodburning device operation and maintenance habits that contribute to visible emissions. The program should identify homes with high opacity emissions and educate the households on ways to reduce the visible emissions from their devices.

Since 1993, Maricopa County has pursued a Public Information Program to inform and educate citizens about effective wood stove and wood heat operations and equipment. This program has also addressed the general health concerns about wood smoke. In October 1994, Maricopa County adopted the Residential Woodburning Restriction Ordinance to restrict residential woodburning in a non-approved device when monitoring or forecasting indicates that the carbon monoxide standard and/or the particulate matter standard are likely to be exceeded. In October 1994, Maricopa County adopted Rule 318, which describes standards for approval of residential woodburning devices that may be exempted from the restrictions established by the Residential Woodburning Restriction Ordinance. The ordinance, information program, and Rule 318 are regionwide measures that apply to both the incorporated and unincorporated areas within Maricopa County.

A. Suggested Implementing Entity. This measure could be undertaken by the Arizona Department of Environmental Quality, Arizona Department of Commerce Energy Office, and Maricopa County. Perhaps the Maricopa County Public Information Program and/or the Maricopa County Residential Woodburning Restriction Ordinance could be enhanced.

B. Cost. This analysis assumes that residences heated by certified woodburning devices are weatherized, thereby reducing wood consumption and emission rates. From discussions with energy agency and public utility staff, the cost to weatherize a home is estimated to be $1,800 and the improvements have a useful life of ten years.

C. Basis for Consideration. In the Best Available Control Measures guidance dated September 1992, EPA identified this measure as an integral measure for residential wood combustion. This measure is related to the Improved Performance of Woodburning Devices (Areawide Strategy) from the MAG 1991 Particulate Plan for PM-10 for the Maricopa County Area and 1993 Revisions.

D. Benefits and Other Considerations. It is assumed that this measure will be implemented in the modeled year (2000 for CO) and will reduce residential heat demand by approximately 25 percent and, therefore wood heating device use by 25 percent.

Estimated Reduction in Total CO Emissions in 2000 less than 0.1%

55. Inducements/Requirements to Eliminate or Upgrade Existing Wood Stoves and Fireplaces

According to the Technical Information Document for Residential Wood Combustion Best Available Control Measures, September 1992, this measure is designed to provide permanent control of woodburning emissions by reducing the number of existing uncertified wood stoves and fireplaces. This measure provides for inducements or requirements to eliminate or upgrade existing woodburning units. Generally, this measure would provide inducements that would lead to reductions in the stove and fireplace population or use by the following:

- encouraging the accelerated conversion of existing non-certified wood stoves to EPA-certified Phase II stoves or other new technology stove (e.g., hybrid designs, pellet stoves) through tax credits, subsidized stove purchases, or other incentives;

- encouraging the accelerated conversion of existing woodburning fireplaces to gas logs through tax credits or other incentives;

- encouraging the changeover of woodburning devices to low-emitting devices through tax credits or other incentives;

- encouraging a reduction in the number of woodburning devices (i.e., removing or disabling the devices) through tax credits or other incentives;

- discouraging the resale of used stoves through taxes, fees, or other disincentives; and

- discouraging the availability or free (or very inexpensive) firewood by increasing cutting fees or limiting the cutting season.

The EPA document suggests that the implementing agency should establish a conversion deadline and publicize the requirement to the community. The conversion process could be accelerated by requiring conversion upon transfer of real estate or re-leasing of rental units.

In October 1994, Maricopa County adopted the Residential Woodburning Restriction Ordinance to restrict residential woodburning in a non-approved device. The Maricopa County Ordinance requires that uncertified wood stoves be shut down during curtailment periods, but allows certified wood stoves to continue operating. Residences with uncertified stoves must switch over to alternative fuel sources that result in lower emissions than those produced by certified stoves. In October 1994,

Maricopa County adopted Rule 318, which describes standards for approval of residential woodburning devices. Devices approved under this rule may be exempted from the restrictions established in the Maricopa County Residential Woodburning Restriction Ordinance.

In April 1994, the Legislature passed House Bill 2575, which provided further clarification. Sections 17 and 19 of this Legislation provide for a state income tax deduction of up to $500, beginning in the 1994 taxable year, for the purchase or conversion of qualified wood stoves and wood or gas fireplaces or related equipment. The ordinance, information program, Rule 318 and State Legislation are regionwide measures that apply to both the unincorporated areas within Maricopa County.

A. Suggested Implementing Entity. This measure could be undertaken by the Arizona Legislature and Maricopa County. Perhaps the Maricopa County Residential Woodburning Restriction Ordinance and/or Maricopa County Rule 318, Approval of Residential Woodburning Devices, could be enhanced.

B. Cost. The installed price of a certified wood stove is $1,050 per residence. While a portion of this cost would be rebated under an incentive program, it would still appear as a implementation expense to the implementing agency. The lost value of a scrapped non-certified wood stove is estimated to be $100.

C. Basis for Consideration. In the Best Available Control Measures guidance dated September 1992, EPA identified this measure as a flexible measure designed to provide permanent control of residential woodburning emissions. This measure is related to the Inducements to Reduce the Number of Stoves and Fireplaces (Areawide Strategy) from the MAG 1991 Particulate Plan for PM-10 for the Maricopa County Area and 1993 Revisions.

D. Benefits and Other Considerations. During non-curtailment days, the emissions of PM-10 in upgraded residences would be lower than in residences in which uncertified wood stoves have not been replaced. Also, upgraded residences would burn slightly less firewood than residences in which uncertified wood stoves have not been replaced because of the generally higher combustion efficiencies of certified wood stoves. This measure was not modeled for CO impacts.

56. Restrict the Number or Design of New Wood Stoves and Fireplaces

According to the Technical Information Document for Residential Wood Combustion Best Available Control Measures, September 1992, this measure is designed to limit the growth in the number and design of new residential wood combustion devices. The measure does not serve to reduce existing emission levels directly, instead it limits the rate of particulate emission growth in future years (since new residences could only be constructed with certified wood stoves). It is also expected that the high cost of certified wood stoves will reduce the number of new homes that offer woodburning devices.

In October 1994, Maricopa County adopted the Residential Woodburning Restriction Ordinance to restrict residential woodburning in a non-approved device. In October 1994, Maricopa County adopted Rule 318, which describes standards for approval of residential woodburning devices. Devices, approved under this rule may be exempted from the restrictions established in the Maricopa County Residential Woodburning Restriction Ordinance. In April 1994, the Legislature passed House Bill 2575, which provided further clarifications. Sections 17 and 19 of this Legislation provide for a state income tax deduction of up to $500, beginning in the 1994 taxable year, for the purchase or conversion of qualified wood stoves and wood or gas fireplaces or related equipment. The ordinance, information program, Rule 318 and State Legislation are regionwide measures that apply to both the incorporated and unincorporated areas within Maricopa County.

Maricopa County Rule 318 currently allows any woodburning device to be installed in new homes. Under this control strategy, the rule would be amended to prohibit the installation of all but EPA certified wood heating devices in new homes.

A. Suggested Implementing Entity. Rule 318 could be expanded to include this measure. Alternatively, the measure could be undertaken by the Arizona Legislature and Maricopa County.

B. Cost. It is assumed that the existing ordinance is amended to allow only certified woodburning devices in new construction. In general, the cost to amend an ordinance is estimated to be up to $9,300 based on personnel cost data provided by Maricopa County. The enforcement costs of this measure are estimated to be zero, because building departments are already enforcing similar regulations for new home construction. Consumer costs are estimated to increase by $1.23 per curtailment day in comparison to heating with the next most expensive energy source (i.e., fuel oil).

C. Basis for Consideration. In the Best Available Control Measures guidance dated September 1992, EPA identified the measure as a flexible measure designed to provide permanent control of residential woodburning emissions. Also, the Governor's Air Quality Strategies Task Force recommended a similar measure entitled, Clean Burning Fireplace Construction.

This measure is related to the Inducements to Reduce the Number of Stoves and Fireplaces (Areawide Strategy) and Design Specifications and Catalytic Controls for New or Remodeled Fireplaces and Woodburning Stoves (Areawide Strategy) from the MAG 1991 Particulate Plan for PM-10 for the Maricopa County Area and 1993 Revisions.

D. Benefits and Other Considerations. During non-curtailment days, the emissions of PM-10 in upgraded residences would be lower than in residences in which uncertified wood stoves have not been replaced. On non-curtailment days, upgraded residences would burn slightly less firewood than residences in which uncertified wood stoves have not been replaced because of the generally higher combustion efficiencies of certified wood stoves. This measure was not modeled for CO impacts.

57. Ban on Fireplace Installation in New Homes

This measure would involve a ban on the installation of woodburning fireplaces in new home construction or as an "add-on" to an existing home. Woodburning may cause up to 40 percent of the pollution in neighborhoods during temperature inversions according to the Arizona Department of Environmental Quality. This measure is similar to the measure entitled, Clean Burning Fireplace Construction recommended by the Governor's Air Quality Strategies Task Force.

As recommended by the Governor's Air Quality Strategies Task Force, this measure could be implemented by adopting legislation to require the construction of clean burning fireplaces and woodburning devices as defined by the Environmental Protection Agency for all newly constructed residential fireplaces. These products would meet EPA Phase II standards which include EPA certified appliances, natural gas appliances, and fireplaces that have been designated "as clean as" EPA certified appliances by a certified air pollution control agency.

Based on a study conducted by Sheldon Research and RADCO Labs, conventional fireplaces emit an average of 256 grams of carbon monoxide per hour and 47 grams of particulates per hour. In July 1990, the EPA Phase II regulations became effective. These regulations required that all appliances manufactured and ultimately sold in the United States be EPA certified and meet the performance

standards of 4.1 grams of particulate emissions per hour for catalytic appliances and 7.5 grams of particulate emissions per hour for non-catalytic appliances.

A. Suggested Implementing Entity. The Arizona Legislature could implement this measure through legislation. The legislation could authorize the County to adopt an ordinance/regulation to implement the measure.

B. Cost. According to the Governor's Task Force, the requirement for new fireplaces to be clean burning would require no new tax dollars to be appropriated by the State, County, or cities. The cost to the consumer varies from $50.00 to over $1,000 depending on the product selected.

C. Basis for Consideration. This measure was recommended by the Governor's Air Quality Strategies Task Force on December 2, 1996.

D. Benefits and Other Considerations. The requirement for new fireplaces to be clean burning (ban on woodburning fireplace installation in new homes) would require no new tax dollars to be appropriated by the State, County or cities. The cost to the consumer varies from $50.00 to $1,000.00 depending on the product selected. However, operating efficiencies and material costs may actually result in significant overall customer savings plus significant air quality enhancements.

It is assumed that this measure will be implemented in the modeled year (2000 for CO). It is further assumed that, upon transfer of real estate or re-leasing of rental units, all woodburning fireplaces and uncertified wood stoves in homes will be replaced with cleaner burning alternative woodburning devices or have the flue sealed.

Estimated Reduction in Total CO Emissions in 2000 0.1%

58. Episode Curtailment Program for Residential Wood Combustion (Removes Current Exemptions)

The EPA guidance entitled, Technical Information Document for Residential Wood Combustion Best Available Control Measures, September 1992, indicates that the purpose of wood smoke curtailment programs is to restrict woodburning during periods when atmospheric conditions and the level of woodburning activity result in ambient concentrations of wood smoke in excess of the national standards for PM-10. Episodic curtailment is best suited for making short-term, but significant, reductions in ambient levels of PM-10.

This measure would involve establishing an episode curtailment program that includes the following components: public awareness, forecasting and prediction, public notification, exemptions, enforcement, and tracking. The measure would also remove the current exemptions provided for in the Maricopa County Residential Woodburning Restriction Ordinance. The EPA document indicates that the curtailment program should be implemented in stages, with less severe restrictions imposed at lower predicted PM-10 concentrations.

In October 1994, Maricopa County adopted the Residential Woodburning Restriction Ordinance. The purpose of this ordinance is to restrict residential woodburning within the PM-10 nonattainment area in a non-approved device when monitoring or forecasting indicates that the carbon monoxide standard and/or the particulate matter standard are likely to be exceeded. After a restricted-burn period is declared, residential woodburning is prohibited except in specified approved residential woodburning devices or in cases where an exemption has been granted because the device is the sole source of heat for the residence. Any person who violates this ordinance within a one-year period after having been issued a warning notice is guilty of a civil offense and is subject to a $100 fine. As a regionwide ordinance, the Residential Woodburning Restriction Ordinance applies to both the incorporated and unincorporated areas within Maricopa County.

A. Suggested Implementing Entity. The Arizona Legislature and Maricopa County could implement this measure. Alternatively, the Maricopa County Residential Woodburning Restriction Ordinance could be strengthened.

B. Cost. This assumes that the existing ordinance is amended to prohibit the use of any woodburning devices during a curtailment period. In general, the cost to amend an ordinance is estimated to be up to $9,300 based on personnel cost data provided by Maricopa County. Enforcement costs are estimated to be the same as those under the existing ordinance. Consumer costs are estimated to be negative (i.e., they save money) and amount of $1.05 in savings per woodstove-winter day, by heating with the next most expensive energy source (i.e., fuel oil).

C. Basis for Consideration. In the Best Available Control Measures guidance dated September 1992, EPA identified this measure as an integral measure for residential wood combustion. During the winter months, the temperature inversion that traps carbon monoxide also traps particulate pollution. A mandatory woodburning ordinance could be instrumental in reducing particulate emissions.

This measure is related to the Episode Curtailment Program for Residential Wood Combustion (Areawide Strategy) and Ordinances to Control the Use of Fireplaces and Woodburning Stoves (Areawide Strategy) from the MAG 1991 Particulate Plan for PM-10 for the Maricopa County Area and 1993 Revisions.

D. Benefits and Other Considerations. An episode curtailment program that totally prohibited the burning of wood would be beneficial in reducing PM-10 emissions. It may be difficult to accurately predict episodes and enforcement may be problematic. This measure was not modeled for CO impacts.

REDUCTION OF VEHICLE IDLING

59. Limit Excessive Car Dealership Vehicle Starts

A significant number of new and used car dealers start their vehicles daily to avoid battery failure and assure smooth start-ups for customer test drives. During the start-up phase of operation, a vehicle experiences cold start exhaust emissions. The cold start is the highest polluting operating mode for a motor vehicle since the catalytic converter does not function until its operating temperature (about 600 degrees centigrade) is achieved. This temperature is reached after approximately two minutes of operation. Car dealership lots are located throughout Maricopa County. For purposes of emission estimation, they are classified as area sources.

This control measure would require car dealers to limit the starting of vehicles for sale on their lot(s) to once every two weeks.

A. Suggested Implementing Entity. This measure could be adopted by Maricopa County.

B. Cost. Savings would result from less fuel consumption and lower labor cost associated with this routine task. Cost to the enforcement agency would depend on the actual measure.

C. Basis for Consideration. The South Coast Air Quality Management District in California is considering this measure.

D. Benefits and Other Considerations. Cold start/idle emissions for passenger cars and light trucks for sale in the Maricopa area car dealerships would be reduced with each engine start-up eliminated by this measure.

This measure was not modeled. The onroad mobile portion of the inventory does not include the idling of vehicles. A change in the amount of vehicle idling would have no effect on modeling, although it would produce an emission benefit.

60. Limit Idling Time to Three Minutes

Extended vehicle idling can result in VOC and CO emissions beyond those associated with one engine start. This control measure may reduce curb and drive through facilities idling to a maximum time limit for all motor vehicles on private and public property. Based on available data from mostly colder areas the time limit adopted is three minutes. However, additional analyses would be needed to be performed to precisely determine this limit.

Those vehicles that require the engine to operate a loading, unloading, or processing device are mostly exempt from this measure. In addition, emergency vehicles such as police cars, ambulances, and fire trucks would be considered for exemption as well.

A. Suggested Implementing Entity. This control measure could be implemented regionwide through action by Maricopa County.

B. Cost. Savings would result from less fuel consumption. Cost to the enforcement agency would depend on the actual measure.

C. Basis for Consideration. Section 108(f) of the Clean Air Act identifies "programs to control extended idling of vehicles" as a transportation control measure for consideration in air quality plans. Other air quality nonattainment areas which are considering or have approved this measure are New York City, New Hampshire, San Francisco, and Toronto. The Toronto measure focuses on delivery trucks and buses.

D. Benefits and Other Considerations. This measure was not modeled. The onroad mobile portion of the inventory does not use the length of vehicle idling as an input. A change in the amount of vehicle idling would have no effect on modeling, although it would result in some emission reduction in certain cases.

61. Emission Reduction Credit for Truck Stop Electrification

Trucks with gross vehicle weight (GVW) between 14,000 and 33,000 pounds are classified as medium heavy-duty trucks. The majority of those trucks are powered

by diesel fuel, while a smaller portion are powered by gasoline. Trucks with a GVW over 33,000 pounds are classified as heavy-duty trucks (HDTs), powered exclusively by diesel engines. This control measure includes all HDTs powered by either gasoline or diesel fuels.

It is estimated that HDTs idle for more than 50 percent of engine running time. Most of the engine idling occurs at truck stops. Engine idling takes place for various reasons, such as to provide continuous power to refrigerated truck trailers and to provide heating/cooling to the truck cab. As a result, idling emissions represent over 25 percent of the HDT emissions. Idling HDTs produce about 75% of the on-road mobile source PM-10 emissions.

The proposed method of control is based on off-the-shelf equipment to retrofit HDTs and install electric outlets at truck and bus stop locations. The truck equipment will replace all of the engine idling functions by connecting to ground based electric power.

A. Suggested Implementing Entity. This control measure cold be implemented regionwide through action by Maricopa County.

B. Cost. Savings would result from less fuel consumption, but could be offset by the cost of electrification. It is assumed that any net cost increase incurred by truck stop operators and truckers ultimately would be reflected in the consumer cost of trucked goods. The administrative and/or enforcement costs of this measure are expected to be minimal.

C. Basis for Consideration. Section 108(f) of the Clean Air Act identifies "programs to control extended idling of vehicles" as a transportation control measure for consideration in air quality plans. Other areas are evaluating this control measure with support from the electric power industry. None have adopted this measure.

D. Benefits and Other Considerations. This measure would seek to eliminate the need for idling by trucks and buses by installing on-board electrification packages and equipping truck stops to accommodate such electrified vehicles. To date there has been little research in the area of quantifying potential emission benefits from eliminating idling trucks and buses, and methodologies to determine actual VOC, CO and PM-10 reductions. A detailed study would need to be completed as part of the rule development process to quantify these potential emission reductions.

CHAPTER SEVEN

SUGGESTED MEASURES FOR THE PLAN

The extensive planning process that was used to develop this plan involved the thorough review of pertinent air quality information by the MAG Air Quality Technical Advisory Committee and MAG Air Quality Policy Committee. The information included: emission inventories which identify the sources of carbon monoxide and particulate pollution problems; air quality modeling data; and descriptions and assumptions associated with the air quality control measures. The committees also reviewed extensive information on the cost effectiveness of the air quality control measures and the requirements of the Clean Air Act.

Following the consideration of the various types of information, the air quality committees began their deliberation to recommend a Suggested List of Measures for Particulate Matter and Carbon Monoxide. Measures for the two pollutants were considered at the same time since several of the measures impact both carbon monoxide and particulates. Also, the Serious Area Plans for both pollution problems are due to be submitted to the Environmental Protection Agency within relatively close proximity. Ultimately, the Suggested List of Measures was approved by the MAG Regional Council on January 29, 1997 with revisions on March 26, 1997. The measure selection process is depicted in Figure 7-1 and described below.

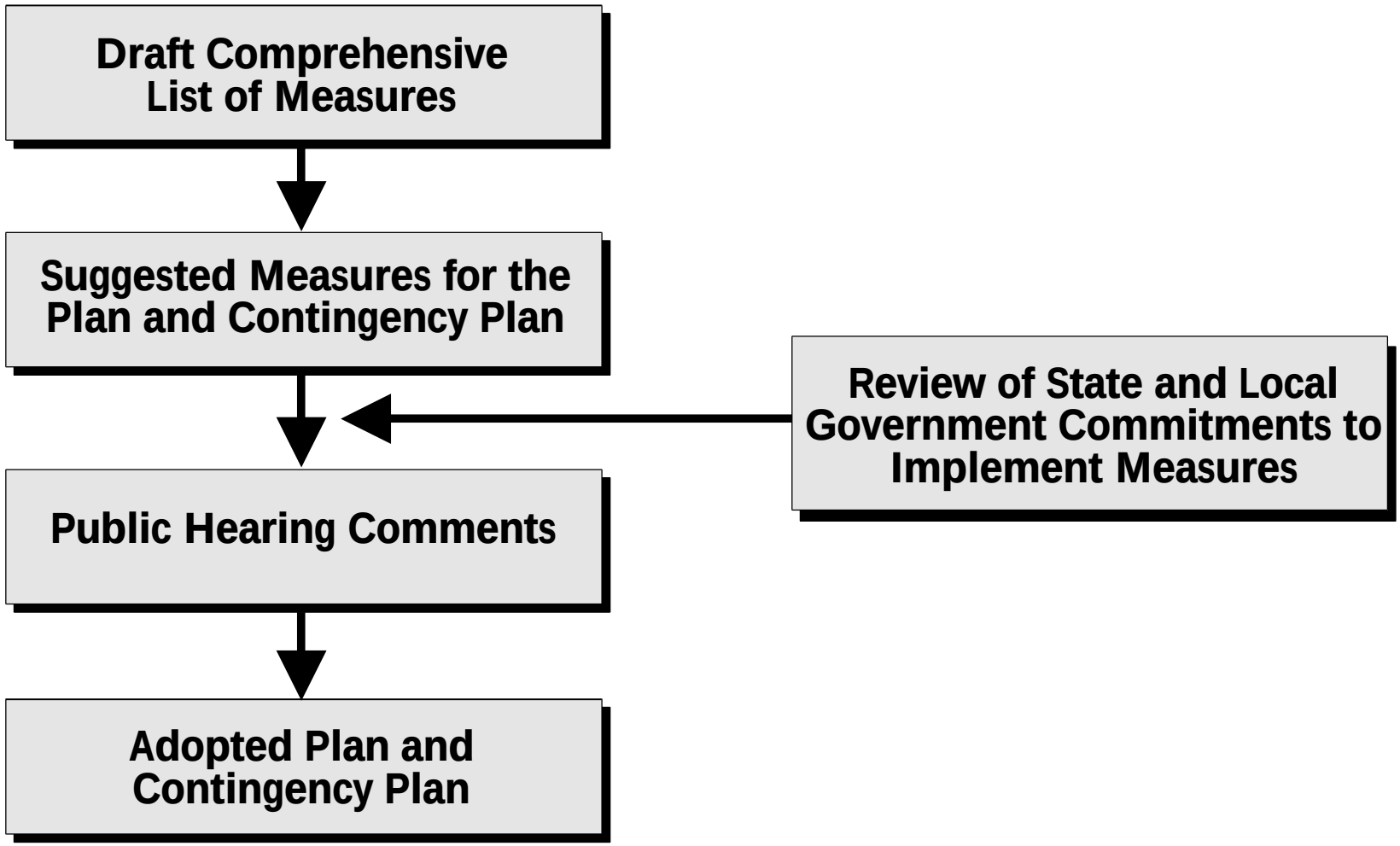
MAG AIR QUALITY TECHNICAL ADVISORY COMMITTEE RECOMMENDATION FOR THE SUGGESTED LIST OF MEASURES

During November-December 1996, a Draft Comprehensive List of Measures for Particulate Matter and Carbon Monoxide was prepared as described in Chapter Five. The potential control measures for the list were identified from several sources. The first key source was the Clean Air Act which included the specific transportation control measures in Section 108 (f) of the Act. Secondly, Arizona Law (A.R.S. Section 49-402) identified additional control measures to be considered in air quality plans. Thirdly, the list also included other potential measures from previous MAG air quality plans or derived from other air quality plans from other nonattainment areas around the country. Finally, the list included various measures based on preliminary suggestions from the 1996 Governor's Air Quality Strategies Task Force.

The Comprehensive List was divided into two major sections - Part I: New Measures and Part 2: Existing Measures Which Could be Considered for Strengthening. On November 6, 1996, the MAG Air Quality Technical Advisory Committee began reviewing the Draft Comprehensive List of Measures for Particulates and Carbon Monoxide. Subsequently, break out group discussions on these measures were held at the December 19, 1996 Technical Advisory Committee meeting to consider in detail the cost effectiveness of the measures. In addition, a report entitled, Preliminary Description of the Draft Comprehensive List of Measures of Particulate Matter and Carbon Monoxide was prepared by MAG to assist in the evaluation of measures. On November 14, 1996, the Draft Comprehensive List of Measures was reviewed by the MAG Air Quality Policy Committee.

Figure 7-1

Measure Selection Process for MAG Air Quality Plans



In January, the MAG Air Quality Technical Advisory Committee embarked upon a two day process to recommend measures for the Suggested List. On January 8, 1997, the Technical Advisory Committee reviewed the entire Draft Comprehensive List of Measures (dated December 30, 1996) involving a list of more then 60 potential new measures and more than 80 existing measures which could be considered for strengthening. This process resulted in a show of hands to identify measures to recommend, not recommend, or consider in further discussion. On January 9, 1997, the Technical Advisory Committee voted on specific recommendations, as follows:

- First, potential new measures for which further discussion had been requested were addressed and voted upon individually. Measures newly proposed for addition to the list were also addressed in this manner. The outcome of this process was presented in Section One of the voting results table.

- Second, existing measures which had been identified for possible strengthening were voted on as a group of 20 measures. In addition, two other existing measures were the subject of individual discussion and voting. The outcome of this process was presented in Section Two of the voting results table.

- Third, a vote was taken regarding a group of 26 potential new measures for which further discussion had not been requested during the January 8, 1997 review by the Technical Committee. This group of measures included some being recommended for inclusion in the Suggested List, and others not recommended for inclusion. The outcome of this process was presented in Section Three of the voting results table.

As a result of this voting process, the MAG Air Quality Technical Advisory Committee recommended to the Air Quality Policy Committee a total of 68 measures, including 46 new measures and 22 existing measures which could be considered for strengthening. While the existing measures are already being implemented or in place, the Committee thought that perhaps some could be strengthened further. A complete copy of the Voting Results from the January 9, 1996 MAG Air Quality Technical Advisory Committee meeting is provided in Appendix B, Exhibit 5.

<u>Air Quality Technical Advisory Committee Justification for Not Recommending Various Measures for the Suggested List</u>

Collectively, a total of nine measures were not recommended by the Air Quality Technical Advisory Committee for inclusion in the Suggested List of Measures. The Committee also provided their justification for not recommending these measures during the voting process. The measures not recommended and the Committee's justification is as follows:

- Use of Clean Fuels on a Statewide Basis - The measure would have only negligible impact on air quality due to spillover benefits from existing requirements already in place.

- Fuel Tax Increase - Travel reduction sensitivity to fuel price is not sufficient in magnitude or duration to warrant the adverse economic impacts.

- Heavier Gasoline Tanker Trucks - This measures is not sufficiently developed and the details are not worked out. This was withdrawn by the Committee member who suggested it.

- Encourage Use of Yield Signs and Round-Abouts in Place of Stop Signs and Traffic Signals - This measure was not recommended due to safety considerations. These design decisions should be left to the discretion of local traffic engineers.

- Ban Sale/Use of Gasoline-Powered Lawn and Garden Equipment - Sufficient quantities of alternative equipment are not available to support a widespread ban.

- Mitigation Bond Requirement of Construction and Development Projects to Provide Funding for Agencies to Control Project Emissions in the Event of Contractor Noncompliance - No data is available regarding the costs and air quality benefits of this measures.

- Require Dust Mitigation Plan Submission and Implementation by Property Owner for Vacant Parcels Greater Than 10 Acres - The Committee recommended that this measure be included as part of another measure: Strengthening and Better Enforcement of Fugitive Dust Control Rules.

- Truck Stop Electrification - This measure would result in insignificant emissions reductions due to an insignificant number of facilities in the nonattainment area.

- Transient Loaded Mode Test for 1967-1980 Vehicles and Heavy-Duty Gasoline Trucks 1981 and Newer - This measure would increase emissions compared to the existing program according to the Arizona Department of Environmental Quality.

- Control of Emissions Due to Material Transport (e.g., Truck Covers, Freeboard Requirements, Material Dampening, Responsibility for Clean-up of Spills - This measure is considered part of a separate recommended measure, Strengthening and Better Enforcement of Fugitive Dust Control Rules.

The justification for not recommending these measures for the Suggested List is reflected in the Voting Results, Appendix B, Exhibit 5.

MAG AIR QUALITY POLICY COMMITTEE RECOMMENDATION FOR THE SUGGESTED LIST

On January 16, 1997, the MAG Air Quality Policy Committee thoroughly reviewed the recommendations from the Air Quality Technical Advisory Committee. The Policy Committee discussed the voting results report from the Technical Committee and the justification for not recommending various measures. Following a lengthy discussion, the MAG Air Quality Policy Committee also recommended to the MAG Regional Council the same 68 measures.

MAG REGIONAL COUNCIL APPROVAL OF THE SUGGESTED LIST OF MEASURES

On January 29, 1997, the MAG Regional Council considered the recommendation from the Air Quality Policy Committee. The Regional Council then approved a total of 61 measures for the Suggested List and returned the seven agricultural measures to the Air Quality Policy Committee for further study. The Regional Council expressed concern that the agricultural measures could have widespread negative economic impacts on the agricultural community.

The Air Quality Policy Committee then began to work with the Maricopa County Farm Bureau on the measures. On February 19, 1997, the Maricopa County Farm Bureau recommended seven agricultural measures to the MAG Air Quality Policy Committee which would be effective in reducing particulate emissions and would not negatively impact the agricultural community. The Farm Bureau also provided their justification concerning the infeasibility of some of the previous agricultural measures (see Appendix B, Exhibit 6). The MAG Air Quality Policy Committee then endorsed the recommended measures from the Maricopa County Farm Bureau.

On March 26, 1997, the MAG Regional Council revised the Suggested List of Measures to include six new agricultural measures. The Regional Council did not approve one agricultural measure; Dust Control on Farm Roads. Under this measure, local entities could develop a program of cooperative agreements with farms to provide dust control on farm roads. In general, the Regional Council indicated that this measure would be economically infeasible due to the number of unpaved farm roads and the high costs for control. This could cause negative economic impacts on the agricultural community.

The Suggested List of Measures of Particulate Matter and Carbon Monoxide as revised on March 26, 1997 by the Regional Council is included in Table 7-1.

SUGGESTED LIST OF MEASURES FOR PARTICULATE MATTER AND CARBON MONOXIDE

These measures may or may not be feasible and available to the implementing entities.

PART 1: NEW MEASURES

MEASURE	Potential Implementing Entity
VEHICLE EMISSIONS TESTING	
97-IM-1. Phased-In Emission Test Cutpoints More stringent I/M 240 pass/fail standards ("final standards") for motor vehicle emissions testing were mandated to be effective on January 1, 1997, but have not been implemented. Studies conducted in the Arizona emissions testing lanes during 1995 and 1996 demonstrated, that without adequate preconditioning 50 percent or more of the vehicles failing under final standards will be false failures. Therefore, this measure would involve the development of an alternative test protocol to reduce false failures.	State
97-IM-2. Enhanced Emission Testing of Constant Four-Wheel Drive Vehicles This measure would require that full-time four-wheel drive vehicles and vehicles equipped with traction control receive the transient loaded emissions test (i.e., I/M 240). Implementation would require the installation of dual-axle dynamometers in several locations throughout the inspection station network in the metropolitan area.	State
97-IM-3. Geographic Expansion of the Emissions Testing Program This measure would expand the geographic coverage of the I/M program requirements to encompass all of Maricopa County or the entire state, reducing the emissions generated by these vehicles on occasions when they are operated within the Nonattainment Area.	State
97-IM-4. One-Time Waiver from Vehicle Emissions Test In 1996, S.B. 1002 limited the issuance of a waiver for failure to comply with the emission testing requirements to one-time only, beginning January 1, 1997.	Adopted by State in 1996 Air quality impact will be evaluated for plans.
97-IM-5. No-Waiver or Increased Waiver Repair Limit Options This measure would modify the vehicle inspection maintenance program to allow no waivers from passing the emissions test, or further increase the amount of money which a motorist must spend for repairs in order to obtain a waiver. In 1993, H.B. 2001 increased the repair threshold for gasoline powered vehicles in order to be eligible for a waiver from $50 to $100 for vehicle model years 1967-1974; from $200 to $300 for vehicle model years 1975-1980; and from $300 to $450 for vehicle model year 1981 and newer.	State

Table 7-1 (continued)

MEASURE	Potential Implementing Entity
97-IM-6. Tougher Enforcement of Vehicle Registration and Emissions Test Compliance This measure would use additional methods to increase the registration compliance of residents. Also, it would address compliance with I/M test requirements by commuters residing outside the nonattainment area or college students attending school in the nonattainment area.	State
97-IM-7. Vehicle Pollution Charge * * Recommended with two conditions: 1. Additional study should be conducted to determine appropriate and feasible implementation mechanisms; and 2. The measure should not be implemented until after resolution of the technical problems with implementing the "final" cutpoints in the enhanced vehicle emissions testing program (I/M 240). This concept entails modification of the existing structure of motor vehicle registration charges by linking the fees to the results of the existing Vehicle Inspection/Maintenance Program. A base emissions fee would be charged for all vehicles at registration. In addition, an incrementally higher fee would be added depending upon how much the tailpipe emission of the individual vehicle exceed those of the average vehicle. This would encourage owners of older high-emitting vehicles to retire their vehicles, while owners of newer vehicles would tend to effect repairs beyond those required by the current I/M program cost waivers. If the program were not revenue-neutral, any excess revenues could be allocated for transit improvements.	State
97-IM-8. Require Pre-1988 Heavy-Duty Diesel Commercial Vehicles Registered in the Nonattainment Area to Meet 1988 Federal Emission Standards; Provide Incentives to Encourage Voluntary Accelerated Vehicle Replacement by the Year 2001 In 1996, S.B. 1002 was passed by the Arizona Legislature requiring that after January 1, 2004 all commercial Diesel vehicles operating in Area A that weigh more than 26,000 pounds and are registered in Area A must meet or surpass the 1988 federal emission standards unless they were built in or after 1988. In addition, providing incentives could help accelerate replacement of older vehicles.	Adopted by State in 1996 Air quality impact will be evaluated for plans.
97-IM-9. Snap Acceleration Test for Heavy-Duty Diesel Vehicles In 1996, S.B. 1002 was passed by the Arizona Legislature requiring that beginning March 1, 1997, medium and heavy duty Diesel vehicles registered or re-registered in Area A that are more than 33 months beyond the initial date of registration, to take the snap acceleration test.	Adopted by State in 1996 Air quality impact will be evaluated for plans.

Table 7-1 (continued)

MEASURE	Potential Implementing Entity
CLEAN FUELS FOR CONVENTIONAL VEHICLES	
97-CF-1. Implement Clean Fuels Approach Recommended by the Governor's Air Quality Strategies Task Force Short term: Opt into Federal Reformulated Fuel Program starting in 1997. Long term, consider several options: Federal Reformulated Fuel California Phase 2 Fuel Specifications Performance-Based Standards for Motor Vehicle Fuel	State
97-CF-2. Tighter Limits on Sulfur Content in Gasoline The "CO Complex Model" indicates that fuel oxygen and sulfur content have the heaviest influence on exhaust CO emissions. A change in the sulfur fuel parameter from 339 ppm to 139 ppm indicated an 8 to 9 percent reduction in CO vehicle emissions. The average sulfur content for Maricopa County for Summer fuel is approximately 168 ppm.	State
97-CF-3. Measures to Encourage the Construction and Operation of Fueling Stations for Alternative Fuel Vehicles The measure is aimed at encouraging the development of a fueling infrastructure for alternative fuels. Through actions of the Arizona Legislature, the goal would be to develop an alternative fueling network for public/governmental agencies through a statewide credit/debit fuel card system. Also, provisions would be made to encourage private sector development of alternative fueling stations through fuel tax credits.	State
97-CF-4. California Reformulated Diesel Fuel or Other Clean Diesel Fuel An alternative to Diesel #1 is CARB "clean" Diesel, which was required in California beginning in the fall of 1993. The regulation requiring "clean" Diesel specifies and aromatic content of 10 percent (for large refiners) and a sulfur content of 0.05 percent. However, refiners can use alternative formulations if they can demonstrate that the same emission reductions achieved with their formulation.	State
97-CF-5. Limit Sulfur Content of Diesel Fuel Oil to 500 ppm Federal regulations require that on-road Diesel fuel sold throughout the contiguous U.S., have a maximum sulfur content of 0.05 percent by weight (500 ppm). Arizona S.B. 1002 prohibits sale of Diesel fuel (including off-road) use in the Nonattainment area that contains in excess of 500 ppm sulfur.	Adopted by State in 1996 Air quality impact will be evaluated for plans.
CLEANER VEHICLE TECHNOLOGIES	
97-VT-1. Adoption of the California Low-Emission Vehicle Program The California Low-Emission Vehicle Program establishes tailpipe emissions standards for a series of vehicle classes ranging from Transitional Low-Emission Vehicles to Zero-Emission Vehicles. The program allows manufactures to use any combination of emission control technology and alternative fuels to meet the standards.	State

Table 7-1 (continued)

MEASURE	Potential Implementing Entity
97-VT-2. Voluntary Gasoline Vehicle Retirement Programs, Including Enhanced Notification For Older Vehicles and in High Pollution Areas This measure would institute a program to purchase and retire vehicles which produce excessive emissions, particularly pre-1980 model year light duty automobiles and trucks. A voluntary vehicle retirement program might be implemented as an enhancement to the existing inspection/maintenance program; this would involve retiring vehicles which fail the emissions test and require repairs more costly than the waiver limit.	State, County
97-VT-3. Voluntary Diesel Vehicle Retirement This measure would institute a program to purchase and retire heavy-duty Diesel vehicles. This measure is focused on the heavier weight classes because they have the highest emissions and are driven the most. A vehicle retirement program could be implemented as an enhancement to the existing inspection/maintenance program; this would involve retiring vehicles that fail the emissions test and require repairs more costly than the waiver limit. The analysis performed for this study assumed a bounty of $10,000 for each retired vehicle, offered only for pre-1991 model year vehicles.	State
97-VT-4. Heavy-Duty Diesel Engine Replacement or Overhaul at Recommended Intervals Heavy-duty Diesel engines are typically overhauled several times before being replaced. This measure would offer incentives to heavy-duty Diesel vehicle owners to replace the existing engine with a new (i.e., 1994 or later model year) engine at the time of overhaul. The focus of this measure is on pre-1991 model year heavy-duty Diesel trucks.	State
97-VT-5. Retrofit Existing Diesel Vehicles - e.g. with Oxidation Catalyst This measure would involve the voluntary use of emission control devices on Diesel-powered vehicles. In existing vehicles, the installation of oxidation catalysts or related devices could be encouraged at the time of engine overhaul, or as a pilot test program. Pre-1991 model years could be targeted.	State
REDUCED VEHICLE USE AND TRAFFIC CONGESTION	
97-TC-1. Mass Transit Alternatives This measure is envisioned as a major change to the scope and service levels offered by the existing public transit system in the region. A light rail component is currently under consideration, but this is not intended to rule out alternative technologies or different sized systems. The current Long Range Transportation Plan for the region calls for a doubling of the regional bus system after the year 2005.	State, Local
97-TC-2. High Occupancy Vehicle Lane Pricing The pricing of High Occupancy Vehicle (HOV) lanes for peak hour use by non-HOVs offers a mechanism for taking advantage of underused roadway capacity. This concept would result in higher overall average speeds in the general traffic lanes, which would produce a reduction in air pollution.	State

Table 7-1 (continued)

MEASURE	Potential Implementing Entity
97-TC-3. Develop Intelligent Transportation Systems The term "Intelligent Transportation Systems" includes a variety of technological applications intended to produce more efficient use of existing transportation corridors. The primary application currently implemented in the Maricopa County area is the Freeway Management System (FMS) operated by the Arizona Department of Transportation. The FMS combines the use of in-road sensors, surveillance cameras, ramp metering controls, and variable message signs to detect and respond to freeway incidents.	State, County, Local
97-TC-4. Special Event Controls - Required Implementation from List of Approved Strategies This measure would require new and existing owners/operators of the special event centers to reduce mobile source emissions generated by their events. A list of optional strategies would be available that reduce mobile source emissions. The definition of "special event center" could be developed through the rule development process.	State, County, Local
REDUCED EMISSIONS FROM NON-ROAD EQUIPMENT	
97-NR-1. Voluntary Retirement Program for Gasoline-Powered Lawn and Garden Equipment This measure would encourage the voluntarily replacement of high-emitting lawn and garden equipment with lower-emitting or zero-emitting models, emphasizing removal of 2-cycle engines.	State
97-NR-2. Require Government Agencies to Minimize Use of Gasoline-Powered Lawn and Maintenance Equipment Where Feasible and Appropriate A policy to minimize emissions from lawn and maintenance equipment by government agencies is likely to have a substantial impact on the emissions from this class of nonroad equipment.	State
97-NR-3. Emissions Standards for New Heavy-Duty Construction Equipment Numeric credit will be taken for federal emissions standards adopted in 1994. Adoption of tougher California standards would provide PM-10 reductions beginning in 2001. The adoption of California's standards would only affect off-road heavy duty diesel engines between 175 and 750 horsepower.	State
97-NR-4. Emissions Standards for Utility Equipment This measure would involve adoption of California emissions standards for newly manufactured utility engines. The types of equipment affected by this measure include lawn and garden equipment (e.g. lawn mowers, leaf blowers, and edge trimmers) as well as general utility equipment such as pumps, generators, grinders, and compressors.	State
97-NR-5. Emission Standards for Off Road Vehicles - Motorcycles and Recreational Vehicles This measure would establish emissions standards for new off-road motorcycles and recreational vehicles sold within the state. Manufacturers would be required to test engine emissions through a quality-audit program and certify that their engines meet emissions standards.	State

Table 7-1 (continued)

MEASURE	Potential Implementing Entity
97-NR-6. Encourage the Use of Temporary Electrical Power Lines Rather than Portable Generators at Construction Sites Emissions from the production of electrical power used in new home construction could be reduced substantially by the use of temporary electrical power rather than generators. Electrical service can usually be established within 30 days of the request. This is a voluntary measure that would reduce noise as well as air pollution.	County, Local
97-NR-7. Defer Emissions Associated with Governmental Activities This measure is aimed at reducing activities where feasible and appropriate by State agencies and local governments in the Nonattainment Area that may contribute to seasonal air quality problems. This would involve a shift in the timing of activities or postponement altogether, until after critical air pollution periods.	State, County, Local
REDUCED EMISSIONS FROM INDUSTRIAL SOURCES	
97-IS-1. PM-10 Best Available Control Technology (BACT) Determinations for Stationary Sources The Maricopa County Environmental Services Department could make an industry-by-industry study of the major point sources to determine the best types of control technologies that are available to yield emission reductions. Subsequently, Maricopa County could require the use of the Best Available Control Technology.	County
FUGITIVE DUST CONTROL	
97-DC-1. Strengthening and Better Enforcement of Fugitive Dust Control Rules It may be possible to achieve improved compliance with existing air pollution control regulations (Rule 310) through the provision of additional inspection and enforcement personnel. The effectiveness of enacting tougher regulations would also depend upon the level of enforcement provided.	County
97-DC-2. Dust Control Plans for Construction/Land Clearing and Industrial Sites (Including Active Landfills), with Elements Addressing Trackout Prevention, Site and Material Maintenance, Construction Staging, and High Wind Operating Restrictions This measure would involve requiring dust control plans for construction, demolition, land clearing, and industrial projects. The dust control plan could include a variety of site-specific preventative and mitigative measures.	County

Table 7-1 (continued)

MEASURE	Potential Implementing Entity
REDUCED EMISSIONS FROM AGRICULTURAL ACTIVITIES	
97-AG-1. Incentives and Credits for Use of Improved Agricultural Practices A variety of credits and incentives could be provided by the State to encourage the use of agricultural practices which reduce PM-10 emissions. For example, flex account water credits could be provided in cases where agricultural PM-10 control measures entail increased water use. Tax credits could be provided to off-set additional operating costs arising from implementation of PM-10 control measures. Also, farmers could get an extension on required plow-up dates on a day for day basis whenever they had been restricted from tilling due to a high wind event.	State
97-AG-2. Tilling Restrictions on High Wind Days and Tillage Irrigation Where Feasible To reduce PM-10 emissions generated by tilling operations, tillage pre-irrigation would be encouraged where feasible, including consideration of incentives to offset the additional water usage. Additionally, on days with wind speed exceeding 25 miles per hour, tilling in unplanted fields could be prohibited unless there is sufficient soil moisture. The Maricopa County Farm Bureau suggests that the Arizona Department of Agriculture could handle the enforcement requirements.	State
97-AG-3. Reduce Emissions of Ammonia and Nitrates from Agricultural Operations This measure involves incorporating manure into the soil within 48 hours of spreading to minimize ammonia emissions. This measure would also enable farmers to obtain maximum benefit of the nitrates for soil enrichment. The Maricopa County Farm Bureau suggests that the Arizona Department of Agriculture could handle the enforcement requirements.	State
97-AG-4. Cooperative Development of Management Practices to Reduce Emissions from Agricultural Activities Agricultural interests could continue to participate with various entities to develop and implement management practices that reduce dust from agricultural activities. The Maricopa County Farm Bureau suggests that the Arizona Department of Agriculture could handle the enforcement requirements.	State
97-AG-5. Deep Furrowing of Fallow Fields Dust emissions may be generated by wind erosion of open agricultural land. The amount of emissions is affected by wind speed, frequency of surface disturbance and roughness of the surface. Deep furrowing of fallow fields would increase roughness and reduce wind erosion. The Maricopa County Farm Bureau suggests that the Arizona Department of Agriculture could handle the enforcement requirements.	State

Table 7-1 (continued)

MEASURE	Potential Implementing Entity
97-AG-6. Provide Burial of Whole Stalks During Plowdown - If Research Documents No Increase in Spread of Plant Disease or Pests from this Practice Current Arizona Department of Agriculture rules require farmers to plowdown or shred and bury plant stalks after harvest and before new planting can begin. Perhaps this could be changed to allow whole stalks to be buried, thereby reducing the number of tills needed. The Maricopa County Farm Bureau suggests that the Arizona Department of Agriculture could handle the enforcement requirements.	State
FIREPLACE AND OTHER BURNING RESTRICTIONS	
97-FP-1. Clean Burning Fireplace Construction This measure would involve the adoption of legislation to require the construction of clean burning fireplaces and woodburning devices as defined by the Environmental Protection Agency for all newly constructed residential fireplaces, including "add-ons" to existing homes.	State, County
97-FP-2. Public Information Program on Wood Stoves and Wood Heat This program would acquaint citizens with details of control regulations or ordinances, their responsibilities under the ordinance, and the justification for the ordinance; and enhance the support and provide reinforcement of the issues and principles behind the ordinance.	County
97-FP-3. Improved Performance/Maintenance of Woodburning Devices, Including Weatherization Programs This measure would involve encouraging improved performance of woodburning devices through the use of public education programs, energy audits, and financial incentives such as low-interest loans, cash grants, and tax credits for low income households.	County
97-FP-4. Integrated Program to Reduce Woodburning Emissions A number of additional actions could be taken to provide further means of reducing woodburning emissions: Inducements/Requirements to Eliminate or Upgrade Existing Wood Stoves and Fireplaces; Require Change-Out of Uncertified Wood Stoves or Existing Fireplaces Upon Sale of Home; Restrict the Number or Design of New Wood Stoves and Fireplaces; Ban on Fireplace Installation in New Homes; Tradable Permits for Wood Stoves; Episode Curtailment Program for Residential Wood Combustion (Removes Current Exemptions).	State, County
REDUCTION OF VEHICLE IDLING	
97-VI-1. Limit Excessive Car Dealership Vehicle Starts This control measure would require car dealers to limit the starting of vehicles for sale on their lot(s) to once every two weeks. Presently, a number of new and used car dealers start their vehicles daily to avoid battery failure and assure smooth start-ups for customer test drives. In the start-up phase of operations, a vehicle experiences cold start emissions. The cold start is the highest polluting operating mode for a vehicle since the catalytic converter does not function until its operating temperature is achieved.	State, County

Table 7-1 (continued)

MEASURE	Potential Implementing Entity
97-VI-2. Encourage Limitations on Vehicle Idling Encourage limitations to limit extended idling operations (e.g. by delivery trucks and buses) to three minutes.	County
PART 2: EXISTING MEASURES WHICH COULD BE CONSIDERED FOR STRENGTHENING	
VEHICLE EMISSIONS TESTING	
97-IM-10. Remote Sensing A Random On-Road Testing Program (Remote Sensing) is operated in the Maricopa County nonattainment area as a supplement to the periodic inspection requirement through the Vehicle Emissions Inspection Program. Six on-road testing units are used throughout the nonattainment area. Vehicles possibly out of compliance are required to be emissions tested. This measure would involve improvements to Remote Sensing such as use of additional remote sensing units.	State
97-IM-11. Toll-Free Number to Report Gross Emitting Vehicles A toll-free telephone number could be made available to supplement the existing "Smoking Vehicle Hotline" (207-7045) to enable citizens to report gross emitting vehicles, with the purpose of getting gross emitting vehicles tested and repaired as appropriate. This measure could include better enforcement.	State
CLEAN FUELS FOR CONVENTIONAL VEHICLES	
97-CF-6. Public Education Program for Oxygenated Fuels This measure provides information to the public regarding the need for oxygenated fuels to reduce wintertime emissions of carbon monoxide.	State
CLEANER VEHICLE TECHNOLOGIES	
97-VT-6. Alternative Fuels for Fleets This measure is aimed at encouraging the use of alternative fuels for vehicle fleets operated in the nonattainment area. Reduced emissions are realized almost immediately after introducing alternative fuels into public and private vehicle fleets. The level of emissions reduction will progressively increase as more alternative fueled vehicles replace older fleet vehicles.	State
97-VT-7. Incentive for the Use of Alternative Fuels in Fleets Reduced emissions are realized almost immediately after introducing alternative fuels into public and private vehicle fleets. The level of emissions reduction will progressively increase as more alternative fueled vehicles replace older fleet vehicles. This measure would focus on providing financial incentives such as tax relief to increase the use of alternative fuels in fleets.	State

Table 7-1 (continued)

MEASURE	Potential Implementing Entity
97-VT-8. Alternative Fuels for General Vehicle Use - Includes Tax Deductions for Alternative Fueled Vehicles Encourage the use of low polluting alternative fueled vehicles in the general population by providing tax incentives, rebates, etc. Individual and corporate state income tax deductions were provided in H.B. 2001 to further promote the purchase or conversion of vehicles to alternative fuels.	State
REDUCED VEHICLE USE AND TRAFFIC CONGESTION	
97-TC-5. Expansion of Public Transportation Systems This measure would focus on expanding and enhancing existing public transit services. Transit improvements increase mobility and travel options for existing riders and attract new users. Transit also offers cost savings to commuters. At reasonable levels of utilization, transit is more energy efficient than automobile travel and can also reduce traffic congestion.	State, Local
97-TC-6. Employer Rideshare Program Incentives This measure provides a variety of employer rideshare incentives as well as introducing strategies designed to reduce single occupant vehicle trips. Such strategies could include: preferential parking for carpools and vanpools, public awareness campaigns, Transportation Management Associations among employers, alternative work hours, vanpools for County and State employees, and vanpool purchase incentives.	State, County, Local
97-TC-7. Preferential Parking for Carpools and Vanpools This measure encourages public and private employers to provide preferential parking spaces for carpools and vanpools to decrease the number of single occupant automobile work trips. The preferential treatment could include covered parking spaces or close-in spaces.	State, County, Local
97-TC-8. Coordinate Traffic Signal Systems This measure implements and enhances synchronized traffic signal systems to promote steady traffic flow at moderate speeds. Signal synchronization has been implemented by most of the larger municipalities in the area, and efforts are underway for large-scale coordination across the entire MAG region.	State, County, Local
97-TC-9. Reduce Traffic Congestion at Major Intersections This measure implements a wide range of traffic control techniques designed to facilitate smooth, safe travel through intersections. These techniques include signalization, turn lanes or median dividers. The use of grade separations may also be appropriate for high volume or unusually configured intersections, such as those along Grand Avenue.	State, County, Local
97-TC-10. Site-Specific Transportation Control Measures This measure would encourage the implementation of any available transportation control measures targeting specific locations or subareas. This could include geometric or traffic control improvements at specific congested intersections or at other substandard locations. Another example might be reprogramming left turn signals at certain intersections to lag, rather than lead, the green time for through traffic.	State, County, Local

Table 7-1 (continued)

MEASURE	Potential Implementing Entity
97-TC-11. Encouragement of Bicycle Travel This measure would involve the promotion of bicycle travel to reduce automobile use and improve air quality. One useful channel for public sector encouragement of bicycling is bikeway system planning. Identifying and publicizing appropriate routes for inter-city bike trips could help bicyclists avoid other, less safe facilities. Another area for potential actions is the development and distribution of educational materials, regarding bicycle use and safety.	County, Local
97-TC-12. Development of Bicycle Travel Facilities This measure encourages a variety of capital improvements to increase bicycle use in the MAG area. Off-street bikeways may be implemented where high speed roadways preclude safe bicycling. In downtown areas, on-street bicycle routes are more feasible because traffic generally flows at a slower rate. Bicycle travel facilities should be clearly marked with signs and adequately maintained.	County, Local
97-TC-13. Alternative Work Schedules Alternative work hours, or flextime, is an employer policy which enables workers to choose their own working hours within certain constraints. Flextime provides the opportunity for employees to use public transit, ridesharing, and other nonmotorized transportation. A related strategy, staggered work hours, is designed to reduce peak congestion in the vicinity of the workplace. Alternative work weeks have been implemented extensively by large private and public employers.	State, County, Local
97-TC-14. Land Use/Development Alternatives This measure includes encouraging land use patterns which support public transit and other alternative modes of transportation. In general, this measure would also encourage land use patterns designed to reduce travel distances between related land uses (e.g., residential-commercial). Shorter trip lengths ultimately relieve traffic congestion and improve air quality.	County, Local
97-TC-15. Areawide Public Awareness Programs This measure focuses on conducting ongoing public awareness programs throughout the year to provide the public with information on air pollution and encourage changes in driving behavior and transportation mode use.	RPTA
97-TC-16. Encouragement of Pedestrian Travel This measure involves encouraging the use of pedestrian travel as an alternative to automobile travel. Pedestrian travel is quite feasible for short shopping, business, or school trips. Promotion of pedestrian travel could be included in air pollution public awareness efforts to remind people of this basic alternative.	County, Local
FUGITIVE DUST CONTROL	
97-DC-3. Paving, Vegetating, and Chemically Stabilizing Unpaved Access Points onto Paved Roads (Especially Adjacent to Construction/Industrial Sites) Mud and dirt carryout from unpaved areas such as construction sites often accounts for a substantial fraction of paved road silt loadings in many areas. The elimination of this carryout may significantly reduce paved road emissions. This measure would involve paving, vegetating, or chemically stabilizing access points where unpaved traffic surfaces adjoin paved roads.	State, County, Local

Table 7-1 (continued)

MEASURE	Potential Implementing Entity
97-DC-4. Curbing, Paving, or Stabilizing Shoulders on Paved Roads (Includes Painting Stripe on Outside of Travel Lane) Preventative measures are very important since mitigative measures are often less effective for paved roads, especially in instances where no dominant or localized source of dust loading can be identified. This measure would require the curbing, paving, or stabilizing (chemically or with vegetation) of shoulders of paved roads.	State, County, Local
97-DC-5. Frequent Routine Sweeping or Cleaning of Paved Roads Paved road sweeping and flushing represents a mitigative measure for paved road surface dust loading. This measure would involve the frequent sweeping or cleaning of paved roads, including the flushing of paved roads. Vacuum and regenerative sweeping are acceptable methods. Another option, roadway flushing, involves the use of high-pressure water sprays.	State, County, Local
97-DC-6. Restrictions on the Use of Gasoline-Powered Blowers for Landscaping Maintenance This measure would involve restricting or prohibiting the use of blowers for landscaping maintenance in Maricopa County. Blowers are sometimes used for landscaping maintenance for commercial and residential areas to blow away dirt, leaves, and small rocks. While they improve the appearance of the landscape, they blow dust particles in the air and contribute to particulate pollution.	County, Local

Special note: *These measures may need more study or input from experts, citizens and the regulated community. In some cases, proposed measures may not result in the same benefits experienced in other regions. This may be due to regional differences in climate, geography or airshed. Further refinement of these measures may be made as additional information becomes available through the planning process.*

Modeling of 24-hour average concentrations of particulate matter is being conducted by the Arizona Department of Environmental Quality (ADEQ), and will not be completed until April 1997. The U.S. Environmental Protection Agency has directed the Maricopa Association of Governments to incorporate the ADEQ modeling results into the regional modeling for the Serious Area PM-10 Plan. It is anticipated that the regional modeling work will be completed by summer 1997.

Table 7-1 (continued)

APPENDIX

Contents:

- Measures in Section 108(f) of the Clean Air Act
- Measures Required for Consideration Under Arizona Law

Table 7-1 (continued)

MEASURES IN SECTION 108(f) OF THE CLEAN AIR ACT

1. Programs for improved public transit

2. Restrictions of certain roads or lanes to, or construction of such roads or lanes for use by, passenger buses or high occupancy vehicles

3. Employer-based transportation management plans, including incentives

4. Trip reduction ordinances

5. Traffic flow improvement programs that achieve emission reductions

6. Fringe and transportation corridor parking facilities serving multiple occupancy vehicle programs or transit service

7. Programs to limit or restrict vehicle use in downtown areas or other areas of emission concentration particularly during periods of peak use

8. Programs for the provision of all forms of high occupancy, shared-ride services

9. Programs to limit portions of road surfaces or certain sections of the metropolitan area to the use of non-motorized vehicles or pedestrian use, both as to time and place

10. Programs for secure bicycle storage facilities and other facilities, including bicycle lanes, for the convenience and protection of bicyclists, in both public and private areas

11. Programs to control extended idling of vehicles

12. Programs to reduce motor vehicle emissions, consistent with Title II, which are caused by extreme cold start conditions

13. Employer-sponsored programs to permit flexible work schedules

14. Programs and ordinances to facilitate non-automobile travel, provision and utilization of mass transit, and to generally reduce the need for single-occupant vehicle travel, as part of transportation planning and development efforts of a locality, including programs and ordinances applicable to new shopping centers, special events, and other centers of vehicle activity

15. Programs for new construction and major reconstructions of paths, tracks, or areas solely for the use by pedestrian or other non-motorized means of transportation when economically feasible and in the public interest

16. Programs to encourage the voluntary removal from use and the marketplace of pre-1980 model year light duty vehicles and pre-1980 model year light duty trucks

Table 7-1 (continued)

MEASURES REQUIRED FOR CONSIDERATION UNDER ARIZONA LAW

1. Mandatory employee parking fees
2. Park and ride programs
3. Removal of on-street parking
4. Rideshare programs
5. Mass transit alternatives
6. Expansion of public transportation systems
7. Optimizing freeway ramp metering
8. Coordinating traffic signal systems
9. Reduction of traffic congestion at major intersections
10. Site specific transportation control measures
11. Reversible lanes
12. Fixed lanes for buses and carpools
13. Encouragement of pedestrian travel
14. Encouragement of bicycle travel
15. Development of bicycle travel facilities
16. Employer incentives regarding rideshare programs
17. Modification of work schedules
18. Strategies for controlling the generation of air pollution by nonresidents of nonattainment areas
19. Use of alternative fuels
20. Use of emission control devices on public diesel powered vehicles
21. Paving of roads
22. Restricting off-road vehicle traffic
23. Construction site air pollution control
24. Other air quality control measures

COMPARISON OF THE SUGGESTED LIST OF MEASURES WITH THE MEASURES FOR CONSIDERATION IN THE CLEAN AIR ACT AND ARIZONA REVISED STATUTES

Section 108 (f) of the Clean Air Act contains a list of sixteen transportation control measures which may be considered for reducing air pollution. The Arizona Revised Statutes 49-402 requires that the regional air quality planning agency consider a list of twenty-four measures. Both sets of measures were incorporated into the Draft Comprehensive List.

A comparison of the Suggested List of Measures for Particulate Matter and Carbon Monoxide with the Section 108 (f) Clean Air Act Measures and the measures in State law is presented in Tables 7-2 and 7-3 . From the comparison, it is evident that both sets of measures were considered by the regional air quality planning agency, and included in the Suggested List of Measures.

THE NEXT STEP IN THE PROCESS

After the Suggested List of Measures for Particulate Matter and Carbon Monoxide were approved by the Regional Council, the next step in the planning process involved the consideration of the measures by the appropriate implementing entities. Commitments to implement measures primarily from the State and local governments are then reviewed to determine which measures received firm commitments for inclusion in the Adopted Plan.

TABLE 7-2

COMPARISON OF THE SUGGESTED LIST OF MEASURES WITH MEASURES IN SECTION 108(f) OF THE CLEAN AIR ACT

SECTION 108(f) CLEAN AIR ACT MEASURES	CORRESPONDING MEASURES ON THE MAG SUGGESTED LIST
1. Programs for improved public transit	97-TC-1, 5
2. Restrictions of certain roads or lanes to, or construction of such roads or lanes for use by, passenger buses or high occupancy vehicles	97-TC-2
3. Employer-based transportation management plans, including incentives	97-TC-6, 7
4. Trip reduction ordinances*	97-TC-6, 7
5. Traffic flow improvement programs that achieve emission reductions	97-TC-3, 8, 9, 10
6. Fringe and transportation corridor parking facilities serving multiple occupancy vehicle programs or transit service	97-TC-10
7. Programs to limit or restrict vehicle use in downtown areas or other areas of emission concentration particularly during periods of peak use	97-TC-4, 14
8. Programs for the provision of all forms of high occupancy, shared-ride services**	97-TC-6, 7, 13
9. Programs to limit portions of road surfaces or certain sections of the metropolitan area to the use of non-motorized vehicles or pedestrian use, both as to time and place	97-TC-16
10. Programs for secure bicycle storage facilities and other facilities, including bicycle lanes, for the convenience and protection of bicyclists, in both public and private areas	97-TC-11, 12
11. Programs to control extended idling of vehicles	97-VI-1, 2
12. Programs to reduce motor vehicle emissions, consistent with Title VI, which are caused by extreme cold start conditions	12 Not Applicable in MAG Region (for areas with temperatures of sub-20 degrees Fahrenheit)
13. Employer-sponsored programs to permit flexible work schedules	97-TC-13
14. Programs and ordinances to facilitate non-auto-mobile travel, provision and utilization of mass transit, and to generally reduce the need for single-occupant vehicle travel, as part of transportation planning and development efforts of a locality, including programs and ordinances applicable to new shopping centers, special events, and other centers of vehicle activity	97-TC-4, 14, 16
15. Programs for new construction and major reconstructions of paths, tracks, or areas solely for the used by pedestrian or other non-motorized means of transportation when economically feasible and in the public interest	97-TC-16
16. Programs to encourage the voluntary removal from use and the marketplace of pre-1980 model year light duty vehicles and pre-1980 model year light duty trucks	97-VT-2, 3

*A Regional Trip Reduction Ordinance was adopted in 1988 and strengthened in 1992, 1994, and 1996.
**Regional rideshare services are provided by RPTA in an ongoing program.

TABLE 7-3

COMPARISON OF THE SUGGESTED LIST OF MEASURES WITH MEASURES IN STATE LAW REQUIRED FOR CONSIDERATION

MEASURES REQUIRED FOR CONSIDERATION BY STATE LAW	CORRESPONDING MEASURES ON THE MAG SUGGESTED LIST
1. Mandatory employee parking fees	97-TC-6
2. Park and ride programs	97-TC-7
3. Removal of on-street parking	97-TC-10
4. Rideshare programs	97-TC-6,7,13
5. Mass transit alternatives	97-TC-1
6. Expansion of public transportation systems	97-TC-5
7. Optimizing freeway ramp metering	97-TC-10
8. Coordinating traffic signal systems	97-TC-8
9. Reduction of traffic congestion at major intersections	97-TC-9
10. Site specific transportation control measures	97-TC-10
11. Reversible lanes	97-TC-10
12. Fixed lanes for buses and carpools	97-TC-2
13. Encouragement of pedestrian travel	97-TC-16
14. Encouragement of bicycle travel	97-TC-11
15. Development of bicycle travel facilities	97-TC-12
16. Employer incentives regarding rideshare programs	97-TC-6
17. Modification of work schedules	97-TC-13
18. Strategies for controlling the generation of air pollution by nonresidents of nonattainment areas	97-IM-3
19. Use of alternative fuels	97-CF-3, 97-VT-6,7,8
20. Use of emission control devices on public diesel powered vehicles	97-VT-5
21. Paving of roads	97-DC-3, 4
22. Restricting off-road vehicle traffic	97-DC-1
23. Construction site air pollution control	97-DC-1, 2
24. Other air quality control measures	97-IM-1 through 11, 97-CF-1 through 6, 97-VT-1 through 8, 97-NR-1 through 7, 97-IS-1, 97-AG-1 through 6, 97-FP-1 through 4, 97-VI-1 and 2, 97-DC-1 through 6,

CHAPTER EIGHT

THE ADOPTED PLAN AND IMPLEMENTATION SCHEDULE FOR THE MAG 1998 CARBON MONOXIDE PLAN

During the process of developing this plan, the State and local governments reviewed the measures from the Suggested List which were under their respective authorities. The Suggested List included both carbon monoxide and particulate control measures since Serious Area plans for both pollutants were being prepared in close proximity. Each entity then determined which measures were technologically and economically feasible for implementation by that entity.

Formal resolutions with commitments to implement carbon monoxide and particulate pollution control measures were received from the local governments, Maricopa County, Arizona Department of Transportation, and Regional Public Transportation Authority. The resolutions noted that Best Available Control Measures are required to be included in the Serious Area Particulate Plan for PM-10.

These resolutions were reviewed in order to determine which measures received firm commitments for inclusion in the MAG 1998 Carbon Monoxide Plan. According to the Arizona Department of Environmental Quality (ADEQ), the criteria for a firm commitment include: measures with the implementation, funding, and time frame specified; ongoing programs; commitments to implement measures without a specific funding source identified; commitments to draft documents; and commitments to conduct feasibility studies. Jurisdictional support for a measure is not a firm commitment unless the jurisdiction also agrees to enforce the measure. Measures were also analyzed by MAG to determine which measures could be used for numeric credit towards attainment (see Chapter Nine, Demonstration of Attainment Status).

At the state level, the Arizona Legislature passed legislation for several air quality measures in 1996, 1997 and 1998. Since legislation constitutes a firm commitment, these measures were also included in the adopted plan. The primary pieces of legislation included Senate Bill 1002 passed in a 1996 Special Session, House Bills 2237 and 2307 passed during the 1997 Regular Session, and Senate Bills 1427 and 1269 and House Bill 2347 passed during the 1998 Regular Session.

Collectively, a broad range of commitments were received from the State and local governments for the measures in the adopted plan. These extensive commitments demonstrate the level of effort that is being made to improve air quality. Many of these measures impact all three pollutants: particulates, carbon monoxide, and ozone. In the determination of attainment status, specific emissions reduction credits were not taken where the basis for estimating air quality benefits was limited. However, in many cases these commitments will produce emission reductions above and beyond what has been

quantified in the evaluation of attainment status. These measures represent additional efforts by the State and local jurisdictions to reduce emissions and improve air quality. It is anticipated that as additional experience is gained in the implementation of these measures over time, a more detailed assessment of their air quality benefits can be developed and reported.

The resolutions from the respective entities and the State legislation are included in Chapter Eleven and the corresponding commitment documents which accompany this plan.

The effective implementation of the measures in the adopted plan is an important element in expeditious air quality improvement. Based upon the Clean Air Act, the carbon monoxide attainment date for Serious Areas is December 31, 2000. Effective and expeditious implementation enhances the achievement of the standard by the attainment date and the continued maintenance of that standard.

COMMITTED MEASURES AND IMPLEMENTATION SCHEDULES

Based upon the commitments made by the State and local jurisdictions, the following describes the measures in the adopted plan and their schedule for implementation. The commitments involve the implementation of New Measures; Existing Measures Which Are Being Strengthened; and Additional Commitments for Measures Not on the Suggested List.

1. Phased -In Emission Test Cutpoints

- Arizona Legislature passed H.B. 2237 in 1997 which contains an appropriation of $120,000 from the State General Fund to the Arizona Department of Environmental Quality to develop and implement an alternative test protocol to reduce the false failure rates associated with the more stringent pass-fail standards for the Vehicle Emissions Testing Program (Section 19 of H.B. 2237).

  In 1998, the Arizona Legislature passed S.B. 1427 which requires that vehicles in Area A and B be emissions tested. The vehicles subject to the Vehicle Emissions Inspection Program that have been included within the new boundaries of Area A are required to comply beginning from and after December 31, 1998. The newest five model year vehicles are exempted from the Vehicle Emissions Inspection Program on a rolling basis. Owners of these vehicles are required to pay an in lieu fee equivalent to the price of the test unless they choose to take and pay for an emissions test. The in lieu fees will be deposited into the Arizona Clean Air Fund. S.B. 1427 also allows the Vehicle Emissions Inspection contract to be extended for three

additional years (A.R.S. 49-542, 49-543, 49-545 and Section 41 of S.B. 1427).

In addition, the Arizona Department of Environmental Quality will be implementing Interim Test Cutpoints for the Vehicle Emissions Inspection Program until issues are resolved with the final test cutpoints for the I/M 240 Program. The Interim Cutpoints were selected in an attempt to achieve the following failure rates in all three vehicle class categories (Light Duty Gasoline Vehicles, Light Duty Gasoline Trucks 1, and Light Duty Gasoline Trucks 2: 50 percent for Model Years 1981-85; 25 percent for 1986 to 1989 model years, and 10 percent for Model Years 1990-93).

2. Phased-In Emission Testing of Constant Four-Wheel Drive Vehicles

- Arizona Legislature passed S.B. 1427 in 1998 which requires motor vehicles, including constant four-wheel drive vehicles, manufactured in or after Model Year 1981, with a gross vehicle weight rating of 8,500 pounds or less, other than diesel powered vehicles, to take and pass a transient load emissions test (I/M 240). Previously, constant four-wheel drive vehicles were required to pass a curb idle emissions test (A.R.S. 49-542).

3. One-Time Waiver from Vehicle Emissions Test

- Arizona Legislature passed S.B. 1002 in 1996 which limits the issuance of a waiver for failure to comply with the emission testing requirements to one-time only beginning January 1, 1997.

  Also, the Arizona Legislature passed House Bill 2237 in 1997 which requires the Arizona Department of Environmental Quality to submit a report on one-time vehicle waivers to the Governor, President of the Senate, and Speaker of the House of Representatives by September 30,1997. The report is required to include: a description of the air quality benefits from the measure; recommendations on making the provision more effective, considering the impact on motorists; and recommendations on improving motorists access to the repair grant program.

4. Increased Waiver Repair Limit Options

- Arizona Legislature passed S.B. 1427 in 1998 which increases the amount a person must spend to repair a failing 1967-1974 vehicle in Area A to qualify for a waiver. The increased amount is $200 rather than the previous $100 (A.R.S. 49-542).

5. Gross Polluter Option for I/M Program Waivers

- Arizona Legislature passed S.B. 1427 in 1998 which requires that in order to obtain a waiver from compliance with the Vehicle Emissions Inspection Program, the owner of a vehicle emitting more than twice the emission standard has to repair the vehicle sufficiently to reduce the emission levels to less than twice the standard (A.R.S. 49-542).

6. Catalytic Converter Replacement Program

- Arizona Legislature passed S.B. 1427 in 1998 which requires a person whose vehicle fails the Vehicles Emissions Inspection Test due to a faulty catalytic converter to replace it in Area A. These vehicles are not eligible for a waiver. The catalytic converter replacements are exempt from the existing repair cost limits for qualification for a waiver. Also, $275,000 was appropriated from the State General Fund to the Arizona Department of Environmental Quality for fiscal year 1998-1999 to the utilization of the Vehicle Repair Grant Program and to implement the Catalytic Converter Replacement Program (A.R.S. 49-542 and Section 39 of S.B. 1427).

7. Vehicle Repair Grant Program

- Arizona Legislature passed S.B. 1427 in 1998 which appropriates $275,000 from the State General Fund to the Arizona Department of Environmental Quality for fiscal year 1998-1999 to improve the utilization of the Vehicle Repair Grant Program and to implement the Catalytic Converter Replacement Program. The Vehicle Repair Grant Program also applies to Area A (Section 39 of S.B. 1427).

8. Voluntary Vehicle Repair and Retrofit Program

- Arizona Legislature passed S.B. 1427 in 1998 which requires Maricopa County to establish and coordinate a Voluntary Vehicle Repair and Retrofit Program in Area A. The County is required to coordinate the program with the Arizona Department of Environmental Quality and Arizona Department of Transportation. The program is required to begin by January 1, 1999 and provide for quantifiable emissions reductions based on actual emissions testing performed on the vehicle before repair and retrofit.

  A vehicle owner may participate in the program if all of the following criteria are met: 1. The owner is willing to participate in the program. 2. The vehicle is functionally operational. 3. The vehicle has been titled in this state and registered in Area A for at least twenty-four months. 4. The vehicle is at least

twelve years older than the current model year passenger car or light duty truck. 5. The vehicle fails the emissions test. It is important to note that vehicles that are not required to take the emissions inspection test are not eligible to participate in the program.

The County is required to develop a Pilot Emissions Control Repair and Retrofit Program in cooperation with the ADEQ that has the following provisions:

1. Vehicle owners who qualify for the repair and retrofit program will pay the first $100 as a co-payment.

2. Vehicle owners that require more than $500 in repair costs or $650 in retrofit parts and labor costs are not eligible unless the vehicle owner chooses to pay additional costs.

Diesel powered motor vehicles with a gross vehicle rating of more than 8,500 pounds that are registered in Area A which fail any random roadside vehicle test conducted by the State are eligible for up to $1,000 in repair or retrofit costs from the program. Qualified vehicle owners will be responsible for one-half of the costs of the qualified repairs and the other one-half of the costs will be funded from the program up to $1,000. No more than 20 percent of the program funds in any year may be used for these purposes.

S.B. 1427 also establishes a Voluntary Vehicle Repair and Retrofit Program Fund consisting of monies appropriated by the Legislature and political subdivisions and gifts, grants, and donations. S.B. 1427 includes an appropriation of $800,000 from the State General Fund in fiscal year 1998-1999 for the Voluntary Vehicle Repair and Retrofit Program Fund.

The County Board of Supervisors is required to appoint an advisory committee composed of representatives from the Arizona Department of Transportation, Arizona Department of Environmental Quality, and the parties affected by the Voluntary Vehicle Repair and Retrofit Program, including automobile hobbyists and the automotive after-market products industry. The role of the committee is to advise and make recommendations on the development and implementation of the program.

By December 1 of each year, the County is required to prepare a report on the Voluntary Vehicle Repair and Retrofit Program that includes the number of vehicles repaired or retrofitted by model year, the cost effectiveness of the program in terms of dollars spent per ton of vehicle emissions reductions, any recommendations for improving the effectiveness of the program, and the administrative costs of the program. The report is required to be submitted to the Arizona Department of Environmental Quality, Arizona

Department of Transportation, Speaker of the House of Representatives, President of the Senate, Governor, Secretary of State, and Director of the Arizona Department of Library, Archives, and Public Records (A.R.S. 49-474.03 and Section 34 and 36 of S.B. 1427).

9. Tougher Enforcement of Vehicle Registration and Emissions Test Compliance

- Arizona Department of Transportation indicates that this measure would use additional methods to increase the registration compliance of residents. According to the December 1996 Report of the Governor's Air Quality Strategies Task Force, the Motor Vehicle Division (MVD) of the Arizona Department of Transportation (ADOT) has instituted a comprehensive enforcement program. Three key elements of the new program are a Registration Enforcement Team, a Registration Enforcement Tracking System, and a New Resident Tracking Program. Through public participation, consistent policy and procedure application, and new tracking methods, MVD will enforce the Arizona registration laws to ensure vehicles in question are registered properly. This will be an ongoing effort.

  Another phase of the Program is an initiative to coordinate ADOT efforts with other law enforcement agencies to assist MVD personnel in enforcing registration compliance. Other initiatives include a system user agreement between MVD and the City Courts to utilize information in conjunction with registration compliance and discussions with U.S. West for obtaining information relating to new connect customers.

  The Registration Compliance Program began in January 1994 with one full time employee responding only to complaints. In April of 1996, this program was enhanced with five MVD officers periodically conducting a statewide effort locating and issuing warning notices on vehicles suspected of being in violation of Arizona registration laws. This effort resulted in a substantial increase in Vehicle Licenses Tax (VLT) for 1996. As the program continues, there will be an enhanced focus on the local vehicles not in compliance.

  Administration of the program began with a required staff time equivalent to one full time employee. Currently, the required staff time is equivalent to eight full time employees. Additional staff requirements for the initial phase of the Registration Compliance Program will require a total of 12 full time (active) employees and one supervisor. The funding allocated for implementation of the Registration Compliance Program is included as part of the overall MVD budget.

- Arizona Legislature passed S.B. 1427 in 1998 which requires school districts and special districts in Area A to prohibit parking in employee parking lots by

employees who have not complied with emissions testing requirements. Cities, towns, and counties in Area A and Area B are currently subject to this provision (A.R.S. 49-552).

10. Random Roadside Testing of Diesel Vehicles

- Arizona Legislature passed S.B. 1427 in 1998 which requires the Arizona Department of Environmental Quality to implement a pilot random roadside emissions testing program for diesel vehicles over 8,500 pounds using the snap acceleration test developed by the Society of Automotive Engineers (J 1167). This program will not be implemented unless the Directors of the Arizona Department of Transportation and Arizona Department of Public Safety agree that the program can be conducted safely and in compliance with federal regulations relating to interstate travel and safety.

  If the program is implemented by November 15, 1999, the ADEQ Director will report on the results of the pilot program, including pass and fail rates, the nature of the registration of the failing vehicles, the extent of noncompliance of the failing vehicles, and recommendations for implementation of a permanent program. The report will be transmitted to the Governor, Speaker of the House of Representatives, and President of the Senate (Section 35 of S.B. 1427).

11. Snap Acceleration Test for Heavy-Duty Diesel

- Arizona Legislature passed S.B. 1002 in 1996 which requires that beginning March 1, 1997, medium and heavy duty diesel vehicles registered or re-registered in Area A that are more than 33 months beyond the initial date of registration, to take the snap acceleration test.

12. Require Pre-1988 Heavy-Duty Diesel Commercial Vehicle Registered in the Nonattainment Area to Meet 1988 Federal Emissions Standards; Provide Incentives to Encourage Voluntary Accelerated Vehicle Replacement By the Year 2004

- Arizona Legislature passed S.B. 1002 in 1996 which requires that after January 1, 2004 all commercial diesel vehicles operating in Area A must meet or surpass the 1988 federal emission standards unless they were built in or after 1988.

13. Long - Term Fuel Reformulation: From and After May 1, 1999

- Arizona Legislature passed H.B. 2307 in 1997 which contains requirements for the sale of gasoline from and after May 1, 1999 in Area A, subject to an

appropriate waiver granted under Section 211 (c)(4) of the Clean Air Act, that meets the following fuel reformulation options:

- California Phase 2 Reformulated Gasoline, including alternative formulations allowed by the predictive model, as adopted by the California Air Resources Board pursuant to the California Code of Regulations, Title 13, Sections 2261 through 2262.7 and 2265, in effect on January 1, 1997, that meets the maximum 7.0 psi summertime vapor pressure requirements in A.R.S. Section 41-2083, Subsections D and F.

- Gasoline that meets the standards for Federal Phase II Reformulated Gasoline, as provided in 40 CFR Section 80.41, paragraphs (a) through (h), in effect on January 1, 1997, that meets the maximum 7.0 psi summertime vapor pressure requirement in A.R.S. Section 41-2083 Subsections D and F.

- From and after November 1 through March 31 of each year, both of these fuels are required to meet the oxygenated fuel requirements in A.R.S. 41-2123.

By September 15, 1997, the Director of the Arizona Department of Environmental Quality in consultation with the Director of the Weights and Measures, is required to adopt rules for the 1998 and 1999 fuel reformulation requirements.

House Bill 2307 also provides that if the Environmental Protection Agency fails to approve the sale and use of both reformulated gasolines, the Director of the Arizona Department of Environmental Quality will adopt standards by rule for one of the following fuels:

- A gasoline that meets standards for Federal Phase II Reformulated Gasoline, as provided in 40 C.F.R. Section 80.41, paragraphs (a) through (h) in effect on January 1, 1997, that meets the maximum vapor pressure requirements of A.R.S. Section 41-2083, Subsections D and F. In addition, the requirements of A.R.S. Section 41-2123 must be met November 1 through March 31 of each year.

- California Phase 2 Reformulated Gasoline, including alternative formulations allowed by the predictive model, as adopted by the California Air Resources Board pursuant to the California Code of Regulations, Title 13, Sections 2261 through 2262.7 and 2265, in effect on January 1, 1997, that meets the maximum vapor pressure requirements of A.R.S. Section 41-2083, Subsections D and F. In addition, the requirements of A.R.S. Section 41-2123 must be met November 1 through March 31 of each year.

14. <u>Winter Fuel Reformulation: California Phase 2 Reformulated Gasoline with 3.5 Percent Oxygen Content November 1 through March 31</u>

- Arizona Legislature passed H.B. 2347 in 1998 which contains requirements for all gasoline produced and shipped to Maricopa County and sold or offered for sale for use in motor vehicles in Area A from and after November 1, 2000 through March 31, 2001 and from the period beginning November 1 through March 31 of each subsequent year. The fuel must comply with the standards for California Phase 2 Reformulated Gasoline, including alternative reformulations allowed by the predictive model, as adopted by the California Air Resources Board, and must meet the maximum vapor pressure requirements of 9 pounds per square inch in A.R.S. 41-2083, Subsections D and F. The fuel must also contain a minimum oxygen content by weight of 3.5 percent as required in A.R.S. 41-2123, Subsection A, Paragraph 2.

  From November 1, 2000 through March 31, 2001 and each winter season of November through March thereafter, the Director of the Arizona Department of Weights and Measures is required to determine the average levels of the constituents in the gasoline sold or offered for sale in Area A. The Director of the Arizona Department of Environmental Quality must analyze the data and no later than July 1, 2001 and each July thereafter, determine the average daily carbon monoxide reductions resulting from the use of the gasoline during the preceding winter season. If the average daily carbon monoxide reductions resulting from the gasoline are less than 90 percent of the goal of 32 tons per day in 2001, 31 tons per day in 2003 and 30 tons per day in 2005, 29 tons per day in 2007, or 28 tons per day in 2009, the Arizona Department of Environmental Quality will immediately notify the Governor, President of the Senate, and Speaker of the Arizona House of Representatives.

  Also, any registered supplier or oxygenate blender may petition the Director of the Department of Weights and Measures to authorize the use of other oxygenates if an ethanol shortage is imminent. A petition must: (a) Identify specific supply conditions that will result in a shortage of ethanol. (b) Identify which oxygenate or oxygenates will be blended into gasoline for sale or use in Area A. (c) Demonstrate that the alternative oxygenate blend comes closest to meeting a 3.5 percent by weight oxygen content at reasonable cost. (d) Specify a time period for compliance with any provision of A.R.S. 41-2123, Subsection A, not to exceed 60 days.

  The Director of Weights and Measures will either grant or deny the petition within seven days of its receipt. The decision to grant a waiver will be equally equitable to all registered suppliers or oxygenate blenders. The petition may be reauthorized for up to 30 days if the shortage conditions

continue. The Director of the Arizona Department of Weights and Measures is required to consult with the Director of the Arizona Department of Environmental Quality prior to granting, reauthorizing or denying any petition.

The legislation specifies the intent of the Legislature to re-evaluate the existing authorized measures as well as alternative measures if this winter gasoline reformulation does not result in the carbon monoxide emission benefits specified in the bill (A.R.S. 41-2124).

15. Limit Sulfur Content of Diesel Fuel Oil to 500 ppm

- Arizona Legislature passed S.B. 1002 in 1996 which prohibits the sale of Diesel fuel (including off-road) in the nonattainment area that contains in excess of 500 ppm sulfur. In addition, federal regulations require that on-road Diesel fuel sold throughout the contiguous U.S. have a maximum sulfur content of 0.05 percent by weight (500 ppm).

16. Diesel Fuel Sampling and Reporting

- Arizona Legislature passed S.B. 1427 in 1998 which requires that beginning on January 1, 1999 through July 1, 1999, gasoline refiners and other suppliers of diesel fuel that is supplied or sold as a final product for the fueling of diesel vehicles within Area A report to the Director of the Arizona Department of Weights and Measures on the quantity and quality of diesel fuel shipped to Maricopa County during the preceding month. The report is required to include by batch, the sulfur content, aromatic hydrocarbon content, cetane number, specific gravity, American Petroleum Institute gravity, and the temperatures at which ten percent, fifty percent, and ninety percent of the diesel fuel has boiled off during distillation. The report is due on the fifteen day of each month.

  In addition, the report must contain a certification of truthfulness and accuracy of the data submitted. By October 1, 1999, the Director of the Arizona Department of Weights and Measures is required to report the results of the six month sampling and reporting period to the Director of the Arizona Department of Environmental Quality, Governor, Speaker of the Arizona House of Representatives and President of the Arizona Senate (Section 40 of S.B. 1427).

17. Alternative Fuel Vehicles for Local Governments and School Districts/Low Emission Vehicle Requirements

- Arizona Legislature passed S.B. 1427 in 1998 which establishes additional requirements for vehicles owned by cities and towns, and counties in Area A. These provisions also apply to bus fleets operated by the cities, towns, and Regional Public Transportation Authority; school districts with a membership of more than 3,000 located within or which has bus routes running within Area A; the issuance of tax credits or subtractions for alternative fuel vehicles authorized by state law; and the federal government fleets. At a minimum, the alternative fuel vehicles are required to comply with any one of the following:

  1. The U.S. Environmental Protection Agency Standards for Low Emission Vehicles pursuant to 40 Code of Federal Regulations Section 88.104-94 or 88.105-94.

  2. The vehicle engine is certified by the engine modifier to meet the Addendum to Memorandum 1-A of the U.S. Environmental Protection Agency, as printed in the Federal Register, Volume 62, Number 207, October 27, 1997, pages 55635-55637.

  3. The vehicle engine is the subject of a waiver for that specific engine application from the U.S. Environmental Protection Agency's Addendum to Memorandum 1-A requirements and that waiver is documented to the reasonable satisfaction of the Department of Commerce Energy Office.

  The cities, counties, and school districts which have been included within the boundaries of Area A are required to comply with the provisions of A.R.S. 9-500.04 C. through G., 15-349, and 49-474.01 C. through E. relating to the conversion of fleet vehicles to alternative fuels according to the following schedule:

  1. At least 18 percent of the total fleet by December 31, 2000.

  2. At least 25 percent of the total fleet by December 31, 2001.

  3. At least 50 percent of the total fleet by December 31, 2003.

  4. At least 75 percent of the total fleet by December 31, 2005.

  These provisions do not apply to cities and towns with a population of less than 7,500 according to the most recent U.S. decennial census and that lie

outside Area A. Also, S.B. 1427 authorizes that monies in Arizona Clean Air Fund may be used for a public awareness program for alternative fuels. An accounting of the Arizona Clean Air Fund expenditures are to be included in the annual report to the Legislature on the fund activities (A.R.S. 9-500.04, 15-349, 41-1516, 49-474.01, 49-573 and Section 42 of S.B. 1427).

18. Alternative Fuel Vehicles for State Government/Low Emission Vehicle Requirements

- Arizona Legislature passed S.B. 1269 in 1998 which requires the Director of the Arizona Department of Administration (DOA) to appoint a State Motor Vehicle Fleet Alternative Fuel Coordinator to develop, implement, document, monitor and modify as necessary a Statewide Alternative Fuels Plan in consultation with all state agencies and departments that are subject to the alternative fuel requirements. Specifically, the plan is to include the agencies currently exempt from the state fleet alternative fuel conversion requirements (Arizona Department of Public Safety, Arizona Department of Corrections, Universities and Community Colleges, and Arizona State School for the Deaf and the Blind). These agencies are to submit their programs for alternative fuels and fuel economy to the Coordinator.

  The Coordinator is required to approve all vehicle acquisitions by the state and assume several functions of the Director relating to the acquisition of alternative vehicle fuel (AFVs) refueling facilities, the development of the vehicle fleet energy conservation plan and the identification of the appropriate AFVs for each state agency. The legislation requires an increasing percentage of new state vehicles weighing less than 8,500 pounds purchased for operation in Maricopa and Pima counties, including all of the agencies exempted from the DOA fleet, to be capable of operating on alternative fuels. The schedule is as follows:

  - 10 percent of all 1997 model years purchased
  - 15 percent of all 1998 model years purchased
  - 25 percent of all 1999 model years purchased
  - 50 percent of all 2000 model years purchased
  - 75 percent of all 2001 model years purchased

  In addition, S.B. 1269 requires an increasing percentage of the AFVs weighing less than 8,500 pounds purchased for operation in Maricopa County to comply with the Environmental Protection Agency's standards for Low Emission Vehicles (LEVs) starting in model year 2000.

The schedule is as follows:

- 40 percent of model year 2000 AFVs
- 50 percent of model year 2001 AFVs
- 60 percent of model year 2002 AFVs
- 70 percent of model year 2003 AFVs

Other provisions in S.B. 1269 include a deadline of December 31, 1999, for the Arizona Department of Administration to convert 40 percent of the DOA administered state fleet to alternative fuels. Fire suppression vehicles are excluded from the alternative fuel conversion requirements for the state fleet. For state agencies that use alcohol fueled AFVs, it must be demonstrated to the Director of DOA that the fuel for the vehicle is available within a ten mile radius of the primary home base for that vehicle.

Regarding reporting requirements, all state agencies, including those exempted from the state fleet, are required to report annually to the Director of DOA on vehicle costs, operation, maintenance, mileage and any other information that the Director deems necessary for the submittal of the annual report to the Legislature and the Governor. The Director of the DOA is required to submit an annual report to the Legislature, the Governor and each of these branches budget offices that provides information about the state fleet including detailed information regarding the conversion of the fleet to alternative fuels (A.R.S. 28-5805 and 41-803).

19. <u>Alternative Fuel Vehicle and Equipment Tax Incentives/Low Emission Vehicle Requirements</u>

- Arizona Legislature passed H.B. 2237 in 1997 which extends the existing individual and corporate tax credit for the purchase or conversion of an alternative fuel vehicle or the purchase of an alternative fuel delivery system through 2001 and expands the tax credit to include minimum three year leases of an alternative fuel vehicle. It also increases the tax credit to $1,000 from $500 in 1997 and $250 in 1998 (A.R.S. 43-1086).

  In 1998, the Arizona Legislature passed S.B. 1269 which provides a variety of tax incentives and financial assistance to encourage the use of alternative fuel vehicles (AFVs). The definition of alternative fuel is expanded to included an emulsion of water-phased hydrocarbon fuel that contains at least 20 percent water and that complies with one of three specified EPA standards and in combination of at least 70 percent alternative fuel and not more than 30 percent petroleum-based fuel for an engine that meets an equivalent of the EPA Low Emission Vehicle (LEV) standard.

The following tax incentives are provided in the bill:

1. AFV's and alternative fuel conversion equipment are exempt from the retail and personal property rental classifications and use taxation.

2. Corporate and individual income taxpayers are authorized to take both the AFV and equipment subtraction and credits for AFVs and equipment, as well as obtain a grant from the Arizona Clean Air Fund.

3. Individual and corporate income tax credits for tax years 1998 through 2001 are increased from $1,000 to $2,000 for the purchase, lease, or conversion of a dedicated AFV or purchase of a dedicated alternative fuel delivery system. The maximum credit for a bi-fueled AFV remains at $1,000.

4. Nonrefundable individual and corporate income tax credits for tax years 1998 through 2001 are authorized for expenses associated with constructing or operating an alternative fuel fueling station. The amount of the credit for a public-accessible station or a station dispensing renewable fuel is 50 percent of the costs incurred, up to $400,000. For other stations, the credit is the lesser of 25 percent of the costs incurred or $200,000.

5. The maximum corporate income tax subtraction for the purchase of a new AFV is increased from $5,000 to $10,000. This becomes effective for taxable years after December 31, 1997.

6. The maximum corporation income tax subtraction for the conversion to an AFV is increased from $3,000 to $5,000. This becomes effective for taxable years after December 31, 1997.

7. Nonrefundable individual and corporate tax credits are authorized for the purchase or lease (for at least three years) of original equipment manufactured AFVs. For tax years 1999 through 2011, the amount of credit ranges from 50 to 90 percent of the incremental cost above the cost of a conventionally fueled vehicle, based on the emissions levels of the AFV. For tax years 2012 through 2019, the amount of credit ranges from 25 to 75 percent of the incremental cost above the cost of a conventionally fueled vehicle, based on the emissions levels of the AFV.

8. Grants from the Arizona Clean Air Fund (ACAF) are made available for AFVs purchased or leased and the amount of the grant is increased from $1,000 to $2,000.

Passed by the Arizona Legislature in 1998, S.B. 1427 tax credits or subtractions for alternative fuel vehicles authorized by state law will only be allowed if the vehicle meets one of the following:

1. The vehicle is certified to meet at a minimum the U.S. Environmental Protection Agency Low Emission Vehicle Standard pursuant to 40 Code of Federal Regulations Section 88.104-94 or 88.105-94.

2. The vehicle meets the requirements of the Addendum to Memorandum 1-A, issued by the U.S. Environmental Protection Agency, as printed in the Federal Register, Volume 62, Number 207, October 27, 1997, pages 55635-55637.

3. The vehicle is the subject of a waiver for that specific engine application from the U.S. Environmental Protection Agency's Memorandum 1-A requirements and that waiver is documented to the reasonable satisfaction of the Department of Commerce Energy Office (A.R.S. 1-215, 41-1516, 42-5061, 42-5071, 42-5159, 43-1026, 43-1086, 43-1128.01, and 43-1174).

20. Public Awareness Program for Alternative Fuels

- Arizona Legislature passed S.B. 1427 in 1998 which allows monies from the State Clean Air Fund to be used to conduct public awareness programs for alternative fuels (A.R.S. 41-1516).

21. National Low Emission Vehicle Program

- Arizona Legislature passed S.B. 1427 in 1998 which requires the State to participate in the National Low Emission Vehicle Program adopted in 40 Code of Federal Regulations Part 9, Part 85 and Part 86 effective March 9, 1998, as part of the long term air quality strategy. The State will not bear any of the administrative costs of the program. Also, the State retains the authority to adopt any alternative emissions reduction program which demonstrates air quality benefits for the State (A.R.S. 49-556).

22. Voluntary Gasoline Vehicle Retirement Program

- Maricopa County indicates that this measure involves implementing a program to purchase and retire vehicles which produce excessive emissions, particularly pre-1980 model year light duty automobiles and trucks. Maricopa County is in the process of revising its Trip Reduction Ordinance to include the flexibility provisions authorized under A.R.S. Section 49-588 which

includes voluntary vehicle trade-outs. The proposed revisions will allow tradeouts that have been completed after October 16, 1996 to be used to achieve the emission reduction goals established under the ordinance.

May 1997 -- A public workshop has been scheduled on May 22, 1997 to discuss the proposed revisions to the Trip Reduction Ordinance.

June 1997 -- A public hearing and Board consideration of the proposed revision is scheduled for June 25, 1997.

August 1997 -- Submittal as a SIP revision to ADEQ and EPA.

Personnel and funding will be provided through existing staff and funding. Additional resources will not be necessary to fulfill the commitment set forth.

Data collection and survey data analysis are consistent as TRP staff process and analyze all employers' surveys to prepare summary results which are then used by the employer to develop a trip reduction plan. When the TRP plan is submitted, it undergoes an intensive analysis by division staff. The staff follow a checklist which contains statute requirements, ordinance requirements, and Task Force guidelines.

After the plan has been approved, but prior to the next annual survey, division staff contact the transportation coordinator by phone or in person to monitor the implementation of the plan. They complete a monitoring checklist. If the plan has not been implemented, the Task Force shall describe the inadequacies and shall direct modifications in the plan implementation. If the plan as modified is not approved, the Task Force shall evaluate all supporting data and determine if enforcement action is necessary.

23. <u>Oxidation Catalyst for Heavy Duty Diesel Vehicles</u>

- Arizona Legislature passed H.B. 2237 in 1997 which requires cities, towns, Maricopa County, school districts, the state and the federal government to install a technology (oxidation catalyst) on their heavy duty Diesel vehicles if the entities receive a waiver to opt out of the alternative fuel requirements for fleets. The heavy duty Diesel vehicles with a gross vehicle weight of 8500 pounds or more manufactured in or before model year 1993 would have the catalyst installed based upon the following time schedule in A.R.S. 49-555:

  a. 25 percent of the Diesel fleet vehicles by December 31, 1998.
  b. 40 percent of the Diesel fleet vehicles by December 31, 1999.
  c. 60 percent of the Diesel fleet vehicles by December 31, 2000.
  d. 80 percent of the Diesel fleet vehicles by December 31, 2001.
  e. 100 percent of the Diesel fleet vehicles by December 31, 2002.

The technology is to be effective at reducing particulate emissions by at least 25 percent and be approved by the Environmental Protection Agency pursuant to the Urban Bus Engine Retrofit/Rebuilt Program. This measure applies to Area A which is generally the nonattainment area (A.R.S. 9-500.04, 15-349, 41-803, 49-474.01, 49-573 and 49-555).

24. Mass Transit Alternatives

- Arizona Legislature passed H.B. 2237 in 1997 which allows cities and towns to voluntarily refer an advisory question relating to public transportation to the voters at a special or general election (A.R.S. 9-500.15).

- Town of Gilbert began providing public transit and dial-a-ride service during 1996. A local bus route in Mesa was extended through Gilbert, providing connections with several regional bus routes. This route provides 370 daily miles of service in Gilbert, amounting to 94,350 service miles annually, and is operated Monday through Friday from approximately 5 a.m. until 7 p.m.

  An express bus route was extended into downtown Gilbert, providing service for commuters to downtown Phoenix. The Gilbert portion of this route accounts for 30 daily and 7,650 annual service miles, and is operated Monday through Friday from approximately 5 a.m. until 6:30 p.m.

  In addition, the Town of Gilbert began providing town-wide dial-a-ride service by joining the Mesa/Chandler Dial-a-Ride (now the Mesa/Chandler/Gilbert Dial-a-Ride). This service is also provided Monday through Friday from about 4 a.m. until 7 p.m.

  The Gilbert Town Council approved funding in May 1996. The Town of Gilbert began providing express bus service in August 1996. The Town of Gilbert began providing dial-a-ride service in September 1996. The Town of Gilbert began providing local bus service in March 1997.

  Participation in regional and local transit planning is allocated through the annual budget process. The Gilbert Town Council dedicated $300,000 for the above described public transit measures during FY 1996-97.

- City of Glendale is currently participating in a Major Investment Study (a regional planning process) to evaluate multi-modal transportation technologies and alignment alternatives to reduce traffic congestion and increase urban mobility. One part of the study is expected to be devoted to evaluating the feasibility of a regional fixed guideway transit system linking Glendale to the Greater Phoenix Metropolitan area. The City's

Transportation Department is responsible for this measure. Legal authority for this action is provided under Section 9-240, "General powers of common council" of the Arizona Revised Statutes.

Project Initiation/Public Involvement Program: April 1997
Initial Screening of Alternatives: July 1997
Evaluation of Alternatives: November 1997
Conceptual Design/Detailed Evaluation of Alternatives: February 1998
Final Report: April 1998
End of Contract: June 1998

Funding will be determined through the City's annual budget development process.

- City of Goodyear has participated in the Southwest Valley Transportation Study to develop a comprehensive transportation plan for the Southwest Valley. This study is a guide for future multi-modal transportation planning and programming for the next 25 years. The study contains alternative transit components and has been adopted by council.

  Project initiation/Public involvement program: April 1998
  Initial screening of alternatives: July 1998
  Evaluations of Alternatives: November 1998
  Conceptual Design/Detailed Evaluation of Alternatives: February 1999
  Final Report: April 1999
  End of Contract: June 1999.

  The Transportation Study is completed and it contains a five-year (1996-2001) transportation improvement program, a ten year (2001-2006) medium range transportation plan, and a long range plan for 25-years. The five-year program is based on the current MAG Regional Transportation Improvement Program for the City. The City of Goodyear and Maricopa County Department of Transportation Capital Improvement Programs were also used for the study. The mayors of the Southwest Valley are working cooperatively to address regional transportation issues.

  The City is exploring a local bus service, an express bus service, an inter-city bus service, and a Dial-a-Ride program. An option the City may have for mass transit is a commuter rail service. Although it may not be feasible at this time, it may require serious consideration in the future. Funding will be determined through the City's annual budget process.

- City of Mesa is participating in a cooperative effort with the Federal Transit Administration (FTA), the Maricopa Association of Governments (MAG), the

Regional Public Transit Authority (RPTA) and the cities of Tempe, Scottsdale, Phoenix and Glendale to conduct feasibility studies to evaluate the need and general location for high capacity transit corridors throughout the metropolitan area. This effort will also include a series of Major Investment Studies which focus on subregions within the metropolitan area. Studies are also planned to evaluate the feasibility of high-capacity transit options such as light rail, bus ways, and commuter rail.

These studies are part of a continuing effort to evaluate transportation options. Related studies include the Arizona Passenger Rail Feasibility Continuation Study (1994), Downtown Phoenix Rail Trolley Feasibility Study (1995), Commuter Rail Demonstration Project Feasibility Study (1995), and Major Investment Studies for the Squaw Peak and Superstition Corridors-Phase I.

Bus service in Mesa will continue to expand; one new express route has been added during the last year and during 1998 it is anticipated that Saturday service will be added to some sections of the system. The City will continue to explore additional funding sources to further expand the bus system. Evaluation of the feasibility of transit options is ongoing. Participation in regional transit planning is allocated through the annual budget process.

- City of Peoria indicates that this measure will require commitment by other neighboring Cities, State, and County jurisdictions. Plans and funding alternatives require commitment by all, coordinated through RPTA. Existing Public Works and Engineering Department Engineering Division staff will continue to attend scheduled meetings by RPTA to discuss and work out alternatives.

- City of Phoenix is participating in a cooperative effort with the Federal Highway Administration (FHWA), the Federal Transit Administration (FTA), the Maricopa Association of Governments (MAG), the Regional Public Transit Authority (RPTA), and the cities of Tempe, Scottsdale, Mesa, and Glendale to conduct feasibility studies to evaluate the need and general location for high capacity transit corridors throughout the metropolitan area. This effort will also include a series of Major Investment Studies which focus on subregions within the metropolitan area. Studies are also planned to evaluate the feasibility of high-capacity transit options such as light rail, busways, and commuter rail.

  These studies are part of a continuing effort to evaluate transportation options. Related studies include the Arizona Passenger Rail Feasibility Continuation Study (1994), Downtown Phoenix Rail Trolley Feasibility Study

(1995), Commuter Rail Demonstration Project Feasibility Study (1995), and Major Investment Studies for the Squaw Peak and Superstition Corridors-Phase I.

The City has worked with the RPTA to submit an application for federal discretionary funds from the 1997 re-authorization of the Intermodal Surface Transportation Efficiency Act (ISTEA) and the FY 1998 U.S. Department of Transportation Appropriations Bill. The application requests $130 million to fund the initial 10-mile segment of a high-capacity rail system connecting the downtown areas of Phoenix and Tempe.

The City has also worked with the RPTA to submit an application for funds to support the purchase of transit buses from the 1997 re-authorization of the Intermodal Surface Transportation Efficiency Act (ISTEA) and the FY 1998 U.S. Department of Transportation Appropriations Bill. The application requests $29.2 million in fiscal year 1998 to purchase new buses. Matching funds will be required from local communities requesting buses.

The Major Investment Study for the Phoenix-Tempe corridor is in progress. Applications for ISTEA and DOT Appropriation Bills were submitted in February 1997. Participation in regional transit planning is allocated through the annual budget process.

- City of Scottsdale is participating in a cooperative effort with the Federal Highway Administration (FHWA), the Federal Transit Administration (FTA), the Maricopa Association of Governments (MAG), the Regional Public Transit Authority (RPTA), and the cities of Phoenix, Tempe, Mesa, and Glendale to conduct feasibility studies to evaluate the need and general location for high capacity transit corridors throughout the metropolitan area.

  One of the City of Scottsdale Transportation Department, Transit Division program objectives stated in the Biennial Budget for fiscal years 1997-1999 is completion of a Major Investment Study by December 1997, which focuses on subregions within the Phoenix metropolitan area. Studies are also planned to evaluate the feasibility of high-capacity transit options such as light rail, busways, and commuter rail.

  These studies are part of a continuing effort to evaluate transportation options. Related studies include the update of the Transit Plan which is a Transportation Department Objective for fiscal years 1997-1999. Implementation is in progress. Participation in regional transit planning is allocated through the annual budget process.

- City of Tempe indicates that this measure is envisioned as a major change to the scope and service levels offered by the existing public transportation system in the region.

  The City of Tempe is currently participating in a cooperative effort with the Federal Transit Administration (FTA), the Maricopa Association of Governments (MAG), the Regional Pubic Transportation Authority (RPTA), and the cities of Phoenix, Scottsdale, Mesa and Glendale to conduct feasibility studies to evaluate the need and general location for high capacity transit corridors throughout the metropolitan area. This effort includes a series of Major Investment Studies which focus on subregions within the metropolitan area. The studies will evaluate the feasibility of high-capacity transit options such as light rail, busways and commuter rail. One subregional study area is downtown Tempe, Arizona State University, and Rio Salado. The City would continue these study efforts.

  The City is working with the RPTA in an application for federal discretionary funds from the 1997 reauthorization of the Intermodal Surface Transportation Efficiency Act (ISTEA) and the FY 1998 U.S. Department of Transportation Appropriations Bill. The application requests $130 million to fund the initial ten mile segment of a high-capacity rail system connecting the downtown areas of Tempe and Phoenix.

  The City is also working with the RPTA in the application for funds for purchase of transit buses from the 1997 reauthorization of the ISTEA and the FY 1998 U.S. Department of Transportation Appropriations Bill. The application requests $29.2 million in fiscal year 1998 and would require matching funds from local communities requesting buses.

  The Major Investment Study for the Phoenix-Tempe corridor and the downtown Tempe, ASU, and Rio Salado is in progress. Applications for ISTEA and DOT Appropriation Bills were submitted in February 1997. Participation in regional transit planning is provided through the dedicated sales tax for transit.

- Regional Public Transportation Authority indicates that this measure involves implementing the long range transit improvements as described in the Regional Transit Plan for Maricopa County, Arizona prepared by the RPTA Citizen Advisory Committee. This plan expands the days and times when bus service is available and more than doubles the annual miles of bus service. Service improvements would include adding new bus routes and increasing the frequencies on existing routes. By the fifth year, the plan calls for:

- 29 million miles of annual bus service
- 625 buses in services
- All routes operating 7 days a week
- Service 5 a.m. to midnight, Monday-Saturday
- Service 6 a.m. to 8 p.m., Sundays and Holidays
- Dial-a-Ride service would triple

The plan also calls for conducting a feasibility study to determine the need for rail transit.

The Regional Transit Plan for Maricopa County, Arizona was adopted by the Regional Public Transportation Authority Board of Directors on July 9, 1992. In November, 1994, voters rejected a joint proposal which would have provided a half-cent tax increase for highways and transit. Since that time, the RPTA Board has been studying alternative methods to finance the plan. In 1996, voters in Tempe approved a one-half of one percent sales tax increase dedicated to public transit improvements. The City of Phoenix will hold an election on such a measure on September 9, 1997, and the Council of the City of Scottsdale is considering placing such a measure before its electorate on the same date. If these two communities follow Tempe's course, the transit needs of approximately 58 percent of the population of the MAG region can be addressed by such a dedicated funding source. Such action may compel other communities in the region to follow suit, as they may otherwise find it difficult to attract new employers and other developments with a lower level of infrastructure.

The level of personnel committed to transit operations in Fiscal Year 1997-1998 is equivalent to 5.5 FTE. This plan has not yet been funded (other than in Tempe). Implementation will require securing the new funding sources dedicated to public transportation described above. The RPTA is responsible for transit planning and program implementation. The projected RPTA operating budget for fiscal year 1997-1998 is estimated at $17.9 million. Sources of operating revenue include federal and state grants, RPTA sales tax, farebox revenues, and other income sources including interest.

25. Develop Intelligent Transportation Systems

- City of Chandler is participating in the AzTech Model Deployment Initiative, a three-year project to demonstrate application of currently available technology to improve collection and dissemination of information such as road closures, current operating conditions and services available for all modes of travel. Another goal of the project is to improve interagency coordination for traffic control and incident management. The City of

Chandler has representatives on the AzTech Executive Committee and AzTech Technical Oversight Committee. The City will provide information about City of Chandler operations to support development of a data base, collection system, and communications network covering the Phoenix metropolitan area. Responsible agencies include Arizona Department of Transportation, Maricopa County, and the City of Chandler Public Works Department, Transportation Division. Implementation will be ongoing. Funding is allocated through the annual budget process.

- City of Glendale is participating in a regional effort to demonstrate intelligent transportation systems to enhance traffic flow and promote safety. A total of eight transportation corridors in the Phoenix Metropolitan area have been selected for testing. Three of the corridors are partially located in Glendale (Bell Road, Glendale Avenue and Grand Avenue). Currently in progress. The City's Transportation Department is responsible for implementing this measure. Funding for the measure will come from Glendale's share of the $7.5 million Intelligent Transportation Systems grant awarded to Arizona by the U.S. Department of Transportation.

- City of Goodyear is participating in a regional effort to demonstrate intelligent transportation systems to enhance traffic flow and promote safety. Many jurisdictions in the west valley are coordinating with Maricopa County Department of Transportation to address transportation issues concurrently. The concept is to promote communication between the communities to ensure smoother traffic flows. Currently in progress. The City's Public Works Department is responsible for implementing this measure. The City is working with Arizona Department of Transportation and Maricopa County Department of Transportation for assistance in applying this measure. Funding for the measure will come from the City's annual budget process.

- City of Mesa is working with the Arizona Department of Transportation to coordinate the synchronization of City traffic signals with ADOT freeway signals. Synchronization will be achieved by sharing traffic information through a new communication link between the City's traffic management system and the ADOT Freeway Management System (FMS). The interconnect of the two signal systems will allow both agencies the ability to share information on a real-time basis and adapt signal timing more effectively for unusual traffic conditions such as accidents and other obstructions.

  The City is also working on a model deployment initiative (AzTech) for the development of intelligent transportation systems to provide feedback to motorists on unusual conditions. Mesa is participating in a $7.5 million

project to develop this system. The City also works with the ADOT to ensure that timing for freeway ramp metering is designed to avoid unnecessary local traffic congestion. Implementation is ongoing. Funding is allocated through the annual budget process. Of the $7.5 million regional Intelligent Transportation System funding for implementation, Mesa will be providing in-kind matches including services, staff time, and possibly funding.

- Town of Paradise Valley will be working with the Maricopa Department of Transportation on developing this measure in the form of monitors, signage and cameras on Lincoln Drive. This may be done with an inter-governmental agreement as the Arizona Department of Transportation grant money becomes available to Maricopa County. Town of Paradise Valley Engineering Department.

  The plan will be presented to the Council this fiscal year. The Town Engineer will spend approximately 200 hours on this project at a cost of around $7,000. This is funded by the Town's annual budget. The Maricopa County Department of Transportation will fund the program with grant funds from the Arizona Department of Transportation.

- City of Peoria participated with Maricopa County and other regional Cities to determine the existing and planned levels of signal control and coordination. All agreed that a coordinated, regional approach of traffic management is needed. Ten arterials were selected for development of regional signal coordination strategies. Peoria is willing to assist in any way to implement a signal coordination system. Maricopa County will be the lead agency and will prepare a schedule. The City will enter into an intergovernmental agreement.

- City of Phoenix will work with the Arizona Department of Transportation (ADOT) to coordinate the synchronization of City Traffic Signals with ADOT Freeway signals. Synchronization will be achieved by sharing traffic information through a new communication link between the City's Advantage Traffic Management Center and the ADOT Freeway Management System (FMS). The interconnect of the two signal systems will allow both agencies the ability to share information on a real-time basis and adapt signal timing more effectively for unusual traffic conditions such as, accidents and other obstructions. Phoenix, with its 835 signals and central location, is key to the effectiveness of the program.

  The City also works with the ADOT to ensure that timing for freeway ramp metering is designed to avoid unnecessary local traffic congestion. Implementation is in progress. Funding is allocated though the annual

budget process. $1.8 million in funding has been allocated regionally for the connections of the ADOT FMS to seven Valley cities including Phoenix.

- City of Scottsdale will work with the Arizona Department of Transportation (ADOT) and neighboring cities to coordinate the synchronization of City of Scottsdale traffic signals. Synchronization will be achieved by sharing traffic information through communication links.

  Three program objectives for the City of Scottsdale Transportation Department, Traffic Engineering Division, which are reported in the Biennial Budget for fiscal years 1997-1999 are:

  - Install preliminary phase of comprehensive traffic detection system by June 1998.
  - Install preliminary phase of Traveler Information System by December 1997.
  - Improve operation and accident analysis through video and computer technology enhancement.

  The City of Scottsdale has negotiated a long-term agreement with U.S. West for leased telephone lines to communicate with the City's traffic signals. Implementation is in progress.

  Funding is allocated through the biennial budget process. $1.8 million in funding has been allocated regionally for the connection of the ADOT FMS to seven Valley cities including Scottsdale.

- City of Tempe indicates that this measure involves the application of new technology to produce more efficient use of existing transportation corridors. The City will work with the Arizona Department of Transportation (ADOT) to coordinate the synchronization of City traffic signals with ADOT Freeway signals. The City will also participate in AzTech Model Deployment, Traffic Signal Coordination across city boundaries, and Advanced Public Transit system.

  Implementation in progress. Funding for the Transportation Division is allocated through the annual budget process. A federal grant of $7.5 million was awarded to the region in October 1996. The grant requires matching funds from local public and private sector funds . Funds will be used as follows:

  $2 million to implement advanced information system, expanded on existing use of variable message signs and ADOT Internet page (real-time freeway camera views) and set up kiosks showing

up-to-date information at shopping centers, bus terminals and the airport.

$1.8 million will be used to standardize and link traffic signal synchronization systems used by the State, Phoenix, Tempe, Scottsdale, Glendale, and Mesa.

$1.7 million to install cameras and sensors onto seven of the busiest streets in the Valley.

$700,000 to be used to install automatic vehicle locators on buses and $100,000 on public outreach and education.

In addition, a city employee, Jim Decker, has been loaned to the ADOT for implementation of the Model Deployment Program.

- Maricopa County indicates that the term “Intelligent Transportation Systems” includes a variety of technological applications intended to produce more efficient use of existing transportation corridors. The primary application currently implemented in the Maricopa County area is the Freeway Management System (FMS) operated by the Arizona Department of Transportation. The FMS combines the use of in-road sensors, surveillance cameras, ramp metering controls and variable message signs to detect and respond to freeway incidents.

  Maricopa County is a major participant in the AzTech, public/private partnership to provide a variety of technological applications to produce more efficient use of existing transportation systems. As the regional jurisdiction, Maricopa County is devoting its resources and personnel to coordinating ITS efforts among smaller jurisdictions.

  The AzTech Intelligent Transportation System (ITS) Model Deployment Initiative (MDI) is a seven year project (two year implementation and five year operation) that will develop an integrated intelligent transportation system for the Phoenix metropolitan area. When fully implemented in 1998, AzTech will produce freeway and arterial street networks that are safer and more efficient for the traveling public, decreasing travel time and enhancing traveler mobility. Once complete, the system will serve approximately 97 percent of the state's population.

  AzTech is being developed through a wide partnership between the public and private sectors. Management of traveler information and client development is administered through a cooperative multi-agency and corporation effort.

Approximately $2.4 million will be used to implement an advance traveler information system which will expand on the existing use of variable freeway message signs and the ADOT Internet page (of real-time freeway camera views and link speeds) and set up kiosks showing up-to-date travel information at shopping centers, bus terminals, and the airport. It will also transmit information to pagers, mobile and stationary computers and in vehicle navigation devices.

Approximately $2.3 million will be used to standardize and link traffic signal synchronization systems used by the State and seven cities, including Phoenix, Tempe, Scottsdale, Glendale, and Mesa.

Approximately $1.7 million will install cameras and sensors (as currently used on freeways) onto eight of the busiest streets in the Valley. This will help traffic flow especially during special events. Maricopa County has committed $1.8 million of the total funding of this project from the Department of Transportation Budget. $6.4 million of the funds are from a FHWA grant, and $2.8 million is coming from ADOT. Other local jurisdictions are also participating in the funding.

- Arizona Department of Transportation indicates that the term "Intelligent Transportation System" (ITS) includes a variety of technological applications intended to produce more efficient use of existing transportation corridors. The primary application currently in the Maricopa County area is the Freeway Management System (FMS) operated by ADOT. The FMS combines the use of in-road sensors, surveillance cameras, ramp metering controls, and variable message signs to detect and respond to freeway incidents. The system is managed from the ADOT Traffic Operations Center located on Durango Street just west of Interstate 17. This will be an ongoing effort.

  A copy of the ITS Project Outline and Funded Projects as shown in the ADOT ITS SEMI-ANNUAL REPORT PROJECT LIFECYCLE PLAN is being provided to MAG for the required implementation schedule information. This report also contains information on future, and completed projects, and information on the Freeway Management System projects. The ITS Program has several user service bundles, or activities. The Freeway Management System currently utilizes ITS technology such as Incident Management and En-Route Drive Information. Route Guidance, or in-vehicle navigation system will soon be available through ITS technology as well as electronic clearance at the Ports-of-Entry. Longer term projects include those that would require automated highway systems for advanced vehicle control and safety systems. (Attachments)

The current plan contains a total of 17 phases covering an envisioned 240 miles of freeway for the Phoenix area. The first two phases have been implemented and the third, fourth, and fifth phases are in the process of being instituted. In addition, a $7.5 million grant was received from the FHWA to become a model for deployment of ITS. Only four of 23 proposals were selected for ITS model deployment. This project is referred to as the AzTech Project.

In October 1996, the U.S. Department of Transportation awarded to Arizona a $7.5 million grant to provide for ITS technology. The grant requires local public and private sector funds to match every federal dollar. Administration of the plan development and program began with required staff time equivalent to seven full time employees. Other funding sources include local governments and the private sector.

- Regional Public Transportation Authority indicates that a total of 88 buses will be equipped with automatic vehicle locators by December 1997. There will be 23 City of Mesa buses, 55 City of Phoenix buses, and ten RPTA buses. The City of Phoenix and RPTA buses will be operated on routes 0, and 72, the Red Line and the Blue Line. The purpose of the project is to provide passengers with real time travel information of buses within the transit system. Information will be made available through variable message signs at selected locations throughout the Phoenix metropolitan region.

  This measure will be implemented by the City of Phoenix Public Transit Department, the Regional Public Transportation Authority (RPTA), and the cities of Mesa, Scottsdale, and Tempe. Implementation of this measure is one activity made possible by a U.S. Department of Transportation grant for $7.5 million that was awarded to the State of Arizona to provide intelligent transportation systems. This measure is expected to be implemented in December 1997.

  Administration of this measure is accomplished by the equivalent of 0.25 full time employee. The administrator is an employee of the City of Phoenix Public Transit Department, but officially represents both the City of Phoenix and the RPTA. The estimated cost of this measure is $700,000, consisting equally of the “Americas Model Deployment Initiative for Intelligent Transit Systems” federal grant funds, and local match monies.

26. <u>Special Event Controls-Required Implementation from List of Approved Strategies</u>

- City of Avondale is working with the public and private sector stakeholders to evaluate options for managing parking and traffic associated with activity

centers and PIR events. The City is developing a downtown parking program. Community Development will also work with the City departments, PIR, cultural and downtown property owners, and other stakeholders to address parking issues, to identify linkages to alternative modes of travel, and to consider the availability of public and private transportation services for these venues.

Expansion of Public Transportation Programs (Measure 97-TC-5) may result in increased funding for transit and ultimately help provide transit options for travel to activity centers. Without expansion of the current public transportation system, options of encouraging alternative transportation will be limited. However, Fiscal Year 1997-1998 the City has expanded the public transportation system to provide service to three new communities. Also see measure 97-TC-10: Site Specific Transportation Control Measures. Implementation is ongoing. Funding is allocated through the annual budget process.

- City of Chandler indicates that transit service between the downtown area and remote parking areas (shopping center parking lots along north Arizona Avenue) was implemented on a trial basis during the last festival in Chandler. Since this festival attracts more than 200,000 people over a three-day period, this resulted in a reduction to the number of cars cruising the downtown area in search of parking spaces and less idling as a result of reduced congestion in and near downtown parking areas. Beginning 1998, remote parking areas will be provided for each of the two festivals Chandler holds each year. Funding is allocated through the annual budget process.

- City of Glendale indicates that in the event that Maricopa County or the Arizona Department of Environmental Quality develops a rule with regionwide applicability, the City will consider implementing this measure. At this time, there is no legal definition of a “special event center”. The City will explore the implementation of this measure after the legal definition of a special event center is developed by Maricopa County or the Arizona Department of Environmental Quality. The City Traffic Engineer will be responsible to explore the feasibility of implementing this measure. Funding will be determined through the City’s annual budget development process.

- City of Goodyear indicates that in the event that Maricopa County or the Arizona Department of Environmental Quality develops a rule with regionwide applicability, the City will consider implementing this measure. At this time, there is no legal definition of a “special event center”. The City will explore the implementation of this measure after the legal definition of a special event center is developed by Maricopa County or the Arizona

Department of Environmental Quality. The Public Works Department will be responsible to explore the feasibility of implementing this measure. Funding will be determined through the City's annual budget process.

- City of Mesa indicates that at this time there are a minimal number of large events in the City of Mesa. The City will continue to evaluate parking management and traffic control improvements for smaller special events.

  Development of the ITS system may aid in the implementation of this measure. Mass Transit Alternatives (Measures 97-TC-1) and Expansion of Public Transportation Programs (Measure 97-TC-5) may result in increased funding for transit and ultimately help provide transit options for travel to activity centers. Without expansion of the current public transportation system, options of encouraging alternative transportation will be limited. Also see Measure 97-TC-10: Site Specific Transportation Control Measures. Coordination will be ongoing. Funding is allocated through the annual budget process.

- City of Peoria indicates that this measure involves emission controls from special events resulting in parking and point source from vehicle and equipment. The type of controls are dependent upon the duration of the event and the anticipated number of participants. Events are categorized as either City sponsored or non-City sponsored events. Current staffing in the Community Services Department, Community Development Department, Police Department, and Public Services Department are utilized to implement the controls. Controls include dust preventative measures in paved and non-paved parking areas, and traffic control for large, short duration City sponsored events. The Community Services Department enforces the controls for the City sponsored events through coordination with other City departments. Non-City sponsored events are controlled through the Use Permit process administered by the Community Development Department by a series of conditions which stipulate dust and traffic control.

- City of Phoenix is working with the public and private sector stakeholders to evaluate options for managing parking and traffic associated with activity centers and special events in the downtown area. The City has established a position for a temporary staff person with primary responsibility for developing a downtown parking program for City-owned parking facilities. The Coordinator will also work with City departments, the Downtown Phoenix Partnership. Cultural and sport venue management, downtown property owners, parking managers, and other stakeholders to address parking issues, to identify linkages to alternative modes of travel, and to consider the availability of public and private transportation services for these venues.

Mass Transit Alternatives (Measures 97-TC-1) and Expansion of Public Transportation Programs (Measure 97-TC-5) may result in increased funding for transit and ultimately help provide transit options for travel to activity centers. Without expansion of the current public transportation system, options of encouraging alternative transportation will be limited. Also see Measure 97-TC-10: Site Specific Transportation Control Measures.

Job responsibilities are currently assigned to an existing staff person. Recruitment for the Parking Management Coordinator is expected to be completed by July 1, 1997. Funding is allocated through the annual budget process. Temporary Parking Management Coordinator position (Estimated $85,000).

- Town of Queen Creek does not have a large number of special events throughout the year. The Town, however, will include in the current special events application a requirement to obtain a Maricopa County dust permit. The Town estimates that ten (10) events would be affected by this measure with attendance which varies from 50 to 5,000.

  It is expected that this measure will be implemented no later than January 1, 1998. Implementation would involve adding the requirement of a Maricopa County dust permit to the existing special events application. To implement the measure, the current Building Department staff would be adequate to check completed special event applications for a Maricopa County dust permit. Funding to implement this measure would be budgeted from the Town's General Fund.

- City of Scottsdale evaluated traffic patterns before and during Super Bowl XXX, and programmed the signal computer to alleviate and avoid traffic predicaments.

  The City of Scottsdale completed construction of two bridges associated with the Greenway/Hayden CAP crossing prior to the 1997 Phoenix Open to alleviate traffic congestion. The Phoenix Open is an annual event.

  The City of Scottsdale Transportation Department's objective for 1997-1999 is to implement a traffic management program.

  The City works with the Chamber of Commerce, public and private sector stakeholders to evaluate options for managing parking and traffic associated with activity centers and special events throughout Scottsdale.

Mass Transit Alternatives (Measure 97-TC-1) and Expansion of Public Transportation Programs (Measure 97-TC-5) may result in increased funding for transit and ultimately help provide transit options for travel to activity centers. Without expansion of the current public transportation system, options of encouraging alternative transportation will be limited. Also see Measure 97-TC-10: Site Specific Transportation Control Measures.

Implementation is in progress. Funding is allocated through the biennial budget process.

- City of Tempe indicates that this measure would require new and existing owners/operators of special event centers to reduce mobile source emissions generated by their events. A list of available strategies would be available that reduce mobile source emissions. The definition of "special event center" would be developed through the rule process.

  The expanded transit system, as referenced in Measure 97-TC-5, will assist special event promoters in providing alternative transportation to special events. In addition, the City is continuing to study a special event traffic management system.

  The Events Task Force, comprised of representatives from various city departments, currently reviews special event applications. The Task Force serves as the means to address event issues such as traffic and safety. This measure can be implemented upon definition of special event center and development of available strategies. Funding is provided through the annual budget process.

27. <u>Voluntary Lawn Mower Emissions Reduction Program</u>

- Arizona Legislature passed H.B. 2237 in 1997 which requires Maricopa and Pima Counties to establish a Voluntary Lawn Mower Emissions Reduction Program to begin no later than July 1, 1998. A lawn mower owner may participate in the program if the lawn mower starts and is used for commercial or residential purposes. The voucher for retired commercial lawn mowers is $200 and must be used for the purchase of a lawn mower that generates lower emissions. The voucher for retired residential lawn mowers is $100 and must be used for the purchase of an electric lawn mower. Retired lawn mowers are prohibited from use in Arizona.

  In order to fund this program, H.B. 2237 establishes the Voluntary Lawn Mower Emissions Reduction Fund consisting of monies appropriated by the Legislative and political subdivisions along with gifts, grants and donations. The Counties are required to prepare and submit a progress report on

December 1 of each year which describes the number of lawn mowers retired by brand and year of manufacture; cost effectiveness of the program in terms of dollars spent per ton of emissions reductions; recommendations for improving the effectiveness of the program; and administrative costs of the program (A.R.S. 49-474.02).

The bill also contains a $1,000,000 appropriation for the State General Fund for fiscal year 1997-1998 for deposit into the Voluntary Lawn Mower Emission Reduction Fund (Section 21 of H.B. 2237).

In 1998, the Arizona Legislature passed S.B. 1427 which expanded the program to include garden equipment as well as lawn mowers. The bill specifies that a voucher will be issued in the amount of $50 to the owner of a gasoline powered lawn or garden device that is retired. The voucher must be used for the purchase of a lawn or garden device that generates lower emissions. Retired equipment is prohibited in the state. In addition to lawn mowers, the progress report due from the counties on December 1 of each year must include garden equipment. The bill also contains an appropriation of $500,000 in FY 1998-1999 and $500,000 in FY 1999-2000 (A.R.S. 49-474.02 and Section 36 of S.B. 1427).

- Maricopa County indicates that this measure involves implementing a voluntary program to purchase and retire commercial and residential lawn mowers which produce excessive emissions. This measure will be implemented by the Maricopa County Environmental Services Department, Community Service Division. Legal Authority for this action is provided under Section 49-474.02 of the Arizona Revised Statutes.

  The Maricopa County Community Services Division is currently in the developmental stages of program implementation.

  July 1997, Define program parameters
  July 1997, Develop RFP for Vendors
  August 1997, Issue RFP for Vendors
  October 1997, Select Vendor
  October 1997, Finalize paperwork
  November 1997, Program implementation

  Personnel will be provide through existing staff. The sum of $1,000,000 has been appropriated from the state general fund to be split among counties with a population of more than 500,000 persons.

28. Off-Road Vehicle and Engine Standards

` ■ Arizona Legislature passed H.B. 2237 in 1997 which requires the Arizona Department of Environmental Quality to adopt rules for air pollution emission standards for off-road vehicles and engines marketed in the State beginning with the 1999 model year. The standards may include the following categories:

f. Heavy duty Diesel vehicles rated at 175-750 horsepower.
g. Small utility and lawn and garden equipment engines rated at less than 25 horsepower.
h. Recreational vehicles rated at less than 25 horsepower.
i. Specialty engines and go-carts rated at greater than 25 horsepower.
j. Off-road motorcycles and all terrain vehicles.

The Arizona Department of Environmental Quality is also required to adopt air pollution emission standards for golf cart engines in Maricopa County (A.R.S. 49-542.04).

29. Encourage the Use of Temporary Electrical Power Lines Rather than Portable Generators at Construction Sites

■ City of Avondale would participate in program with the electrical utility companies and the Homebuilders Association to encourage the use of temporary construction power devices (meter socket receptacles) for construction sites. The receptacles connect to the power pole and eliminate the need for petroleum-powered generators. The reusable equipment is available through Arizona Public Service Company and Salt River Project Agricultural Improvement and Power District.

The City will assist with the creation and distribution of informational materials as appropriate. Public Works and Community Development Services Department staff will be familiar with the program and will encourage participation by developers and contractors. Implementation is in progress. Funding is allocated through the annual budget process.

■ Town of Buckeye will encourage the use of temporary power by working with Arizona Public Service and contractors to consider the use of temporary power lines instead of portable generators. The Town's Building Safety Division is responsible for this measure. Legal Authority is provided by the adopted Uniform Electrical Code, adopted by the Town Council. This measure is already being implemented. Funding is provided through the Town's General Fund for Building Safety personnel.

- Town of Carefree is a semi-rural community with approximately 2300 residents located on the north edge of the Phoenix metropolitan area. The average annual new residential construction is approximately 60 dwelling units. The Town of Carefree, in conjunction with the Arizona Public Service Company, encourages the use of temporary power for new construction.

  This measure will be implemented by the Town of Carefree. Legal authority for this action is provided under Section 9-270-A (14) of the Arizona Revised Statutes. The approval and encouragement of temporary electrical power for new construction is continual. The annual operating cost of the Town of Carefree Building and Safety Department is approximately $110,000. However, there is no additional cost to the Town in implementing this measure.

- Town of Cave Creek will adopt requirements for all new construction to install Temporary Metered Power Outlet prior to pre-slab inspection. However, due to the remoteness of certain areas and the current backlog of the power company to hook up even primary services, this measure would not be attainable at all phases of construction but would be obtainable by 50 percent stage of construction. When primary power becomes available, Temporary Metered Power will be required by the Building Official.

- City of El Mirage will work with other entities to encourage building contractors and developers to consider the use of temporary electrical power rather than portable generators, where appropriate. The City will work with other key partners, i.e., electrical utility companies, developer/builder associations and state and local governmental agencies to develop and/or distribute appropriate materials to encourage building contractors and developers to consider the use of temporary electrical power instead of portable generators. The City's Building Department is responsible for the implementation of this measure. Funding will be determined through the City's annual budget development process.

- Town of Fountain Hills agrees to implement a program which encourages the use of Salt River Project ("SRP") temporary power devices at new construction sites. This measure is jointly implemented by the Town of Fountain Hills Building and Safety Department and SRP. Legal authority for this is provided under Arizona Revised Statutes Section 9-240-"General Powers of Council".

  The Town of Fountain Hills Building and Safety Department currently encourages the use of "temporary power devices", however, the actual hook-up and monitoring is controlled and managed by SRP. The program began

on January 1, 1997. There are no funds allocated for this measure from the Town of Fountain Hills budget. This measures does not represent an ordinance, regulation, or rule requiring enforcement. SRP manages and enforces this "temporary power" program. All temporary power devices are installed and inspected by SRP personnel at the construction site.

- Town of Gilbert indicates that homebuilders can choose to use SRP's Temporary Metered Power Outlet at subdivisions. The receptacles connect to the power pole and eliminate the need for petroleum-powered generators. The Town will assist with the creation and distribution of informational materials as appropriate. Building and Code Enforcement Department staff is familiar with the program and available to answer questions by developers and contractors. Implementation is in progress. Funding is allocated through the annual budget process.

- City of Glendale will work with other entities to encourage building contractors and developers to consider the use temporary electrical power rather than portable generators, where appropriate. The City will work with other key partners, e.g., electrical utility companies, developer/builder associations, and state and local governmental agencies to develop and/or distribute appropriate materials to encourage building contractors and developers to consider the use of temporary electrical power instead of portable generators. The City's Community Development Group is responsible for the implementation of this measure. Funding will be determined through the City's annual budget development process.

- City of Goodyear will work with other entities to encourage building contractors and developers to consider the use of temporary electrical power rather than portable generators, where appropriate. The City will work with other key partners, e.g., electrical utility companies, developer/builder associations, and state and local governmental agencies to develop and/or distribute appropriate materials to encourage building contractors and developers to consider the use of temporary electrical power instead of petroleum powered generators. The City's Community Development Department is responsible for the implementation of this measure. Funding will be determined through the City's annual budget process.

- City of Mesa has a program to facilitate installation of temporary power at any site within the City. The City will monitor the progress of a pilot program between electrical utility companies and the Homebuilders Association to encourage the use of temporary construction power pole and eliminate the need for petroleum-powered generators. The reusable equipment is

available through the Salt River project Agricultural Improvement and Power District.

The City will assist with a regional effort to create and distribute informational materials as appropriate. The Building Inspection Department and the Environmental Division will be familiar with the program and will encourage participation by developers and contractors. Coordination and public education will be ongoing. Funding is allocated through the annual budget process.

- Town of Paradise Valley indicates that the Town plans to include in it's requirements, the use of temporary electrical power during the construction process. This will be accomplished by the passing of Ordinance Number 445, prohibiting the use of gas generators at building sites unless temporary power is unavailable. Town of Paradise Valley Building Inspection Department. Implementation will be within the next calendar year. Funding is allocated through the Town's annual budget.

- City of Peoria indicates that the use of temporary electrical power sources is a standard practice for commercial developers within the City of Peoria. Developers routinely connect to electrical source power rather than use portable generators and other portable equipment. Existing Off-Site and Building inspectors will be utilized.

- City of Phoenix is participating in a pilot program with the electrical utility companies and the Homebuilders Association to encourage the use of temporary construction power devices (meter socket receptacles) for construction sites. The receptacles connect to the power pole and eliminate the need for petroleum-powered generators. The reusable equipment is available through Arizona Public Service Company and Slat River Project Agricultural Improvement and Power District.

  The City will assist with the creation and distribution of informational materials as appropriate. Development Services Department staff will be familiar with the program and will encourage participation by developers and contractors. Implementation is in progress. Funding is allocated through the annual budget process.

- Town of Queen Creek will encourage homebuilders to arrange for installation of temporary power at construction sites by the local utility company. The number of housing units affected by this measure would be approximately six (6) per month. Commercial developments affected would be approximately one (1) per year.

It is expected that this measure will be implemented no later than January 1, 1998. Implementation would involve the addition of the SRP temporary power information packet to the existing materials that the Building Department provides at building permit issuance. To implement the measure, the current Building Department staff would be adequate to encourage the use of temporary power. The funding to implement the measure would be budgeted from the Town's General Fund.

- City of Scottsdale indicates that Arizona Public Service (APS) and Salt River Project (SRP) both have voluntary temporary construction power programs for residential construction. (See Attachments for details.)

  The City of Scottsdale is cooperating with these voluntary programs in conjunctions with the electrical utility companies and the Homebuilders Association to encourage the use of temporary construction power devices (meter socket receptacles) for residential construction sites. The receptacles connect to the power pole and eliminate the need for petroleum-powered generators. The reusable equipment is available through Arizona Public Service Company (APS) and Salt River Project (SRP). Implementation is in progress. Staffing funding for inspection services is through the biennial budget process.

- City of Tempe is implementing this measure by a change in the City's current Electric Code. When the change is completed, the City will work with the electrical utility companies, contractors, owners, and builders to encourage the use of temporary metered power outlets for construction sites. The temporary metered power outlets are connected to the building's electrical service pole and eliminate the need for petroleum-powered generators. The power outlets are available through Salt River Project and Arizona Public Service.

  The City will assist with the creation and distribution of informational materials as appropriate. The Development Services Department staff will be familiar with the program and will encourage participation by developers and contractors. Implementation is in progress. Funding for Development Services is allocated through the annual budget process.

- City of Tolleson Mayor and Council will adopt an ordinance requiring contractors to use temporary power lines only in those areas where it is fiscally and geographically possible. Developments not in close proximity to a permanent electrical power source will not be required to adhere to this measure. The Ordinance will be adopted by July, 1997. City of Tolleson Building Department Staff will fulfill the duties required for the proper

implementation of this measure. Cost of $200 will be incurred for publication of said ordinance.

- Maricopa County indicates that the emissions from the production of electrical power used in new home construction could be reduced substantially by the use of temporary electrical power rather than generators. Electrical service can usually be established within 30 days of the request. This voluntary measure would reduce noise as well as air pollution. Pursuant to A.R.S. Section 11-251 (General Powers of Board of Supervisors), Maricopa County will hand out brochures, when issuing building or earthmoving permits, advising contractors of the availability of the program and appropriate contacts. Departments will obtain or design a handout in June 1997 and begin handing out the information to all permittee after July 1, 1997. Departments' permitting programs are ongoing and funded in the existing budget.

30. Defer Emissions Associated With Governmental Activities

- City of Avondale indicates that the City uses 4-stroke lawnmowers and limits the use of 2-stroke lawn-care equipment wherever feasible. The City will consider options for a pilot program to evaluate electrical-powered lawn-care equipment as the battery technology becomes more feasible for large scale operations.

- Town of Buckeye will evaluate ways to defer emissions associated with Town governmental activities during high pollution periods. The Town will evaluate new low or no emission lawn maintenance and other equipment when they become available for commercial use. The Town will look into establishing procurement standards which require bidders to provide information on substitute products with low or no-content reactive organic compounds in applicable procurement solicitations. Various Town Departments will be responsible for this measure. Legal authority for this action is provided under ARS 9-240, "General Powers of the Common Council". The Town's staff will periodically evaluate low or no emission lawn maintenance and other equipment as they become available for commercial use. Funding will be determined through the Town's annual budget process.

- Town of Cave Creek indicates that wherever and whenever possible, the Town will schedule road construction and maintenance projects outside of the critical air pollution periods. Factors that would affect the Town's ability to re-schedule projects include the efficient use of equipment and manpower.

- City of Chandler indicates that the City's Park Division has reduced the use of gas-powered blowers by limiting the number of days they can be used in the downtown colonnade area from five days per week to only one day per week and by sweeping walks in lieu of using blowers in neighborhood parks when feasible. As contracts for maintenance of city-owned property are re-bid, the City will work with contractors to use cleaner-burning equipment; specifically, motors that comply with either "CARB 95" or "EPA Phase I" standards. The City's Public Works Department will replace worn-out two-cycle, gas-powered trimmers, chain saws, blowers, and lawn mowers with four-cycle equipment whenever possible. Implementation will be ongoing. Funding is allocated through the annual budget process.

- City of El Mirage will evaluate ways to defer emissions associated with City governmental activities during high pollution periods. The City will evaluate new low or no emission lawn and garden equipment when they become available for commercial use or when feasible. The City will look into establishing procurement standards which requires bidders to provide information on substitute products with low or no-content of reactive organic compounds in all applicable procurement solicitations.

  The City's Parks Maintenance and Streets Department will periodically evaluate low or no emission lawn and garden equipment as they become available for commercial use. Funding will be determined through the City's annual budget development process.

- Town of Gilbert, wherever feasible, will reduce activities in the Nonattainment Area that may contribute to seasonal air quality problems. Outside painting activities will be avoided during the summer months. The Town uses 4-stroke lawnmowers and limits the use of 2-stroke lawn-care equipment wherever feasible. The Town will consider options for a pilot program to evaluate electrical-powered lawn-care equipment as the battery technology becomes more feasible for large scale operations. The Town will continue to use employee newsletters or other communication tools to encourage employees to limit engine idling, reduce driving, and to avoid activities which may contribute to air pollution or to schedule activities in a manner to avoid peak pollution periods. Implementation is in progress. Funding is allocated through the annual budget process.

- City of Glendale will evaluate ways to defer emissions associated with City governmental activities during high pollution periods. The City will evaluate new low or no emission lawn and garden equipment when they become available for commercial use or when feasible. The City will explore the possibility of modifying its landscape maintenance contracts to encourage

the use of low or no emissions lawn and garden equipment when existing contracts expire. The City has established procurement standards which requires bidders to provide information on substitute products with low or no-content of reactive organic compounds in all applicable procurement solicitations.

The City's Park Maintenance Division and Right of Way Division will periodically evaluate low or no emission lawn and garden equipment as they become available for commercial use and explore the possibility of modifying landscape service contracts when existing contracts expire. City landscape maintenance crews currently do not use two-cycle engine lawnmowers. The City is currently requesting substitute products with low or no-content of reactive organic compounds in all applicable procurement solicitations. Funding will be determined through the City's annual budget development process.

- City of Goodyear will evaluate ways to defer emissions associated with City governmental activities during high pollution periods. The City will evaluate new low or no emission lawn and garden equipment when they become available for commercial use or when feasible. The City will explore the possibility of modifying its landscape maintenance contracts to encourage the use of low or no emissions lawn and garden equipment when contracted work is required. The City will establish procurement standards which will require bidders to provide information on substitute projects with low or no content or reactive organic compounds in all applicable procurement solicitations.

  The City's Park Maintenance Division and Right-of-Way Division will periodically evaluate low or no emission lawn and garden equipment as they become available for commercial use and explore the possibility of modifying landscape service contracts when existing contracts expire. Funding will be determined through the City's annual budget development process.

- City of Mesa has been working with lawncare contractors to utilize cleaner burning equipment; specifically, motors that comply with either "CARB 95" or "EPA Phase I" standards. The City has developed a pilot program to require the use of equipment that meets either the CARB or EPA standards. As part of this program, two lawncare contractors have committed to using only the cleaner burning equipment for City projects after August 1997. Based on the results of the pilot program, the City will determine if the program can be expanded to all contractors beginning January 1, 1998.

  The City is continuing to evaluate the feasibility of restricting the use of or limiting the hours of usage for lawncare and other gasoline powered

equipment on City property. Implementation will be ongoing. Funding is allocated through the annual budget process.

- Town of Paradise Valley will use the Trip Reduction Program's communication to encourage employees to limit engine idling, reduce driving, and to avoid activities which may contribute to air pollution or to schedule activities in a manner to avoid peak pollution periods. This measure will be included in the annual Trip Reduction Program to be revised and submitted to the Maricopa County Trip Reduction Agency in November of 1997. A full-time exempt employee volunteers their services on off hours, at a cost of zero. The annual budget for this measure is from the Town's General Fund. Development and administration of the Trip Reduction Program Reduction Plan requires staff time equivalent to 0.20.

- City of Phoenix, in 1997, established standard text to be included in City contracts which requires vendors to provide information on the amount of reactive organic compounds in their products and information on substitute products which contain either non-reactive or low-reactive organic compounds. Outside painting activity will be avoided during the summer months whenever feasible.

  The City uses 4-stroke lawnmowers and limits the use of 2-stroke lawncare equipment wherever feasible. The City will consider options for a pilot program to evaluate electrical-powered lawncare equipment as the battery technology become more feasible for large scale operations.

  The City will continue to use employee newsletters or other communication tools to encourage employees to limit engine idling, reduce driving, and to avoid activities which may contribute to air pollution or to schedule activities in a manner to avoid peak pollution periods.

- City of Scottsdale Procurement Guidelines restrict purchase of certain chemicals, including some VOC products. City operational units defer certain painting and street striping operations whenever feasible. The City of Scottsdale Community Maintenance and Recreation Department no longer uses gas-powered leaf blowers to maintain landscaping in the Civic Center Mall. Various options including vacuum-brooming and use of electric powered equipment have been piloted.

  City contracts with landscape maintenance companies for the Civic Center Mall prohibit use of gas-powered leaf blowers. City contract for cleaning and maintenance of Scottsdale Stadium prohibit use of gas-powered leaf blowers (except for six (6) select dates during the year). The City now purchases 4-

stroke lawnmowers to replace older mowers. The City will consider options for a pilot program to evaluate alternatively powered lawncare equipment, including hydrogen powered and electric powered equipment.

The City will continue to use employee newsletters or other communication tools to encourage employees to limit engine idling, reduce driving, and to avoid activities which may contribute to air pollution or to schedule activities in a manner to avoid peak pollution periods. Implementation is in progress. Funding is allocated through the biennial budget process.

- City of Surprise indicates that this measure involves limiting use or idling of Public Works vehicles or utility equipment and minimizing the use of two-cycle gasoline-powered lawn and garden maintenance equipment after 2:00 p.m. during the winter carbon monoxide season (October 1 through March 31). This measure will be implemented by the City of Surprise Public Works Department. Commitment to begin during the 1998 winter carbon monoxide season.

- City of Tempe indicates that this measure involves shifting or postponing certain emission activities during critical air pollution periods.

  - During the summer ozone season, the City will: prioritize and reschedule painting, metal coating, refinishing, and other VOC (Volatile Organic Compounds) emitting activities; restrict the use of 2-cycle gasoline-powered lawn and garden equipment, with no use allowed after 4:00 p.m; encourage the use of hand and electric equipment; stagger the time of day for refueling to avoid heavy emissions all at once, and; include in all procurement solicitations for VOC-containing products a request for a substitute product with a lower or no VOC content.

  - During the winter CO (Carbon Monoxide) season, City personnel are asked: to minimize the use of 2-cycle gasoline-powered lawn and garden equipment after 2:00 p.m.; avoid idling vehicles or utility equipment; and schedule street construction and maintenance projects that disrupt traffic flow during the summer months, when feasible. In the downtown area, the City has committed to clean sidewalks four times a week. To use manpower efficiently, gas blowers are used in the early morning hours, 3:30 a.m. to 6:00 a.m.

  Implementation is in progress. Funding is allocated through the annual budget process.

- Town of Wickenburg indicates that this measure involves limiting the use of idling of Public Works vehicles or utility equipment and minimizing the use of 2-cycle gasoline-powered lawn and garden maintenance equipment after 2:00 p.m. during the winter carbon monoxide season (October 1st through March 31st). An attempt will be made to operate this program during the winter months between October 1st and March 31st.

- Town of Youngtown indicates that the Youngtown Police Department has implemented a four day, ten hour work week. This practice would stagger personnel schedules; thus decreasing Town vehicle usage. This program is currently in operation. No additional personnel or funding is required by the implementation.

- Maricopa County indicates that this measure is aimed at reducing activities where feasible and appropriate, by State agencies and local governments in the Nonattainment Area that may contribute to seasonal air quality problems. This measure would involve a shift in the timing of activities or postponement altogether, until after critical air pollution periods.

  Pursuant to A.R.S. Section 11-251 (General Powers of Board of Supervisors) and the contracting authority set forth in A.R.S. Section 11-201(A), Maricopa County commits to insert a provision into the bid specifications for landscape maintenance to encourage the use of new lawnmower equipment meeting the EPA Phase I specifications, require the use of 4-cycle engines on gasoline powered lawnmower equipment, or restrict the use of 2-cycle equipment after 2:00 p.m. during the winter carbon monoxide season. The provision also states that should smaller 4-cycle engines become available on hand held lawn equipment (weed eaters, vacuums/blowers, etc.) contractors will be required to utilize such equipment.

  Maricopa County is in the process of selecting a contractor to perform landscaping services.

May 1997	Finalize bid specifications
June 1997	Call for bids
August 1997	Award contract

  Ongoing program funded through existing County budget.

- Arizona Department of Transportation indicated that this measure is directed at reducing some activities by State Agencies and local governments where feasible and appropriate in the Nonattainment Area that may contribute to

carbon monoxide air quality problems. This measure will require an internal policy and will be an ongoing effort.

A formal policy will be developed by the ADOT General Operations Group to limit the use or idling of utility equipment and to minimize the use of 2-cycle gasoline-powered lawn and garden maintenance after 2:00 p.m. during the carbon monoxide season. No additional funding or employees would be required to implement this measure. Associated costs are covered by the ADOT administrative budget.

- Regional Public Transportation Authority indicates that the RPTA will reduce activities where feasible and appropriate that may contribute to seasonal air quality problems. This would involve a shift in the timing of activities or postponement altogether, until after critical air pollution periods. RPTA will:

  - encourage and ask contractors, employees, and over 1,250 employer-clients to reschedule painting and refinishing and other VOC emitting activities to occur outside of the summer months whenever feasible;
  - include in procurement solicitations for VOC-containing commodities a request for substitute products with lower or no VOC content;
  - limit use of idling of vehicles during the winter carbon monoxide season;
  - encourage contractors and over 1,250 employer clients to minimize use of 2-cycle gas powered lawn equipment, go electric or use manual equipment, and to limit use after 2 p.m. in the winter. RPTA will work with the ADEQ and MAG, who are co-sponsors of the Clean Air Campaign, in dissemination of information on the above activities.

    Summers/ongoing: seasonal activities to reduce emissions will be disseminated via HPA advisories, articles, fact sheets, internal E-mail, letters, etc.
    Winters/ongoing: seasonal activities to reduce emissions will be disseminated via HPA advisories, articles, fact sheets, internal E-mail, letters to contractors, etc.

No additional funding or personnel is required to disseminate this information.

31. <u>Clean Burning Fireplace Ordinance</u>

- Arizona Legislature passed S.B. 1427 in 1998 which requires cities, towns, and counties in Area A to adopt, implement and enforce an ordinance that complies with the clean burning fireplace standards adopted by the

Metropolitan Planning Organization that is responsible for air quality planning in Area A by December 31, 1998. The ordinance must prohibit the installation or construction of a fireplace or wood stove unless it is one of the following:

1. A fireplace that has a permanently installed gas or electric log insert.

2. A fireplace, a wood stove or any other solid fuel burning appliance that is any of the following:

   (a) Certified by the U.S. Environmental Protection Agency as in compliance with 40 Code of Federal Regulations Part 60, Subpart AAA in effect on July 1, 1990.

   (b) A wood stove tested and listed by a nationally recognized testing agency to meet performance standards equivalent to those in 40 Code of Federal Regulations Part 60, Subpart AAA in effect on July 1, 1990.

   (c) Determined by the County Air Quality Control Officer to meet performance standards equivalent to those in 40 Code of Federal Regulations Part 60, Subpart AAA in effect on July 1, 1990.

3. A fireplace that has a permanently installed wood stove insert that complies with paragraph 2, subdivision (a), (b) or (c) of this section.

The ordinance is required to prohibit the subsequent conversion or alteration of a permitted fireplace or wood stove to a nonpermitted use. The ordinance may provide for exemptions from regulation for heating or industrial equipment, cooking devices and outdoor fireplaces. The state income tax subtraction of $500 dollars for the purchase and installation of a qualified wood stove, wood fireplace or gas fired fireplace and non-optional equipment is removed. The subtraction of $500 dollars for the conversion of an existing wood fireplace to a qualified fireplace is retained.

A county that contains any portion of Area A that has a population of less than 1,200,000 according to the most recent U.S. decennial census shall adopt, implement, and enforce the ordinance only in those portions of the county which are located in Area A (A.R.S. 9-500.16 and 11-875).

32. <u>Public Information Program on Wood Stoves and Wood Heat</u>

- Maricopa County indicates that this measure involves establishing a public information and education program to inform and educate citizens about

relevant State, local and EPA regulations; general health risks of wood smoke; proper woodburning operations and maintenance; heating fuels and practices; new technology stoves; and alternatives to wood heating. The program is supported by two hotlines; fax notifications of high air pollution advisories to media, agencies and major employers; prepared information sheets for handouts, mailers and bill stuffers; and local newspaper articles (32 published during the 1996-1997 winter season).

Pursuant to A.R.S. Section 11-871, Maricopa County developed and implemented a residential woodburning restriction ordinance in October 1994. The Board of Supervisors authorized the Environmental Services Department to carry out the necessary investigations, inspections, and enforcement for County Air Pollution Control pursuant to A.R.S. Section 49-473. To support the residential woodburning restriction ordinance, the Department has developed a Public Information Program to inform and educate the public pursuant to the County's authorities under A.R.S. Section 11-201, 11-202 and 11-251.

To enhance the program, Maricopa County is completing the following actions:

1. In February 1997 published a Woodburning Booklet as part of Maricopa County Pollution Prevention Program. The Woodburning booklet is being distributed to the public and to the media and is available on the Department's Home Page.

2. In Winter 1996 completed an educational brochure to inform new home buyers about High Air Pollution advisories and to promote clean-burning fireplaces working with the Air Quality Committee of the Phoenix Environmental Quality Commission, the Homebuilders Association and the Hearth Products Association. The brochure is being distributed in model homes and by realtors and home builders throughout Maricopa County.

3. Beginning the winter season 1996-1997, Maricopa County in conjunction with RPTA designed a uniform symbol for high air pollution advisory days which is displayed during the weather reports on all except one of the major network affiliate stations. In addition, the local public television station also began running a "crawl" which appears at the bottom of the television screen announcing high air pollution advisories.

4. By August 1997, high air pollution advisories will appear on Maricopa County Environmental Services Home Page, ADOT's Home Page and RPTA's Home Page which is also linked to the Environmental Section

of the Arizona Republic's Home Page. The National Weather Service agreed to include tips with its broadcast wire service air quality report on high air pollution advisory days beginning with the 1996 winter CO season.

The Department designates approximately $30,000 of its Federal 105 grant for the woodburning program including both public information and enforcement. The public involvement coordinator spends one quarter of her time from October to March on this program.

- Regional Public Transportation Authority indicates that the RPTA provides information to the public regarding wood stoves and the no burn ordinance to reduce wintertime emissions of carbon monoxide. Information is disseminated through High Pollution Advisories to over 700 Valley employers via facsimile during both winter and summer high pollution seasons. Periodically, articles are written in employer newsletters and/or employee newsletters (made available in camera ready form to employers for duplication) on the importance of oxygenated fuels. RPTA provides information materials to the over 1,250 employers affected by the TRP that represent about 585,000 employees and students. Maricopa County is responsible for educating the public about the No Burn Day ordinance and wood stoves. RPTA works with the County to provide information to employers and residents.

  - Fax to over 700 employers on High Pollution Advisory Days, on No Burn.
  - Distribute fact sheets when made available by Maricopa County kits to 1,250 employers - Fall, 1997.
  - Ongoing-disseminate information as requested by Maricopa County.

  No additional funding or personnel is necessary to provide periodic information to residents.

33. <u>Encourage Limitations on Vehicle Idling</u>

- Regional Public Transportation Authority updated its engine idling policy in June 1996. The updated policy provides that vehicle operators shall follow the accompanying guidelines on engine idling at layovers, unless actively loading or unloading wheelchair passengers (certain exceptions may apply).
  1. Below 90 degrees and over 3 minutes layover, turn engine off.
  2. Below 90 degrees and within 100 yards of any single- or multi-family residence, regardless of layover time, turn engine off.

3. Any time the temperature is between 90 and 99 degrees, allow engine to run at low idle.
4. Any time temperature is 100 degrees or higher, allow engine to run at high idle.

The Regional Public Transportation Authority working in cooperation with its member jurisdictions. The RPTA will continue to work with member jurisdictions to promote environmentally sensitive transit operations practices and policies. Promoting vehicle idling limitations and other environmentally sensitive transit operations practices and policies are included within the ongoing annual budgets of the RPTA and its member jurisdictions.

34. <u>Expansion of Area A Boundaries</u>

- Arizona Legislature passed S.B. 1427 in 1998 which expands the boundaries of Area A. Previously, the Area A boundaries followed the boundaries of the carbon monoxide and ozone nonattainment area. Area A was expanded to include additional portions of Maricopa County, portions of Pinal County, and portions of Yavapai County. The Area A boundaries are delineated as follows:

(a) In Maricopa County:
Township 8 North, Range 2 East and Range 3 East
Township 7 North, Range 2 West Through Range 5 East
Township 6 North, Range 2 West Through Range 6 East
Township 5 North, Range 2 West Through Range 7 East
Township 4 North, Range 2 West Through Range 8 East
Township 3 North, Range 2 West Through Range 8 East
Township 2 North, Range 2 West Through Range 8 East
Township 1 North, Range 2 West Through Range 7 East
Township 1 South, Range 2 West Through Range 7 East
Township 2 South, Range 2 West Through Range 7 East

(b) In Pinal County:
Township 1 North, Range 8 East And Range 9 East
Township 1 South, Range 8 East And Range 9 East
Township 2 South, Range 8 East And Range 9 East
Township 3 South, Range 7 East Through Range 9 East

(C) In Yavapai County:
Township 7 North, Range 1 East And Range 1 West Through Range 2 West

The Area A map is provided in Figure 8-1. The Area A expanded boundaries are also depicted with the PM-10 nonattainment area boundaries in Figure 8-2.

All of the air quality measures and programs added or modified by S.B. 1427 for Area A will be effective from and after December 31, 2000 in the portion of Area A which includes Pinal County. This does not apply to the conversions of fleet vehicles to alternative fuels by cities, counties, and school districts. Also, the vehicles subject to the Vehicle Emissions Inspection Program that have been included within the new boundaries of Area A are required to comply beginning from and after December 31, 1998.

Collectively, the air quality measures which apply specifically to Area A are: Traffic Synchronization; Plans to Stabilize Targeted Unpaved Roads, Alleys, and Stabilize Unpaved Shoulders on Targeted Arterials; Crack Seal Equipment; Alternative Fuel Vehicles Requirements for Local Governments and School Districts; Adjusted Work Hours; Clean Burning Fireplace Ordinances; Use of Petroleum Products for Road Maintenance; Winter Fuel Reformulation: California Phase 2 Reformulated Gasoline with 3.5 Percent Oxygen Content by Weight; Stage I and II Vapor Recovery; Voluntary Vehicle Repair and Retrofit Program; Vehicle Emissions Testing Program Requirements (including Catalyst Replacement Program and Vehicle Repair Grant Program); Tougher Enforcement of Vehicle Registration and Emissions Test Compliance; Remote Sensing, and Travel Reduction Program (A.R.S. 49-541 and Section 41 and 42 of S.B. 1427).

35. Voluntary No-Drive Days

- Arizona Legislature passed S.B. 1427 in 1998 which changes the Voluntary No Drive Days Program from a winter-time program to a year round program. Maricopa and Pima Counties are required to implement the program (A.R.S. 49-506).

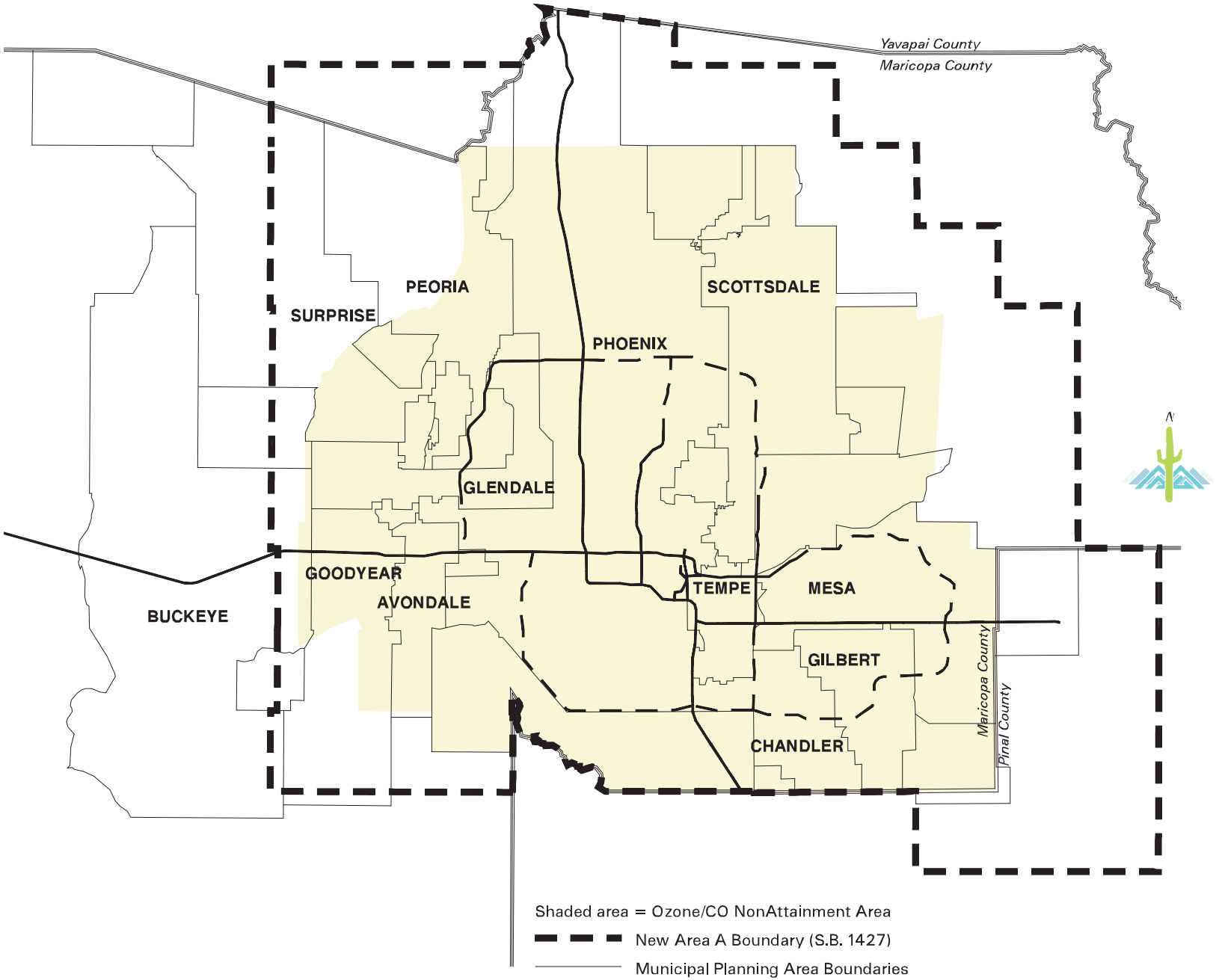
36. Analysis of Intersource Credit Trading and Banking Program

- Arizona Legislature passed S.B. 1427 in 1998 which appropriated $75,000 from the State General Fund to the Arizona Department of Environmental Quality for fiscal year 1998-1999 for the analysis of the environmental and economic feasibility of an intersource credit trading and banking program in Arizona for emission sources within the same nonattainment area, maintenance area, or modeling domain. In order to demonstrate environmental feasibility within a nonattainment area, maintenance area, or modeling domain, all emissions trading actions must result in overall reductions in total emissions within the same nonattainment area, maintenance area, or modeling domain. The general fund appropriation must be matched by an equal expenditure of monies from gifts, grants, or donations or the general fund monies revert to the State General Fund by the end of the fiscal year (Section 39 of S.B. 1427).

OZONE/CO NONATTAINMENT AREA & NEW AREA A BOUNDARIES

FIGURE 8-1

MARICOPA ASSOCIATION of GOVERNMENTS

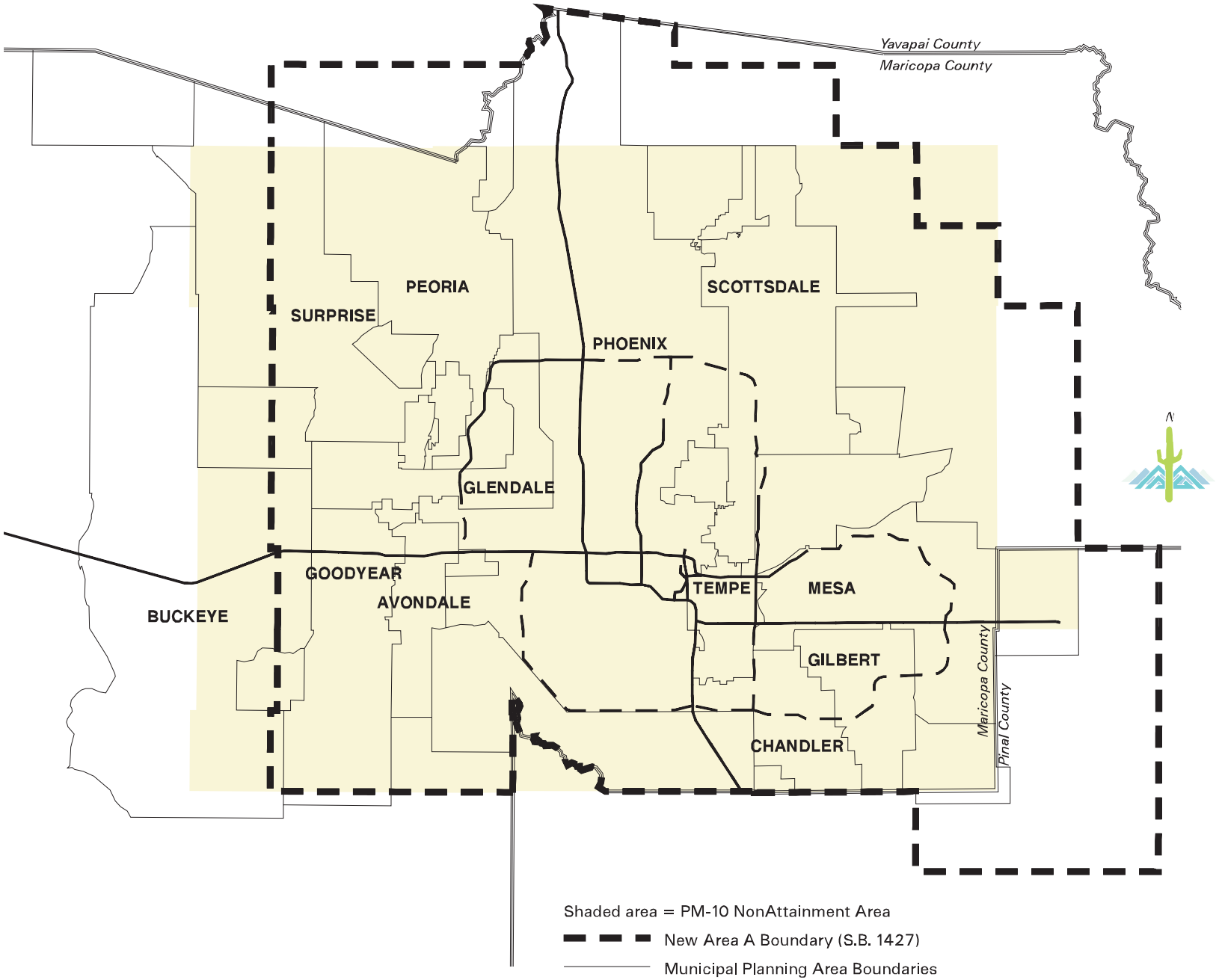


aq/areaaco May, 1998

PM-10 NONATTAINMENT AREA AND NEW AREA A BOUNDARIES

FIGURE 8-2

MARICOPA ASSOCIATION of GOVERNMENTS



aq/areaapm May, 1998

PART 2: EXISTING MEASURES WHICH ARE BEING STRENGTHENED

37. Remote Sensing

- Arizona Legislature passed S.B. 1427 in 1998 which removes the mandate for the deployment of a minimum of six remote sensing van units on the road by ADEQ in the operation of the remote sensing program. The program applies to Area A and is required to include data quality assurance and data quality evaluation.

  In addition, the legislation requires that when any vehicle manufactured after the 1996 Model Year and registered in Area A is identified as exceeding the emissions standards, a notification letter to the registered vehicle owner will be sent requiring an emissions test within thirty days. If the owner does not comply, the vehicle registration will be suspended. Once compliance is achieved, the vehicle owner may apply for reinstatement on payment of applicable fees (A.R.S. 49-542.01).

38. Expansion of Public Transportation Programs

- City of Avondale will continue to seek ways to improve public transportation through short range transit improvements. During FY 1997-1998 the City has expanded the Public Transportation System to provide service to three new communities. Potential service changes may include increasing the level of service, expanding service to areas currently without service, and attracting additional ridership through marketing and promotion. The City will continue to work with RPTA to install bike racks on all buses and to install bike racks at Park-and-Ride locations.

  If voters approve future sales tax earmarked for transportation these funds would be used for services such as expanded local bus service on weekends and holidays, incorporate Dial-a-Ride service, and new transit services such as limited-stop commuter service, neighborhood mini-bus service, and high capacity rapid transit. Implementation is in progress. Funding is allocated through the annual budget process.

- City of Chandler continues implementation of its program to improve bus stop facilities for passengers to include bus shelters and benches. Of 201 bus stops citywide, 81 stops currently have passenger amenities, i.e., shelters and benches. An additional 19 locations are planned for improvement in FY 1998.

  The City has also completed the implementation of 76,000 annual miles of bus service on route #156; 11,000 miles on route #72; added 35,000 miles

on route #136; and increased annual service to 44,000 miles on route #81. A new route, #108, will provide service to Chandler beginning August, 1997, adding an additional 6,100 miles.

In addition, the Mayor and Council have appointed a Task Force to develop a plan for additional transit in Chandler. The plan, adopted on April 27, 1997, calls for a grid bus system with 15 and 30 minute headways, expanded hours of service for bus and dial-a-ride and an expanded transit service area to cover the entire city. The plan also calls for planning for regional commuter/light rail at such time as it should expand to Chandler. A campaign committee from Chandler Chamber of Commerce is in the process of developing election strategies and will likely solicit Council to call for a half-cent sales tax election in 1998.

Improvements to the bus stop facilities will be completed in FY 1998. Increases in miles of service on bus routes is ongoing. If approved by the voters, the implementation of the transit plan is tentatively scheduled to be phased in over a five year period. Transit services are currently funded with approximately $650,000 annually. Two FTEs administer the program. If approved by the voters, half-cent sales tax generates approximately $8.7 million annually. An additional three FTE would be added over the first four years of the plan. Participation in the regional transit planning is allocated through the annual budget process.

- City of El Mirage will work in conjunction with the Regional Planning Transportation Authority (RPTA) to improve the public transit system. The City will continue to seek to expand and/or improve its dial-a-ride services, such as additional routes and providing transit service information to users. In progress. The City will work with the RPTA to expand and improve its bus service when it is deemed prudent. One of our Council members is a member of the RPTA Board of Directors. Funding for new or improved dial-a-ride service are determined in the City's annual budget development process.

- Town of Fountain Hills agrees to upgrade and expand on the existing transit service by implementing a van-shuttle/dial-a-ride program this year on a trial basis. The program begins on September 29, 1997, and is called the Fountain Hills Shuttle Service. This measure will be jointly implemented by the Town of Fountain Hills in collaboration with the Regional Public Transportation Authority ("RPTA"), Maricopa County, and the American Red Cross. Legal authority for this is provided under ARS Section 9-240-"General Powers of Council".

  Regarding implementation this service begins on September 29, 1997, and offers the Town of Fountain Hills' residents the opportunity now to connect

with the 106 and 94 bus routes at Mayo Clinic (Shea Blvd.) With five departure times from each location. This service is free. The Town of Fountain Hills has included $27,000 in the Town budget to cover payment for the Red Cross personnel used to drive the vans. This measure does not represent an ordinance, regulation, or rule requiring enforcement.

- Town of Gilbert began providing public transit and dial-a-ride service during 1996. A local bus route in Mesa was extended through Gilbert, providing connections with several regional bus routes. This route provides 370 daily miles of service in Gilbert, amounting to 94,350 service miles annually, and is operated Monday through Friday, from approximately 5 a.m. until 7 p.m.

  An express bus route was extended into downtown Gilbert, providing service for commuters to downtown Phoenix. The Gilbert portion of this route accounts for 30 daily and 7,650 annual service miles, and is operated Monday through Friday from approximately 5 a.m. until 6:30 p.m.

  In addition, the Town of Gilbert began providing town-wide dial-a-ride service by joining the Mesa/Chandler Dial-a-Ride (now the Mesa/Chandler/Gilbert Dial-a-Ride). This service is also provided Monday through Friday from about 4 a.m. until 7 p.m.

  The Gilbert Town Council approved funding in May 1996. The Town of Gilbert began providing express bus service in August 1996. The Town of Gilbert began providing dial-a-ride service in September 1996. The Town of Gilbert began providing local bus service in March 1997. Participation in regional and local transit planning is allocated through the annual budget process. The Gilbert Town Council dedicated $300,000 for the above described public transit measures during FY 1996-97.

- City of Glendale will work in conjunction with the Regional Planning Transportation Authority (RPTA) to improve the public transit system. The City will continue to seek to expand and/or improve its bus and dial-a-ride services, such as additional routes, providing transit service information to users and placing bicycle racks on transit buses. In progress. The City will work with the RPTA to expand and improve its bus service when it is deemed prudent. Glendale's Mayor is a member of the RPTA Board of Directors. Funding for new or improved bus and dial-a-ride service are determined in the City's annual budget development process.

- City of Goodyear will work in conjunction with the Regional Planning Transportation Authority (RPTA) and neighboring cities to improve the public transit system. The City will seek to initiate a bus route and investigate the addition of a Dial-a-Ride service. In progress. The City will work with the

RPTA to add a bus route when it is deemed prudent. Funding for a new bus service and a dial-a-ride program will be determined in the City's annual budget development process.

- City of Mesa is participating in cooperative effort with the Federal Transit Administration (FTA), the Maricopa Association of Governments (MAG), the Regional Public Transit Authority (RPTA), and the cities of Tempe, Scottsdale, Phoenix, and Glendale to conduct feasibility studies to evaluate the need and general location for high capacity transit corridors throughout the metropolitan area. This effort will also include a series of Major Investment Studies which focus on subregions within the metropolitan area. Studies are also planned to evaluate the feasibility of high-capacity transit options such as light rail, busways, and commuter rail.
  These studies are part of a continuing effort to evaluate transportation options. Related studies include the Arizona Passenger Rail Feasibility Continuation Study (1994), Downtown Phoenix Rail Trolley Feasibility Study (1995), Commuter Rail Demonstration Project Feasibility Study (1995), and Major Investment Studies for the Squaw Peak and Superstition Corridors - Phase I.

  Bus service in Mesa will continue to expand; one express route has been added during the last year and during 1998, it is anticipated that Saturday service will be added to some sections of the system. The City will continue to explore additional funding sources to further expand the bus system. Evaluation of the feasibility of transit options is ongoing. Participation in regional transit planning is allocated through the annual budget process.

- City of Peoria indicates that the City's existing Dial-a-Ride program was not approved for expansion FY 1997-1998. Uncertainties of future Federal, State, County, and local support can make service expansions financially difficult. Currently in operation. The current program funding is $613,220.

- City of Phoenix will continue to seek ways to improve public transportation through short range transit improvements. Potential service changes may include increasing the level of service, expanding service to areas currently without service, and attracting additional ridership through marketing and promotion. The City will continue to work with RPTA to install bike racks on all buses and to install bike racks at Park-and-Ride locations.

  In April 1997, the City Council approved recommendations of the Ad Hoc Transit Steering Committee to include a proposition on the September general election ballot asking voters to approve a half-cent sales tax which would be used to support expansion of public transportation in the City of Phoenix. This measure commits to the election, which will seek voter

approval of funding to support services. If voters approve the tax, the funds may be used for services such as expanded local bus service hours, increased frequency of service on current high-demand routes, expanded service on weekends and holidays, expanded Dial-a-Ride service days and hours, and new transit services such as limited-stop commuter service, neighborhood mini-bus service, and high capacity rapid transit.

The City Council action to approve the item for the ballot was completed on April 29, 1997.
The City general election is scheduled for September 9, 1997.
The schedule for expanded transit and transportation service is contingent upon the results of the election.
Funding is allocated through the annual budget process. Additional funding will be available if voters approve the half-cent sales tax.

- City of Scottsdale has extended Route 72 (Scottsdale Road) from Tempe north to Fashion Square during evenings and weekends, and has extended the former Scottsdale Connection Route 81 (Hayden Road) south to Ray Road in Chandler (Route 82) through an agreement with the RPTA.

  The City of Scottsdale completed construction and opened the Loloma Transit Station, Scottsdale's downtown transit center in May 1997 to facilitate transferring between four major routes.

  Two transit routes are scheduled for expansion in the next two years Route 94 will be expanded to provide transportation to "Scottsdale Town Center", a major shopping mall at the S.E. corner of Pima and Frank Lloyd Wright Blvd. Route 76 will provide transit service counter clockwise to this route.

  The City will continue to seek ways to improve public transportation through short range transit improvements. Potential service changes may include increasing the level of service, expanding service to areas currently without service, and attracting additional ridership through marketing and promotion.

  See attachments for details of the Transit Plan Guidelines which are part of the Circulation Element of the General Plan. The schedule for expanded transit and transportation service is contingent upon the results of the election. Funding is allocated through the biennial budget process. Additional funding will be available if voters approve the half-cent sales tax.

- City of Tempe indicates that this measure focuses on expanding and enhancing existing public transit services. With the passage of the transit funding election. Tempe has expanded hours and days and improved the frequency on existing public transit routes. In the next four years, the City will continue to make improvements including the implementation of new

routes, improved frequency, and expanded hours. Implementation is in progress over the next four years. Funding is provided through the dedicated sales tax for transit.

- City of Tolleson Mayor and Council will adopt a resolution addressing the extension of public transportation programs in Tolleson contingent upon the City of Tolleson and the City of Phoenix entering into an Intergovernmental Agreement of the purpose of extending Bus Route 560 - from 67th Avenue and Van Buren to 91st Avenue and Van Buren. Three miles of bus service will be added to include Tolleson corporate limits. Mayor and Council will adopt this resolution. The City of Tolleson will commit General Fund and Lottery Fund monies upon extension of proposed Bus Route 560. Tolleson's estimated yearly share is approximately $20,000. Cost of $200 will be incurred for publication of said resolution.

- Arizona Department of Transportation indicates that, as mandated by Arizona Revised Statutes (A.R.S.) 28-2611, ADOT will explore public transportation alternatives which could improve air quality and meet regional transportation needs in the metropolitan Phoenix area.

  Previous ADOT implementation commitments for the MAG 1993 Carbon Monoxide Plan included facilitating the increased use of transit and ridesharing and support of the Capitol Rideshare Program in coordination with MAG/RPTA efforts. In support of these measures ADOT has participated in the Capitol Rideshare Program which includes the State's Travel Reduction Survey and Plans.

  ADOT is one of six sponsors of the Clean Air Force which includes the voluntary "Don't Drive One in Five" campaign. The Regional Public Transportation Authority conducts the Clean Air Force program. Each state agency has appointed a year-round travel reduction coordinator. ADOT has one employee who administers the Travel Reduction Survey and monitors the rideshare programs.

  ADOT staff initiates and serves as project managers for non-construction air quality Intergovernmental Agreements for Travel Reduction Programs. The programs, projects, and funding are identified each year as part of the MPO Overall Work Programs.

  ADOT participated as part of the technical committee for the recently completed Rural Maricopa County Transit Development Plan. This study was initiated by the Maricopa County Department of Transportation in response to a variety of issues regarding transportation in the County. Phase I of the Maricopa County Rural Transportation Development Program identified several alternatives for the provision of general public transit in

rural portions of the study area. It was determined that implementing public transit service along the Gila Bend corridor would be the first priority and this is the focus of Phase II of the study. If general public service can be successfully implemented in the Gila Bend/Buckeye area with regional service to Phoenix, this program can be expanded to other corridors and areas. The Wickenburg corridor was identified as a potential second priority. Federal rural transit funding would be applied for through ADOT for this service.

- Regional Public Transportation Authority indicates that this measure involves improving public transportation by restructuring existing service or as additional funding may become available through the Regional Public Transportation Authority or its member jurisdictions budget processes. Short range transit improvements could include increasing the level of service, expanding service to areas currently without service and attracting additional ridership through marketing and promotion.

  In September of 1996 the citizens of the City of Tempe approved a measure to provide a one-half of one percent sales tax increase for public transit. Tempe has already impacted the public transportation system by offering transit service in the City and specific destinations in bordering communities from approximately 5 a.m. to 10 p.m. Monday thru Saturday, and provides the regions only fixed route transit service operating on Sundays. Additionally, Tempe introduced the FLASHlite route, a local circulator which operates weekend service between downtown Tempe and the Phoenix Zoo.

  In an effort to improve regional fixed route transit service, the RPTA and its member jurisdictions evaluate all regional routes on the basis of productivity and efficiency. As a result, non peak hour trips from RPTA funded routes 44, 72, 106, 520, and 570 were scaled back. The financial and capital resources that became available by these changes were used to add peak hour trips to the Red Line, extend route 90 to 67th Avenue, and combine routes 81 and 82 into a single regional route. Total revenue miles of transit service for the region, including fixed route and dial-a-ride service is estimated to exceed 19 million miles in fiscal year 1997-1998.

  Other service expansion improvements include the implementation of three new routes including the Northwest Valley Grand, 184 and 533. Transit service that was recently expanded exclusive of City of Tempe improvements include routes 136 and 531, additionally, the Mesa/Chandler Dial-a-Ride was expanded to include the Town of Gilbert.

  Should additional funding become available, the Regional Public Transportation Authority and the City of Phoenix Public Transit Department

would be responsible for implementation. A.R.S. Section 9-240 (Attachment A) “General Powers of Common Council”.

Ongoing. The RPTA will work with its member jurisdictions to expand and/or improve its bus service on an as needed basis.

The level of personnel committed to transit operations in FY 1997-1998 is equivalent to 5.5 FTE. The RPTA is responsible for transit planning and program implementation. The projected RPTA operating budget for FY 1997-1998 is estimated at $17.9 million. Sources of operating revenue include federal and state grants, RPTA sales tax, farebox revenues, and other income sources including interest.

39. Employer Rideshare Program Incentives

- City of Avondale has developed a comprehensive Trip Reduction Plan (TRP) in compliance with the Maricopa County Travel Reduction Program. A Transportation Coordinator has been designated for the City. Currently the City’s TRP plan includes 70 percent to 90 percent bus subsidies, regional carpool, guaranteed emergency ride home service, new employee information, preferential parking locations, flexible work hours where feasible, and employee communication programs through posters, challenges, awards, and employee news letters. Components of the Trip Reduction Plan will be modified as needed. Implementation is in progress. Funding is allocated through the annual budget process.

- City of Chandler has implemented a variety of rideshare incentives to increase employee participation in carpooling, including providing cash awards on a monthly basis and emergency rides for carpools participants. The City maintains an employee data base to match employees who desire to rideshare. The City has also increased the amount of preferential parking spaces for carpools, including covered parking. An annual trip reduction plan is submitted within 30 days of county approval of the annual plan submitted after each year’s compliance survey. Funding is allocated through the annual budget process.

- Town of Gilbert has developed a Trip Reduction Plan (TRP) in compliance with the Maricopa County Travel Reduction Program. A Rideshare Coordinator has been designated for the Town. Currently, the Town’s TRP includes alternate work schedules, bike racks and storage areas, reserved/preferential parking, subsidized gas/commute expense, guaranteed/emergency ride home, telecommuting options, employee communication programs through bulletin boards, TRP information for new hires, and employee newsletters. The TRP will be modified as needed.

Implementation is in progress. Funding is allocated through the annual budget process.

- City of Glendale is a participant in the Maricopa County Travel Reduction Program as mandated by state law (A.R.S. Section 49-588). The City is required to submit a new plan to the County on an annual basis. The City's program currently consists of preferential parking spaces for carpool participants, subsidized bus passes to employees, gift/drawings, and encouragement of flexible work schedules. The City will seek ways in which to attain a higher level of employee participation and make modifications to its employee ridesharing program as needed. An employee committee was established in 1996 to evaluate the current employer rideshare program. The committee is in the process of identifying ways to improve participation in the program and will present those options to City Management, as appropriate. The City has a Transportation Coordinator who is responsible for implementing the City's Employee Travel Reduction Program. Funding will be determined through the City's annual budget development process.

- City of Goodyear is intent on initiating a program that would consist of preferential parking spaces for carpools participants, gift/drawing for participants, and encourage flexible work schedules. When a bus route is established, subsidized bus passes to employees may be available. The City will seek ways in which to attain a higher level of employee participation and to promote the rideshare programs. The City will establish a employee committee to initiate a employee rideshare program. The committee will identify ways to promote participation in the program and will present options to the City Manager's Office, as appropriate. The City's rideshare committee will be responsible for promoting, designing, and implementing the City's employee rideshare program. Funding will be determined through the City's annual budget process.

- City of Mesa has developed a comprehensive Trip Reduction Plan in compliance with the Maricopa County Travel Reduction Program. A Rideshare Coordinator has been designated to coordinate carpool activities and employee education and incentive programs. A "Clean Air Club" has been organized that has developed a reward system for employees who take alternate modes of transportation to work. Since 1996 the City has provided 100 percent bus subsidies for any employee who rides the bus. The City Rideshare Coordinator uses electronic mail, employee newsletters, and notices in pay stubs to notify employees of air quality advisories and to promote rideshare and alternate transportation activities. Implementation will be ongoing. Funding is allocated through the annual budget process.

- Town of Paradise Valley participates in the Maricopa County Trip Reduction Program. Part of this program provides for employees to be compensated $1.33 a day for ride sharing. This incentive is offered to all employees of the Town and is paid for all alternative modes of transportation. There are also special incentives such as a monthly award drawings for people who use alternative modes of transportation. This program has been implemented by the Trip Reduction Coordinator. This measure is currently in place.

  Development and administration of the Trip Reduction Program Reduction Plan requires staff time equivalent to 0.20. A full-time exempt employee volunteers their services on off-hours, at a cost of zero. The annual budget for this measure is from the Town's General Fund.

- The City of Peoria indicates that Peoria plans to make available several incentives in FY 1997-1998 to encourage City employees to rideshare and/or reduce their single occupancy vehicle trips to work. A major component of the incentive program is a public awareness campaign. In the fall, a transit fair will be held to educate employees about the various modes of transportation available to them. The transit fair will feature free food, prizes, and RPTA and other rideshare related booths.

  The Transit Division will also promote the ridesharing program at the annual employee benefits fair in May of 1998.

  The City of Peoria will provide the following incentives to employees who rideshare: 100 percent bus subsidy; preferential parking (covered at City Hall, Police Department, Court, and Library); Free Bicycle Program to employees who commit to commuting via bicycle; Guaranteed Ride Home Program for employees required to miss their rideshare home; additional bus shelters (10 new shelters added in FY 1996-1997 alone); and monthly drawings for prizes to employees who rideshare.

  Staff in the Transit Division will be responsible for promoting this program. The Transit Division will earmark a total of $10,000 in FY 1997-1998 towards rideshare incentives.

- City of Phoenix has developed a comprehensive Trip Reduction Plan (TRP) in compliance with the Maricopa County Travel Reduction Program. A Rideshare Coordinator has been designated for the City and for each City department. Currently the City's TRP plan includes 50 percent to 100 percent bus subsidies, employee emergency ride home service, new employee information, preferential parking locations and reduced parking fees for carpools and vanpools, telecommuting options, flexible work hours where feasible, and employee communication programs through posters,

challenges, and employee newsletters. Components of the Trip Reduction Plan will be modified as needed.

The City will continue to implement a pilot program developed in 1996 to use electronic mail to notify employees of air quality advisories. Clean Air Tips are included in the electronic mail notifications. Implementation is in progress. Funding is allocated through the annual budget process.

- City of Scottsdale May 9, 1997 year 7 Trip Reduction Plans for the City's two primary campuses (Via Linda Campus and Civic Center Campus) comply with the Maricopa County Travel Reduction Program. A Transit Coordinator has been designated for the City to implement and maintain the program.

  Clean Air and Bike to Work Challenges are offered each year. Various awards/incentives are given to participating employees. Employees are recognized for these rideshare efforts in the employee newsletter "Inside Scottsdale This Week".

  The City of Scottsdale initiated the B.I.K.E.S. Program in 1997. It offers City employees a free bicycle in exchange for a commitment to ride the bike to work a certain number of times monthly for at least six months.

  Various rideshare incentives include: 100 percent bus subsidies; Preferential parking for carpools and vanpools; Carpool and vanpool matching service database; Guaranteed emergency ride home service; Telecommuting options; Flexible work hours where feasible.

  Electronic mail is used to notify employees of air quality advisories. Clean Air Tips are included in the electronic mail notifications.

  Information about rideshare incentives are distributed to all new employees at orientation. Informational reminders are distributed through employee newsletters and posters. Components of the Trip Reduction Program will be modified as needed. Implementation is in progress. Funding is allocated through the biennial budget process. A full-time Transit Coordinator staffs this program.

- City of Tempe indicates that this measure provides a variety of employer rideshare incentives as well as introducing strategies designed to reduce single occupant vehicle trips. The City has developed a comprehensive Travel Reduction Plan in compliance with the Maricopa County Travel Reduction Program. The City has a designated Rideshare Coordinator. The City's plan includes: weekly cash drawings for use of alternative modes and alternative work schedules; preferential parking for carpools; public awareness campaigns; alternative work hours, bike loan program, 100

percent subsidized bus fares, new employee information and guaranteed emergency ride home service. The City is creating and testing telecommuting as an option for applicable employees. Implementation is in progress. Funding is provided through the annual budget process.

- City of Tolleson indicates that this measure includes the adoption of a Resolution addressing rideshare programs and other incentive related programs for those employers with less than 50 employees at a worksite. Additionally, the City will embark on a public awareness campaign to further enhance the carpool and vanpool concept. Adoption of City of Tolleson Resolution by July 15, 1998 and commencement of campaign thereafter. Administration of plan will be coordinated by City Administrative and Planning Staff. Estimated cost for publication of Resolution and printing of brochures is $2,000.

- Maricopa County indicates that this measure provides a variety of employer rideshare incentives as well as introducing strategies designed to reduce single occupant vehicle trips. Maricopa County is providing a 100 percent Bus Card Plus Program subsidy for employees.

  Pursuant to A.R.S. Section 11-251 (General Powers of Board of Supervisors), A.R.S. Section 49-588 and A.R.S. Section 49-474.01 the Board adopted Maricopa County Ordinance P-8 Reduction of Commuter Use of Motor Vehicles by County Employees in 1992. The ordinance provides the County Administrative Officer with the authority to approve and implement non-financial measures and to implement budgeted measures to reduce employee commute trips or the number of miles driven by county employees to and from work.

  Maricopa County increased its subsidy of the Bus Card Plus Program for employees from 50 to 100 percent, effective June 26, 1996. On May 28, 1997, the subsidy was reauthorized for Fiscal Year 1998. Funding for the subsidy is estimated to cost approximately $280,000 which will be absorbed by Maricopa County Departmental budgets. The program is administered by the Human Resources Department.

- Arizona Department of Transportation indicates that this measure provides a variety of strategies/incentives designed to reduce single occupant vehicle trips. Such strategies/incentives could include: preferential parking for carpools and vanpools, public awareness campaigns, Transportation Management Associations among employers, alternative work hours, vanpools for County and State employees, and vanpool purchase incentives. This will be an ongoing effort.

The 1993 Moderate Area Plan Commitments made by ADOT were to facilitate increased use of transit and ridesharing and to support the Capitol Rideshare Program in coordination with MAG/RPTA efforts. No additional funding or employees are required to implement the above programs. Associated costs are covered by the ADOT administrative budget.

To ensure that all employees are provided an opportunity to participate in rideshare programs, ADOT, through the Transportation Planning Group, will develop reporting procedures to identify participation levels in current programs and to identify possible opportunities for increased participation.

ADOT will continue to develop strategies and provide incentives to employees to increase the participation in existing and future rideshare programs. ADOT, through the Transportation Planning Group Air Quality Planner, will conduct a study to evaluate the effectiveness of existing strategies and incentives. This will provide possible opportunities for increased participation through elimination of existing barriers and also provide reasoned justification for those work areas that are not able to participate in the programs.

As baselines for the effectiveness of existing strategies and incentives are developed and reasoned justifications for non-participation are evaluated, opportunities for improvement will be identified to provide for enhanced or additional rideshare strategies/incentives. For the purposes of describing the Commitment the number of strategies and types of incentives would be the reporting unit.

- Regional Public Transportation Authority indicates that this measure involves expanding the Regional Ridesharing Program to increase awareness of participation in alternate modes and work schedules. Efforts will be targeted at 1,250 employers with over 580,000 employees and students affected by the Maricopa County Trip Reduction Program (MCRTP) and the general public through the Regional Ridesharing Program. Since the last commitment, an additional 450 employers have been added to the TRP program. RPTA employee incentives include: free bus pass, alternate work hours, telecommuting, alternate mode subsidy, and guaranteed ride home. The single occupant vehicle rate for RPTA employees has dropped from 42 percent to 36 percent since 1994.

  The Regional Public Transportation Authority, as the regional transit agency for Maricopa County (A.R.S. 48-5101) provides these services to improve mobility and air quality.

  The schedule for planned activities are as follows:

- Carpool, vanpool and bicycle matching services offered daily by phone and interactively on the internet home page
- Turn-key vanpool program available on an ongoing basis
- Fourteen Transportation Management Associations hold periodic meetings
- Area-wide awareness and promotion campaign with paid advertising conducted
- RPTA employee rideshare incentives ongoing
- Employer Transportation Fairs based on employer request
- RPTA's Internet web site offers information on the following rideshare topics: carpooling programs; Commuter Club promotions; Vanpooling programs; Training sessions available.

Portions of up to fourteen professional staff (10 RPTA and 4 contract staff) will spend part of their time providing this information to the public and employers through the above specified activities. This measure is funded by a portion of the total budget for the Regional Ridesharing Program, TRP (RPTA) and CAC programs which is $1,248,000. Of this total, $394,000 is budgeted for the Rideshare Program through ISTEA funding.

40. Preferential Parking for Carpools and Vanpools

- City of Avondale has developed a comprehensive Trip Reduction Plan (TRP) in compliance with the Maricopa County Travel Reduction Program. A Transportation Coordinator has been designated for the City. Currently the City's TRP plan includes 70 percent to 90 percent bus subsidies, regional carpool, guaranteed emergency ride home service, new employee information, preferential parking locations, flexible work hours where feasible, and employee communication programs through posters, challenges, awards, and employee newsletters. Components of the Trip Reduction Plan will be modified as needed. Funding is allocated though the annual budget process. Implementation is in progress.

- City of Chandler increased the number of preferential permitted parking spaces for carpoolers including free/covered spaces adjacent to work locations. An annual trip reduction plan is submitted within 30 days of county approval of the annual plan submitted after each year's compliance survey. Funding is allocated through the annual budget process.

- Town of Gilbert has developed a Trip Reduction Plan (TRP) in compliance with the Maricopa County Travel Reduction Program. A Rideshare Coordinator has been designated for the Town. Currently, the Town's TRP includes alternate work schedules, bike racks and storage areas, reserved/preferential parking, subsidized gas/commute expense,

guaranteed/emergency ride home, telecommuting options, and employee communication programs through bulletin boards, TRP information for new hires, and employee newsletters. The TRP will be modified as needed. Implementation is in progress. Funding is allocated through the annual budget process.

- City of Glendale indicates that preferential parking spaces for employees that carpool have been established at major City facilities. Additional preferential parking spaces will be established in existing and new facilities, where appropriate. An employee committee was established in 1996 to evaluate the current employer rideshare program. The committee is in the process of identifying ways to improve participation in the program and will present those options to City Management, as appropriate. The City's Transportation Coordinator is coordinating the City's efforts. Funding to implement this measure is determined in the City's annual budget development process.

- City of Goodyear indicates that preferential parking spaces for employees that carpool have not yet been established at major City facilities. Additional preferential parking spaces will be established in existing and new facilities, where appropriate. The City will establish an employee committee to evaluate the possibilities of a preferred parking program. The committee will identify ways to improve participation in the program and will present those options to the City Manager's Office, as appropriate. The City's employee committee is coordinating the City's efforts. The City's employee committee will be responsible for promoting, designing, and implementing the City's employee carpools program. Funding will be determined through the City's annual budget process.

- City of Mesa has developed a comprehensive Trip Reduction Plan in compliance with the Maricopa County Travel Reduction Program. A Rideshare Coordinator has been designated to coordinate carpool activities and employee education and incentive programs. A "Clean Air Club" has been organized that has developed a reward system for employees who take alternate modes of transportation to work. Since 1996, the City has provided 100 percent bus subsidies for any employee who rides the bus.

  The City Rideshare Coordinator uses electronic mail, employee newsletters, and notices in pay stubs to notify employees of air quality advisories and to promote rideshare and alternate transportation activities. Implementation will be ongoing. Funding is allocated through the annual budget process.

- Town of Paradise Valley will provide a special parking space for car-poolers. The space will be closer to the building. This program will be implemented by the Trip Reduction Coordinator. This measure will be included in the

annual Trip Reduction Program to be revised and submitted to the Maricopa County Trip Reduction Agency in November of 1997. Development and administration of the Trip Reduction Program Reduction Plan requires staff time equivalent to 0.20. A full-time exempt employee volunteers their services on off-hours, at a cost of zero. The annual budget for this measure is from the Town's General Fund.

- City of Peoria has made available covered, preferential parking spaces at City Hall, Peoria Municipal Court, Peoria Library, and the Peoria Police Department at no charge for employees who carpool. The City of Peoria has also made available uncovered preferred parking spaces at the Municipal Operations Center and Peoria Community Center.

  While the City of Peoria will continue to implement and enforce this measure for its own employees, this measure is not reasonably available throughout the community. As a suburban area, Peoria has only a few city-operated public parking facilities (downtown Peoria, Peoria Municipal Complex, Peoria Community Center, and parks). In the downtown, the city-operated parking is very limited and located on the street adjacent to the independent retail shops. As part of the City's revitalization efforts to improve the downtown business district, the businesses have opposed eliminating the street parking in favor of parking lots. It should also be noted that the employers located in the downtown area employ less than fifty (50) employees and are not subject to the mandatory Maricopa County travel Reduction Program.

  The City of Peoria plans to continue offering preferential parking for employees who rideshare. Costs include maintaining painted stalls and the issuance of carpool permits. The cost of implementing this measure is minimal and will be absorbed by the Facilities Division of the Public Works Department.

- City of Phoenix has developed a comprehensive Trip Reduction Plan (TRP) in compliance with the Maricopa County Travel Reduction Program. A Rideshare Coordinator has been designated for the City and for each City department. Currently the City's TRP plan includes 50 percent to 100 percent bus subsidies, employee parking fees in the downtown area, regional carpool and vanpool matching service, guaranteed emergency ride home service, new employee information, preferential parking locations and reduced parking fees for carpools and vanpools, telecommuting options, flexible work hours where feasible, and employee communication programs through posters, challenges, and employee news letters. Components of the Trip reduction Plan will be modified as needed.

  The City will continue to implement a pilot program developed in 1996 to use electronic mail to notify employees of air quality advisories. Clean Air Tips

are included in the electronic mail notifications. Implementation is in progress. Funding is allocated through the annual budget process.

- City of Scottsdale May 9, 1997 year 7 Trip Reduction Plans for the City's two primary campuses (Via Linda Campus and Civic Center Campus) comply with the Maricopa County Travel Reduction Program. A Transit Coordinator has been designated for the City to implement and maintain the program.

  Employees who carpool and/or vanpool are given preferential parking at both campuses. In addition, there is a matching service database for those who wish to carpool or vanpool. City vehicles are available for work related travel. A guaranteed emergency ride home program is available to all employees. All employees are eligible to receive free bus passes.

  Information about carpool and vanpool options are distributed to all new employees at orientation. Informational reminders are distributed through employee newsletters. The City of Scottsdale is also active in the Greater Scottsdale Transportation Management Association, a public/private partnership which encourages rideshare activities. Implementation is in progress. Funding is allocated through the biennial budget process.

- City of Tempe indicates that this measure provides a variety of employer rideshare incentives as well as introducing strategies designed to reduce single occupant vehicle trips. The City has developed a comprehensive Travel Reduction Plan in compliance with the Maricopa County Travel Reduction Program. The City has a designated Rideshare Coordinator. The City's plan includes: weekly cash drawings for use of alternative modes and alternative work schedules; preferential parking for carpools; public awareness campaigns; alternative work hours, bike loan program, 100 percent subsidized bus fares, new employee information and guaranteed emergency ride home service. The City is creating and testing telecommuting as an option for applicable employees. Implementation is in progress. Funding is provided through the annual budget process.

- City of Tolleson indicates that this measure involves the Adoption of a Resolution addressing rideshare program and other incentive related programs for those employers with less than 50 employees at a worksite. As mentioned under the employer rideshare program, the City of Tolleson will embark on a public awareness campaign to further enhance the carpool and vanpool concept. Adoption of City of Tolleson Resolution and Commencement of Campaign by July 15, 1998. Administration of plan will be coordinated by City Administrative and Planning Staff. Estimated cost for publication of Resolution and printing of publicity brochures is estimated at $2,000.

- Maricopa County indicates that this measure encourages public and private employers to provide preferential parking spaces for carpools and vanpools to decrease this number of single occupant automobile work trips. Pursuant to A.R.S. Section 11-251 (General Powers of Board of Supervisors), A.R.S. 49-588 and A.R.S. Section 49-474.01 the Board adopted Maricopa County Ordinance P-8 Reduction of Commuter Use of Motor Vehicles by County Employees in 1992. The ordinance provides the County Administrative Officer with the authority to approve and implement non-financial measures and to implement budgeted measures to reduce employee commute trips or the number of miles driven by county employees to and from work.

  Maricopa County has relocated carpool preferential parking spaces closer to the building entrance. Moreover, the new parking plan also provides for open parking in place of reserved parking. This policy reduces the motivation for non-carpoolers to park in carpool spaces. The new parking plan was implemented for the Jefferson parking garage in April 1997. This is an ongoing program administered by the Protective Services Office covered by the existing budget.

- Arizona Department of Transportation indicates that this measure encourages public and private employers to provide preferential parking spaces for carpools and vanpools to provide an incentive to decrease the number of single occupant automobile work trips. The preferential treatment could include covered parking spaces or close-in spaces. This will be an ongoing effort and additional spaces will be provided on an as needed basis.

  ADOT provides preferential, close-in parking for employee carpools and vanpools, both covered and uncovered. The preferential parking program is governed by the Manager of the General Operations Group with input from the Executive Quality Council. Location and signing or reserved spaces remains with the Manager, General Operations Group. Parking lots will be managed and will reflect the number of rideshare, handicap, and customer parking spaces according to the changing needs of the Department.

  Carpool vehicles are certified by the Capitol Rideshare Administration. Carpool parking holds preferential location parking and is open to carpool certified employees on a first-come-first-served basis.

  Currently in the ADOT Headquarters Area, there are approximately 1800 parking spaces. In 1993, ADOT changed its parking policy to provide additional spaces for the Rideshare program on an as needed basis. Available spaces for Rideshare vehicles have been increased from 134 in 1993 to 354 in 1997. This includes spaces provided at other ADOT locations in the nonattainment area.

As preferential parking spaces for 30 year employees become available through employee retirement, they will be used for the Rideshare Program. No additional funding or employees are required to implement the parking programs. Associated costs are covered by the ADOT administrative budget.

Providing preferential parking spaces does not ensure participation. ADOT, through the Transportation Planning Group Air Quality Planner, will conduct a study to determine the effectiveness of the Program for air quality purposes. This study will provide information as to the number of actual participants in the program, i.e., the number of occupants per vehicle. This number becomes significant as the criteria is being developed for the use of HOV lanes for future freeways. The study should also provide information to forecast future preferential parking space requirements.

For describing the Commitment the number of preferential spaces for carpools and vanpools will be the reporting unit. This information will be provided to the Maricopa County Environmental Services Division for the required annual report for the Environmental Protection Agency.

- Regional Public Transportation Authority indicates that a special RPTA employer workshop focuses on parking management and demonstrates methods by which employers can develop preferential parking systems. This is targeted primarily at employers with sites affected by the Maricopa County Trip Reduction Program. Approximately 1250 employers are planning to implement strategies with goals to reduce vehicle commuting trips.

  Because of the difficulty in achieving the annual trip reduction target, many employers are looking to more enhanced methods of reducing vehicle trips. Mandatory fees for parking is one of the strongest incentives to rideshare (or disincentives to driving alone). Many employers are subsidizing alternative mode usage in their current parking management programs and Commuter Club and more are implementing fee based parking. Employees of the RPTA currently pay market rates for parking of $30 to $50 per month. RPTA participates as a voluntary TRP organization.

  The Regional Public Transportation Authority, through a contract with the Maricopa County, and according to the Omnibus Air Quality Legislation provided under A.R.S. 49-581 through 49-593 (Attachment B), provides these services.

  Collateral materials and “how to” manuals on various aspects of parking management are available throughout the year. Employer trainings on parking management given about every quarter.

41. Coordinate Traffic Signal Systems

- Arizona Legislature passed H.B. 2237 in 1997 which contains an appropriation of $500,000 in each of fiscal years 1997-1998 and 1998-1999 from the State General Fund to the Arizona Department of Transportation for distribution to cities and counties for synchronization of traffic control signals within and across jurisdictional boundaries (Section 23 of H.B. 2237).

- City of Chandler is currently coordinating traffic signal timings with the Cities of Tempe and Mesa. The City provides for progression of traffic along all north-south arterial streets crossing city boundaries from 56th Street to Alma School Road during peak travel periods. Signals are also timed for progression of traffic along Arizona Avenue, McQueen Road, and all east-west streets from Elliot Road to Chandler Boulevard within the City of Chandler. Reliability of signal coordination will be substantially improved by installation of intertie cabling along Ray Road from 56th Street to Dobson Road and along Alma School Road from Frye Road to Ocotillo Road. Installation of intertie cabling along all other arterials streets in the City of Chandler is programmed for completion by FY 2000.

  In addition, Chandler's City Code requires installation of conduit for cabling to interconnect signals on all newly-constructed arterial streets. Implementation will be ongoing. Installation of intertie cabling along Ray Road from 56th Street to Dobson Road will be completed in June 1997 and along Alma School Road from Frye Road to Ocotillo Road by July 1997. Installation of intertie cabling along all other arterials streets in the City of Chandler is programmed for completion by FY 2000. One new position, traffic signal systems engineer, has been added in FY 1998 to monitor the operation of arterial streets and to optimize signal timing for minimum delays and progression efficiency. Funding is allocated through the annual budget process.

- Town of Gilbert is purchasing equipment capable of time-based coordination. The Town is also completing a signal system feasibility study to recommend a centralized control system. Implementation is in progress. By August the following corridors should have peak hour progression established: Val Vista Drive (Elliot Road to Baseline Road), Cooper Road (Warner Road to Baseline Road), McQueen Road (Elliot Road to Baseline Road). Other corridors will follow as equipment is acquired and updated. Funding is allocated through the annual budget process.

- City of Glendale currently has a coordinated time-based traffic signal system. The City will install signal interconnect conduit and fiber optic cable that will serve as the communications link to improve the City's existing traffic signal

system. These improvements will help enable the City to develop intelligent transportation systems in the future.

The project is anticipated to occur in three phases. The initial installation of the conduit system will occur at 59th Avenue, between Camelback Road and Glendale Avenue (it will be part of the 59th Avenue street improvement project which began in March 1997). The second phase will be on 59th Avenue, from Glendale Avenue to Bell Road. The third phase of the conduit installation will be on 59th Avenue from Bell Road to the Loop 101 Freeway. Phases two and three are currently in the design phase. The City's Transportation Department is responsible for the implementation of this measure. Funding to implement this measure is determined in the City's annual budget development process.

- City of Goodyear is currently in the process of establishing coordinated time-based traffic signal system. The City will install signal interconnect conduit and fiber optic cable that will serve as the communications link to improve the City's existing traffic signal system. These improvements will help enable the City to develop intelligent transportation systems in the future. The project is expected to take 2-3 years to complete. The traffic signals located on Litchfield Road between MC 85 and Indian School Road will be on the system. This portion of the project is close to being completed. The fiber optic cable and interconnect conduit will be installed when feasible. The City's Public Works Department is responsible for the implementation of this measure. Funding to implement this measure is determined in the City's annual budget process.
- City of Mesa currently maintains a computerized traffic signal system that provides coordination of traffic signals for improved traffic flow. In fiscal year 1996-1997 approximately $250,000 was spent for system upgrades. The City will continue to work with MAG to coordinate a regional traffic synchronization program. Implementation will be ongoing. Funding is allocated through the annual budget process.
- City of Peoria indicates that Peoria has received a Federal Grant, administered by the Arizona Department of Transportation for conducting a study of various methodologies and systems available to coordinate the timing and operation of the City's traffic signals. The studies will recommend a specific system and an implementation strategy. Upon completion of the study, the City will commence actual construction. Currently the City has received a grant totaling $800,000 and has $170,000 available from the sale of General Obligation Bonds.
- City of Phoenix currently maintains a computerized traffic signal system that provides coordination of traffic signals for improved traffic flow.

Approximately 98 percent of the City's 835 signals are synchronized through this computer control and a time-based system. Only a few signals in developing areas with low traffic volumes are not synchronized.

Over the next few years Phoenix will be implementing a new computerized signal system that will centralized the operation of the City's signals into an Advanced Traffic Management System (ATMS). The ATMS will include new communication links, traffic signal controller equipment, system detection, video cameras for downtown traffic management, as well as connectivity to the ADOT Freeway Management System and other municipalities. The improved data collection, real-time graphical displays, and video will allow for the City to more closely monitor and more effectively adjust signal timing for improved traffic flow.

Implementation is in progress. The connection of existing traffic signals to the ATMS is expected to be completed by the year 2000. The ATMS has been designed to allow expansion to accommodate the connection up to 2000 traffic signals. $6.3 million dollars has been allocated for the implementation of the ATMS.

- City of Scottsdale traffic signal system is computerized. It provides coordination of traffic signals for improved traffic flow. The computerized system can be programmed to accommodate special events and traffic incidents. Approximately 98 percent of the City's traffic signals are synchronized through this computer control and a time-based system. Only a few signals in developing areas with low traffic volumes are not synchronized.

  The City will work with the Arizona Department of Transportation (ADOT) and neighboring cities to coordinate the synchronization of City of Scottsdale traffic signals. Synchronization will be achieved by sharing traffic information through communication links.

  Three program objectives for the City of Scottsdale Transportation Department, Traffic Engineering Division, which are reported in the Biennial Budget for fiscal years 1997-1999 are: Install preliminary phase of comprehensive traffic detection system by June 1998; Install preliminary phase of Traveler Information system by December 1997; and Improve operation and accident analysis through video and computer technology enhancement.

  The City of Scottsdale has negotiated a long-term agreement with U.S. West for leased telephone lines to communicate with the City's traffic signals. Implementation is in progress. The connection of existing traffic signals to the ATMS is expected to be completed by the year 2000. The ATMS has

been designed to allow expansion to accommodate the connection up to 2000 traffic signals. Funding is allocated through the biennial budget process.

- City of Tempe indicates that this measure implements and enhances synchronization and has been implemented by most of the larger municipalities in the area. The City currently maintains a computerized traffic signal system that provides coordination of traffic signals for improved traffic flow. Efforts are underway for large-scale coordination across the entire MAG region. The City would continue to work on this effort and Model Deployment as described in Measure 97-TC-2. Implementation is in progress. Funding is provided through the annual budget process.

- City of Tolleson Mayor and Council will adopt a resolution to this measure provided the following conditions are met. The City of Tolleson, in coordination with the Department of Transportation and Maricopa County commits to synchronize the five traffic signal systems currently within the City of Tolleson's jurisdiction, if and when traffic volumes reach state mandated 15,000 trips per day, per intersection. Because increases in traffic volume are unpredictable and average daily traffic is well under the above-mentioned state mandated guidelines, setting an implementation date would be premature at this time. Highway User Funds. Allocation of personnel is the responsibility of the Maricopa County Highway Department.

- Arizona Department of Transportation indicates that this measure implements and enhances synchronized traffic signal systems to promote steady traffic flow at moderate speeds. Signal synchronization has been implemented by most of the larger municipalities in the area, and efforts are underway for large-scale coordination across the entire MAG region. This will be an ongoing effort.

  ADOT, as mandated by A.R.S. 9-500.04, will pursue synchronization of traffic signals on State Highways in the nonattainment area in cooperation with local municipalities. Typically on urban portions of State Highways, local governments handle traffic control through agreements with ADOT.

  A.R.S. 28-642 states, "On a State highway which has a traffic flow exceeding 15,000 motor vehicles per day in a nonattainment area, the director, in cooperation with local authorities, shall synchronize traffic control signals."

  Included as part of the approved 1997 air quality House Bill 2237, monies will be appropriated from the General Fund to ADOT in the sum of $500,000 in each of the fiscal years 1997-1998 and 1998-1999 for distribution to cities and counties in Area A and Area B as defined in A.R.S. 49-541, for the

mandatory synchronization of traffic control signals within and across jurisdictional boundaries.

An ongoing ADOT process is to synchronize, where warranted, traffic signals on the Controlled Access Freeways. Traffic signals on all state routes that pass through the City of Phoenix, including Grand Avenue, and the City of Tempe are synchronized. This measure is also a work element of the ongoing Intelligent Transportation System Program. (Refer to BACM #97-TC-3).

As part of a clean-air package signed into law by the Governor on April 29, 1997, House Bill 2237 appropriates the sum of $500,000 in each of the fiscal years 1997-1998 and 1998-1999 from the general fund to ADOT for distribution to cities and counties for synchronization of traffic control signals within and across jurisdictional boundaries.

42. Reduce Traffic Congestion at Major Intersections

- City of Avondale indicates that the City will continue to implement intersection improvements to reduce traffic congestion at major intersections. Intersections are improved through the five-year Capital Improvement Program/Major Street Program, which supports widening of arterial streets. Intersection improvements are included in these projects and new development. The above program improves intersections by adding left turn lanes, thru lanes, and/or right turn lanes. Implementation is in progress. Funding is allocated through the annual budget process.

- Town of Cave Creek indicates that the Town has one major intersection. This intersection is signalized with turn lanes and median dividers. The Town is in the process of conducting a five year transportation plan, and will be in a position to respond to traffic needs as they arise.

- City of Chandler is installing three to five traffic signals per year. The City continues to construct curbed medians on all new arterial streets, and control access for new development (provision of deceleration lanes, location of median openings, and location of driveways relative to public street intersections) is guided by policies documented in Technical Design Manual Number 4. Implementation will be ongoing. Funding is allocated through the annual and five year capital budget process.

- Town of Gilbert continues to make improvements to reduce traffic congestion at major intersections. This is being done through improved signal timing and street widening. Implementation is in progress. Funding allocated through the annual budget process.

- City of Glendale will use a variety of traffic control strategies and devices, such as traffic signals, turn lanes and median dividers to facilitate traffic flow on substandard or excessively congested intersection. In progress. Traffic control strategies and devices are determined on a case-by-case basis as the need arises. Traffic control decisions are made by the City Traffic engineer. Funding to implement this measure is determined in the City's annual budget development process.

- City of Goodyear will use a variety of traffic control strategies and devices, such as traffic signals, turn lanes and median dividers to facilitate traffic flow on substandard or excessively congested intersections. A timing study is in progress to synchronize the traffic signals along the City's major corridor. The timing plan will have a lag-left system which will be activated when the timing study is completed. In progress. Traffic control strategies and devices are determined on a case-by-case basis as the need arises. Traffic control decisions are made by the Public Works Department. Funding to implement this measure is determined through the City's annual budget process.

- City of Mesa indicates that signalized intersections are evaluated periodically to determine if various control strategies can be implemented to reduce overall delay and improve traffic flow. The Traffic Signal Control System software reduces side street delays during off-peak hours. A combination of leading and lagging left turn signal operations are used to improve progression at major intersections. Bus pullouts are installed as adjacent property on existing bus routes is developed to reduce congestion on the streets. Intersection improvements such as adding turn lanes, lengthening turn lanes, and adding through lanes are continuously evaluated and added to the five year capital budget plan as appropriate.

  Traffic patterns associated with special events are continuously evaluated and appropriate temporary congestion remediation measures are implemented such as dedicated through lanes, dedicated event access lanes and manual traffic flow assistance. Implementation will be ongoing. Funding is allocated through the annual and five year capital budget process.

- City of Peoria requires the intersections to be widened as development occurs adjacent to the intersection. The City also budgets funding to conduct warranted studies, design, and construct signals at three intersections per year. Three intersections are signalized each year. Intersections are widened as adjacent development occurs. The City budgets funding to signalize three intersections per year.

- City of Phoenix will continue to implement intersection improvements to reduce traffic congestion at major intersections. Most intersections are improved through the five year Capital Improvement Program/Major Street Program which supports widening of arterial streets. Intersection improvements are included in these projects.

  The City of Phoenix Bottleneck Removal (BN) Program improves intersections by adding left turn lanes, thru lanes, and/or right turn lanes. Additional intersection improvements and traffic management programs will be implemented if voters approve the proposed half-cent sales tax in 1997. Implementation is in progress.

  Funding is allocated through the annual budget process. Additional funding for intersection improvements and traffic management programs will be available through the Arizona Highway User Revenue Fund for the Capital Improvement Program.

- City of Scottsdale will continue to implement intersection improvements to reduce traffic congestion at major intersections. One of the goals of the City of Scottsdale Transportation Department, Traffic Engineering Division, as stated in the Biennial Budget for FY 1997-1999, is to maintain 70 percent or more of the 36 major intersections in Scottsdale at levels of service (LOS) or better. Intersection improvement budget for 1996-1997 was $300,000. Actual expenditure was $400,000. The forecast for 1997-1998 is $1,250,000 and for 1998-1999 is $1,250,000 (Reported in the Biennial Budget for FY 1997-1999).

  The City of Scottsdale Botteneck Removal (BN) Program improves intersections by adding left turn lanes, thru lanes, and/or right turn lanes. Additional intersection improvements and traffic management programs could be implemented if voters approve the proposed half-cent sales tax in 1997.

  Implementation in progress. Funding is allocated through the biennial budget process. Additional funding for intersection improvements and traffic management programs will be available if voters approve the one-half cent sales tax in 1997. Annual funding may also be available through the Arizona Highway User Revenue Fund for the Capital Improvement Program.

- City of Surprise indicates that this measure involves widening Dysart Road (Road of Regional Significance) from Greenway Road to Bell Road and adding a traffic signal at the Greenway Road/Dysart Road intersection. Other roadway widening and intersection improvement projects will be completed, by either the City or the adjacent developer(s), as problems are

identified and as funding becomes available. The Dysart Road widening and the Greenway Road/Dysart Road intersection improvements will be constructed in two phases. The schedule for completing this work is as follows: PHASE I Greenway Road to Grand Avenue; May 1997, complete design; June 1997, advertise bid for construction service; June 1997, initiate construction; September 1997, complete construction. PHASE II: Grand Avenue to Bell Road, fiscal year 1998, complete design; fiscal year 1998, advertise bid for construction services; fiscal year 1998-1999, initiate construction; fiscal year 1998-1999, complete construction.

Administration of Phase I improvements for this project will require staff time equivalent to .25 full-time employee, at an approximate cost of $12,000. This will be accomplished by current department personnel under the adopted City budget for FYs 1997 and 1998. The estimated cost for design and construction of Phase I is $187,000 which has been budgeted. Phase II design and construction is contingent upon grants and City funds becoming available.

- City of Tempe indicates that this measure implements a wide range of traffic control techniques designed to facilitate smooth, safe travel through intersections. These techniques include stabilization, turn lanes or median dividers. The City would continue to evaluate and implement these traffic control techniques as needed at various intersections throughout the City. In addition, the transit plan calls for implementation of bus pull-outs at major intersections where feasible.

  Implementation is in progress. Funding is provided through the annual budget process. Bus pull-outs are funded through private development during the development review process, and through the transit sales tax.

- City of Tolleson will continue to monitor traffic flows and street congestion and make improvements on an as-needed basis. Maricopa County currently reports traffic flow and street congestion findings to the City of Tolleson. A set schedule will be made available should data reveal necessary improvements. City of Tolleson Improvement District Funds. Maricopa County Highway Department funds will finance improvements to those streets that fall under County maintenance jurisdiction. Personnel allocations depend on the jurisdiction of the streets in question.

- Town of Wickenburg indicates that the Town has but one “major” intersection (U.S. Highway 60 where it intersects with U.S. Highway 93), which is governed by a traffic signal under the control and operation of the Arizona Department of Transportation (ADOT). An ongoing effort in coordination with ADOT is being made to reduce stopping and idling time and to move the

traffic. The implementation schedule will depend on engineering studies by ADOT and any corrective measures that ADOT may make.

No funding will be required, as the Town of Wickenburg does not pay the cost of maintenance, operation and timing of the traffic light, but it does pay for the electricity used in its operation. The Town will continue, and is continuing, to fund the electrical costs.

- Arizona Department of Transportation indicates that this measure would implement a wide range of traffic control techniques designed to facilitate smooth, safe travel through intersections. These techniques include signalization, turn lanes, or median dividers. This will be an ongoing effort.

  The ADOT Commitment for the Moderate Area Plan was to implement intersection improvements such as adding turn lanes, lengthening turn lanes, widening streets, eliminating bottlenecks and jogs, and eliminating unnecessary traffic signals.

  Pursuant to A.R.S. 28-104, ADOT is responsible for the planning, construction, and management of facilities on the State Highway System. The ADOT Five-Year Transportation Construction Program includes projects directed at intersection improvements. These projects facilitate turning movements, thereby helping to maximize intersection capacities. ADOT rarely removes traffic signals.

  Intersection improvement projects are an ongoing ADOT construction activity and are included in the Five -Year Construction Program, when applicable. Intersection improvements can be included in the reconstruction of a roadway. Funding is then shown as an item in the Five-Year Highway Construction Program, when applicable.

  Freeway Management Systems (FMS) as part of the Intelligent Transportation Systems (ITS) use cameras, road sensors, and variable message signs to collect and distribute traffic information. A total of 17 phases covering 240 miles of freeway is envisioned for the Phoenix area. Refer also to the measure, Develop Intelligent Transportation Systems.

  Software is being developed to give drivers access to updated traffic conditions on freeways and surface streets in Arizona. The ADOT internet site (www.azfms.com) and a network of kiosks will provide access to “real-time” information on road conditions.

  The first two stages of the software development for the Phoenix Traffic Operations Center are complete. Additional enhancements have been identified and are included in future software stages.

A recent study was conducted to develop a traffic Interchange Improvement Prioritization Process to assist ADOT in establishing a systematic interchange improvement program. A final report was prepared by JHK & Associates in January 1997.

Several steps were required to complete the study including ranking and prioritizing potential construction locations. Nineteen interchanges were identified as potential project locations for complete reconstruction. Of these, ten are in the Phoenix metropolitan area. These potential projects include what improvements would be required to improve traffic flow and safety at each interchange.

For describing the Commitment, ADOT, through the Transportation Planning Group Air Quality Planner, will review progress on the traffic interchange improvement recommendations for potential reconstruction. ADOT will also review progress data on traffic interchange projects in the nonattainment area when shown as part of the Five-Year Highway Construction Program. This information will be provided to the Maricopa County Environmental Services Divisions for the required annual report for the Environmental Protection Agency.

43. Site-Specific Transportation Control Measures

- City of Avondale indicates that the Street Department works with the Police Department to implement Special Event Traffic Control Plans for events involving large volumes of traffic. Implementation is in progress. Funding is allocated through the annual budget process.

- Town of Cave Creek indicates that the Town has one major intersection in its jurisdiction. This intersection will be evaluated for reprogramming to lag rather than lead. The Town is in the process of conducting a five year transportation plan, and will be in a position to respond to traffic needs as they arise.

- City of Chandler indicates that two intersections are programmed for major reconstruction to provide dual left turn lanes. We will be identifying and prioritizing potential spot improvements for other major intersections throughout the City with consultant assistance during the transportation plan update programmed for FY 1998. The first intersection at Alma School Road and Elliot Road is programmed for construction in FY 1999. Construction at the second intersection is tentatively programmed for FY 2001, depending upon availability of funding. Funding is allocated through the annual budget process.

- Town of Gilbert hired a traffic engineer during calendar year 1996. His responsibilities include obtaining traffic counts to determine the number of vehicles at intersections throughout the day and making changes to traffic control signals to ensure that vehicle delays do not occur. The data that is obtained will determine where improvements (traffic signalization) will need to be made. Prior to the hiring of the traffic engineer, the Town hired a consultant to conduct traffic counts.

  The Town has installed traffic controllers at four (4) intersections: Gilbert and Elliot, Lindsay and Elliot, Val Vista and Elliot, and Val Vista and Juniper. In addition, the Town created the position of traffic signalization technician, and hired two employees in July 1996. One of their main responsibilities is to provide operation and maintenance to all traffic signals. The Town will continue to monitor conditions and plan for needed improvements. Implementation is now in progress. Funding is allocated through the annual budget process.

- City of Glendale will use a variety of traffic control strategies and devices to facilitate traffic flow on currently substandard or excessively congested intersections. The City will evaluate site-specific transportation control measures on a case-by-case basis, taking into consideration traffic volume capacities and safety. In progress. For example, the City is currently providing signal protected U-turns (in conjunction with bus bays) where medians limit vehicular access to businesses, thus reducing vehicle miles traveled. Decisions on site-specific transportation control measures are made by the City Traffic Engineer. Funding for the implementation of this measure are determined in the City's annual budget development process.

- City of Goodyear will use a variety of traffic control strategies and devices to facilitate traffic flow on currently substandard or excessively congested intersections. The City will evaluate site-specific transportation control measures on a case-by-case basis, taking into consideration traffic volume capacities and safety. In progress. For example, the City is currently providing signal protected U-turns (in conjunction with bus bays) where medians limit vehicular access to businesses, thus reducing vehicle miles traveled. The City is considering reducing the amount of curb cuts to promote through traffic and is exploring traffic signals at major access points. Decisions on site-specific transportation control measures are made by the Public Works Department. Funding for the implementation of this measure are determined in the City's annual budget process.

- City of Mesa indicates that signalized intersections are evaluated periodically to determine if varius control strategies can be implemented to reduce overall delay and improve traffic flow. The Traffic Signal Control System software

reduces side street delays during off-peak hours. A combination of leading and lagging left furn signal operations are used to improve progression at major intersections. Bus pullouts are installed as adjacent property on existing bus routes is developed to reduce congestion on the streets. Intersection improvements such as adding turn lanes, lengthening turn lanes, and adding through lanes are continuously evaluated and added to the five capital budget plan as appropriate.

Traffic patterns associated with special events are continuously evaluated and appropriate temporary congestion remediation measures are implemented such as dedicated through lanes, dedicated event access lanes and manual traffic flow assistance. Implementation will be ongoing. Funding is allocated through the annual and five year capital budget process.

- City of Peoria attempts to budget funding to study and modify two to three existing traffic signals per year of installing separate protected/permissive left turn movements. Two to three intersections studied each year for installation of left turn movements. The City attempts to budget $50,000 each year.

- City of Phoenix Street Transportation Department works with the Police Department to implement Special Event Traffic Control Plans for events involving large volumes of traffic. The existing traffic control plan for the America West Arena will be revised as needed to incorporate the newer venues in the downtown area (Bank One Ballpark, theaters, museums, retail shops etc.).

  The City will hire a consultant to conduct traffic/parking information feasibility study for downtown Phoenix. The study will evaluate the feasibility of an automated system to provide traffic conditions and parking information to the traveling public as they approach the downtown area. The concept to be evaluated would include a system of radio-controlled electronic message boards to direct traffic away from congestion and to open parking sites. As currently envisioned, the system would primarily be used on days when multiple events are scheduled in the downtown area.

  The Aviation Department implements transportation control measure at Sky Harbor International Airport. Traffic flow patterns have been designed to reduce congestion and vehicle idling. Regional shuttle bus services reduce single occupancy vehicle traffic. Off-site employee parking airport shuttle buses reduce congestion near the terminals. Implementation is in progress. Funding is allocated through the annual budget process Traffic/parking feasibility study (estimated $150,000).

- City of Scottsdale evaluated traffic patterns before and during Super Bowl XXX, and programmed the signal computer to alleviate and avoid traffic predicaments. The City of Scottsdale completed construction of two bridges associated with the Greenway/Hayden CAP crossing prior to the 1997 Phoenix Open to alleviate traffic congestion. The Phoenix Open is an annual event. The City of Scottsdale Transportation Department's objective for 1997-1999 is to implement a traffic management program. The City works with the Chamber of Commerce, public and private sector stakeholders to evaluate options of managing parking and traffic associated with activity centers and special events throughout Scottsdale.

  Mass Transit Alternatives (Measure 97-TC-1) and Expansion of Public Transportation Programs (Measure 97-TC-5) may result in increased funding for transit and ultimately help provide transit options for travel to activity centers. Without expansion of the current public transportation system, options of encouraging alternative transportation will be limited. Also see Measure 97-TC-10: Site Specific Transportation Control Measures. The Street Transportation Department works with the Police Department.

  The Aviation Department implements transportation control measures at Scottsdale Airport. Traffic flow patterns have been designed to reduce congestion and vehicle idling. Regional shuttle bus services reduce single occupancy vehicle traffic. Off-site employee parking airport shuttle buses reduce congestion near the terminals.

  Implementation is in progress. Funding is allocated through the biennial budget process. Traffic/parking feasibility study (estimated $150,000).

- City of Tempe indicates that this measure encourages the implementation of any available transportation control measures targeting specific locations or subareas. This could include geometric or traffic control improvements at specific congestion intersection or at other substandard locations.

  In April 1995, the City Council approved a plan to create a downtown parking management system as recommended by the Downtown Tempe Community Inc. (DTC), a management association of the downtown. Upon further study and testing, the DTC recommended that the parking management system include: the installation of multi-space meters on City controlled parking lots and on-street parking spaces; and the installation of wayfinder system, which would help people locate available parking areas. In February 1997, this system was implemented in Downtown Tempe.

  As part of the development review process, the City reviews site plans and recommends traffic control measures to improve traffic flow as well as measures to encourage the use of alternative modes. Alternative mode

measures include pedestrian amenities, bicycle parking and transit stops. The City will continue to implement and encourage transportation control improvements as opportunities occur. Implementation in progress. Funding is provided through the annual budget process and through private development during the development review process.

- City of Tolleson indicated this measure involves the installation of left turn signals at three City of Tolleson traffic signals when traffic counts warrant installation. Current Average Daily Traffic counts are too low for change in traffic patterns. Not being able to predict high average daily traffic, the City of Tolleson will commit to conduct traffic count studies periodically to determine the need for left turn signal installation. Public Works Department will be responsible for the administration and implementation of the left turn signal lights. The conversion of three traffic signal systems is estimated to cost $75,000 from approved City Highway User Funds (HURF).

- Arizona Department of Transportation indicates that the 1993 Moderate Area Plan Commitment by ADOT was to implement intersection improvements such as adding turn lanes, lengthening turn lanes, widening streets, eliminating bottlenecks and jogs, and eliminating unnecessary traffic signals. This Commitment is addressed here and will also be addressed in the 1998 MAG Serious Area Carbon Monoxide Plans BACM #97-TC-9. This will be an ongoing effort.

  Roadway and intersection improvement projects are an ongoing ADOT construction activity and are included in the attached Five-Year Highway Construction Program. These projects can include widening of roadways and adding turn lanes. Intersection improvements can be included in the reconstruction of a roadway. Funding for each year is shown as an item in the Five-Year Highway Construction Program.

  As the proposed Freeway Management System and Intelligent Transportation System projects are developed and implemented, site-specific intersection improvements could be shown or identified. As part of the recently completed Traffic Interchange Improvement Prioritization Process Study, a total of 17 potential intermediate and 183 potential minor improvement projects were identified statewide. Nine of the potential intermediate projects that were identified are in the Phoenix metropolitan area. Forty-six of the potential minor projects are located in the Phoenix metropolitan area and Maricopa County.

  For the purposes of describing the Commitment, ADOT, through the Transportation Planning Group Air Quality Planner, will review progress data on site-specific improvement projects and provide the Maricopa County Environmental Services Division the information needed for the required

annual report for the Environmental Protection Agency. As requested, this data will include reporting units from BACM #97-TC-8 and BACM #97-TC-9.

- Regional Public Transportation Authority indicates that the RPTA facilitates Transportation Management Associations in the region. There are fourteen TMAs currently active representing 210 employers. Two of the fourteen TMA's are formal dues paying organizations. RPTA staff supports the other twelve informal TMA's groups. The employers in these associations work together to promote alternate mode use by coordinating transportation fairs, sponsoring educational workshops, networking and sharing ideas and jointly implementing programs or incentives that motivate employees i.e., guaranteed ride home programs, carpool matching or vanpool promotions, etc.

  The Regional Public Transportation Authority as the regional transit agency for Maricopa County (A.R.S. 48-5101) provides these services to improve mobility and air quality. The TMAs meet monthly or bi-monthly. In 1997, mini-trainings will be scheduled at these meetings on the following topics:

  - Motivation through Recognition
  - New TRP Flexibility Options
  - Air Pollution 101
  - Bus Card Plus
  - Carpools/Vanpools

  Portions of up to fourteen professional staff (10 RPTA and 4 contract staff) will spend part of their time providing this information to the public and employers through the above specified activities. This measure is funded by a portion of the total budget for the Regional Ridesharing Program, TRP (RPTA) and CAC programs which is $1,248,000. RPTA supports the two formal TMAs by contracting with them for $10,000 per year to provide rideshare and trip reduction support services on its behalf.

44. <u>Encouragement of Bicycle Travel</u>

- City of Avondale encourages bicycle travel through establishing bike lanes with new road development. The Avondale Bikeway System includes bike lanes, bikeable streets, multi-use paths and to facilitate bicycle travel in the Phoenix area. The City continues to install and maintain bike facilities at City parks, bus terminals, and Park and Ride lots. The City has adopted street cross section standards which provide on-street bike lanes on almost all new arterial and collector streets. Implementation is in progress. Additional bikeways are scheduled for the 1997-1998 fiscal year. The City has designated a Planner. Developers pay as development occurs.

- Town of Carefree is a semi-rural community with a population of approximately 2300 residents located on the north edge of the Phoenix metropolitan area. Approximately 96 percent or 48 miles of its 50 miles of streets are paved. The Town of Carefree has an ongoing maintenance program of mowing and trimming the shoulders of streets to provide for full usage of street surfaces for vehicles, bicycles, and pedestrians. The Town of Carefree will continue to encourage bicycle and pedestrian travel and public awareness through its newsletter.

  This measure will be implemented by the Town of Carefree. Legal authority for this action is provided under Section 9-240-3(c) of the Arizona Revised Statutes. The maintenance of the streets and shoulders is continuous. The encouragement of bicycle and pedestrian travel and public awareness announcements will be periodical. The shoulder maintenance will be inspected periodically by the Street Superintendent who will provide reports to the Town Administrator.

  The annual cost of mowing and trimming the street shoulders is approximately $15,000 which is budgeted in the Street Department Maintenance Budget. The Town newsletter is published and distributed three times per year for an annual cost of approximately $8,000 which is budgeted in the Town Council Budget.

- City of Chandler has increased the promotion of bicycle use, including conducting an annual Bike-to-Work Week. This year's promotion included incentives such as free bikes and bike equipment as well as other prizes for participation. Another program offered by the City, provides bicycles that have been confiscated by the police department to employees who commit to using bikes to commute to work. In addition, street design standards were revised in 1993 to require bike lanes on all newly-constructed arterial streets. Implementation will be ongoing. Funding is allocated through the annual budget process.

- City of El Mirage will look into promoting public/employee awareness of bicycle use as an alternative transportation to motor vehicles. The City will explore innovated ways, i.e., demonstration programs to promote bicycle use. The schedule for completing this work is as follows: February 1998-Promote public/employee awareness of bicycle use. Funding for this program is determined in the City annual budget development process.

- Town of Fountain Hills is identifying bikeway routes along arterials, collections, and local roadways and will be signing and striping such routes. The Town of Fountain Hills will promote bicycle travel by encouraging and requiring, where appropriate, both residential and commercial developers to

provide bicycle lanes and/or trails within or adjacent to their projects. This measure will be implemented by the Town of Fountain Hills. Legal authority for this action is provided under ARS Section 9-240-"General Powers of Council". The schedule for completing this work is as follows: Year -1998 - Town-wide signing and striping.

Administration of plan development for this project will require staff time equivalent to 0.2 full-time employee, at an approximate cost of $8,000. This measure will be accomplished by current street maintenance department personnel under the adopted Town budget for FY 1997-1998. This estimated total cost for completion will be $20,000, consisting of $20,000 from approved Town budget, as programmed in the Town Capital Improvement Program.

This measure does not represent an ordinance, regulation, or rule requiring enforcement. Routine enforcement of traffic laws applicable to motorists and bicyclists on the affected streets will be provided by the Town Police Department. Maintenance of pavement and signage on the affected streets and bikeways will be provided by the Town Streets Department, under the Town's routine maintenance program.

- Town of Gilbert encourages the use of bicycles for commuter trips and recreation through the planning and construction of striped, marked bike lanes in collector and arterial streets and off street improved trails. In 1996, these efforts were aided by:

  - Spending $54,537 to develop the Town of Gilbert 1996-2001 Parks, Open Space and Trails Plan. The study includes an inventory of existing facilities and policies for the implementation of new bicycle trails and facilities.

  - Spending $74,500 to develop an impact fee structure for new development. A portion of the revenue is earmarked for use by the Parks and Recreation Department who will budget a portion for expansion of the bicycle trail system.

  - Programmed the use of approximately $1.08 million for the future expansion of the bicycle trail system as defined in the capital improvements plan.

  - Spent $77,000 for the design and construction of bicycle trail improvements along the Western Canal.

  - Constructed approximately 8.4 miles of arterial and collector streets that include additional width and striping for reserved bike lanes and

approximately 5.6 miles of off-street bikepaths within private developments. The Town's system currently is 55 miles.

Implementations in progress. Funding is allocated through the annual budget process.

- City of Glendale promotes public/employee awareness of bicycle use as an alternative transportation to motor vehicles. The City will explore innovated ways, e.g., demonstration programs to promote bicycle use. In progress. The City has purchased an electric powered bicycle and an electric powered retryke (3 wheel cycle) to spark public and employee interest in bicycling. The electric powered bicycle and retryke are available for employees to use.

  The City has started an employee bicycle club to provide employees more confidence to ride safely. The club will continue as long as there is employee interest. Bicycle club participants are rewarded with gifts based on miles traveled to work. The City currently provides employees with a bicycle if they promise to ride it to work on a regular basis. The City's Bicycling Coordinator is assigned to promote bicycle use. Funding for this program is determined in the City annual budget development process.

- City of Goodyear will promote public/employee awareness of bicycle use as an alternative transportation to motor vehicles. The City will explore innovated ways, e.g., demonstration programs to promote bicycle use. In progress. The Southwest Valley Transportation Study has provided the City with recommendation on bike routes. A public committee will be established to initiate a bicycle awareness program. The committee will identify ways to promote bicycle travel and will present options to the City's Manager's Office, as appropriate. The City's public/employee committee is assigned to promote bicycle use. Funding for this program is determined in the City annual budget development process.

- City of Mesa hired a Bicycle Coordinator in 1996. A Bicycle Plan has been developed that includes designs for additional bike lanes on arterials streets and bikepaths separated from the roadway throughout the City. In conjunction with a federal aid project a bike path along one major east-west arterial will be developed with rest stops at City Parks.

  The City distributes information on bike safety including educational and promotional flyers, posters and brochures, and conducts an annual bike event for employees to encourage the safe use of bicycles for commuting. The City installs and maintains bike facilities at City parks, bus terminals, and Park-and-Ride lots. Implementation will be ongoing. Funding is allocated through the annual budget process.

- Town of Paradise Valley encourages bicycle travel. The Town has installed bike racks at the Town facilities. There are bike maps available at the Town Hall. The Town's General Plan calls for bike lanes on newly constructed roadways. The Town's Trip Reduction Program encourages bike travel and pays employees $1.33 per day to employees who ride their bike to work. Implementation has been in progress for three years. The General Plan was revised in July 1997. Development and administration of the Trip Reduction Program Reduction Plan requires staff time equivalent to 0.20. A full-time exempt employee volunteers their services on off-hours, at a cost of zero. The annual budget for this measure is from the Town's General Fund.

- City of Peoria adopted a bicycle route study in 1993 for implementation of a class two bike route. A class two bike route is provided by a striped bike lane or bike path on collector streets or along rivers or other waterways to connect major destinations such as City Hall, parks and schools. Each new development constructed along a collector street is required to stripe the street with a bike lane. Also, the City received a Federal Enhancement Grand to re-stripe City streets to designate a bike lane. This project will be completed in fall of 1997. Peoria attempts to include funding each year for the striping of City streets. Funding varies from year to year.

- City of Phoenix encourages bicycle travel through a number of programs. The City has expanded the bikeway system from 75 miles in 1987 to approximately 422 miles in FY 1996-1997. The Phoenix Bikeway System includes bike lanes, bikeable streets, multi-use paths and grade-separated structures to facilitate bicycle travel in the Phoenix area. Approximately 19 additional miles of bikeways are scheduled for FY 1997-1998, raising the total system to approximately 441 miles. Additional bikes and facilities can be constructed if the voters approve the proposed half-cent sales tax in 1997.

  The City publishes and distributes safety, educational, and promotional flyers, posters, brochures, and bike maps and conducts bike events to encourage safe use of bicycles and safe commuting. The City continues to install and maintain bike facilities at City parks, bus terminals, and Park-and-Ride lots. Private developers and businesses are encouraged to include bike racks, lockers, and showers at work site and other facilities. The City has adopted street cross section standards which provide on-street bike lanes on almost all new arterial and collector streets.

  The City is assisting Maricopa County in a pilot program, to provide free purple bikes (Purple People Movers) for use in the downtown area. This community bike program was created through a partnership of local governments, community organizations, and local businesses. The program

estimates that over 100 purple bikes and 30 purple bike racks will be made available in the downtown area to encourage visitors, employees, tourists and residents to use bikes for short trips to get around downtown, rather than driving a car.

Implementation is in progress. Additional bikeways are scheduled for the 1997-1998 fiscal year. The Purple Bike Pilot Program began in April 1997. The City has designated a Bicycle Coordinator. AHUR funds, City bonds and federal grants provide the funding source for the Phoenix Bikeway Program. From 1987 through FY 1997-1998, the City invested approximately $5.3 million with approximately $300,000 annual expenditures. The annual investment of additional funding for bikeways will be available if the voters approve the half-cent sales tax in 1997.

- City of Scottsdale considers bicycle transportation to be an integral part of citizen mobility. The City has an adopted Bicycle/Pedestrian Transportation Plan. The City encourages bicycle travel through a number of programs. Presently the City publishes and distributes a map of the multi-use path system which includes safety information. We also intend to publish a comprehensive map designed for bicycle commuters.

  The City has a program, B.I.K.E.S., for employees to “earn” a donated bicycle by using it to commute to work a certain amount.

  The City also has a program, Handlebar Helpers, for community youth and adults to “earn” donated bicycles through community volunteer work.

  The City distributes safety, educational, and promotional flyers, posters, brochures, and bike maps and advertises bike events to encourage safe use of bicycles and safe commuting. The City continues to install and maintain bike facilities at City parks. Private developers and businesses are encouraged to include bike racks, lockers, and showers at work site and other facilities.

  Implementation has been in progress since the early seventies. The Transit Division has developed five and ten-year CIP plans. If the voters approve the sales tax increase for Transit in September 1997, then these plans can be accelerated and expanded. Funding is allocated through the biennial budget process. The City has designated a full-time Bicycle Coordinator. Funding comes from sales tax revenue, City bonds, other City funds, and federal grants. The City expects to spend approximately $1,000,000 for FY 1997-1999.

- City of Tempe facilitates and promotes bicycle travel through a variety of programs. More than 85 miles of bikeways currently exist in Tempe;

approximately 70 miles have been implemented since 1990. More than half of all collector and arterial streets in Tempe have a dedicated bicycle facility. These include bicycle lanes, routes, paths and wide outside curb lanes, grade separated crossings and canal crossing treatments. Installation of bicycle racks for parking is ongoing, and required with all new developments.

In the Spring of 1997, Tempe was recognized as a "Bicycle Friendly Community" by the League of American Bicyclists (LAB) and received a Silver Spoke award from the Governor's Task Force on Bicycles for outstanding contributions to bicycle facilities planning and engineering.

The City publishes and distributes safety, educational and promotional information to encourage the use of bicycles and safe commuting including: air quality brochures, a Tempe Bicycle Parking Requirement Guide, a bikeways map and a quarterly newsletter. A bicycle safety and educational video is currently being developed and will be available for public use. Tempe hosted numerous events during Valley Bike Week 1997, including the regions most well-attended Bike to Work and School Day. Tempe, additionally, hosts an annual Fall Tour de Tempe Bike Rally to showcase existing and new bikeways, and provide instruction for appropriate cycling.

The City of Tempe has included art into the design of bicycle lockers and racks. In an effort to improve the experience of the cyclist, four artist-designed bicycle racks have been installed in the Downtown Tempe area. Additionally, four artist-designed bicycle lockers are currently being completed and will be located at three City of Tempe sites. These projects are created through a partnership with the Tempe Arts Commission and the Transit Section.

In September 1996, Tempe citizens passed the sales tax for transit, thereby creating a dedicated source of funding for significant improvements to the local bus, bicycle and pedestrian programs. Additionally, in February 1997 the City hired an Alternative Modes Specialist, with responsibility for bicycle coordination.

Implementation is ongoing. Expansion of the Tempe Bikeway System is done in accordance with the Bicycle Plan. Bicycle racks are installed with new development, and promotional activities are held annually.

Transit Tax funds, federal grants and the City of Tempe Capital Improvement Program provide the funding source for the Tempe Bicycle Program. A base of $250,000 is earmarked from Transit Tax dollars annually. ISTEA and CMAQ grant monies have been used to supplement and maximize Tempe's funding.

- Maricopa County indicates that this measure would involve the promotion of bicycle travel to reduce automobile use and improve air quality. One useful channel for public sector encouragement of bicycling is bikeway system planning. Identifying and publicizing appropriate routes for inter-city bike trips could help bicyclists avoid other, less safe facilities. Another area for potential actions is the development and distribution of educational materials, regarding bicycle use and safety.

  Maricopa County Transportation Department, through its permit authority pursuant to A.R.S. Section 11-251 (General Powers of Board of Supervisors) and A.R.S. Section 18-209, will continue to develop bicycle facilities and encourage bicycle travel. Maricopa County continues to do extensive planning for bicycle facilities throughout the County. Maricopa County will be updating their bicycle plan and completing an implementation plan by May 1998 to better help ensure that new bicycle facilities are built in the future. This is a very important encouragement to the residents who may choose to ride their bicycle in place of driving a car.

  In the last revision to the Department of Transportation Design Manual (11/93), a complete bicycle facilities design chapter was added, and a requirement for provision of bike lanes or sufficient width for bike lanes was added for most types of roadways. Funding will be constrained by revenues received by Maricopa County from the Highway User Revenue Fund for capital projects.

  Maricopa County also provides other types of encouragement through the distribution of the regional bicycle facilities map and the bicycle education that is provided as part of Traffic Engineering's Roadway Safety Program provided to school children all over Maricopa County. Ongoing program funded through existing County budget.

- Regional Public Transportation Authority indicates that efforts will be targeted at the 1,250 employers with about 580,000 employees and students or all sites affected by the Maricopa County Trip Reduction Program (MCTRP) and the general public through the Regional Ridesharing Program. The following materials are made available to employers to help them implement bicycle programs to employees and promote safe bicycling; A "How to Implement a Bicycle Program" manual, "Bike Rack Guide", bike helmet information, bike safety brochure, bike-on-bus brochure and bicycle safety education video. RPTA will also distribute up to 22,000 MAG Regional Bike maps in 1997-1998. RPTA will assist the Governor's Arizona Bicycle Task Force in sponsoring a bicycle conference and/or workshop that will be marketed to employers and the general public. The Regional Ridesharing Program will promote its computerized matching service to those who wish to bicycle with

a companion to work. The Clean Air Campaign will co-sponsor and coordinate Valley Bike Week event.

The schedule for planned activities are as follows:

- Distribution of bicycle educational information is ongoing
- Bicycle matching program will be promoted through MCTRP trainings, workshop, the home page and employer sponsored transportation fairs
- Valley Bike week and conference are annual events

Portions of up to fourteen professional staff (10 RPTA and 4 contract staff) will spend part of their time providing this information to the public and employers through the above specified activities. This measure is funded by a portion of the total budget for the Regional Ridesharing Program, TRP (RPTA) and CAC programs which is $1,248,000.

45. Development of Bicycle Travel Facilities

- City of Avondale encourages bicycle travel through establishing bike lanes with new road development. The Avondale Bikeway System includes bike lanes, bikeable streets, multi-use paths and to facilitate bicycle travel in the Phoenix area. The City continues to install and maintain bike facilities at City parks, bus terminals, and Park and Ride lots. The City has adopted street cross section standards which provide on-street bike lanes on almost all new arterial and collector streets. Implementation is in progress. Additional bikeways are scheduled for the 1997-1998 fiscal year. The City has designated a Planner. Developers pay as development occurs.
- City of Chandler revised its street design standards in 1993 to require bike lanes on all newly-constructed arterial streets. The City of Chandler is in the process of completing the implementation of bike lane striping of collector streets as recommended in the City's Bicycle Plan. Further, the City has re-striped portions of four arterial streets to provide north-south and east-west connectivity with other regional bike routes. Implementation will be ongoing. Funding is allocated through the annual budget process.
- City of El Mirage will maintain existing bicycle lanes and provide additional bicycle lane miles on the public street system and other areas, as appropriate. Implementation of the City's bicycle plan is currently in process. The City currently has approximately one mile of bicycle lanes in the City. The City Manager's Office is responsible for planning for and installing new bicycle lanes. Funding for this program is determined in the City's annual budget development process.

- Town of Gilbert encourages the use of bicycles for commuter trips and recreation through the planning and construction of striped, marked bike lanes in collector and arterial streets and off street improved trails. In 1996, these efforts were aided by:

  - Spending $54,537 to develop the Town of Gilbert 1996-2001 Parks, Open Space and Trails Plan. The study includes an inventory of existing facilities and policies for the implementation of new bicycle trails and facilities.

  - Spending $74,500 to develop an impact fee structure for new development. A portion of the revenue is earmarked for use by the Parks and Recreation Department who will budget a portion for expansion of the bicycle trail system.

  - Programmed the use of approximately $1.08 million for the future expansion of the bicycle trail system as defined in the capital improvements plan.

  - Spent $77,000 for the design and construction of bicycle trail improvements along the Western Canal.

  - Constructed approximately 8.4 miles of arterial and collector streets that include additional width and striping for reserved bike lanes and approximately 5.6 miles of off-street bikepaths within private developments. The Town's system currently is 55 miles.

  Implementations in progress. Funding is allocated through the annual budget process.

- City of Glendale will maintain existing bicycle lanes and provide additional bicycle lane miles on the public street system. Implementation of the City's bicycle plan is currently in progress. The City currently has approximately 100 miles of bicycle lanes in the City. The City anticipates adding 10 miles of bicycle lanes in 1997. The City's Bicycling Coordinator and the Traffic Signs and Signals Division are responsible for planning and installing new bicycle lanes. Funding for this program is determined in the City's annual budget development process. It costs the City approximately $3,000 per mile to add new bicycle lanes. The operational and maintenance cost for bicycle lanes is estimated at $1,500 per mile.

- City of Goodyear will maintain existing bicycle lanes and provide additional bicycle lane miles on the public street system and other areas, as appropriate. Implementation of the City's bicycle plan is currently in progress. The City currently has approximately 24 miles of bicycle lanes in

the City. Since roadways within the City's jurisdiction belong to MCDOT, the City is looking for County participation to create connectivity concerning bikeways. The City anticipates adding bicycle lanes as funding allows. The City's Public Works Department is responsible for planning for and installing new bicycle lanes. Funding for this program is determined in the City's annual budget process.

- City of Mesa hired a Bicycle Coordinator in 1996. A Bicycle Plan has been developed that includes designs for additional bike lanes on arterials streets and bike paths separated from the roadway throughout the City. In conjunction with a federal aid project a bike path along one major east-west arterial will be developed with rest stops at City parks.

  The City distributes information on bike safety including educational and promotional flyers, posters and brochures, and conducts an annual bike event for employees to encourage the safe use of bicycles for commuting. The City installs and maintains bike facilities at City parks, bus terminals, and Park-and-Ride lots. Implementation will be ongoing. Funding is allocated through the annual budget process.

- City of Peoria has adopted a bicycle route plan for the implementation of a class two bike lane. The class two bike lane is to be located on streets with lower traffic volume, such as collector streets. Lanes will be striped, bike decals installed and signed. Peoria will re-stipe sections of collector streets in the fall of 1997 and continue to have new lanes installed as development continues. The City of Peoria currently has $125,000 for re-striping certain streets. The City will continue to have new facilities installed each year as development occurs. The City will attempt to include funding each year in the CIP.

- City of Phoenix encourages bicycle travel through a number of programs. The City has expanded the bikeway system from 75 miles in 1987 to approximately 422 miles in FY 1996-1997. The Phoenix Bikeway System includes bike lanes, bikeable streets, multi-use paths and grade-separated structures to facilitate bicycle travel in the Phoenix area. Approximately 19 additional miles of bikeways are scheduled for FY 1997-1998, raising the total system to approximately 441 miles. Additional bikes and facilities can be constructed if the voters approve the proposed half-cent sales tax in 1997.
  The City publishes and distributes safety, educational, and promotional flyers, posters, brochures, and bike maps and conducts bike events to encourage safe use of bicycles and safe commuting. The City continues to install and maintain bike facilities at City parks, bus terminals, and Park-and-Ride lots. Private developers and businesses are encouraged to include

bike racks, lockers, and showers at work site and other facilities. The City has adopted street cross section standards which provide on-street bike lanes on almost all new arterial and collector streets.

The City is assisting Maricopa County in a pilot program, to provide free purple bikes (Purple People Movers) for use in the downtown area. This community bike program was created through a partnership of local governments, community organizations, and local businesses. The program estimates that over 100 purple bikes and 30 purple bike racks will be made available in the downtown area to encourage visitors, employees, tourists and residents to use bikes for short trips to get around downtown, rather than driving a car.

Implementation is in progress. Additional bikeways are scheduled for the 1997-1998 fiscal year. The Purple Bike Pilot Program began in April 1997. The City has designated a Bicycle Coordinator. AHUR funds, City bonds and federal grants provide the funding source for the Phoenix Bikeway Program. From 1987 through FY 1997-1998, the City has invested approximately $5.3 million with approximately $300,000 annual expenditures. The annual investment of additional funding for bikeways will be available if the voters approve the half-cent sales tax in 1997.

- City of Scottsdale considers bicycle transportation to be an integral part of citizen mobility. The City has an adopted Bicycle/Pedestrian Transportation Plan. Our bikeway system is expanding through inclusion of bicycle facilities in Capital Improvement Projects, Flood Control Districts, new development, and specific bicycle projects. In 1990, the system had about 36 miles of off-road paved paths and two miles of bike lanes. Today the numbers would be 45 miles of path, and 35 miles on-street.

  FY 1997-1998 is expected to add nine miles of separated path, three pedestrian/bicycle/equestrian bridges over three canals, and 15 miles on-street lanes and routes. Presently the City publishes and distributes a map designed for bicycle commuters.

  The City of Scottsdale completed the Pima Bike Roue from Fillmore Street to Chaparral Road within the past two years. The City of Scottsdale completed 8.5 miles of bike lanes, and three miles of multi-use paths within the past two years. The City of Scottsdale completed Phases II and III of the new Indian Bend Wash path, McCormick Parkway to MacDonald Drive within the past two years. Additional bikes and facilities can be constructed if the voters approve the proposed half-cent sales tax in 1997.

  Implementation has been in progress since the early seventies. The Transit Division has developed five and ten-year CIP plans. If the voters approve

the sales tax increase for Transit in September 1997, then these plans can be accelerated and expanded. Funding is allocated through the biennial budget process. The City has designated a full-time bicycle Coordinator. Funding comes from sales tax revenue, City bonds, other City funds, and federal grants. The City expects to spend approximately $1,000,000 for FY 1997-1999.

- City of Tempe facilitates and promotes bicycle travel through a variety of programs. More than 85 miles of bikeways currently exist in Tempe; approximately 70 miles have been implemented since 1990. More than half of all collector and arterial streets in Tempe have a dedicated bicycle facility. These include bicycle lanes, routes, paths and wide outside curb lanes, grade separated crossings and canal crossing treatments. Installation of bicycle racks for parking is ongoing, and required with all new developments.

  In the Spring of 1997, Tempe was recognized as a "Bicycle Friendly Community" by the League of American Bicyclists (LAB) and received a Silver Spoke award from the Governor's Task Force on Bicycles for outstanding contributions to bicycle facilities planning and engineering.

  The City publishes and distributes safety, educational and promotional information to encourage the use of bicycles and safe commuting including: air quality brochures, a Tempe Bicycle Parking Requirement Guide, a bikeways map and a quarterly newsletter. A bicycle safety and educational video is currently being developed and will be available for public use. Tempe hosted numerous events during Valley Bike Week 1997, including the regions most well-attended Bike to Work and School Day. Tempe, additionally, hosts an annual Fall Tour de Tempe Bike Rally to showcase existing and new bikeways, and provide instruction for appropriate cycling.

  The City of Tempe has included art into the design of bicycle lockers and racks. In an effort to improve the experience of the cyclist, four artist-designed bicycle racks have been installed in the Downtown Tempe area. Additionally, four artist-designed bicycle lockers are currently being completed and will be located at three City of Tempe sites. These projects are created through a partnership with the Tempe Arts Commission and the Transit Section.

  In September 1996, Tempe citizens passed the sales tax for transit, thereby creating a dedicated source of funding for significant improvements to the local bus, bicycle and pedestrian programs. Additionally, in February 1997 the City hired an Alternative Modes Specialist, with responsibility for bicycle coordination.

Implementation is ongoing. Expansion of the Tempe Bikeway System is done in accordance with the Bicycle Plan. Bicycle racks are installed with new development, and promotional activities are held annually. Transit Tax funds, federal grants and the City of Tempe Capital Improvement Program provide the funding source for the Tempe Bicycle Program. A base of $250,000 is earmarked from Transit Tax dollars annually, ISTEA and CMAQ grant monies have been used to supplement and maximize Tempe's funding.

- Maricopa County indicates that the Transportation Element of the Maricopa County Comprehensive Plan encourages an efficient, integrated, accessible, environmentally sensitive, and safe Countywide multi-modal system that promotes transit, bikeways, and pedestrian travel. Bicycling is recognized as an alternative method of transportation for recreational and work trips. Increased use of bicycles could be accommodated with improved facilities, increased public awareness of safety issues, and through enforcement of traffic laws.
  The following units could be used to measure attainment:

  1. Number of bicycle trips per household.
  2. Percentage of bicycle facilities used.

  The Maricopa County Department of Planning and Development under A.R.S. Section 11-806 (County Planning and Zoning) is mandated to prepare a comprehensive plan that may include recommendations relative to the location of bicycle facilities.

  The Comprehensive Plan is scheduled for adoption by the Maricopa County Board of Supervisors in 1997. Upon approval, implementation of items in the plan are foreseen to occur in an ongoing basis over the course of the planning horizon.

  Funding is provided by existing Planning and Development Department budget through the Comprehensive Plan adoption process and with normal Zoning/Plan Review staffing enforcement of the Zoning Code and Subdivision Regulations following adoption of the Plan.

- Regional Public Transportation Authority indicates that previously, the RPTA has administered three bike rack distribution programs (for jurisdictions, employers, and the downtown community bike program). Subject to the availability of future federal funds and local match, the RPTA would administer a bike rack distribution program. RPTA will also:

- Assist in the coordination of the Purple Bike Program with the County Adult Probation Department to provide free bikes for short trips in downtown.
- Encourage employers to procure secured bike parking for employees.
- Provide for the use of bike racks on all RPTA fixed route buses.

All activities are ongoing. Portions of up to fourteen professional staff (10 RPTA and 4 contract staff) will spend part of their time providing this information to the public and employers through the above specified activities. This measure is funded by a portion of the total budget for the Regional Ridesharing Program, TRP (RPTA) and CAC programs which is $1,248,000.

46. Alternative Work Schedules

- City of Avondale will offer alternative work schedules to employees to encourage off-peak driving and to accommodate the use of transit and ridesharing. The City management encourages department directors to meet and exceed the 85 percent participation rates defined in A.R.S. 49-454. Alternative work schedules are not limited to the time frame prescribed in the state law and are encouraged throughout the calendar year. Year-round alternative work schedule options are currently in progress. No additional funding is necessary to promote and monitor alternative work schedules.

- Town of Cave Creek has already implemented a 9-80 flextime policy, which is an option for all existing employees. In addition, the Town's public works crew works a staggered schedule and therefore is not required to commute during peak hours. Fifty percent of the Town's work force participates in these programs.

- City of Chandler has increased the number of employees who use alternate/flex work schedules or compressed work week schedules. Citywide, approximately 75 percent of all employees are on some type of alternate work week, with approximately 45 percent working a compressed work schedule. Additionally, the City has recently begun a telecommuting pilot project in an effort to identify appropriate positions and employees for telecommuting opportunities. Results of the pilot will be evaluated to determine how the program can be improved and expanded. Implementation will be ongoing. Funding is allocated through the annual budget process.

- City of El Mirage will look into the use of alternative work hours, to include: (1) workdays that either begins between the hours of 6:00 a.m. to 8:30 a.m. or avoids ending between 4:30 p.m to 5:30 p.m.; and (2) compress work

schedules, i.e., four ten-hour days or nine-day eight-hour pay period, to promote off-peak driving. Each City Department is responsible for establishing employee work schedules. Funding for this program is determined in the City's annual budget development process.

- Town of Gilbert offers alternative work schedules to employees to encourage off-peak driving and to accommodate the use of Ridesharing. The Town management encourages department directors to meet and exceed the 85 percent participation rates defined in A.R.S. 49-454. Alternative work schedules are not limited to the time frame prescribed in the state law and are encouraged throughout the calendar year. Year around alternative work schedule options are currently in progress. No additional funding is necessary to promote and monitor alternative work schedules.

- City of Glendale currently encourages the use of alternative work hours, including: 1) workdays that either begin at 7:30 a.m. and 8:30 a.m. or avoids ending between 4:30 p.m. to 5:30 p.m.; and 2) compressed work schedules, e.g., four ten-hour days or a nine-day eight-hour pay period, to promote off-peak driving. Currently in progress. Each City department is responsible for establishing employee work schedules. Funding for this program is determined in the City's annual budget development process.

- City of Goodyear currently encourages alternative work hours which includes four-ten-hour days to promote off-peak driving. Another option currently being evaluated is the "work at home" concept. With the upgrades in technology, City-issued equipment would allow employees to work at home which would reduce travel time. Currently in progress. Each City department is responsible for establishing employee work schedules. Funding for this program is determined in the City's annual budget development process.

- City of Mesa encourages the use of flexible or staggered work hours for its employees to promote off-peak driving and to accommodate the use of transit and ridesharing. Use of alternate work schedules including a four-day, ten-hour work week and nine-day-80 hour plans are encouraged to reduce the number of peak-hour work trips per employee. Since 1996, the alternative work schedule program has been encouraged on a year-round basis. Year around alternative work schedule options are currently in progress. No additional funding is necessary to implement the alternate work schedules. Schedules are monitored on an individual departmental basis to insure that service levels are maintained throughout the City.

- Town of Paradise Valley encourages alternative work schedules and offers the use of these schedules through the Maricopa County Trip Reduction Program. These schedules include 4-10 hour days, 9-day 80 hour weeks. The Town is in the process of developing a system for managers to have the capability to work at home as well. Over 70 percent of the Town's employees are currently on an alternative work schedule. All Town Departments participate in this program. Year-round alternative work schedule options are currently in progress. A full-time exempt employee volunteers their services on off-hours, at a cost of zero. The annual budget for this measure is from the Town's General Fund. Development and administration of the Trip Reduction Program Reduction Plan requires staff time equivalent to 0.20.

- City of Peoria indicates that a 9-80 alternative work schedule will be implemented in FY 1997-1998 for overtime-exempt employees to help improve air quality in Maricopa County. The City of Peoria has already successfully implemented a 4 day, 10 hour work week for approximately 141 employees, or 20 percent of the workforce. In FY 1997-1998, the City of Peoria will expand the alternative work schedule program to include 9-80 plans for overtime-exempt employees. Overtime-exempt employees include department directors, mid-management, supervisory and technical employees, and other professionals.

  The City of Peoria projects an additional 50 employees will participate in alternative work schedules by June 30, 1997. This will increase the total participation rate from 20 percent in FY 1996-1997 to 27 percent in FY 1997-1998. This will also provide an estimated reduction of 1,250 employee trips to the workplace. The following is the projected timeline for implementing the measure:

  July to August 1997- Identify eligible overtime-exempt employees to participate in program; September 1997 - Kick off of 9-80 alternative work schedule program; March 1998 - Track program and evaluate success of measure; May 1998 - Make modifications, if any, to 9-80 program.

  Implementation of the alternative work schedule measure requires no additional personnel or funding. Existing personnel in the Transit Division will absorb the direct costs, if any, of administering the alternative work schedule program.

- City of Phoenix offers alternative work schedules to employees to encourage off-peak driving and to accommodate the use of transit and ridesharing. The City management encourages department directors to meet and exceed the 85 percent participation rates defined in A.R.S. 49-454. Alternative work

schedules are not limited to the time frame prescribed in the state law and are encouraged throughout the calendar year. Year-round alternative work schedule options are currently in progress. No additional funding is necessary to promote and monitor alternative work schedules.

- City of Scottsdale encourages alternative work schedules to employees to encourage off-peak driving or enhance service levels to our citizens. City management encourages department general managers and directors to meet and exceed the 85 percent participation rates defined in A.R.S. 49-454. Alternative work schedules are not limited to the time frame prescribed in the state law and are encouraged throughout the calendar year.

  A June 1996 survey in response to Governor Symington's Air Pollution Emergency Proclamation showed that Scottsdale had 253 part-time and 1243 full-time employees. Of this number 390 worked alternative hours, 737 worked a compressed work week (9-80 or 4-10) and 137 traveled to and from work by means other than driving to work alone.

  The May 9, 1997 year 7 Trip Reduction Plans for the two major campuses of City facilities reported that 514 employees (in excess of 1/3 total employee base) currently have alternative work schedules. Year-round alternative work schedule options are currently in progress. The City has designated a full-time Transportation Coordinator. The City of Scottsdale Biennial Budget includes Transit Budget increases of 48.8 percent and 18.9 percent respectively for FY 1997-1999 over the previous budgets. No additional funding is necessary to promote and monitor alternative work schedules.

- City of Tempe indicates alternative work hours, or flextime, is currently used extensively throughout the City. In addition, staggered work hours are used. The City is creating and testing telecommuting as an option for applicable employees. Implementation is in progress. Funding is provided through the annual budget process.

- City of Tolleson indicates that in an effort to reduce commuter traffic at peak travel times during the summer months, the City of Tolleson commits to encourage the use of staggered work schedules that allow employees to select their own working hours with certain parameters. Measure is already in place. All employees of the City of Tolleson are encouraged to participate.

- Town of Youngtown indicates that the Youngtown Police Department has implemented a 4-day, 10-hour work week. This practice will stagger personnel schedules; thus decreasing Town and personnel vehicle usage. Currently in operation. No additional personnel or funding is required by this implementation.

- Maricopa County indicates that alternative work hours, or flextime, is an employer policy which enables workers to choose their own working hours within certain constraints. Flextime provides the opportunity for employees to use public transit, ridesharing, and other nonmotorized transportation. A related strategy, staggered work hours, is designed to reduce peak congestion in the vicinity of the workplace.

  Pursuant to A.R.S. Section 11-251 (General Powers of Board of Supervisors), A.R.S. Section 49-588 and A.R.S. 49-474.01 the Board adopted Maricopa County Ordinance P-8 Reduction of Commuter Use of Motor vehicles by County Employees in 1992. The ordinance provides the County Administrative Officer with the authority to approve and implement non-financial measures and to implement budgeted measures to reduce employee commute trips or the number of miles driven by county employees to and from work.

  Maricopa County conducted an employee awareness program in June 1996 and established goals of 90 percent participation in alternate modes for departmental employees. The County surveyed employees in the summer and again in the fall. This is an existing program administered by the designated transportation coordinator in the Human Resources Department. All supplemental costs for the outreach effort were absorbed by existing budgets.

- Arizona Department of Transportation indicates that as mandated by A.R.S. 41-796.01, 49-474.01, and Arizona Administrative Code R2-1-601-605, ADOT follows the rules developed by the Director of the ADOA to establish adjusted work hours for at least 85 percent of employees in the nonattainment area for the period October 1 to April 1. In addition, ADOT will continue to provide employees year-round options of alternative work schedules where service to the public will not be affected. This measure is also a component of the Employer Rideshare Incentives Program. Refer to BACM 97-TC-6.

  Statistical information compiled by ADOT for the period of October 1, 1996 through April 1, 1997 indicates that 90.2 percent of the 2,363 Phoenix area ADOT employees were participating in various types of adjusted work hour programs in the nonattainment area. These programs included flextime, staggered work hours, 4-ten hour days, telecommuting, and the 9 day-80 hour program

  No additional ADOT funding or employees were required to implement the above programs. Associated costs are covered by the ADOT administrative budget. Current adjusted work hours for ADOT employees in the Maricopa

County nonattainment area reflect a 90.2 percent compliance with regulations. Compliance figures are required each year by ADOA. Programs will be monitored through the normal ADOT management reporting processes and reported to the ADOA as appropriate.

An additional reporting requirement this year will be a Telecommuting report from all Arizona agencies, boards, and commissions to report on their progress in achieving a goal of 15 percent of state employees in Maricopa County participating in the program by December 31, 1998.

For the purposes of describing the Commitment, ADOT through the Transportation Planning Group Air Quality Planner, will conduct a study to evaluate the availability of opportunities for employees to participate in the adjusted work hour, trip reduction, and telecommuting programs in the nonattainment areas. This will identify possible opportunities for increased participation by removing current barriers and also provide documented reasoned justification for those work areas that are not able to participate. The reporting unit will be the number of employees participating.

- Regional Public Transportation Authority indicates that the RPTA facilitates up to one formal training bimonthly on compressed work weeks and/or alternative work schedules. Invited to these trainings are approximately 1,250 employers with about 580,000 employees and/or students at sites affected by the Maricopa County Trip Reduction Program. As needed, RPTA conducts special in-house training sessions and one-on-one assistance to employers. A "How to Implement a Compressed Work Week (CWW) Program" manual is available as part of the class. RPTA staff contacts employers affected by TRP to offer assistance several times annually, and is especially promoting the implementation of compressed work weeks to employers. A special mailing on compressed weeks to CEO's was mailed in 1997 with a brochure. A strong response from employers is generating follow up briefings and presentations to employer management committees. RPTA maintains an Internet web site with the following information on alternative work schedules:

  - Do CWW produce more trips
  - Picture Brochure
  - Sample Employer Survey
  - CWW's Impact on Air Pollution and Traffic Congestion
  - Training Schedule
  - Fact Sheet
  - Research Findings

  Formal MCTRP trainings will take place no less than an average of three times monthly. On-site assistance for individual employers is provided on an as-needed basis. Portions of up to fourteen professional staff (10 RPTA and

4 contract staff) will spend part of their time providing this information to the public and employers through the above specified activities. This measure is funded by a portion of the total budget for the Regional Ridesharing Program, TRP (RPTA) and CAC programs which is $1,248,000.

47. Land Use/Development Alternatives

- City of Avondale is implementing an In-Fill Program to encourage development of single-family homes in the central parts of the City. The program provides fee waivers and expedited development reviews to projects meeting certain standards of quality. Developers are required to provide pedestrian paths per the open space plan.

  In addition, the City of Avondale continues to implement general land use planning and development administration to improve the quality of life, promote land use compatibility, reduce infrastructure costs, promote accessibility, and reduce traffic congestion. Promotion of air quality is an integral part of this effort and a natural by-product.

  The General Plan and Area Specific Plans encourages alternatives to single-occupancy vehicle trips and encourages shorter trips and fewer vehicle trips through land use policies; zoning and subdivision ordinances; zoning stipulations; and design review policies.

  The City's planning and zoning program continue to support:

  - Adoption and implementation of street classification policies requiring safe space for bicycles and pedestrians and encouragement of transit in residential or mixed-use areas.
  - Designation of concentrated activity centers with emphasis on pedestrian and alternative forms of travel.
  - Linkage of activity centers by transit and bikeways.
  - Pedestrian access from transit stops into nonresidential uses and pedestrian access from neighborhoods into retail centers.
  - Inclusion of traffic-demand-management strategies in projects generating large amounts of traffic.
  - Development of trail systems Citywide through public and private dedications and financing.

  The Community and Economic Development (CEDD) continues to promote projects to encourage land use planning goals and objectives through building permits and approval of plot plans. The City continues to implement street-scape improvements including landscaping, sidewalks, pedestrian lighting, bus pads and shelters, and directional signage.

Implementation is in progress. Public funded projects are included in the Capital Improvements Program adopted annually as part of the City's budget.

General Plan policies are revised or added as required. Zoning and subdivision ordinances are amended as needed. Zoning stipulations for privately financed development are approved in conjunction with rezoning cases continually. Single and multi-family development and nonresidential development on major streets undergo site plans and/or design reviews, based on their proximity to residential areas or specific zoning districts.

Planning and Zoning Department staff are funded through the City's General Fund which is partially supported by rezoning and other development fees. Funding is allocated through the annual budget process.

- Town of Gilbert has committed to ensuring land use development is planned with the pedestrian in mind by creating an interrelated set of development policies.

  Staff drafted the Residential Subdivision Design guidelines that the Town Council adopted on September 10, 1996. The Town will use the document to encourage subdivision developers to create bicycle links between subdivisions and within planned bicycle trail corridors along canals and transmission easements.

  The Town Council enacted a residential zoning moratorium on September 24, 1996. One of the stated reasons for the moratorium was to allow the Town time to incorporate goals and policies from the 1996-2001 Parks, Open Space and Trails Plan into the General Plan.

  Implementation is in progress. Planning and Zoning Department staff are funded through the Town's General Fund which is partially supported by rezoning and other development fees. Funding is allocated through the annual budget process.

- City of Glendale indicates that the City's General Plan contains land use development policies that supports public transit and reduces travel distances. Currently in progress. The City's current General Plan contains several policies that encourages land use patterns which support public transit and reduces travel distances. General Plan policies are evaluated and revised on an annual basis. The City's Planning Department is responsible for land use planning. Funding for this program is determined in the City's annual budget development process.

- City of Goodyear indicates that the General Plan contains land use development policies that supports public transit and reduces travel distances. Currently in progress. A citizen's committee, with the help of local business representatives, will assist in evaluating the City's current General Plan. The General Plan contains several policies that encourages land use patterns which support public transit and reduces travel distances. General Plan policies are evaluated and revised on an annual basis. The City's planning department is responsible for establishing employee work schedules. Funding for this program is determined in the City's annual budget development process.

- City of Mesa indicates that the Mesa General Plan outlines goals, objectives and policies to promote a balanced transportation system that serves the needs of diverse economic, social, physical and geographical needs of Mesa's present and future residents. The City has an ongoing program to redevelop the downtown area. A major aspect of that planning process is a re-design of the downtown commercial and cultural area to encourage and promote pedestrian travel.

  The City is also pursuing the installation of new industrial and commercial developments to enhance and expand the local employment base. One of the goals of this efforts is to decrease the percentage of Mesa residents that must travel to employment sites outside of the City. Implementation is ongoing. New developments are regulated by the General Plan. Zoning and Planning and Community Development is responsible for developing and administering development policies and the General Plan and is funded through the annual budget process.

- Town of Paradise Valley indicates that the Town's general land use planning and one house per acre zoning requirement is a land use that contributes to, and promotes clean air by limiting the number of homes that could be built. The promotion of air quality is an integral part of the Town's commitment to reduce pollution. The Town's General Plan was recently revised and includes the implementation of landscaping, sidewalk, and recreation paths that encourage alternative modes of transportation throughout the Town. The Special Use Permit process now prohibits any use that will result in adverse pollution. Town of Paradise Valley, Planning Department. Implementation in progress. Personnel include the Town Planner, Town Zoning Administrator, Town Engineer. Annual budget, general fund.

- City of Peoria (through SPANS) will begin their annual update of the Peoria Comprehensive Master Plan in September 1997. At that time, staff will analyze the various use categories and land use policies to ensure the land use/development alternatives are supporting public transit and other alternative modes of transportation. Further, the Current Planning Division

of Community Development will review all land use applications ensuring that alternative modes of transportation (e.g., bus bays, bike paths, sidewalks) are being obtained when possible. Three full time staff members are assigned to the General Plan update and analysis. Four full time staff members are assigned to land use application reviews in Current Planning. The funding sources are through the City budget process which is not under review by the Peoria City Council.

- City of Phoenix is implementing an In-Fill Program to encourage development of single-family homes in the central parts of the City. The program provides fee waivers and expedited development reviews to projects meeting certain standards of quality and has assisted with the construction of 450 homes during 1996 and 1997.

  The City is also assessing impact fees on new development located in the northern and southern peripheral areas of the City at the time of building permit issuance. These fees are to help cover the cost of facilities to serve development in the areas covered by specific infrastructure financing plans. In 1996, the City updated the plans and raised the fees. Since these fees are not charged citywide, there is an incentive for development to locate in areas closer to most employment and services.

  In addition, the City of Phoenix continues to implement general land use planning and development administration to improve the quality of life, promote land use compatibility, reduce infrastructure costs, promote accessibility, and reduce traffic congestion. Promotion of air quality is an integral part of this effort and a natural by-product.

  The General Plan encourages alternatives to single-occupancy vehicles trips and encourages shorter trips and fewer vehicle trips through land use policies; zoning and subdivision ordinances; zoning stipulations; and design review policies.

  The City's planning and zoning programs continue to support:

  - Adoption and implementation of street classification policies requiring safe space for bicycles and pedestrians and encouragement of transit in residential or mixed-use areas.

  - Designation of concentrated activity centers (village cores) with emphasis on pedestrian and alternative forms of travel.

  - Linkage of activity centers by transit and bikeways.

  - Pedestrian access from transit stops into nonresidential uses and pedestrian access from neighborhoods into retail centers.

- Inclusion of traffic-demand-management strategies in projects generating large amounts of traffic.

- Designation of locations for Park-and-Ride lots and other transit facilities.

- Development of trail systems citywide through public and private dedications and financing.

The Community and Economic Development Department (CEDD) continues to promote projects to encourage land use planning goals and objectives through building permits and approval of plot plans. The City continues to implement street-scape improvements including landscaping, sidewalks, pedestrian lighting, bus pads and shelters, and directional signage.

Implementation is in progress. The In-Fill Program and revised development fees began in 1996. Public funded projects are included in the Capital Improvements Program adopted annually as part of the City's budget. General Plan policies are revised or added annually. Zoning and subdivision ordinances are amended as needed. Zoning stipulations for privately financed development are approved in conjunction with rezoning cases continually. Multi-family development and nonresidential development on major streets undergo site plans and/or design reviews, based on their proximity to residential areas or specific zoning districts. Planning and Zoning Department staff are funded through the City's General Fund which is partially supported by rezoning and other development fees. Funding is allocated through the annual budget process.

- City of Scottsdale continues to implement general land use planning and development administration to improve the quality of life, promote land use compatibility, reduce infrastructure costs, promote accessibility, and reduce traffic congestion. Promotion of air quality is an integral part of this effort and a natural by-product.

  The General Plan is currently being studied for revision. Revised air guidelines could include continued promotion of mass transit alternatives, future land use development and community design policy recommendations which specifically recognize air quality benefits of certain land use patterns.

  The Circulation Element of the General Plan encourages alternatives to single-occupancy vehicle trips and encourages shorter trips and fewer vehicle trips through land use policies; zoning and subdivision ordinances; zoning stipulations; and design review policies. The Transportation

Departments objectives for 1997-1999 is to update the Circulation Element of the General Plan.

The City of Scottsdale continues to promote projects to encourage land use planning goals and objectives through building permits and approval of plot plans. The City continues to implement streetscape improvements including landscaping, sidewalks, pedestrian lighting, bus pads and shelters, and directional signage. Implementation is in progress. City of Scottsdale, Community Planning, Community Development, Redevelopment, Economic Development and Transportation staff are funded in the Biennial Budget for FY 1997-1999.

- City of Tempe indicates that the recently adopted Tempe General Plan 2020 is committed to encourage City growth through in-fill development, land re-use and redevelopment efforts. This is especially critical to Tempe, since it is a land-locked community with less than 10 percent land available for development. The General Plan 2020 goals which support this measure include:

  - Develop and implement a Comprehensive Multi-modal Circulation Plan which provides mobility for all, complements land use and improves air quality. This includes the development of evaluation standards for arterial streets, the development of a multi-modal streets and travelways plan, and the development of a pedestrian plan. The Bicycle and Transit plans have already been developed.

  - Promote land development that integrates multiple modes of transportation, including transit, pedestrians and bicycles.

  - Create ordinances policies or design guidelines that support the Comprehensive Multi-modal Circulation Plan. In addition, development-related documents and review processes will be revised to encourage transit oriented development with new projects or redevelopment projects.

  - Encourage mixed use development and promotion of non-polluting modes of travel into urban design.

  Tempe has a very successful track record in implementing development projects in the downtown area. Over the next five years, there are an estimated 16 in-fill development projects which will bring over 2,000,000 square feet of mixed use development, 260 hotel rooms, and 700 housing units to the downtown area.

The City currently promotes pedestrian travel by improving pedestrian facilities such as the Mill Avenue and University Drive Pedestrian Enhancement projects which include improved landscaping, sidewalks, pedestrian lighting, and signage. The City will continue to improve pedestrian facilities and provide transit shelters at bus stops with a portion of the transit sales tax monies.

The Development Services Department has recently created several new higher residential zoning districts and is in process of creating new zoning districts within the City which emphasize mixed use and encourage transit oriented locations. They will also continue to promote in-fill mixed use development projects in the downtown area. The Public Works Department, Transportation Division is hiring a planner to develop transit oriented guidelines and participate in the development review process. In September 1996, Tempe citizens passed the Tempe Transit Tax, thereby creating a dedicated source of funding for significant improvements to the local bus, bicycle and pedestrian programs. This revenue will allow the City to hire the additional planner position. The zoning work is being accomplished by current Development Services staff and funding is provided through the annual budget process.

- Maricopa County indicates that the Land Use Element of the Maricopa County Comprehensive Plan encourages efficient land development that is compatible with adjacent land uses, well integrated with the transportation system, and sensitive to the natural environment. The Department of Planning and Development may integrate transportation planning with existing and future land use and promote the use of Development Master Plans (DMPs). DMP design plans strive to reduce the dependency on automobiles and consider alternative transportation modes such as transit, bikeways, equestrian trails, and pedestrian networks.

  The following units could be used to measure attainment:

  1. Number of vehicle trips per dwelling unit.
  2. Average trip length compared to existing developments.

  The Maricopa County Department of Planning and Development through its comprehensive plan has the authority under Arizona Revised Statutes Section 11-806 (County Planning and Zoning) and additionally from its authority to adopt and enforce Zoning ordinance provisions under A.R.S. Section 11-808 and A.R.S. Section 11-821.B.

  The Comprehensive Plan is scheduled for adoption by the Maricopa County Board of Supervisors in 1997. Upon approval, implementation of items in the plan are foreseen to occur on an ongoing basis over the course of the

planning horizon. Funding is provided by existing Planning and Development Department budget through the Comprehensive Plan adoption process and with normal Zoning/Plan Review staffing enforcement of the Zoning Code and Subdivision Regulations following adoption of the Plan.

- Regional Public Transportation Authority publishes a Passenger Facilities Handbook. This guide explains and blueprints off-street improvements for transit. Information is disseminated to assist local land planners, designers and developers on techniques for facilitating transit service delivery and encouraging transit patronage in new developments.

  The RPTA will continue to work with member jurisdictions, land planners, designers, and developers to develop new transit facilities when needed. Assistance with the development of off-street improvements for transit is included within the ongoing annual budget of the RPTA.

48. Encouragement of Pedestrian Travel

- City of Avondale is implementing an In-Fill Program to encourage development of single-family homes in the central parts of the City. The program provides fee waivers and expedited development reviews to projects meeting certain standards of quality. Developers are required to provide pedestrian paths per the open space plan.

  In addition, the City of Avondale continues to implement general land use planning and development administration to improve the quality of life, promote land use compatibility, reduce infrastructure costs, promote accessibility, and reduce traffic congestion. Promotion of air quality is an integral part of this effort and a natural by-product.

  The General Plan and Area Specific Plans encourages alternatives to single-occupancy vehicle trips and encourages shorter trips and fewer vehicle trips through land use policies, zoning and subdivision ordinances, zoning stipulations, and design review policies.

  The City's planning and zoning program continue to support:

  - Adoption and implementation of street classification policies requiring safe space for bicycles and pedestrians and encouragement of transit in residential or mixed-use areas.
  - Designation of concentrated activity centers with emphasis on pedestrian and alternative forms of travel.
  - Linkage of activity centers by transit and bikeways.
  - Pedestrian access from transit stops into nonresidential uses and pedestrian access from neighborhoods into retail centers.

- Inclusion of traffic-demand-management strategies in projects generating large amounts of traffic.
- Development of trail systems Citywide through public and private dedications and financing.

The Community and Economic Development Department (CEDD) continues to promote projects which encourage land use planning goals and objectives through building permits and approval of plot plans. The City continues to implement street-scape improvements including landscaping, sidewalks, pedestrian lighting, bus pads and shelters, and directional signage.

Implementation is in progress. Public funded projects are included in the Capital Improvements Program adopted annually as part of the City's budget.

General Plan policies are revised or added as required. Zoning and subdivision ordinances are amended as needed. Zoning stipulations for privately financed development are approved in conjunction with rezoning cases continually. Single and multi-family development and nonresidential development on major streets undergo site plans and/or design reviews, based on their proximity to residential areas or specific zoning districts.

Planning and Zoning Department staff are funded through the City's General Fund which is partially supported by rezoning and other development fees. Funding is allocated through the annual budget process.

- Town of Carefree is a semi-rural community with a population of approximately 2300 residents located on the north edge of the Phoenix metropolitan area. Approximately 96 percent or 48 miles of its 50 miles of streets are paved. The Town of Carefree has an ongoing maintenance program of mowing and trimming the shoulders of the streets to provide for full usage of street surfaces for vehicles, bicycles, and pedestrians. The Town of Carefree will continue to encourage bicycle and pedestrian travel and public awareness through its newsletter.

  This measure will be implemented by the Town of Carefree. Legal authority for this action is provided under Section 9-240-3(c) of the Arizona Revised Statutes. The maintenance of the streets and shoulders is continuous. The encouragement of bicycle and pedestrian travel and public awareness announcements will be periodical. The shoulder maintenance will be inspected periodically by the Street Superintendent who will provide reports to the Town Administrator.

  The annual cost of mowing and trimming the street shoulders is approximately $15,000 which is budgeted in the Street Department Maintenance Budget. The Town newsletter is published and distributed

three times per year for an annual cost of approximately $8,000 which is budgeted in the Town Council budget.

- Town of Fountain Hills agrees to encourage pedestrian travel within its commercial core and other areas. Developers that seek site plan approval for commercial development will be encouraged to provide easy and comfortable pedestrian connections with other commercial buildings in downtown Fountain Hills, thereby encouraging easy and comfortable pedestrian travel within the core. To the extent possible within existing deed restrictions, the development of common parking lots for the commercial core will be encouraged. The Town of Fountain Hills may also encourage developers to provide additional sidewalks where needed in multi-family and single family zoned areas to complete proposed pedestrian walking routes.

  This measure will be implemented by the Town of Fountain Hills Engineering Department. Legal authority for this action is provided under ARS Section 9-240- ”General Power of Council”. Encouragement of pedestrian travel will be integrated in the Fountain Hills’ General Plan. Since most of the commercial core, including the streets, is privately owned, the implementation schedule depends in large part upon the development of that core by private owners. Fountain Hills has little control over the timing of either commercial or multi-family development.

  Administration of plan development for this project will require staff time equivalent to 0.2 full-time employee, at an approximate cost of $8,000. This will be accomplished by current department personnel under the adopted Town budget for FY 1997-1998. This estimated total cost for construction will be $30,000, form the approved Town budget, as programmed in the Town Capital Improvement Program, plus substantial developer stipulations. This measure does not represent an ordinance, regulation, or rule requiring enforcement. Maintenance of sidewalks will be provided by the Town of Fountain Hills Street Department under the Town’s routine maintenance program.

- Town of Gilbert has committed to ensuring land use development is planned with the pedestrian in mind by creating an interrelated set of development policies.

  - Staff drafted the Residential Subdivision Design Guidelines that the Town Council adopted on September 10, 1996. The Town will use the document to encourage subdivision developers to create bicycle links between subdivisions and within planned bicycle trail corridors along canals and transmission easements.

- The Town Council enacted a residential zoning moratorium on September 24, 1996. One of the stated reasons for the moratorium was to allow the Town time to incorporate goals and policies from the 1996-2001 Parks, Open Space and Trails Plan into the General Plan.

Implementation is in progress. Planning and Zoning Department staff are funded through the Town's General Fund which is partially supported by rezoning and other development fees. Funding is allocated through the annual budget process.

- City of Glendale indicates that the City's General Plan contains policies that encourage pedestrian travel. Currently in progress. The City's current General Plan contains policies that encourage land use patterns that encourage pedestrian travel. General Plan policies are evaluated and revised on an annual basis. The City's Planning Department is responsible for land use planning. Funding for this program is determined in the City's annual budget development process.

- City of Goodyear indicates that the City's General Plan contains policies that encourage pedestrian travel. The City is considering a open space plan which will feature pedestrian walkways, bikeways, and equestrian trails. Currently in progress. The City's current General Plan contains policies that encourage land use patterns that encourage pedestrian travel. General Plan polices are evaluated and revised on an annual basis. The City's Planning Department is responsible for land use planning. Funding for this program is determined in the City's annual budget process.

- City of Peoria indicates that this process is ongoing through the review of capital improvement projects, subdivision and site plan review, and assisting the school districts in their long term planning. Every project is now analyzed to ensure that development is encouraging pedestrian travel. Conditions of approval for all site plans and subdivisions include sidewalks and pathways. All land use development applications are referred to the appropriate school district to enable them to better locate their school sites to serve the neighborhoods. Further, the Public Works Department sponsors a clean air campaign which encourages the use of pedestrian travel. This campaign involves contacting the majority of Peoria citizens through promotional efforts.

  The Public Works Department employs seven full time staff members who review capital improvement projects, site plans and subdivisions. One full time employee oversees the public transit division and oversees promotional efforts. The Current Planning Division of the Community Development

Department employs four full staff time members who review site plans and subdivisions as well as work with the School District planners.

- City of Phoenix is implementing an In-Fill Program to encourage development of single-family homes in the central parts of the City. The program provides fee waivers and expedited development reviews to projects meeting certain standards of quality and has assisted with the construction of 450 homes during 1996 and 1997.

  The City is also assessing impact fees on new development located in the northern and southern peripheral areas of the City at the time of building permit issuance. These fees are to help cover the cost of facilities to serve development in the areas covered by specific infrastructure financing plans. In 1996, the City updated the plans and raised the fees. Since these fees are not charged citywide, there is an incentive for development to locate in areas closer to most employment and services.

  In addition, the City of Phoenix continues to implement general land use planning and development administration to improve the quality of life, promote land use compatibility, reduce infrastructure costs, promote accessibility, and reduce traffic congestion. Promotion of air quality is an integral part of this effort and a natural by-product.

  The General Plan encourages alternatives to single-occupancy vehicle trips and encourages shorter trips and fewer vehicle trips through land use policies, zoning and subdivision ordinances, zoning stipulations, and design review policies.

  The City's planning and zoning programs continue to support:

  - Adoption and implementation of street classification policies requiring safe space for bicycles and pedestrians and encouragement of transit in residential or mixed-use areas.

  - Designation of concentrated activity centers (village cores) with emphasis on pedestrian and alternative forms of travel.

  - Linkage of activity centers by transit and bikeways.

  - Pedestrian access from transit stops into nonresidential uses and pedestrian access from neighborhoods into retail centers.

  - Inclusion of traffic-demand-management strategies in projects generating large amounts of traffic.

- Designation of locations for Park-and-Ride lots and other transit facilities.

- Development of trail systems citywide through public and private dedications and financing.

The Community and Economic Development Department (CEDD) continues to promote projects to encourage land use planning goals and objectives through building permits and approval of plot plans. The City continues to implement streetscape improvements including landscaping, sidewalks, pedestrian lighting, bus pads and shelters, and directional signage.

Implementation is in progress. The In-Fill Program and revised development fees began in 1996. Public funded projects are included in the Capital Improvements Program adopted annually as part of the City's budget. General Plan policies are revised or added annually. Zoning and subdivision ordinances are amended as needed. Zoning stipulations for privately financed development are approved in conjunction with rezoning cases continually. Multi-family development and nonresidential development on major streets undergo site plans and/or design reviews, based on their proximity to residential areas or specific zoning districts. Planning and Zoning Department staff are funded through the City's General Fund which is partially supported by rezoning and other development fees. Funding is allocated through the annual budget process.

- City of Scottsdale considers pedestrian travel to be an integral part of citizen mobility. The City has an adopted Bicycle/Pedestrian Transportation Plan. Presently the City publishes and distributes a map of the multi-use path system which includes safety information.

  The Circulation Element of the General Plan encourages alternatives to single-occupancy vehicle trips and encourages shorter trips and fewer vehicle trips through land use policies; zoning and subdivision ordinances; zoning stipulations; and design review policies. The Transportation Department's objectives for 1997-1999 is to update the Circulation Element of the General Plan.

  Implementation is in progress. Planning and Zoning Department staff are funded in the Biennial Budget for FY 1997-1999.

- City of Tempe indicates that the recently adopted Tempe General Plan 2020 is committed to encourage City growth through in-fill development, land re-use and redevelopment efforts. This is especially critical to Tempe, since it is a land-locked community with less than 10 percent land available for

development. The General Plan 2020 goals which support this measure include:

- Develop and implement a Comprehensive Multi-modal Circulation Plan which provides mobility for all, complements land use, and improves air quality. This includes the development of evaluation standards for arterial streets, the development of a multi-modal streets and travelways plan, and the development of a pedestrian plan. The Bicycle and Transit plans have already been developed.

- Promote land development that integrates multiple modes of transportation, including transit, pedestrians, and bicycles.

- Create ordinance policies or design guidelines that support the Comprehensive Multi-modal Circulation Plan. In addition, development-related documents and review processes will be revised to encourage transit oriented development with new projects or redevelopment projects.

- Encourage mixed use development and promotion of non-polluting modes of travel into urban design.

Tempe has a very successful track record in implementing development projects in the downtown area. Over the next five years, there are an estimated 16 in-fill development projects which will bring over 2,000,000 square feet of mixed use development, 260 hotel rooms, and 700 housing units to the downtown area.

The City currently promotes pedestrian travel by improving pedestrian facilities such as the Mill Avenue and University Drive Pedestrian Enhancement projects which include improved landscaping, sidewalks, pedestrian lighting, and signage. The City will continue to improve pedestrian facilities and provide transit shelters at bus stops with a portion of the transit sales tax monies.

The Development Services Department has recently created several new higher residential zoning districts and is in process of creating new zoning districts within the City which emphasize mixed use and encourage transit oriented locations. They will also continue to promote in-fill mixed use development projects in the downtown area. The Public Works Department, Transportation Division is hiring a planner to develop transit oriented guidelines and participate in the development review process.

In September 1996, Tempe citizens passed the Tempe Transit Tax, thereby creating a dedicated source of funding for significant improvements to the local bus, bicycle and pedestrian programs. This revenue will allow the City

to hire the additional planner position. The zoning work is being accomplished by current development services staff and funding is provided through the annual budget process.

- City of Tolleson encourages pedestrian travel among its citizens and employees. This measure will be strengthened by further raising awareness via the Tolleson Flyer, the City Newsletter, outlining the benefits of walking as well as other alternative modes of transportation. The scheduled duration of this measure encompasses the months of September through December 1997 and March through June 1998. City of Tolleson General Funds, approximately $7,600 yearly for newsletter publication.

- Maricopa County indicates that the Transportation Element of the Maricopa County Comprehensive Plan encourages an efficient, integrated, accessible, environmentally sensitive, and safe County-wide multi-modal system that promotes transit, bikeways, and pedestrian travel. Provisions for pedestrian travel are included in the plan. Walking is recognized as a useful mode of travel for school, convenience shopping, recreation, social, and work trips and can be accommodated with improved facilities and appropriate urban design.

  The following units could be used to measure attainment:

  1. The percentage of Development Master plans constructed with pedestrian enhancements.

  2. Average vehicle trips per household compared to existing developments.

  The Maricopa County Department of Planning and Development under Arizona Revised Statutes Section 11-806 (County Planning and Zoning) is mandated to prepare a comprehensive plan that may include recommendations relative to the location of bicycle facilities.

  The Comprehensive Plan is scheduled for adoption by the Maricopa County Board of Supervisors in 1997. Upon approval, implementation of items in the plan are foreseen to occur on an ongoing basis over the course of the planning horizon.

  Funding is provided by existing Planning and Development Department budget through the Comprehensive Plan adoption process and with normal Zoning/Plan Review staffing enforcement of the Zoning Code and Subdivision Regulations following adoption of the Plan.

- Regional Public Transportation Authority indicates that the RPTA will encourage pedestrian travel. Educational efforts including a “Pedestrian Friendly Guidebook” and “Livable Cities” presentation will be targeted at approximately 1,250 employers with sites affected by the Maricopa County Trip Reduction Program. RPTA will assist and co-host a pedestrian conference with MAG.

  The Regional Public Transportation Authority as the regional transit agency for Maricopa County (A.R.S. 48-5101) provides these services to improve mobility and air quality. The schedule for planned promotional activities are as follows:

  - MCTRP employer trainings
  - Information will be distributed through transportation (information) fairs
  - Co-host the annual Pedestrian Conference with MAG

  Portions of up to fourteen professional staff (10 RPTA and 4 contract staff) will spend part of their time providing this information to the public and employers through the above specified activities. This measure is funded by a portion of the total budget for the Regional Ridesharing Program, TRP (RPTA) and CAC programs which is $1,248,000.

49. <u>Restrictions on the Use of Gasoline-Powered Blowers for Landscaping Maintenance</u>

- City of Avondale indicates that the Community Development Department continues to have a policy to avoid the use of blowers for City landscaping activities. The operations have generally been replaced with vacuums and brooms. Desert landscaping will continue to be used where practical to reduce the need for mowing and other lawn care. Implementation is in progress. Funding is allocated through the annual budget process.

- Town of Buckeye indicates that desert landscaping will be encouraged to reduce the need for blowers. City ordinance disallows for the use of blowers. The Public Works Department is already implementing this measure, ongoing. Funding is provided through the Town’s General Fund.

- City of Chandler will reduce the use of gasoline powered blowers by City employees during FY 1998. As contracts for the maintenance of City owned property are re-bid, the City will work with contractors to use cleaner-burning equipment; specifically, motors that comply with either “CARB 95" or “EPA Phase I” standards. Implementation will be ongoing. Funding is allocated through the annual budget process.

- City of El Mirage currently does not use any gasoline-blowers for landscape maintenance on City facilities. If the need arises to purchase blowers, the City will explore the possibility of restricting the use of gasoline-blowers. Implementation as needed. The City's Parks Maintenance and Streets Department will provide the evaluations. Funding for the implementation of this measure is determined in the City's annual budgeting process.

- Town of Gilbert commits to adopt restrictions on the use of blowers concurrently with the county and other municipalities. The Town will consider purchasing a vacuum during FY 1997-1998. Implementation is in progress. Funding is allocated through the annual budget process.

- City of Glendale will explore the possibility of restricting the use of gasoline-blowers for landscape maintenance on City facilities. In progress and as needed. The City's Parks Maintenance and Right-of-Way divisions will provide the evaluations. Funding for the implementation of this measure is determined in the City's annual budgeting process.

- City of Goodyear will explore the possibility of restricting the use of gasoline-blowers for landscaping maintenance on City facilities. In progress as needed. The City's Parks Maintenance and Right-of-Way divisions will provide the evaluations. Funding for the implementation of this measure is determined in the City's annual budgeting process.

- City of Phoenix continues to have a policy to avoid the use of blowers for City landscaping activities. The operations have generally been replaced with vacuums and brooms. Desert landscaping will continue to be used where practical to reduce the need for mowing and other lawn care. In 1994, the citizen-based City's Environmental Quality Commission studied options for restrictions on blowers used by private citizens and businesses. The Commission recommended that the City should not adopt restrictions on private use landscape blowers based on the emerging EPA standards for non-road engines and the information available on relative contribution of this activity to PM-10 levels. Implementation is in progress. Funding is allocated through the annual budget process.

- City of Scottsdale Community Maintenance and Recreation Department no longer uses gas-powered leaf blowers to maintain landscaping in the Civic Center Mall. Various options including vacuums, brooms, and use of electric powered equipment have been piloted.

  City contracts with landscape maintenance companies for the Civic Center Mall prohibit use of gas-powered leaf blowers. City contract for cleaning and maintenance of Scottsdale Stadium prohibits use of gas-powered leaf blowers (except for 6 select dates during the year).

The City now purchases 4-stroke lawnmowers to replace older mowers. The City will consider options for a pilot program to evaluate alternatively powered lawn-care equipment, including hydrogen powered and electric powered equipment.

Widespread use of desert landscaping will continue where practical to reduce the need for mowing and other lawn care.

The City of Scottsdale Environmental Management Office (EMO) has studied options for restrictions on blowers used by private citizens and businesses. EMO will consider recommending a voluntary scrappage program for gas-powered leaf blowers, rather than recommending that the City adopt restrictions on private use landscape blowers. These recommendations will be based on: The emerging EPA standards for non-road engines and the information available on relative contribution of this activity to PM-10 and PM-2.5 air pollution levels. Implementation is in progress. Funding is allocated through the biennial budget process.

- City of Surprise will utilize electric blowers where power is reasonably available. In addition, the City recently purchased a chipper/vac ($1,700) as an alternative to blowing. The City will purchase an electric blower in FY 1998. Funding for this measure will come from the City's General Fund.

- City of Tempe currently allows gas blowers to be used only in the downtown area, and only during certain hours, generally before 6:00 a.m. This action is part of the Downtown Merchants Association agreement and will continue to be enforced. Other areas of the City are blown less frequently, and only during the early morning hours. Electrical equipment is used wherever possible.

  The City continues to avoid the use of gas powered landscape equipment as much as possible. Many operations are generally being done by brooms. Desert landscaping will continue to be used where practical to reduce the need for mowers and blowers.

  Implementation is in progress. Funding is allocated through the annual budget process.

- Town of Wickenburg will utilize alternative blowers in maintenance of its parks and recreational facilities insofar as it is practical. Some of these facilities are so located, however, that electrical power is not practical.

  As present equipment wears out, efforts will be made to replace gasoline-powered blowers with electrical blowers. However, as above mentioned,

there are facilities outside the reach of electrical power. Funding will come from the Town's General Fund, which annually includes appropriation for capital equipment.

50. Alternative Fuels for Fleets

- Regional Public Transportation Authority indicates that State law (A.R.S. Section 49-571; Clean Burning Fuel Requirements for New Buses; 1992) requires a city, town, or county which purchases buses for use in a county with a population of more than five hundred thousand persons from and after December 31, 1993 shall only purchase buses which operate on clean burning alternative fuel. RPTA purchases only alternatively fueled buses for operation by its contractors.

  RPTA, and its member agencies, have already begun an aggressive campaign to purchase, convert, and replace older, higher polluting Diesel buses. The regional transit fleet now consists of 52 dedicated compressed natural gas (CNG) vehicles, 43 bifuel CNG/gas dial-a-ride vehicles, 11 propane powered dial-a-ride vehicles, and one electric bus.

  Future commitments include the pending delivery of 180 low floor, forty-foot buses. These vehicles should be delivered beginning May 1998 and will operate solely on liquefied natural gas (LNG). The City of Tempe is expecting delivery of nine, thirty-five foot buses and 15 thirty-foot buses which shall also operate on LNG.

  A retrofit program has already replaced the engines of 75 middle aged buses with clean burning Diesel engines and oxidation catalysts that meet 1994 EPA Urban Bus Heavy-Duty Engine Standards. Sixty-seven (67) of these buses belong to the City of Phoenix and eight are owned by the RPTA.

  This measure represents an ordinance. Funding shall come from the RPTA and member agency capital improvement budgets. Incremental costs for alternative fueled vehicles may be reimbursed by the Arizona Department of Commerce Energy Office through the Clean Air Fund.

51. Areawide Public Awareness Programs

- Regional Public Transportation Authority indicates that an areawide public awareness program will be targeted to the almost 1,250 employers with about 580,000 employees and students for all sites affected by the Maricopa County Trip Reduction Program, employers not affected by TRP and the general public through the Clean Air Campaign. Employer promotional kits are mailed to 1,250 employers with 2,500 sites up to four times per year. There is paid radio and TV advertising for eight weeks during the winter

pollution season. Events will be conducted to increase awareness of alternative modes of transportation and work schedules through Rideshare Week and Valley Bike Week. Workshops will be held to increase participation in Clean Air Campaign events.

By Arizona Statute 49-506, Maricopa County must conduct a voluntary no-drive day campaign. Maricopa County contracts with RPTA to conduct this campaign. Other sponsors of the Clean Air Campaign include the Arizona Departments of Transportation and Environmental Quality, MAG, Maricopa County and the Phoenix Chamber of Commerce.

The schedule for planned activities are as follows:

- Ongoing public and media relations program
- TV, radio, and print advertising is placed during the winter high pollution season.
- Clean Air Campaign event workshops will be held in the fall.
- Promotional events are scheduled:

  Rideshare Week-November 1997
  Earth Day activities - April 1998
  Valley Bike Week - Week 1998
  Fresh Air Science Fair - March 1998
  Summer ozone pollution promotion - June - September - 1998
  Telecommute America Campaign - October

- High Pollution Advisory faxes are sent to over 700 Valley employers during the winter and summer high pollution season when it is “forecast” by the County or ADEQ to potentially exceed federal air quality standards. Tips are provided to encourage high levels of participation on these days.

Portions of up to fourteen professional staff (10 RPTA and 4 contract staff) will spend part of their time providing this information to the public and employers through the above specified activities. This measure is funded by a portion of the total budget for the Regional Ridesharing Program, TRP (RPTA) and CAC programs which is $1,248,000. The Clean Air Campaign budget is estimated to be about $350,000 of this total.

PART 3: ADDITIONAL COMMITMENTS FOR MEASURES NOT ON THE SUGGESTED LIST

52. Encouragement of Vanpooling

- Regional Public Transportation Authority indicates that this measure involves assisting employers in the formation of new vanpools. Efforts will be targeted at employers with sites affected by the Maricopa County Trip Reduction Program (MCTRP) and the general public through the Regional Ridesharing Program. Currently 121 vanpools are operating with about 1085 riders. This represents a 270 percent increase from 33 vanpools since RPTA's last air quality commitment.

  The Regional Public Transportation Authority as the regional transit agency for Maricopa County (A.R.S. 48-5101) provides these services to improve mobility and air quality. The schedule for promotional activities are as follows:

  - Vanpool presentations to employers upon request, estimated one per month.
  - Provide vanpool collateral material to all interested parties. New material is being developed in 1997.
  - Provide vanpool matching on a daily basis.
  - Conduct vanpool group formation meetings with potential groups (about 2-5 per month) at request of employer.
  - RPTA staff will assist employers in promoting vanpools and will encourage employers to provide subsidies to their employees.

  RPTA commits one full-time professional staff to promote vanpooling. RPTA has budgeted $680,000 for the vanpool services contract in 1997-1998 which will accommodate 155 vanpools by the year end. Funding for capital expenses will be made available to RPTA through a Federal Transit Administration Section 9 grant and local match. Seventy percent are FTA Section 9 funds and 30 percent are local funds. Passenger fares account for 100 percent of operating costs.

53. Trip Reduction Program

- Regional Public Transportation Authority indicates that the RPTA provides formal trainings, one-on-one assistance, facilities Transportation Management Associations (TMA), and provides informational materials to over 1,250 employers in Maricopa County with 50 or more employees at a site. The Trip Reduction Program affects approximately 580,000 employees

and students at 2,500 sites countywide. The Regional Public Transportation Authority is on contract with Maricopa County to provide services to employers affected in the Trip Reduction Program under A.R.S. 49-581 through 49-593.

The schedule for planned promotional activities are as follows:

- Employer trainings (attended by 20-60 employers a month include: Introduction to TRP, Plan Writing Workshop, Marketing TRP, Telecommuting, Compressed work week programs).
- Employer Transportation Fairs based on employer request.
- Fourteen Transportation Management Associations (TMA's) periodic meetings.
- Over 400 employer contacts made monthly.

Portions of up to fourteen professional staff (10 RPTA and 4 contract staff) will spend part of their time providing this information to the public and employers through the above specified activities. This measure is funded by a portion of the total budget for the Regional Ridesharing Program, TRP (RPTA) and CAC programs which is $1,248,000 of which $819,000 is specific to the Trip Reduction Program. Maricopa County contracts with RPTA to provide TRP support services.

54. Park and Ride Lots

- Regional Public Transportation Authority indicates that the RPTA works with member agencies to promote and expand Park and Ride lots as a means to encourage ridesharing and the use of transit. As of December 1996, sixty (60) Park and Ride lots and four (4) transit centers provided 2,556 parking spaces throughout the region. Currently, two new permanent park and ride facilities are being developed. These facilities will be located near 32nd Street and SR 51 (Squaw Peak Highway) and Bell Road and I-17 (Black Canyon Freeway).

  The RPTA will continue to work with member jurisdictions, private entities, and employers in the development, design, and implementation of new Park and Ride facilities in locations where they are needed. Park and Ride activities are in the ongoing annual budgets of the RPTA and its member jurisdictions.

55. Encouragement of Telecommuting, Teleworking and Teleconferencing

- Regional Public Transportation Authority indicates that the RPTA encourages the use of telecommuting and telecommunications to replace motor vehicle trips such as working at home or remote work centers close to

home. RPTA efforts are targeted largely at the 1,250 employers with about 580,000 employees and/or students. A *Step-By-Step* telecommuting training class is provided to employers planning to implement a telecommuting program. A "how to" implement guidebook is provide to those attending. On-site assistance to employers is also available. RPTA pro-actively seeks out employers with an interest and gives management briefings and follow up consultation until their programs are up and running. RPTA maintains an Internet web site to include the following telecommuting information and materials:

Telecommuting Preview w/FAQs
Telecommuting Fact Sheets
Sample Telecommuting Policies
Research Instruments
Training Schedule
Sample Management Presentations
Sample Agreement
Telecommuting Research Projects

RPTA participates in an in-house formal telecommuting program. In 1996, 15 of RPTA's 25 employees participated as telecommuters. RPTA staff also participates in the Arizona Telecommuting Advisory Council (Chapter member of TAC): The International Telework Association, which encourages and assists Arizona employers in developing and implementing telecommuting programs.

The schedule for planned activities are as follows:

- MCTRP telecommuting trainings are given at least once monthly.
- On an as needed basis, assist employers with all stages of implementation for telecommuting programs including management briefings.
- Participate monthly in AzTAC meetings for interagency cooperation.
- RPTA's telecommuting program is ongoing.
- Promote during Telecommute America Week, October 1997 (national campaign)

Portions of up to fourteen professional (10 RPTA and 4 contract staff) will spend part of their time providing this information to the public and employers through the above specified activities. This measure is funded by a portion of the total budget for the Regional Ridesharing Program, TRP (RPTA) and CAC programs which is $1,248,000.

56. <u>Promotion of High Occupancy Vehicle Lanes and By-Pass Ramps</u>

- Regional Public Transportation Authority indicates that as new facilities open, RPTA will coordinate the promotion of rideshare activities. Efforts will be

targeted at 1,250 employers representing over 500,000 employees and students affected by the Maricopa County Trip Reduction Program (MCTRP) and the general public through the Clean Air Campaign (CAC).
The Regional Public Transportation Authority as the regional transit agency for Maricopa County (A.R.S. 48-5101) provides these services to improve mobility and air quality. The schedule for planned promotional activities are as follows:

- Employers' Transportation Fairs based on employers request.
- Fourteen Transportation Management Associations periodic meetings as appropriate.
- Mailings to employers prior to new HOV lane segment opening or expansion.

Portions of up to fourteen professional (10 RPTA and 4 contract staff) will spend part of their time providing this information to the public and employers through the above specified activities. This measure is funded by a portion of the total budget for the Regional Ridesharing Program, TRP (RPTA) and CAC programs which is $1,248,000.

TRACKING PLAN IMPLEMENTATION

The Maricopa County Environmental Services Department determines reasonable further progress, and reviews the implementation status of the various measures contained in the air quality plans on an annual basis. In order to accurately monitor or track plan implementation, the Maricopa County Environmental Services Department will be requesting that the implementing agencies and jurisdictions complete the annual progress report form contained in Appendix C, Exhibit 1. The Environmental Services Department will then review and summarize this information, prepare an implementation status report, and then present the report to the MAG Air Quality Policy Committee. The Maricopa County Environmental Services Department will also continue to have the responsibility for conducting ambient air quality monitoring. The most recent progress report entitled, MAG Air Quality Plan 1996 Annual Progress Report (July 1998) is provided in Appendix B, Exhibit 2.

Supplemental to the tracking efforts of the Maricopa County Environmental Services Department, the Maricopa Association of Governments publishes regional traffic flow maps and calculates regional vehicle miles of travel from these flow maps. MAG also conducts vehicle occupancy studies and performs special traffic volume and speed studies, as needed. Phoenix Public Transit continuously monitors transit ridership and summarizes daily ridership for each month. The Regional Public Transportation Authority will also be collecting transit and carpooling ridership information. The Arizona Department of Environmental Quality continuously monitors the number of vehicles inspected in the Vehicle Inspection Maintenance Program, the number of vehicles failing the test, and the improvement in tail pipe emissions after failed vehicles are repaired.

In addition, the MAG Air Quality Technical Advisory Committee and the MAG Air Quality Policy Committee will review the implementation report prepared by the Maricopa County Environmental Services Department. The committees will also review the air quality monitoring data on an annual basis to assist in tracking air quality improvement over time.

ASSURANCES THAT THE STATE HAS THE AUTHORITY TO IMPLEMENT THE MEASURES IN THE PLAN

In order to comply with Section 110(a)(2)(E) of the Clean Air Act, a State law was passed in 1992 which provides an approach for assurances that State and local committed measures will be adequately implemented (A.R.S. Section 49-406 I. and J.). If any person (includes State, County, local governments, regional agencies, and other entities) fails to implement a committed measure, the County would file an action in Superior Court to have the Court order that the measure be implemented. Likewise, the Director of the Arizona Department of Environmental Quality will backstop the County if it fails to implement a committed measure or if the County fails to backstop the local governments and regional agencies (see Appendix C, Exhibit 2).

Regarding committed measures, A.R.S. Section 49-406 G. (passed by the Legislature in 1992) requires that each agency which commits to implement any control measure contained in the State Implementation Plan must describe the commitment in a resolution. The resolution must be adopted by the appropriate governing body of the agency. State law also requires the entity to specify the following information is the resolutions: (1) its authority for implementing the limitation or measure as provide in statue, ordinance, or rule; (2) a program for the enforcement of the limitation or measure; and (3) the level of personnel and funding allocated to the implementation of the measure.

As noted in the MAG regional air quality plans, the action taken by the MAG Regional Council to approve the Suggested Measures and Adopted Plan Measures does not commit each jurisdiction to implement those measures. As indicated in the resolutions and commitments, each jurisdiction determines which measures are reasonably available for implementation by that jurisdiction.

CHAPTER NINE

DEMONSTRATION OF ATTAINMENT STATUS

Chapter Nine covers several of the key elements of the carbon monoxide planning process, including a summary of control measures commitments and modeling assumptions, and an assessment of future air quality conditions and attainment status. In addition, issues such as contingency measures, reasonable further progress, and air quality conformity are addressed.

COMMITTED MEASURE DESCRIPTIONS

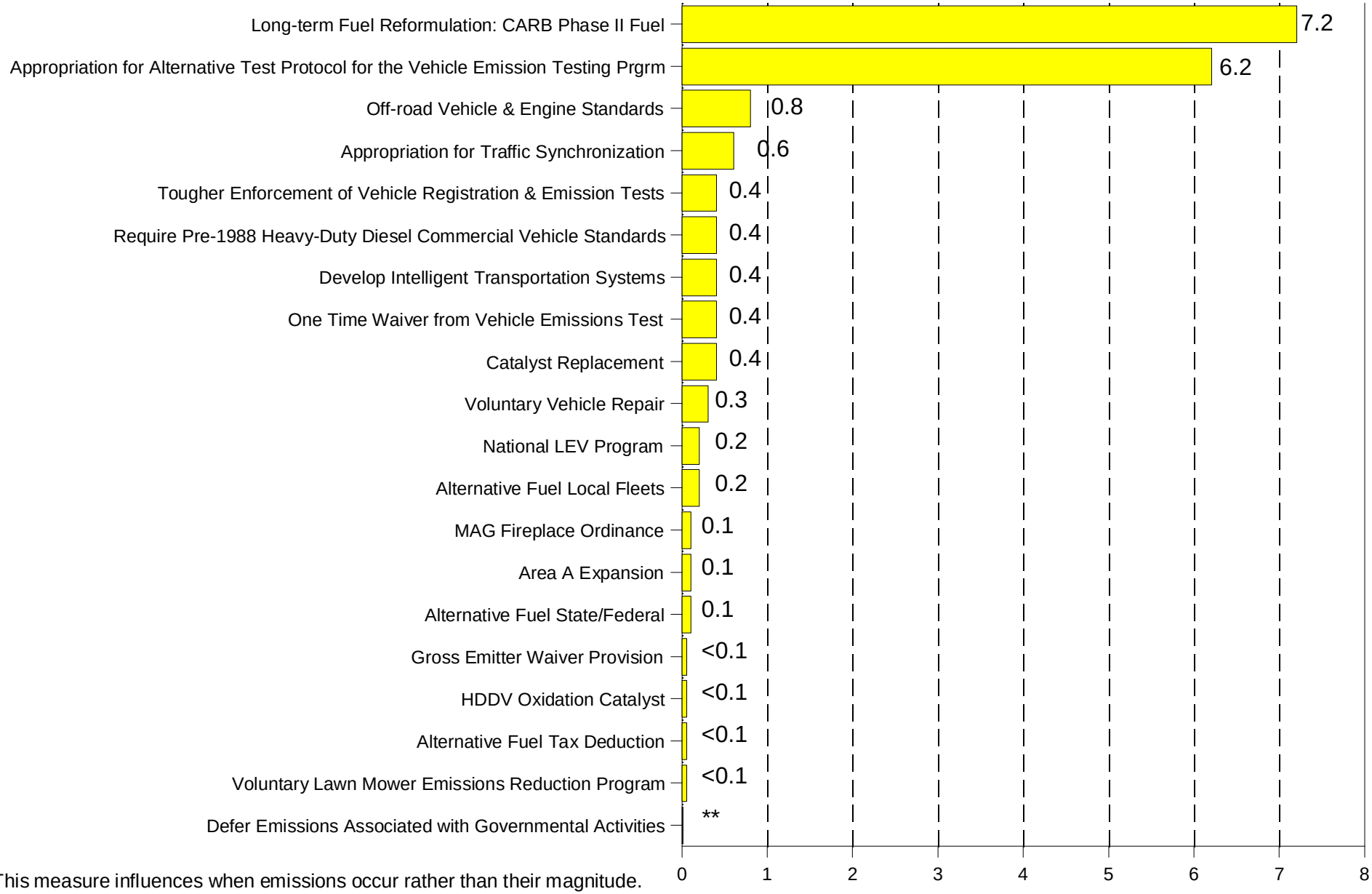
A description of the committed air quality measures is provided below. These include H.B. 2307, H.B. 2237, S.B. 1002, S. B. 1427, S.B. 1269, H.B. 2347, and local government commitments. The first group of measures includes those measures which will be used for numeric credit. The modeling approach for the measures is also provided, along with a summary of reasoned justification for nonimplementation, as appropriate. The second group of measures includes additional measures for which commitments were received, but are not used for numeric credit. The impacts of these measures were not readily quantifiable, and no credit was taken for the associated emission reductions. However, the measures clearly represent additional efforts by the region to reduce emissions and improve air quality.

Figure 9-1 presents a summary of the modeling results for the individual control measures for 2000. The data are presented in terms of the percent reduction in total CO emissions. This percentage was calculated on the basis of the difference between total regional emissions without the measure (base case) minus emissions with the measure, divided by the total CO emissions for the base case. The emissions were those modeled for December 16 and 17, 1994. These individual reductions may not be added directly to obtain the total reduction because some measures interact. To determine the total reduction, the measures must be processed in combination through the full modeling chain.

As indicated in Figure 9-1, the foundation of the Plan is provided by measures affecting fuels. Enhanced effectiveness of the I/M Program as the new cutpoints are phased in by 1999 provides a six percent reduction in 2000. Long-term fuel reformulation contributes an additional seven percent. These measures are supplemented by a number of other mobile source reductions, including traffic control signal synchronization (0.6 percent), intelligent transportation systems (0.4 percent), and tougher enforcement for vehicle emissions testing (0.4 percent).

Figure 9-1

2000 Carbon Monoxide Emission Reductions from Individual Measures



** This measure influences when emissions occur rather than their magnitude.

I. Measures Used for Numeric Credit

1. Long - Term Fuel Reformulation: CARB Phase II Fuel

Related to measure 97-CF-1 in the Suggested List of Measures for Particulate Matter and Carbon Monoxide, Revised March 26, 1997.

Beginning November 1, 2000 through March 31, 2000 and from November 1 through March 31 of each subsequent year, H.B. 2347 requires all gasoline produced and shipped to Maricopa County and sold or offered for sale for use in motor vehicles in area A comply with standards for California Phase II formulated gasoline as adopted by California Air Resources Board. In addition, the oxygen content must not be less than ten percent by volume of ethanol nor more than the maximum percentage allowed by the EPA.

A January 30, 1998 Draft report from MathPro titled Evaluation of Gasoline and Diesel Fuel Options for Maricopa County suggests an average future fuel formulation which is likely to be present in Area A with the passage of a law requiring CARB Phase II fuel. The formulation is shown in Table 9-1.

TABLE 9-1. Estimated Baseline Properties for Gasoline Starting With the Winter 2000-2001 Season.

Property	Units	Value
RVP	psi	8.7
Oxygen Content	wt. %	3.5
Sulfur Content	ppm	20
Aromatics Content	vol. %	23.0
Benzene Content	vol. %	0.56
Olefins content	vol. %	3.9
E200	vol. %	54.4
E300	vol. %	88.9

In Maricopa County, it is assumed for the year 2000 that 100% of the gasoline oxygenate used is ethanol.

Modeling Approach

This measure will be modeled by emissions post-processing. The CO COMPLEX model, although not an official model of the EPA, provides an estimate of the benefits of different fuel formulations on CO emissions from gasoline powered onroad vehicles. The difference between CO emissions from the MathPro

formulation and a baseline fuel representative of wintertime fuel characteristics in the Maricopa County area will be estimated with the CO COMPLEX model. This difference will be applied as an across-the-board percentage reduction to the CO onroad mobile output totals from gasoline vehicles.

The effect of the MathPro formulation on nonroad mobile sources is estimated with the same methodology as for the onroad mobile sources, except that the base sulfur content is maintained in the committed measure case. With the effect of sulfur content changes removed from the model, the emission reductions from nonroad engines without catalysts are estimated.

Reasoned Justification for Nonimplementation: N/A

All suggested implementing entities have committed to implement this measure.

2. Voluntary Lawn Mower Emissions Reduction Program

Related to measure 97-NR-1 in the Suggested List of Measures for Particulate Matter and Carbon Monoxide, Revised March 26, 1997.

House Bill 2237 requires Maricopa and Pima counties to establish a Voluntary Lawn Mower Emissions Reduction Program to begin no later than July 1, 1998. A lawn mower owner may participate in the program if the lawn mower starts and is used for residential or commercial purposes. The voucher for retired commercial lawn mowers is $200 and must be used for the purchase of a lawn mower that generates lower emissions. The voucher for retired residential lawn mowers is $100 and must be used for the purchase of an electric lawn mower. Retired lawn mowers are prohibited from use in Arizona.

In order to fund this program, H.B. 2237 establishes the Voluntary Lawn Mower Emissions Reduction Fund consisting of monies appropriated by the Legislative and political subdivisions along with gifts, grants, and donations. The Counties are required to prepare and submit a progress report on December 1 of each year which describes the number of lawn mowers retired by brand and year of manufacture, cost effectiveness of the program in terms of dollars spent per ton of emissions reductions; recommendations for improving the effectiveness of the program; and administrative costs of the program (A.R.S. 49-474.02).

The bill also contains a $1,000,000 appropriation from the State General Fund for fiscal year 1997-1998 for deposit into the Voluntary Lawn Mower Emissions Reduction Fund (Section 21 of H.B. 2237).
Senate Bill 1427 contains an appropriation of $500,000 from the state general fund in fiscal year 1998-1999 and $500,000 in fiscal year 1999-2000 to the existing voluntary lawnmower replacement program. In addition, the program is expanded to include other gas-powered lawn and garden equipment.

Maricopa County, which was identified as the suggested implementation agency, indicated that it would implement a voluntary program to purchase and retire commercial and residential lawn mowers which produce excessive emissions. Funding has been appropriated through the state general fund.

Modeling Approach

This measure will be modeled in the CNTLEM module of EPS 2.0. The CNTLEM module is capable of applying a reduction factor to emissions by AIRS Source Category (ASC).

It is assumed that this measure will result in the retirement of 7,500 gasoline-powered lawn mowers, replaced by electric mowers, in the year 2000. This assumption, when applied to the "Nonroad Engine and Vehicle Emission Study" (NEVES) (EPA, July, 1992) two-stroke lawn mower population projected to 2000, provides a 1.5 percent reduction in emissions. Emissions from gasoline-powered lawn mowers could be reduced to 98.5 percent of the base case total for CO.
A /PROJECT AMS/ packet will apply a factor of 0.985 to gasoline-powered two- and four-stroke lawn mowers (ASC 2260004010 and 2265004010). The newly created packet will be applied by an additional execution of the CNTLEM module after the base case projections and controls have been applied.

Reasoned Justification for Nonimplementation: N/A

All suggested implementing entities have committed to implement this measure.

3. <u>Appropriation for Alternative Test Protocol for the Vehicle Emissions Testing Program</u>

Related to measure 97-IM-1 in the Suggested List of Measures for Particulate Matter and Carbon Monoxide, Revised March 26, 1997.

House Bill 2237 contains an appropriation of $120,000 from the state general fund to the Arizona Department of Environmental Quality to develop and implement an alternative test protocol to reduce the false failure rates associated with the more stringent pass-fail standards for the Vehicle Emissions Testing Program (Section 19 of H.B. 2237).

Senate Bill 1427 exempts the five newest model year vehicles from the vehicle inspection and maintenance program.

Modeling Approach

This measure will be modeled by modification of MOBILE5a output files. According to the ADEQ, this measure provides for implementation of the cutpoints called “Alternative #2 with current +4" by the year 1999.

MOBILE5a is run with the base cutpoints (2.00, 30.0, and 3.00) input. The emission rates output from MOBILE5a for the appropriate vehicle type categories in model years 1981 and later are then adjusted to reflect emission reductions estimated by Sierra Research for the “Alternative #2 with current +4" scenario using the by-year program.

Reasoned Justification for Nonimplementation: N/A

All suggested implementing entities have committed to implement this measure.

4. Appropriation for Traffic Synchronization

Related to measure 97-TC-8 in the Suggested List of Measures for Particulate Matter and Carbon Monoxide, Revised March 26, 1997.

House Bill 2237 contains an appropriation of $500,000 in each of fiscal years 1997-1998 and 1998-1999 from the state general fund to the Arizona Department of Transportation for distribution to cities and counties for synchronization of traffic control signals within and across jurisdictional boundaries (Section 23 of H.B. 2237).

In addition, cities and towns responded to measure 97-TC-8, Coordinate Traffic Signal Systems. The synchronization of existing signals, as well as the enhancement of coordination in signal systems which are already synchronized, has been identified by many jurisdictions through a number of programs. Enhancement efforts range from large scale programs covering broad geographic areas to incremental additions of a few synchronized signals to the network. This includes both individual city projects and regional level programs, such as AzTech which is noted under Develop Intelligent Transportation Systems below.

Modeling Approach

Based on submittals from local governments, as well as the provision in H.B. 2237 for signal coordination, it is estimated that the coordination will be enhanced for approximately 435 signals in the region by the end of the year 2000.

This measure will be modeled by modification of MOBILE5a input files and by emissions post-processing. The enhancement of traffic signal synchronization will reduce the idling time at traffic signals. The average CO emission rate at idle will be determined with the MOBILE5a model. The emission rate at idle will be multiplied by the estimated reduction in idle time across the modeling domain due to the control measure. The resulting product will be a total reduction in CO

emissions in the modeling domain. This emissions reduction will be applied as an across-the-board reduction to the onroad CO emissions inventory.

Reasoned Justification for Nonimplementation:

Reasoned identified by jurisdictions finding this measure technologically or economically infeasible include lack of applicability due to few traffic signals, few intersections in which to install systems, lack of a congestion problem, lack of jurisdiction over traffic signal installation and operation, and the prohibitive cost of increasing the present level of effort.

5. Require Pre-1988 Heavy-Duty Diesel Commercial Vehicles Registered in the Nonattainment Area to Meet 1988 Federal Emission Standards; Provide Incentives to Encourage Voluntary Accelerated Vehicle Replacement by the Year 2001
Related to measure 97-IM-8 in the Suggested List of Measures for Particulate Matter and Carbon Monoxide, Revised March 26, 1997.

Senate Bill 1002 requires that after January 1, 2004 all commercial Diesel vehicles operating in Area A that weigh more than 26,000 pounds and are registered in Area A must meet or surpass the 1988 federal emission standards unless they were built in or after 1988. In addition, providing incentives could help accelerate replacement of older vehicles.

Modeling Approach

This measure will be modeled by modification of the MOBILE5a input files. To estimate the effect of incentives encouraging accelerated replacement by 2000, it is assumed that 15 percent of the pre-1988 heavy-duty diesel commercial vehicles would be replaced with vehicles meeting 1988 emission standards. The registration distribution will be adjusted to replace 15 percent of the pre-1988 heavy-duty diesel vehicles with 1988 heavy-duty diesel vehicles to provide a conservative estimate. This may provide a conservative estimate of benefits, because some vehicles may be replaced with newer than 1988 model year vehicles.

Reasoned Justification for Nonimplementation:

Reasons identified by jurisdictions finding this measure technologically or economically infeasible include lack of enabling legislation for incentives for early implementation.

6. Tougher Enforcement of Vehicle Registration and Emission Tests

Related to measure 97-IM-6 in the Suggested List of Measures for Particulate Matter and Carbon Monoxide, Revised March 26, 1997.
The ADOT has identified a comprehensive enforcement program to increase the registration compliance of residents. The three key elements of the program are a

Registration Enforcement Team, a Registration Enforcement Tracking System, and a new Resident Tracking Program.

Modeling Approach

The report of the Governor's Air Quality Strategies Task Force (December 3, 1996) estimated that an additional 41,000 vehicles would be emission tested as a result of this measure. This figure has since been confirmed with ADOT as being a reasonable, and perhaps somewhat conservative, estimate of the number of vehicles registered due to this measure.

This measure will be modeled for CO by an adjustment of the weighting between I/M and non-I/M emission factors from MOBILE5a. The number of vehicles registered in Maricopa County is approximately 1.83 million. The inspection of an additional 41,000 vehicles would be an additional 2.0 percent of the vehicles being emissions tested. The number of vehicles which participate in the I/M program will be increased by 2.0 percent, changing the weighting from 89.6/10.4 to 91.6/8.4.

Reasoned Justification for Nonimplementation:

Reasons identified by jurisdictions finding this measure technologically or economically infeasible include lack of enabling legislation for implementation.

7. Develop Intelligent Transportation Systems

Related to measure 97-TC-3 in the Suggested List of Measures for Particulate Matter and Carbon Monoxide, Revised March 26, 1997.

A number of jurisdictions have identified programs to apply new technology to produce more efficient use of existing transportation facilities, often termed intelligent transportation systems (ITS). A key element of these efforts is the ongoing freeway management system (FMS). Another major program is the AzTech Intelligent Transportation System Model Deployment Initiative that will implement an ITS for the region by mid-1999. An important element of the AzTech program involves enhancing traffic signal coordination between jurisdictions. In addition, real time travel information will be provided in 88 buses by the end of 1997.

Modeling Approach

This measure will be modeled by modification of MOBILE5a input files and by emissions post-processing. The emission reductions from the three components of this measure, FMS, the installation of ITS instrumentation from AzTech, and enhancing of signal coordination are modeled separately.

The emissions benefits of the continued installation of the FMS will be estimated using the modeling methodology developed by Sierra Research in Feasibility and Cost Effectiveness of New Air Pollution Control Measures Pertaining to Mobile Sources. A reduction in emissions per mile of FMS installed will be multiplied by the number of additional miles of FMS installed, resulting in a total emissions reduction. It is estimated that an additional 33 centerline miles will be implemented by 2000.

The installation of ITS instrumentation from AzTech on 150 miles of arterials will result in an increase in average vehicle speeds due to the rerouting of traffic around congestion. The increase in vehicle speeds and average trip length are estimated in the November 15, 1996 Alternative Transportation System Task Force report.

The change in average vehicle emission rates due to the increase in vehicle speeds will be estimated with MOBILE5a. The change in emission rates will be multiplied by the estimated volume of traffic effected by the control measure, also estimated in the Alternative Transportation System Task Force report. The resulting product estimates the change in emissions due to the speed change. This will be added to the change in total emissions estimated for increase in average trip length. The resulting sum will be a total change in CO emissions in the modeling domain due to the control measure.

The enhancing of traffic signal coordination through AzTech will be modeled by modification of MOBILE5a input files and by emissions post-processing. The enhancement of traffic signal synchronization will reduce the idling time at traffic signals. The average CO emission rate at idle will be determined with the MOBILE5a model. The emission rate at idle will be multiplied by the estimated reduction in idle time across the modeling domain due to the control measure. It is estimated that approximately 95 signals will be affected. The resulting product will be a total reduction in CO emissions in the modeling domain.

The three emission reductions modeled from the separate aspects of this measure will be totaled. The total will be applied as an across-the-board reduction to the onroad CO emissions inventory.

Reasoned Justification for Nonimplementation:

Reasons identified by jurisdictions finding this measure technologically or economically infeasible include lack of applicability due to low traffic density, lack of a congestion problem, and lack of jurisdiction over ITS installation and operation.

8. <u>Defer Emissions Associated with Government Activities</u>

Related to measure 97-NR-7 in the Suggested List of Measures for Particulate Matter and Carbon Monoxide, Revised March 26, 1997.

A number of jurisdictions have identified their intent to pursue methods for deferring emissions out of critical air pollution periods. These activities include restructuring use of two-cycle gasoline-powered lawn and garden maintenance equipment after 2:00 p.m. placing requirements on maintenance contractors, and encouraging employees to limit vehicle idling and other activities which may contribute to air pollution during critical periods.

Modeling Approach

Based on submittals it is estimated that approximately six percent of two-stroke engine powered nonroad emissions occurring after 2:00 p.m. are shifted to between 6:00 a.m. and 2:00 p.m. This measure will be modeled in the TMPRL module of EPS2.0. The TMPRL module is capable of allocating emissions to certain hours of the day.

It is assumed that this measure will result in a reduction in the use of two-stroke gasoline engine equipment by governmental agencies in the afternoon during the winter CO season. It is further assumed that six percent of the total affected emissions occurring after 2:00 p.m. are shifted to between 6:00 a.m. and 2:00 p.m.

Based on these assumptions, the temporal profile for two-stroke gasoline powered equipment will be adjusted to reflect a decrease in emissions after 2 p.m. by six percent. These emissions will be reallocated to between 6:00 a.m. and 2:00 p.m.

Reasoned Justification for Nonimplementation:

Reasons identified by jurisdictions finding this measure technologically or economically infeasible include lack of applicable local equipment use, current scheduling of equipment use already outside of peak emission periods, inability to adjust times of operation, and lack of jurisdiction.

9. <u>Off Road Vehicle and Engine Standards - Contingency Measure</u>

Related to measure 97-NR-3, 4, and 5 in the Suggested List of Measures for Particulate Matter and Carbon Monoxide, Revised March 26, 1997.

This measure in H.B. 2237 requires the Arizona Department of Environmental Quality to adopt rules for air pollution emission standards for off-road vehicles and engines marketed in the State beginning with the 1999 model year. The standards may include the following categories:

a. Heavy duty diesel vehicles rated between 175-750 horsepower.
b. Small utility and lawn and garden equipment engines rated less than 25 horsepower.
c. Recreational vehicles rated less than 25 horsepower.

d. Specialty vehicles and go-carts rated greater than 25 horsepower.
e. Off road motorcycles and all terrain vehicles.

The Arizona Department of Environmental Quality is also required to adopt air pollution emissions standards for golf cart engines in Maricopa County (A.R.S. 49-542.04).

However, recent communications with the California Air Resources Board indicated that the State of California has not enacted the regulations on the original schedule. Starting with model year 2000, California standards for engines rated less than 25 horsepower in small utility, lawn and garden equipment, and recreational vehicles will be more stringent than Federal standards. California standards for specialty vehicles and golf carts rated greater than 25 horsepower and off road motorcycles and all terrain vehicles are not anticipated until 2001. Current California regulations require that golf carts be electric-powered.

Modeling Approach

This measure will be modeled in the CNTLEM module of EPS 2.0. The CNTLEM module is capable of applying a reduction factor to emissions by ASC.

It is assumed that this measure will result in the replacement of utility equipment engines with engines meeting new standards at a turnover rate of 14 percent per year for spark-ignition (i.e. two- and four-stroke gasoline) engines and four percent for compression-ignition (i.e. diesel) engines. The new standards are assumed to have no effect on CO emissions from compression-ignition engines. It is assumed that the measure takes effect in 1999 for golf carts and in 2000 for other engines affected by this measure.

For utility equipment spark-ignition engines, this measure could result in a CO emission reduction to 89 percent of the base case emissions in the year 2000. For specialty vehicles and golf carts, this measure could result in a CO emission reduction to 90 and 72 percent, respectively, of base case emissions in the year 2000. All assumptions are derived from the Report of the Governor's Air Quality Task Force, December 2, 1996 and personal communications with the California Air Resources Board.

A /PROJECT AMS/ packets will apply a factor of 0.893 to spark ignition utility equipment (ASC 2260006 and 2265006) for CO emissions. In addition, the /PROJECT AMS/ packet will apply factors of 0.8992 to both two- and four-stroke specialty vehicles (ASC 2260001060, 2265001060), and a factor of 0.72 to golf carts (ASC 2260001050, 2265001050). The newly created packets will be applied by additional executions of the CNTLEM module after the base case projections and controls have been applied.

Reasoned Justification for Nonimplementation: N/A

All suggested implementing entities have committed to implement this measure.

10. <u>One Time Waiver from Vehicle Emissions Test - Contingency Measure</u>

Related to measure 97-IM-4 in the Suggested List of Measures for Particulate Matter and Carbon Monoxide, Revised March 26, 1997.

Senate Bill 1002 limits the issuance of a waiver for failure to comply with the emission testing requirements to one-time only, beginning January 1, 1997.

Modeling Approach

This measure will be modeled by an adjustment of the weighting between I/M and non-I/M emission factors from MOBILE5a and the modification of MOBILE5a input files. This measure cannot be modeled directly through the use of MOBILE5a, which does not have the option of limiting the number of waivers to a given number of years. MOBILE5a does have the option of reducing the percentage of vehicles receiving waivers to zero. MOBILE5a will be run with zero waivers allowed in order to estimate the resulting decrease in Carbon Monoxide emission rates in 2000.

It is assumed that the average remaining vehicle life of a vehicle which has received a waiver is three years (page E-5 of Feasibility and Cost-Effective Study of New Air Pollution Control Measures Pertaining to Mobile Sources). It is assumed that the base case run includes the three-year life after waiver implicitly through MOBILE5a. This measure would effectively reduce that three-year life to one year, and result in approximately two thirds of the reductions of a change to zero waivers. EXPLORA will be run with the no waiver MOBILE5a emission rates weighted at twice the waiver MOBILE5a emission rates to produce final emission totals which reflect a reduction to a single waiver per vehicle. The waiver rate which was four percent for pre-81 model years and three percent for 1981 and later model years will be changed to 1.33 percent and 1.00 percent respectively.

Reasoned Justification for Nonimplementation: N/A

All suggested implementing agencies have committed to implement this measure.

11. <u>National LEV Program - Contingency Measure</u>

Related to measure 97-VT-1 in the Suggested List of Measures for Particulate Matter and Carbon Monoxide, Revised March 26, 1997.

Senate Bill 1427 requires the sate to participate in the national Low Emission Vehicle Program.

Modeling Approach

This measure will be modeled by modification of MOBILE5a input files. The MOBILE5a model has an undocumented diagnostic feature which makes the modeling of the National LEV program possible.

As a non-OTR state (ozone transport region), Arizona will receive cars that meet the National Low Emitting Vehicle (NLEV) standards beginning in the 2001 model year at the latest. MOBILE5a assumes that new model year light duty vehicles become available on October 1 of the previous year. Therefore, some NLEV vehicles are expected to be registered and operating in the nonattainment area prior to December 2000. It is important to note that at this time, no commitment has been made to lower the I/M cutpoints for these vehicles. Since this is the case, the more conservative of the two levels of credit which are build into MOBILE5a for the LEV program have been chosen.

Reasoned Justification for Nonimplementation: N/A

All suggested implementing agencies have committed to implement this measure.

12. <u>MAG Fireplace Ordinance - Contingency Measure</u>

Related to measure 97-FP-1 in the Suggested List of Measures for Particulate Matter and Carbon Monoxide, Revised March 26, 1997.

Senate Bill 1427 requires the counties and cities and towns in Area A to adopt the Maricopa Association of Governments clean-burning fireplace ordinance by 1999. The MAG clean-burning fireplace ordinance prohibits the installation or construction of new fireplaces or wood stoves that do not meet clean-burning fireplace standards.

Modeling Approach

This measure will be modeled in the CNTLEM module of EPS 2.0. The CNTLEM module is capable of applying a reduction factor to emissions by ASC.

It is assumed that this measure will be implemented in the 1999. It is further assumed that all newly constructed residential fireplaces and all newly installed residential wood stoves will be “low-emitters” or EPA-certified Phase II or equivalent. Based on the 1996 MAG Residential Wood Combustion Survey, 28 percent of residences have fireplaces and one percent have wood stoves. Fireplace and wood stove population estimates were derived by combining the aforementioned percentages with the estimated number of residences in the CO Nonattainment Area. These 1994 population estimates were projected to the years 1998 and 2000 to determine the number of new fireplaces and wood stoves constructed in 1999

and 2000. All fireplaces constructed in 1999 and 2000 were assumed to be EPA certified fireplaces that emit at a rate 49 percent the rate of non-Phase II fireplaces. All wood stoves installed in 1999 and 2000 were assumed to be EPA-certified Phase II or equivalent stoves that emit at 77 percent (CO) the rate for all stoves combined.

Based on these assumptions, it is estimated that fireplace emissions could be reduced to 97 percent of the base case total for CO. Wood stove emissions could be reduced to 98.7 percent of the CO base case total.

A /PROJECT AMS/ packet will apply factors of 0.97 to fireplaces (ASC 2104008001) for CO, and 0.9868 to wood stoves (ASC 2104008010). The newly created packet will be applied by an additional execution of the CNTLEM module after the base case projections and controls have been applied.

Reasoned Justification for Nonimplementation: N/A

Senate Bill 1427 requires that counties, cities, and towns in Area A adopt this measure by 1999.

13. Area A Expansion - Contingency Measure

Related to measure 97-IM-3 in the Suggested List of Measures for Particulate Matter and Carbon Monoxide, Revised March 26, 1997.

Senate Bill 1427 expands the existing Area A boundaries.

Modeling Approach

This measure will be modeled by adjusting the weighting between I/M and non-I/M emission factors from MOBILE5a. MAG estimates that an additional 15,555 people will reside in the expanded section of Area A in 2000. The vehicles registered to these people will be required to undergo I/M testing. The ratio of the number of registered vehicles (ADOT data) to the number of residents in the county (MAG data) as of 1997 was one vehicle for every 1.48 people in the county. Assuming that this ratio is accurate for the expanded section of Area A, we can expect approximately 10,500 vehicles in that area in 2000.

An increase of 10,500 vehicles is anticipated to increase the weighting of I/M vehicles by approximately 0.5 percent. The number of vehicles which participate in the I/M program will be increased by 0.5 percent, changing the weighting ratio from 91.6/8.4 to 92.1/7.9.

Reasoned Justification for Nonimplementation: N/A

All suggested implementing agencies have committed to implement this measure.

14. Catalyst Replacement - Contingency Measure

Related to measure 97-IM-5 in the Suggested List of Measures for Particulate Matter and Carbon Monoxide, Revised March 26, 1997.

Senate Bill 1427 prohibits a vehicle that fails the vehicle inspection and maintenance test due to a faulty catalytic converter from receiving a waiver. This bill exempts catalytic converter replacement from the existing repair cost limit for waiver qualification.

Modeling Approach

This measure will be modeled for CO by an adjustment between I/M and non-I/M emission factors from MOBILE5a. The Emissions Research Laboratory (ERL) of the Arizona Department of Environmental Quality (ADEQ) estimates that approximately 68 percent of vehicles which fail the I/M test do so primarily because of a faulty catalytic converter. This estimate is derived from research done for the Automotive Catalytic Converter Testing Program by the ERL.

The ERL is also expected to have a catalyst efficiency test in place as a part of the I/M program by 1999. This program would be designed to identify vehicles with faulty catalytic converters. These vehicles would not be eligible for I/M waivers and would be required to have a functioning catalytic converter in order to drive.

The program can be expected to reduce the waiver rate by 68 percent as the 68 percent of vehicles failing the I/M program would have a catalyst installed. In conjunction with Measure 7, the One Time Waiver from Vehicle Emissions Test, the waiver rate which was four percent for pre-81 model years and three percent for 1981 and later model years will be changed to 0.43 percent and 0.32 percent respectively.

Reasoned Justification for Nonimplementation: N/A

All suggested implementing agencies have committed to implement this measure.

15. Alternative Fuels for Local Fleets and Buses - Contingency Measure

Related to measure 97-VT-6 in the Suggested List of Measures for Particulate Matter and Carbon Monoxide, Revised March 26, 1997.

House Bill 2001 requires that governments prepare vehicle fleet plans for the purchase or conversion of alternative fuel vehicles to meet specific percentage requirements which increase through the year 2000. The fleet composition

requirements and schedule applicable to the county, cities and towns, and school districts are as follows:

a. 10 percent of the fleet vehicles by December 31, 1994.
b. 25 percent of the fleet vehicles by December 31, 1996.
c. 50 percent of the fleet vehicles by December 31, 1998.
d. 75 percent of the fleet vehicles by December 31, 2000.

Modeling Approach

The Moderate Area CO Plan estimates average emission rates for alternatively fueled vehicles of various classes. The average emission rates for conventionally fueled vehicles of those same classes is estimated using MOBILE5a. The difference between the alternatively fueled emission rates and conventionally fueled emission rates are calculated.

The difference in emissions is multiplied by the number of vehicle-miles per day estimated for alternatively fueled local government vehicles. The total number of affected local government vehicles is estimated by multiplying the appropriate fraction from the phase in schedule above with an estimate of the local government fleet population. It is assumed that each school bus travels an average of 67.5 miles per day while each non-bus would travel 45 miles per day.

The result of this calculation is a total reduction of emissions estimate per day. The total estimated emissions reduction estimated using this procedure will be applied as a post-processing adjustment.

Reasoned Justification for Nonimplementation: N/A

All suggested implementing agencies have committed to implement this measure.

16. Voluntary Vehicle Repair - Contingency Measure

Senate Bill 1427 appropriates $275,000 from the state general fund to the Arizona Department of Environmental Quality to improve the utilization of the vehicle repair grant program. This program is to begin no latter than January 1, 1999 and vehicle provides funds to assist vehicle owners with repair expenses. Among other requirements, to be eligible for this program, a vehicle must have been registered in the Area A for the past 24 months, must be at least twelve years older than the current model year vehicle, and must have failed the emissions test.

The vehicle owner must pay the first $100 dollars for repairs as a copayment. The owner must pay any additional costs beyond $500 in repairs or $650 in retrofit parts and labor.

Modeling Approach

ADEQ provided data describing the repair costs of vehicles of different model years based upon 1997 I/M testing. This analysis only affects vehicles whose repair cost estimates exceed the waiver limit cost, since those vehicles whose repairs cost less than the waiver limit are expected to be repaired with or without the existence of this program. It is important to note that not all vehicles do, in fact, get repaired even if their repair costs are less than the waiver limit. These vehicles are accounted for in the compliance rate of MOBILE5a.

It is assumed that one third of all vehicles requiring more than $500 in repairs will participate in the program whereas without the program they would not have been repaired. It is also assumed that two thirds of vehicles requiring repairs which cost between the waiver limit for the particular vehicle and $500 will participate in the program whereas without the program they would not have been repaired.

These fractions were applied to the waiver data provided by ADEQ in order to derive a revised waiver rate for pre-81 vehicles and 1981 and later vehicles. The base waiver rates of 4 percent and 3 percent, respectively were revised to 1.5 percent and 2 percent, respectively.

This measure will be modeled by adjustment of the weighting between I/M and non-I/M emission factors and adjustment of MOBILE5a input files. Since MOBILE5a is not able to read fractional waiver percentages, such as 1.5 percent, two MOBILE5a runs will be performed. One run will have a waiver fraction of 0 percent and 0 percent. The other run will have waiver rates of 3 percent and 4 percent, respectively. These two MOBILE5a outputs will be weighted equally, simulating a MOBILE5a run of waiver rates 1.5 percent and 2 percent, using the MOBILE5a weighting capabilities of EXPLORA.

Reasoned Justification for Nonimplementation: N/A

All suggested implementing agencies have committed to implement this measure.

17. <u>Gross Emitter Waiver Provision - Contingency Measure</u>

Senate Bill 1427 addresses vehicles that emit at more than twice the standard. In order for these gross emitters to receive a waiver, their emissions must be reduced to less than twice the standard.

Modeling Approach

The modeling analysis for this measure will be conducted by the Arizona Department of Environmental Quality. The number of vehicles of each age that received a waiver will be estimated. The number of vehicles will be multiplied by an age-specific estimate of the number of miles a vehicle travels in a day. The product of these two estimates is the number of miles per day driven by waived vehicles of

each age. The difference in emission rates, for each vehicle age, between waived vehicles emitting more than twice the standard and twice the standard will be estimated. This emission rate difference will be multiplied by the estimated number of miles per day driven by waived vehicles of each age to estimate the emissions reduction achieve by repairing the gross emitters to emit at a level less than twice the standard before they are eligible for a waiver. This methodology may result in a conservative estimate of the benefits since some vehicles will be repaired to less than twice the emission standard.

Reasoned Justification for Nonimplementation: N/A

All suggested implementing agencies have committed to implement this measure.

18. Oxidation Catalyst for Heavy Duty Diesel Vehicles - Contingency Measure

Related to measure 97-VT-5 in the Suggested List of Measures for Particulate Matter and Carbon Monoxide, Revised March 26, 1997.

House Bill 2237 requires cities, towns, Maricopa County, school districts, the state and the federal government to install a technology (oxidation catalyst) on their heavy duty diesel vehicles if the entities receive a waiver to opt out of the alternative fuel requirements for fleets. The heavy duty diesel vehicles with a gross vehicle weight of 8,500 pounds or more manufactured in or before model year 1993 would have the catalyst installed based upon the following time schedule in 49-555:

a. 25 percent of the diesel fleet vehicles by December 31, 1998.
b. 40 percent of the diesel fleet vehicles by December 31, 1999.
c. 60 percent of the diesel fleet vehicles by December 31, 2000.
d. 80 percent of the diesel fleet vehicles by December 31, 2001.
e. 100 percent of the diesel fleet vehicles by December 31, 2002.

The technology is to be effective at reducing particulate emissions by at least 25 percent and be approved by the Environmental Protection Agency pursuant to the Urban Bus Engine Retrofit/Rebuild Program. This measure applies to Area A which is generally the nonattainment area. (A.R.S. 9-500.04, 15-349, 41-803, 49-474.01, 49-573, and 49-555).

Modeling Approach

An information sheet for the Voluntary Vehicle Repair, Retrofit, and Recycle (VVRRR) program estimates that the installation of a catalyst reduces CO emissions by 81 percent.

It is estimated that 710 pre-1993 heavy duty diesel government fleet vehicles would be retrofitted with oxidation catalysts by the end of 2000. The effect of the reduction

in emissions from heavy-duty diesel fleet vehicles on the onroad mobile fleet will be estimated using MOBILE5a. The percentage reduction on the total fleet emissions will be applied as an across-the-board reduction to the onroad mobile CO emission totals.

Reasoned Justification for Nonimplementation: N/A

All suggested implementing agencies have committed to implement this measure.

19. Alternative Fuels for State and Federal Fleets - Contingency Measure

Related to measure 97-VT-3 in the Suggested List of Measures for Particulate Matter and Carbon Monoxide, Revised March 26, 1997.

House Bill 2001 requires that governments prepare vehicle fleet plans for the purchase or conversion of alternative fuel vehicles to meet specific percentage requirements which increase through the year 2000. The fleet composition requirements and schedule applicable to the county, cities and towns, and school districts are as follows:

a. 10 percent of the fleet vehicles by December 31, 1994.
b. 40 percent of the fleet vehicles by December 31, 1995.
c. 90 percent of the fleet vehicles by December 31, 1997.

Senate Bill 1269 extends the deadline for conversion of 40 percent of the state fleet to alternative fuel from December 31, 1995 to December 31, 1999. In addition, Senate Bill 1269 requires new state vehicles weighing less than 8,500 pounds in Maricopa County to be capable of operating on alternative fuels on the following schedule

a. 10 percent of all 1997 model years purchased.
b. 15 percent of all 1998 model years purchased.
c. 25 percent of all 1999 model years purchased.
d. 50 percent of all 2000 model years purchased.
e. 75 percent of all 2001 model years purchased.

Modeling Approach

The Moderate Area CO Plan estimates average emission rates for alternatively fueled vehicles of various classes. The average emission rates for conventionally fueled vehicles of those same classes is estimated using MOBILE5a. The difference between the alternatively fueled emission rates and conventionally fueled emission rates are calculated.

This difference in emissions rates is multiplied by the number of vehicle-miles per day estimated for alternatively fueled state and federal government vehicles. The total number of affected state and federal government vehicles is estimated by multiplying the appropriate fraction from the phase in schedule above with an estimate of the state and federal government fleet population. It is assumed that each vehicle travels 45 miles per day.

The result of this calculation is a total reduction of emissions estimate per day. The total estimated emissions reduction estimated using this procedure will be applied as a post-processing adjustment.

Reasoned Justification for Nonimplementation: N/A

All suggested implementing agencies have committed to implement this measure.

20. Tax Deductions for Alternative Fueled Vehicles - Contingency Measure

Related to measure 97-VT-8 in the Suggested List of Measures for Particulate Matter and Carbon Monoxide, Revised March 26, 1997.

This measure in House Bill. 2237 extends the existing individual and corporate tax credit for the purchase or conversion of an alternative fuel vehicle or the purchase of an alternative fuel delivery system through 2001 and expands the tax credit to include minimum three year leases of an alternative fuel vehicle. It also increases the tax credit to $1,000 from $500 in 1997 and $250 in 1998 (A.R.S. 43-1086).

Senate Bill 1269 increases from $1,000 to $2,000 the individual and corporate income tax credits for the purchase, lease , or conversion of a dedicated alternative fuel vehicle for tax years 1998 through 2001. The maximum corporate income tax subtraction for the purchase of an alternative fuel vehicle is increased from $5,000 to $10,000. The maximum corporate income tax subtraction for the conversion of a conventional vehicle to an alternative fuel vehicle is increased from $3,000 to $5,000. In addition, nonrefundable individual and corporate income tax credits for the purchase or lease of original equipment manufactured alternative fuel vehicles is authorized for tax years 1999 through 2011. The credit ranges from 50 to 90 percent of the incremental cost above the cost of a conventional fuel vehicle.

Modeling Approach

This measure encourages the purchase or retrofit of privately or commercially owned vehicles. The number of commercially owned fleet vehicles is estimated at 135,000 in 1994. It is estimated that one percent of this vehicle population will be converted to alternatively fueled vehicles as a result of this control measure.

In addition to commercially owned fleet vehicles, some alternatively fueled vehicles are expected to be privately owned. The Arizona Department of Transportation (ADOT) provided vehicle registration data which counted the number of privately owned alternatively fueled vehicles as of 1/4/98. This data was used to estimate the population of privately owned alternatively fueled vehicles in 2000. It was assumed that with the increased tax benefits, the 11 vehicles registered of model year 1997 would be doubled in each of the three years from 1998 to 2000 to 22 vehicles/yr.

The Moderate Area CO Plan estimates average emission rates for alternatively fueled vehicles of various classes. The average emission rates for conventionally fueled vehicles of those same classes is estimated using MOBILE5a. The difference between the alternatively fueled emission rates and conventionally fueled emission rates are calculated.

The difference in emissions is multiplied by the number of vehicle-miles per day estimated for alternatively fueled private and commercial vehicles. It is assumed that each vehicle would travel 45 miles per day.

The result of this calculation is a total reduction of emissions estimate per day. The total estimated emissions reduction estimated using this procedure will be applied as a post-processing adjustment.

Reasoned Justification for Nonimplementation: N/A

All suggested implementing agencies have committed to implement this measure.

II. Measures Which Improve Air Quality, But Were Not Used for Numeric Credit

1. Referral of Public Transportation Questions to Voters

House Bill 2237 in 1997 which allows cities and towns to voluntarily refer an advisory question relating to public transportation to the voters at a special or general election. This provides a mechanism to create new measures which may have an influence on emissions. Credit was not taken for any reduction in carbon monoxide emissions.

Reasoned Justification for Nonimplementation: N/A

All suggested implementing entities have committed to implement this measure.

2. Short - Term Fuel Reformulation: June 1, 1998 - September 30, 1998

For June 1, 1998 - September 30, 1998, House Bill 2307 contains requirements for the sale of gasoline in Area A, subject to an appropriate waiver granted under

Section 211(c) (4) of the Clean Air Act, that meets the following fuel reformulation options:

- California Phase 2 Reformulated Gasoline, including alternative formulations allowed by the predictive model, as adopted by the California Air Resources Board pursuant to the California Code of Regulations, Title 13, Sections 2261 through 2262.7 and 2265, in effect on January 1, 1997, that meets the maximum 7.0 pounds per square inch (psi) summertime vapor pressure requirements in A.R.S. Section 41-2083, Subsection F.

- Gasoline that meets the standards for Federal Phase I Reformulated Gasoline, as provided in 40 CFR Section 80.41, paragraphs (a) through (h), in effect on January 1, 1997, that meets the maximum 7.0 psi summertime vapor pressure requirement in A.R.S. Section 41-2083, Subsection F.

Reasoned Justification for Nonimplementation: N/A

All suggested implementing entities have committed to implement this measure.

3. Snap Acceleration Test for Heavy-Duty Diesel Vehicles

Related to measure 97-IM-9 in the Suggested List of Measures for Particulate Matter and Carbon Monoxide, Revised March 26, 1997.

Senate Bill 1002 requires that beginning March 1, 1997, medium and heavy duty Diesel vehicles registered or re-registered in Area A that are more than 33 months beyond the initial date of registration, must take the snap acceleration test.

Reasoned Justification for Nonimplementation: N/A

All suggested implementing entities have committed to implement this measure.

4. Mass Transit Alternatives

Related to measure 97-TC-1 in the Suggested List of Measures for Particulate Matter and Carbon Monoxide, Revised March 26, 1997.

Many cities are pursuing a variety of mass transit alternatives. These include feasibility studies to evaluate the need and general location for high-capacity transit corridors throughout the metropolitan area, efforts to obtain Federal assistance for high-capacity rail transit and plans for local taxes to support expanded transit service.

Reasoned Justification for Nonimplementation:

Reasons identified by jurisdictions finding this measure technologically or economically infeasible include the prohibitive costs of implementation, lack of demand for transit, and the prohibitive cost of increasing the present level of effort.

5. High Occupancy Vehicle Lane Pricing

Related to measure 97-TC-2 in the Suggested List of Measures for Particulate Matter and Carbon Monoxide, Revised March 26, 1997.

Regional agencies are assessing options regarding the use and expansion of high occupancy vehicle (HOV) lanes. These include congestion pricing for peak hour periods and toll lane proposals by private consortiums.

Reasoned Justification for Nonimplementation: N/A

All suggested implementing entities have committed to implement this measures.

6. Special Event Controls

Related to measure 97-TC-4 in the Suggested List of Measures for Particulate Matter and Carbon Monoxide, Revised March 26, 1997.

Several cities are evaluating options for managing parking and traffic associated with special events. An important aspect is the linkage of reducing vehicular congestion with alternative modes of travel.

Reasoned Justification for Nonimplementation:

Reasons identified by jurisdictions finding this measure technologically or economically infeasible include lack of local special event centers, lack of staff to monitor special events, the prohibitive cost of hiring additional staff to monitor special events, and lack of jurisdiction over local special event centers.

7. Encourage Limitations on Vehicle Idling

Related to measure 97-VI-2 in the Suggested List of Measures for Particulate Matter and Carbon Monoxide, Revised March 26, 1997.

The Regional Public Transportation Authority has updated its engine idling policy regarding idling at layovers. It is also working in cooperation with member jurisdictions to promote vehicle idling limitations and other environmentally sensitive transit operations practices.

Reasoned Justification for Nonimplementation:

Reasons identified by jurisdictions finding this measure technologically or economically infeasible include that this measure would be unenforceable in the majority of Maricopa County and could be counter-productive because of additional uncontrolled start-up emissions.

8. Expansion of Public Transportation Programs

Related to measure 97-TC-5 in the Suggested List of Measures for Particulate Matter and Carbon Monoxide, Revised March 26, 1997.

Many individual cities, as well as regional agencies, have ongoing public transportation programs. Most recently a number of local jurisdictions are considering sales tax sources to provide funding for service expansions.

Reasoned Justification for Nonimplementation:

Reasons identified by jurisdictions finding this measure technologically or economically infeasible include lack of funding, lack of demand for transit, the prohibitive cost of implementation due to distances involved, and the prohibitive cost of increasing the present level of effort.

9. Employer Rideshare Program Incentives

Related to measure 97-TC-6 in the Suggested List of Measures for Particulate Matter and Carbon Monoxide, Revised March 26, 1997.

Many local governments are providing incentives for employees to participate in the rideshare program. These employers have designated Rideshare Coordinators and are promoting their incentives programs through public awareness campaigns, employee matching services, and new employee information. Incentives include preferential parking for carpools, bus subsidies, emergency rides home, and weekly or monthly prize drawings. Some jurisdictions have also included telecommuting and alternate work schedule options in their Trip Reduction Plans. Funding for these programs are usually allocated through the annual budget process. This measure is assumed to be an implementation mechanism for the Trip Reduction Program.

Reasoned Justification for Nonimplementation:

Reasons identified by jurisdictions finding this measure technologically or economically infeasible include lack of large local employers to implement the measure, lack of local congestion, and lack of local parking problem.

10. Preferential Parking for Carpools and Vanpools

Related to measure 97-TC-7 in the Suggested List of Measures for Particulate Matter and Carbon Monoxide, Revised March 26, 1997.

Many cities and towns are providing preferential parking spaces for carpools and vanpools as part of their Trip Reduction Plans. Funding for this measure has been provided through each jurisdiction's individual Trip Reduction Program budget in conjunction with other various local departments such as Transportation or Public Works. This measure is assumed to be an implementation mechanism for the Trip Reduction Program.

Reasoned Justification for Nonimplementation:

Reasons identified by jurisdictions finding this measure technologically or economically infeasible include lack of large local employers, lack of local traffic congestion, and lack of local parking problem.

11. Reduce Traffic Congestion at Major Intersections

Related to measure 97-TC-9 in the Suggested List of Measures for Particulate Matter and Carbon Monoxide, Revised March 26, 1997.

In addition to congestion reductions from traffic signal coordination and intelligent transportation systems (covered under those measures), many local governments have identified other ways of reducing traffic congestion at major intersections. These methods include bus pullouts, additional turn lanes, parking access controls and median treatments.

Reasoned Justification for Nonimplementation:

Reasons identified by jurisdictions finding this measure technologically or economically infeasible include lack of local congested intersections, lack of local major intersections, and the prohibitive cost of increasing the present level of effort.

12. Coordinate Traffic Signal Systems

Related to measure 97-TC-8 in the Suggested List of Measures for Particulate Matter and Carbon Monoxide, Revised March 26, 1997.

The synchronization of existing signals, as well as the enhancement of coordination in signal systems which are already synchronized, has been identified by many jurisdictions through a number of programs. Enhancement efforts range from large-scale programs covering broad geographic areas to incremental additions of a few synchronized signals to the network. These efforts include both individual city

projects and regional level programs, such as AzTech which was noted under Develop Intelligent Transportation Systems. This measure was modeled for numeric credit in combination with Measure 11-Appropriation for Traffic Synchronization.

Reasoned Justification for Nonimplementation:

Reasons identified by jurisdictions finding this measure technologically or economically infeasible include lack of applicability due to few traffic signals, few intersections in which to install signal systems, lack of a congestion problem, lack of jurisdiction over traffic signal installation and operation, and the prohibitive cost of increasing the present level of effort.

13. Site-Specific Transportation Control Measures

Related to measure 97-TC-10 in the Suggested List of Measures for Particulate Matter and Carbon Monoxide, Revised March 26, 1997.

This measure is closely related to Reduce Traffic at Major Intersections. Activities being pursued by jurisdictions to implement site-specific improvements are generally directed at major intersections, and include turn lanes, parking access controls, and median work. In addition, under this measure transportation management associations (TMA's) covering 14 different areas were identified. TMA's provide implementation methods for the Trip Reduction Program.

Reasoned Justification for Nonimplementation:

Reasons identified by jurisdictions finding this measure technologically or economically infeasible include lack of local congested intersections, lack of jurisdiction over local intersections, and the prohibitive cost of increasing the present level of effort.

14. Encouragement of Bicycle Travel

Related to measure 97-TC-11 in the Suggested List of Measures for Particulate Matter and Carbon Monoxide, Revised March 26, 1997.

Many local governments are pursuing continued improvements in bicycle information and educational programs. These efforts include safety, educational and promotional flyers, posters and brochures and bike events to encourage safe use of bicycles and safe commuting. Also bike plans and a regional bike map are prepared. This measure is assumed to be an implementing mechanism for the Trip Reduction Program.

Reasoned Justification for Nonimplementation:

Reasons identified by jurisdictions finding this measure technologically or economically infeasible include the prohibitive costs of purchasing bicycle rights-of-way, and lack of jurisdiction over applicable areas.

15. Development of Bicycle Travel Facilities

Related to measure 97-TC-12 in the Suggested List of Measures for Particulate Matter and Carbon Monoxide, Revised March 26, 1997.

A number of cities and towns are continuing programs to improve and expand bicycle facilities. Those programs cover provisions for bike lanes on arterial streets installation of bike racks, showers and lockers, and construction of multi-use paths accessible to bikes. This measure is assumed to be an implementing mechanism for the Trip Reduction Program.

Reasoned Justification for Nonimplementation:

Reasons identified by jurisdiction finding this measure technologically or economically infeasible include the prohibitive costs of purchasing bicycle rights-of-way, and lack of jurisdiction over applicable areas.

16. Alternative Work Schedules

Related to measure 97-TC-13 in the Suggested List of Measures for Particulate Matter and Carbon Monoxide, Revised March 26, 1997.

Many local governments are encouraging alternative work schedules. Strategies, such as 4-day, 10-hour work weeks, 9-day, 80-hour work plans, staggered work schedules, and Flextime have been successfully implemented by many of the local governments. Some jurisdictions have set goals to incorporate up to 85 percent of their employees into some type of alternative work schedule. This measure is usually funded through individual departmental budgets. This measure is assumed to be an implementation mechanism for the Trip Reduction Program. Also, work schedule adjustments as a result of the Governor's authority to declare an air pollution emergency are included in the base case air quality inventories.

Reasoned Justification for Nonimplementation:

Reasons identified by jurisdictions finding this measure technologically or economically infeasible include lack of large local employers to implement the measure, and lack of local congestion, lack of a local parking problem.

17. Land Use/Development Alternatives

Related to measure 97-TC-14 in the Suggested List of Measures for Particulate Matter and Carbon Monoxide, Revised March 26, 1997.

Many local governments are encouraging land use patterns that support public transit and other alternative modes of travels. General plans outline goals, objectives, and policies to promote a balanced transportation system. Development master plans strive to reduce dependency on automobiles, increase densities, provide for shorter trips, and consider alternative modes of travel. Also, plans and fee structures which encourage development in-fill have been adopted. Land use patterns and plans are reflected in the socioeconomic databases used in the air quality/transportation modeling process.

Reasoned Justification for Nonimplementation:

Reasons identified by jurisdictions finding this measure technologically or economically infeasible include lack of a local transit system, a predefined local land use plan being in effect, and low local population density.

18. Alternative Fuels for Fleets

Related to Measure 97-VT-6 in the Suggested List of Measures for Particulate Matter and Carbon Monoxide, Revised March 26, 1997.

The Regional Public Transportation Authority and its member agencies have begun an aggressive campaign to purchase, convert and replace older, higher polluting diesel buses.

Reasoned Justification for Nonimplementation:

All suggested implementing entities have committed to implement this measure.

19. Area-wide Public Awareness Programs

Related to measure 97-TC-15 in the Suggested List of Measures for Particulate Matter and Carbon Monoxide, Revised March 26, 1997.

RPTA is carrying out an area-wide public awareness program. The program is targeted to employers and employees affected by the Maricopa County Trip Reduction Program (TRP), employers not affected by TRP and the general public. The awareness program includes paid radio and television advertising for eight weeks during the winter pollution season, promotional mailings to TRP participants up to four times per year, workshops to increase participation in Clean Air Campaign events, and events to increase awareness of alternative modes of

transportation and work schedules. High Pollution Advisory faxes are also sent to over 700 Valley employers during the winter and summer high pollution season when it is “forecast” to potentially exceed federal air quality standards. This measure is assumed to be an implementation mechanism for the Trip Reduction Program.

Reasoned Justification for Nonimplementation: N/A

All suggested implementing entities have committed to implement this measure.

20. Encouragement of Pedestrian Travel

Related to measure 97-TC-16 in the Suggested List of Measures for Particulate Matter and Carbon Monoxide, Revised March 26, 1997.

This measure is closely related to Land Use/Development Alternatives. Activities pursued by local governments to encourage pedestrian travel are included in land use/development planning. Efforts to increase densities, shorten trip lengths, and promote alternative transportation modes all encourage pedestrian travel. Land use patterns and plans are reflected in the socioeconomic databases used in the air quality/transportation modeling process.

Reasoned Justification for Nonimplementation:

Reasons identified by jurisdictions finding this measure technologically or economically infeasible include great distances which make pedestrian travel unlikely, and lack of jurisdiction over likely local pedestrian areas.

21. Encouragement of Telecommuting, Teleworking and Teleconferencing

Related to measure 97-TC-17 in the Suggested List of Measures for Particulate Matter and Carbon Monoxide, Revised March 26, 1997.

RPTA is carrying out a regional effort to increase telecommuting in the area. RPTA provides training classes, on-site assistance, and an Internet web-site to valley employers interested in implementing telecommuting programs. This effort is on-going and is funded as part of the budget for the Regional Rideshare Program. This measure is assumed to be an implementation mechanism for the Trip Reduction Program.

Reasoned Justification for Nonimplementation: N/A

All suggested implementing entities have committed to implement this measure.

22. Promotion of High Occupancy Vehicle (HOV) Lanes and Bus-Pass Ramps

Related to measure 97-TC-18 in the Suggested List of Measures for Particulate Matter and Carbon Monoxide, Revised March 26, 1997.

The regional effort to promote HOV lanes is incorporated into the Maricopa County Trip Reduction Program and the Clean Air Campaign. As part of the regional effort to promote HOV lanes and by-pass ramps, RPTA has made a commitment to coordinate Employer Transportation Fairs, periodic Transportation Management Association meetings, and mailings to employers prior to new HOV lane segment openings. This measure is assumed to be an implementation mechanism for the Trip Reduction Program.

Reasoned Justification for Nonimplementation: N/A

All suggested implementing entities have committed to implement this measure.

23. Encouragement of Vanpooling

Related to measure 97-TC-19 in the Suggested List of Measures for Particulate Matter and Carbon Monoxide, Revised March 26, 1997.

RPTA is assisting employers in the formation of new vanpools through presentations to employers, providing materials to all interested parties, conducting vanpool group formation meetings, and providing vanpool matching. RPTA staff also assist employers in promoting vanpools and will encourage employers to provide subsidies to their employees. This measure is assumed to be an implementation mechanism for the Trip Reduction Program.

Reasoned Justification for Nonimplementation: N/A

All suggested implementing entities have committed to implement this measure.

24. Trip Reduction Program

Related to measure 97-TC-20 in the Suggested List of Measures for Particulate Matter and Carbon Monoxide, Revised March 26, 1997.

The RPTA is under contract with Maricopa County to provide services to employers affected in the Trip Reduction Program under Arizona Revised Statutes 49-581 through 49-593. RPTA provides formal trainings, one-on-one assistance, facilitates Transportation Management Associations and provides informational materials to over 1,250 employers in Maricopa County with 50 or more employees at a site. The Trip Reduction Program affects approximately 580,000 employees and students at

2,500 sites county-wide. The benefits of the Trip Reduction Program are reflected in the base case modeling.

Reasoned Justification for Nonimplementation: N/A

All suggested implementing entities have committed to implement this measure.

25. Restrictions on the Use of Gasoline Powered Blowers

Related to measure 97-DC-6 in the Suggested List of Measures for Particulate Matter and Carbon Monoxide, Revised March 26, 1997.

Many local governments are reducing the use of gasoline powered blowers. These governments will reduce the use of blowers by restricting their use during certain hours and replacing them with vacuums and brooms. At this time, the details of vacuum sweeper equipment usage and scheduling have not been specified.

Reasoned Justification for Nonimplementation:

Reasons identified by jurisdictions finding this measure technologically or economically infeasible include lack of enforcement resources, limited use of blowers, infeasibility of alternatives, and lack of jurisdiction.

26. Encourage the Use of Temporary Electrical Power Lines Rather than Portable Generators at Construction Sites

Related to measure 97-NR-6 in the Suggested List of Measures for Particulate Matter and Carbon Monoxide, Revised March 26, 1997.

A number of local governments are taking steps to begin implementing this measures. Efforts include providing information brochures to developers, adjusting electrical codes, identifying reusable equipment, and conducting pilot projects. The number of construction units that may be affected is not determined at this time.

Reasoned Justification for Nonimplementation:

Reasons identified by jurisdictions finding this measure technologically or economically infeasible include construction site proximity to power sources, scheduling difficulties, and uniform application problems.

27. Public Education Program for Oxygenated Fuels

Related to measure 97-CF-6 in the Suggested List of Measures for Particulate Matter and Carbon Monoxide, Revised March 26, 1997.

RPTA is providing information to the public regarding the need for oxygenated fuels to reduce wintertime and summertime emissions of carbon monoxide and/or ozone.

Information is disseminated through High Pollution Advisories to over 700 Valley employers during both summer and winter pollution seasons.

Reasoned Justification for Nonimplementation: N/A

All suggested implementing entities have committed to implement this measure.

28. Voluntary Gasoline Vehicle Retirement Program

Related to measure 97-VT-2 in the Suggested List of Measures for Particulate Matter and Carbon Monoxide, Revised March 26, 1997.

Maricopa County is in the process of revising its Trip Reduction Ordinance to include voluntary vehicle trade-outs. The proposed revisions will allow trade-outs that have been completed after October 16, 1996 to be used to achieve the emission reduction goals established under the ordinance. This measure is assumed to be a mechanism for implementation of the Trip Reduction Program goals.

Reasoned Justification for Nonimplementation:

Reasons identified by jurisdictions finding this measure technologically or economically infeasible include lack of enabling legislation.

29. Public Information Program on Wood Stoves and Wood Heat

Related to measure 97-FP-2 in the Suggested List of Measures for Particulate Matter and Carbon Monoxide, Revised March 26, 1997.

Maricopa County, which was identified as the suggested implementing agency, is continuing the implementation of the public information and education program to inform and educate citizens about issues pertaining to woodburning. The program includes two hotlines, fax notifications of high air pollution advisories, information sheets, and newspaper articles. Maricopa County also indicated that it will post High Pollution Advisories on the Maricopa County Environmental Services Home Page and distribute educational brochures to promote clean-burning fireplaces. This measure is assumed to be a mechanism for implementing the Residential Woodburning Restriction Ordinance which is reflected in the base emission inventories.

Reasoned Justification for Nonimplementation: N/A

All suggested implementing entities have committed to implement this measure.

30. Park and Ride Lots

Related to measure 97-TC-5 in the Suggested List of Measures for Particulate Matter and Carbon Monoxide, Revised March 26, 1997.

The RPTA is continuing to work with member jurisdictions, private entities, and employers in the development, design, and implementation of new Park and Ride facilities in locations where they are needed. Park and Ride activities are in the on-going annual budgets of the RPTA and its member jurisdictions. This measure is assumed to be an implementation mechanism for the Trip Reduction Program.

Reasoned Justification for Nonimplementation: N/A

All suggested implementing entities have committed to implement this measure.

31 Phased-In Emission Testing of Constant Four-Wheel Drive vehicles

Related to measure 97-IM-2 in the Suggested List of Measures for Particulate Matter and Carbon Monoxide, Revised March 26, 1997.

Senate Bill 1427 requires motor vehicle; including constant four-wheel drive vehicles, manufactured in or after Model Year 1981, with a gross vehicle weight rating of 8,500 pounds or less, other than diesel-powered vehicles, to pass a transient load emissions test.

Reasoned Justification for Nonimplementation: N/A

All suggested implementing agencies have committed to implement this measure.

32. Increased Waiver Repair Limit Options

Related to measure 97-IM-5 in the Suggested List of Measures for Particulate Matter and Carbon Monoxide, Revised March 26, 1997.

Senate Bill 1427 increase the amount a person must spend to repair a failing 1967-1974 vehicle in Area A to qualify for a waiver. The increased amount is $200 rather than the previous $100. This change in limit is taken into consideration when modeling the effect of the Voluntary Vehicle Repair and Retrofit Program.

Reasoned Justification for Nonimplementation: N/A

All suggested implementing agencies have committed to implement this measure.

33. Vehicle Repair Grant Program

Senate Bill 1427 contains an appropriation of $275,000 from the State general Fund to the Arizona Department of Environmental Quality for fiscal year 19989-1999 to improve the utilization of the Vehicle Repair Grant Program and Catalytic Converter Replacement Program. This appropriation is accounted for in the modeling assumptions for the catalyst replacement measure and the voluntary vehicle repair measure.

Reasoned Justification for Nonimplementation: N/A

All suggested implementing agencies have committed to implement this measure.

34. Random Roadside Testing of Diesel Vehicles

Senate Bill 1427 requires the Arizona Department of Environmental Quality to implement a pilot random roadside emissions testing program for diesel vehicles over 8,500 pounds using the snap acceleration test developed by the Society of Automotive Engineers (J1167).

Reasoned Justification for Nonimplementation:

This measure will not be implemented unless the Directors of the Arizona Department of Transportation and the Arizona Department of Public Safety agree that the program can be conducted safely and in compliance with federal regulations relating to interstate travel and safety.

35. Limit Sulfur Content of Diesel Fuel Oil to 500 ppm

Senate Bill 1002 prohibits the sale of Diesel fuel (including off-road) in the nonattainment area that contains in excess of 500 ppm sulfur.

Reasoned Justification for Nonimplementation: N/A

All suggested implementing agencies have committed to implement this measure.

36. Diesel Fuel Sampling and Reporting

Senate Bill 1427 requires that beginning on January 1, 1999 through July 1, 1999, gasoline refiners and other suppliers of diesel fuel that is supplied or sold as a final product for the fueling of diesel vehicles within Area A report to the Director of the Arizona Department of Weights and Measures on the quantity and quality of diesel fuel shipped to Maricopa County during the proceeding month.

Reasoned Justification for Nonimplementation: N/A

All suggested implementing agencies have committed to implement this measure.

37. Voluntary No-Drive Days

Senate Bill 1427 changes the Voluntary No Drive Days Program from a winter-time program to a year round program. Maricopa and Pima Counties are required to implement the program.

Reasoned Justification for Nonimplementation: N/A

All suggested implementing agencies have committed to implement this measure.

38. Analysis of Intersource Credit Trading and Banking Program

Senate Bill 1427 contains an appropriation of $75,000 form the State General Fund to the Arizona Department of Environmental Quality for fiscal year 1998-1999 for the analysis of environmental and economical feasibility of an intersource credit trading and banking program in Arizona for emission sources within the same nonattainment area, maintenance area, or modeling domain.

Reasoned Justification for Nonimplementation:

The general fund appropriation must be matched by an equal expenditure of monies from gifts, grants, or donations or the general fund monies revert to the State General Fund by the end of the fiscal year.

39. Remote Sensing

Senate Bill 1427 removes the mandate for the deployment of a minimum of six remote sensing van units on the road by the Arizona Department of Environmental Quality in the operation of the remote sensing program. In addition, the program requires that when any vehicle manufactured after the 1996 Model Year and registered in Area A is identified as exceeding the emissions standards, a notification letter to the registered vehicle owner will be sent requiring an emissions test within thirty days.

Reasoned Justification for Nonimplementation: N/A

All suggested implementing agencies have committed to implement this measure.

SUMMARY OF MEASURES FROM THE SUGGESTED LIST OF MEASURES WHICH DID NOT RECEIVE FIRM COMMITMENTS FOR IMPLEMENTATION

All of the measures from the MAG Suggested List have received some type of firm commitment, as defined by the Arizona Department of Environmental Quality, with the exception of the measures which are described below.

The MAG Suggested List of Measures indicates that the State of Arizona would be the suggested implementing entity for the following measures:

Vehicle Emissions Testing

97-IM-7. Vehicle Pollution Charge

Clean Fuels for Conventional Vehicles

97-CF-4. California Reformulated Diesel Fuel or Other Clean Diesel Fuel.

Cleaner Vehicle Technologies

97-VT-1. Adoption of the California Low-Emission Vehicle Program
97-VT-3. Voluntary Diesel Vehicle Retirement
97-VT-4. Heavy-Duty Diesel Engine Replacement or Overhaul at Recommended Intervals

Reduced Vehicle Use and Traffic Congestion

97-TC-2 High Occupancy Vehicle Pricing

The MAG Suggested List of Measures indicates that Maricopa County or the State of Arizona would be the suggested implementing entity for the following measures:

Fireplace and Other Burning Restrictions

97-FP-4. Integrated Program to Reduce Woodburning Emissions

Maricopa County has indicated that it lacks the statutory authority to implement 97-FP-4 on a regional basis.

Reduction of Vehicle Idling

97-VI-1. Limit Excessive Car Dealership Vehicle Starts

Maricopa County has indicated that enforcement of this measure would not be practical given the fact that violations would be of brief duration and could be up to 13 days apart.

Fireplace and Other Burning Restrictions

97-FP-3. Improved Performance/Maintenance of Woodburning Devices, Including Weatherization Programs

Maricopa County has indicated that local utilities already advertise energy audits.

STATUS OF CONTINGENCY MEASURES

The 1990 Clean Air Act Amendments, Section 172(c)(9) Contingency Measures requires that nonattainment area plans must provide for the implementation of specific measures to be undertaken if the area fails to make reasonable further progress, or to attain the air quality standard by the applicable attainment date. These contingency measures take effect without further action by the State or the EPA Administrator.

Based on EPA guidance provided in a memorandum from G.T. Helms to the Air Branch Chiefs of Regions I through X, and entitled Early Implementation of Contingency Measures for Ozone and Carbon Monoxide (CO) Nonattainment Areas, implementation of contingency measures before they are required to be implemented is permitted. Committed, implemented measures may be considered contingency measures if they are not needed to show attainment and they do not hasten attainment.

COMMITMENTS FOR IMPLEMENTATION

Resolutions from the respective implementing entities are discussed in Chapter Eight and the commitments themselves are contained in Chapter Eleven. These resolutions contain specific commitments to implement the various control strategies as appropriate in the MAG 1998 Carbon Monoxide Plan.

The action taken by the MAG Regional Council to approve the Suggested Measures and the Adopted Plan Measures does not commit each jurisdiction to implement those measures. As indicated in the resolutions and commitments, each jurisdiction has determined which measures are feasible for implementation by that jurisdiction.

FUTURE AIR QUALITY CONDITIONS

An assessment of the air quality conditions involves not only the examination of existing air quality data describing the major contributors to the carbon monoxide problem (see Chapter Four) , but also the development of projections which can be used to predict future air quality conditions. More specifically, these projections are used to determine the reduction needed to attain the national standards and to determine the potential effectiveness of various control strategies in reducing carbon monoxide emissions and concentrations.

A detailed description of the modeling is presented in the Technical Support Document (TSD) for Regional Carbon Monoxide Modeling in Support of the 1998 Serious Area Carbon Monoxide Plan for the Maricopa County Nonattainment Area contained in Appendix B, Exhibit 4. A general overview of this material is provided below. The methodology developed in the TSD provides an assessment of future air quality conditions.

Background

Air quality modeling was performed to relate CO emissions to ambient CO concentrations in the nonattainment area. A December 1994 CO episode was simulated on an urban scale to account for the regional patterns of CO emissions and meteorological transport. Microscale modeling was also conducted to assess the impacts of vehicular emissions at two roadway intersection "hotspots". The results of the models were combined to determine whether existing control programs are likely to result in attainment of the CO standard in 2000.

Design Day Selection

Weather conditions have a critical role in determining pollutant concentrations and must be specified as inputs for projecting future air quality. Since future weather conditions are not known, a set of worst case conditions are assumed. Upon review of measured CO concentrations and meteorological data for the 1994-95 winter season, the period of December 16-17, 1994 was selected as the design day for modeling. Widespread high CO concentrations were monitored during that period due to heavy traffic, and minimal dispersion due to the nocturnal thermal inversion along with light and variable winds.

Selection of Future Years for Modeling

The future year selected to be modeled was 2000. Modeling for 2000 was considered obligatory, due to the requirement that national ambient air quality standards be attained no later than December 31, 2000.

Emissions Inventory Development

Area-wide emission inventories needed for CO modeling were developed using the motor vehicle traffic emissions model EXPLORA and the Emissions Preprocessor System (EPS2.0). The EXPLORA program generates CO emission estimates for on-road mobile sources, which are the major source of CO emissions in the nonattainment area. CO emissions from all other sources are considered "background" emissions and include stationary point, area and non-road mobile sources such as factory stacks, wood burning fireplaces, and lawnmowers. It is important to note that the 1994 and 2000 base case background inventories were projected from the 1993 Base Year Carbon Monoxide Emissions Inventory, September 1996, prepared by the Maricopa County Environmental Services Department (Appendix A, Exhibit 4).

Mobile source emissions were estimated by combining emission factors, in units of grams per mile, with vehicle miles traveled (VMT). The emission factors were obtained from MOBILE5a, which incorporates several parameters, including fuel modifications, specific scenario conditions, and fleet characteristics. The EXPLORA program was utilized to combine the emission factors and the traffic forecasts to estimate on-road mobile source emissions.

The EPS2.0 was used to develop Urban Airshed Model (UAM) emission input files for the years 1994 and 2000. The 1994 base year reflects current controls including the current Vehicle Inspection/Maintenance (I/M) program, oxygenated gasoline, and the Maricopa County Trip Travel Reduction Ordinance (TRO). The projected future-year base case inventories include projected emission reductions due to the TRO, as well as controls mandated by the Clean Air Act Amendments (CAAA), such as the cold-start CO standard for 1994 and later model vehicles. No additional control measures for background emissions are included in the future year base inventories.

Urban Airshed Modeling Analysis

The Urban Airshed Model (UAM) is an air pollution dispersion model which translates emissions data into estimates of pollutant concentration for the area of interest for specified periods of time. The UAM was validated for the urban area to determine the applicability of the model for use in the air quality modeling process. This validation involved testing the ability of the model to reproduce monitored air quality concentrations based on the meteorological conditions and estimated CO emissions assumed for the selected design day. The UAM performance was assessed on the basis of neighborhood-scale monitors, with emphasis placed on monitors located in the central urbanized area. All qualitative and quantitative measures of model performance were found to be within the accepted performance criteria.

Microscale Modeling Analysis

The roadway intersection model CAL3QHC was used to estimate the hotspot CO contribution at two major intersections. This model predicts the ambient concentration levels near roadways and congested intersections, incorporating the impacts of both free flowing traffic and idling vehicles. The model was applied to two six-legged intersections: 35th Avenue, Indian School Road, and Grand Avenue (near the West Indian School monitoring location) and 27th Avenue, Thomas Road, and Grand Avenue (near the Thomas monitoring location). These intersections were selected because earlier work has indicated that they are representative of microscale regions where traffic congestion can lead to high local CO concentrations.

2000 Base Case Air Quality Modeling Estimates (Without Control Measure Commitments)

The hourly UAM and CAL3QHC predictions were summed and running eight-hour averages were calculated. The combined UAM/CAL3QHC results were compared to the measured CO concentrations at the hotspot monitoring locations to assess the performance of the combined modeling system. After the model performance was found to meet the accepted performance criteria, base case simulations were conducted for 2000. This simulation was performed to determine whether reductions from in-place control programs are expected to result in attainment by 2000.

Peak eight-hour average concentrations for each base and future year set of simulations were tabulated. These results were then used in the attainment demonstration. The 2000 base case simulation yielded an eight-hour average CO concentration greater than 9 ppm in the modeling domain. It was concluded that the Maricopa County Nonattainment Area would not be in attainment of the standard by December 31, 2000 without the application of additional CO control measures.

Contour plots of simulated maximum eight-hour average CO concentrations show that there were two areas in the domain where CO concentrations above the standard of 9 ppm were simulated. One area is in the vicinity of the intersection of Grand Avenue and Interstate 17, with a maximum located slightly south of the two hotspot sites. The other area is in the vicinity of the intersection of Interstate 10, Route 202, and Route 51, extending west along the south side of Interstate 10. A summary of the base case results is provided below.

ESTIMATED EMISSION REDUCTION NEEDED FOR ATTAINMENT OF THE CO STANDARD

Year	Amount	Location
1994	19.8 %	Phoenix Grand Ave (PHGA) Receptor
2000	13.6 %	West Indian School Road (WISR) Receptor

These reduction targets are estimates of the emission reductions needed in the year noted to achieve attainment. These figures represent the base case conditions, assuming no new measures are implemented to improve air quality. Actual emission reductions may need to be larger or smaller than these values, depending upon the spatial and temporal distribution of the emissions reductions. A number of potential CO emission control measures were modeled for their individual emissions effectiveness and are discussed in Chapter Six.

The projected reductions provide the targets for the air quality planning effort. New measures to improve air quality will need to reduce emissions levels by the target reductions if the air quality standards are to be met. It is important to note that both the air quality planning and the air quality modeling efforts represent continuing processes. It is anticipated that as new air quality monitoring data becomes available and modeling techniques are updated, new estimates of future air quality conditions will be prepared.

PROJECTED 2000 ATTAINMENT STATUS (WITH CONTROL MEASURE COMMITMENTS)

The total CO reductions associated with the commitments in combination are estimated to be approximately 14 percent for 2000. This emission reduction is larger than the

estimated target reductions needed for attainment in 2000. Therefore, based on emissions considerations, the committed measures appear adequate for attainment.

The combined impact of the committed air quality measures is ultimately assessed through application of the full modeling chain to the package of measures in combination. This process provides a projection of pollutant concentration levels in the target year to determine if the committed package is sufficient to achieve the required air quality standard.

To demonstrate attainment of the carbon monoxide standard, the combined results of areawide (UAM) and roadway intersection modeling (CAL3QHC) should show no predicted eight-hour maximum carbon monoxide concentrations greater than 9.0 parts per million (ppm) anywhere in the modeling domain for the episode modeled. The combined UAM/CAL3QHC results for the committed measures for 2000 simulate a maximum eight-hour average CO concentration of 8.94 ppm. Therefore, the 1998 committed plan measures are expected to result in attainment of the 9.0 ppm standard in 2000.

As part of the attainment demonstration, emission inventories were developed for the two days which served as the basis for the episode which was modeled. Inventories were developed both for 2000 base case conditions and the package for committed plan measures which resulted in attainment. These inventories are summarized in the Technical Support Document (Appendix B, Exhibit 4).

It is important to note that when evaluating the effect of the committed control measures on future year air quality, only measures one through eight listed in this chapter under Measures Used for Numeric Credit were applied to the emission inventory. The contingency measures listed in this chapter under Measures Used for Numeric Credit were not incorporated into the committed measure package that was applied to the emissions inventory. Therefore, without implementation of the contingency measures, the remaining committed measures appear sufficient for attainment.

REASONABLE FURTHER PROGRESS

In Part D of the Clean Air Act, Section 171 indicates that the term “Reasonable Further Progress” means such annual incremental reductions in emissions of the relevant air pollutant as are required by this part or may reasonable be required by the Administrator for the purpose of ensuring attainment of the applicable national ambient air quality standard by the applicable date.”

It has been shown in this Plan that an approximately 14 percent reduction in emissions will be needed from projected December 2000 emission levels to meet the federal carbon monoxide standard. Based upon projected daily emissions of 626.7 metric tons under design day modeled conditions (December 16, 1994) for 2000 without the Plan measures, a 14 percent reduction would equal 87.7 metric tons, and the allowable remaining emissions would be approximately 539 metric tons per day.

These values are presented graphically in the Reasonable Further Progress (RFP) line shown in Figure 9-2. Straight-line interpolation between the estimated December 1997 emissions and the target level for December 2000 was used to develop the RFP line. The 539 metric tons per day target emission level is an approximate goal because hotspot carbon monoxide concentrations will be affected by the timing and location of emissions, as well as the total amount of emissions in the region. The projected emission reductions from the Plan would result in December 2000 emissions of approximately 537 metric tons per day, which would satisfy the RFP requirement.

Section 187(b)(1) of the Clean Air Act states that Serious Areas are subject to requirements of Moderate areas with a design value greater than 12.7 ppm. Section 187(a)(7) requires specific annual carbon monoxide emission reductions for Moderate Areas with a design value greater than 12.7 ppm at the time of classification. The Maricopa County Area has a design value of 12.6 ppm, though, in being reclassified to Serious, is subject to this requirement under section 187(b)(1). Figure 9-2 presents a graphical representation of the annual reduction as a result of the adoption of the Plan.

CONFORMITY OF TRANSPORTATION ACTIVITIES WITH AIR QUALITY PLANS AND EMISSIONS BUDGETS

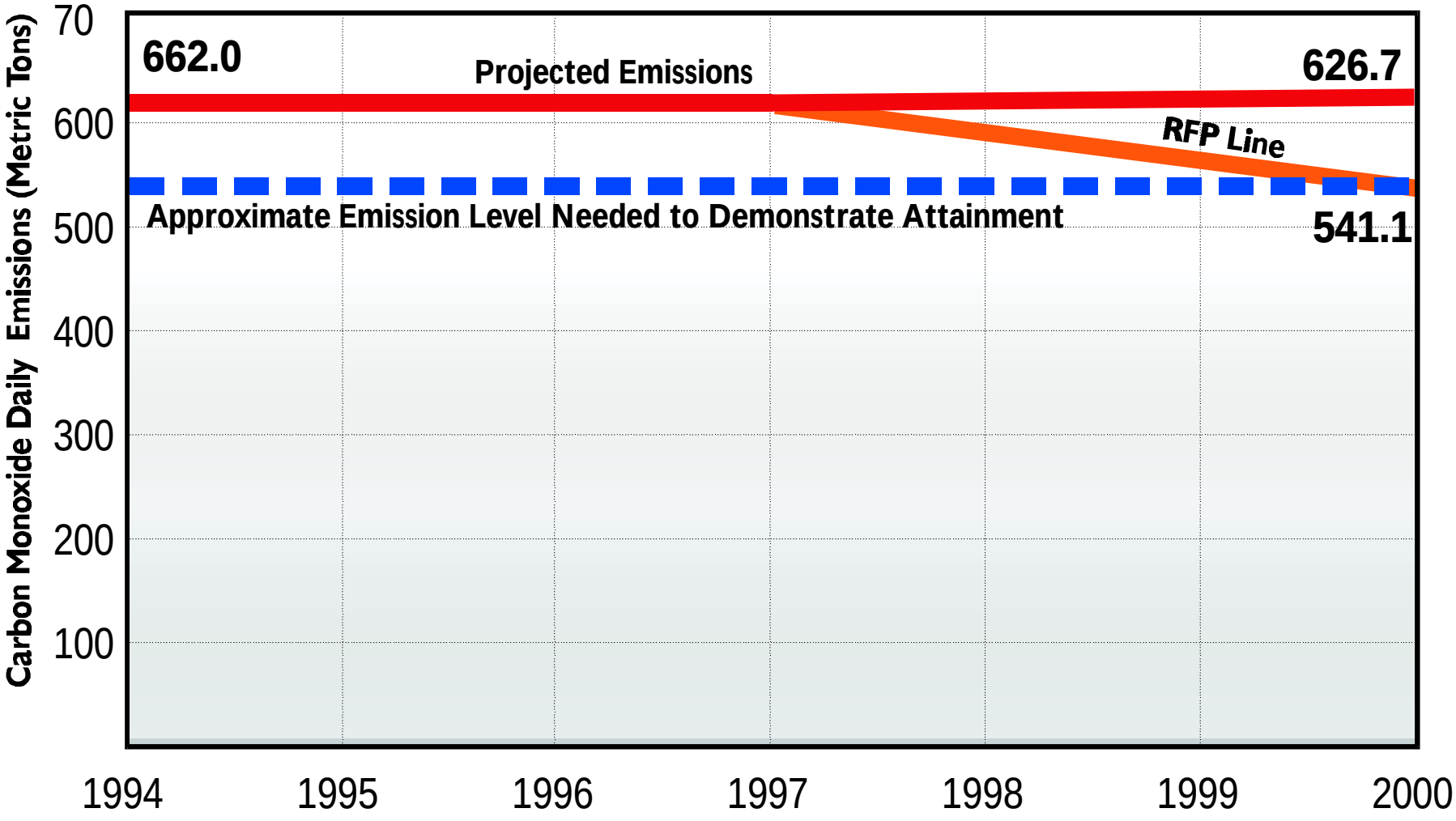
In accordance with the 1990 Clean Air Act Amendments, conformity requirements are intended to ensure that transportation activities do not result in air quality degradation. Section 176 of the Amendments requires that transportation plans, programs, and projects conform to applicable air quality plans before the transportation action is approved by a Metropolitan Planning Organization (MPO). The designated MPO for the Maricopa County area is MAG. In order to perform the carbon monoxide conformity analysis, MAG will adhere to the most recent approved EPA requirements as identified in 40 CFR Parts 51 and 93: Transportation Conformity Rule.

The most recent, approved Maricopa Association of Governments conformity analysis was for the MAG 1998-2002 Transportation Improvement Program (TIP) and Long Range Transportation Plan (LRTP) Summary and 1997 Update. A finding of conformity for this TIP and LRTP was made by the Federal Highway Administration and the Federal Transit Administration on November 19, 1997. This finding and conformity analysis are included in Appendix C, Exhibit 3.

It is important to note that effective May 1, 1998, the U.S. Congress passed Public Law 105-174 which impacts the conformity analysis for carbon monoxide (Appendix A, Exhibit 4). The law states that no requirements set forth in any carbon monoxide federal implementation plan that are based on the Clean Air Act in effect prior to the 1990 amendments to the Act may be imposed in the State of Arizona.

In addition, the MAG Regional Council on May 29, 1991, adopted a “Policy for Conformity Determinations by MAG”. In accordance with the 1990 Clean Air Act Amendments and Federal Implementation Plan for Carbon Monoxide, this policy included approaches for preventing and reacting to nonconformance. The adopted MAG policy is described as follows:

Figure 9-2
Reasonable Further Progress Line for Carbon Monoxide



Emission estimates correspond to December conditions (i.e. 1994 means December 1994)
Emissions are estimated for December 16, 1994.

Approaches to Prevent Nonconformance

- Identify Areas with High Levels of Traffic Congestion and High Pollution Concentration

  Identifying areas with high levels of traffic congestion and high pollution concentration in relationship to projects in the Transportation Improvement Program (TIP) and other transportation plans. This approach could enhance the decision making process for conformity determinations.

- Prioritize Transportation Projects

  Transportation projects could be prioritized in the TIP and other transportation plans based upon a variety of factors including air quality. The air quality factor could be based upon the levels of congestion relief within areas of high pollution concentration associated with the project. Transit and demand management projects could also be components of the air quality factor. The air quality factor could be weighted. The other factors could include: safety, system continuity, and relationship to the land use assumptions in the base case for the transportation model.

Approaches to React to Nonconformance

- Modify Projects, Eliminate Projects, or Add Control Measures

  Establishing policies for the Conformity Modifications specified in the Federal Implementation Plan (FIP) for Carbon Monoxide. These modifications are designed to bring a nonconformity transportation plan into conformity with the emissions ceiling in the air quality plan. The modifications include: elimination of the projects that cause the nonconformance; modifications to the projects which cause the nonconformance; modifications to other projects sufficient to offset emissions and concentration increase form the projects causing the nonconformance; or expeditious implementation of sufficient additional control measures to eliminate excess or reduce ambient concentrations to the levels in the applicable air quality plan.

  Transportation projects located in areas of high congestion that contribute to nonconformance should be redesigned to incorporate features to encourage and support non-single occupant vehicle travel. These features may include facilities for pedestrians, bicyclists, carpooling, vanpooling, transit, etc. Transportation projects located in uncongested areas may be considered for reprogramming in order to enhance air quality. Reprogramming could include redesigning the project, changing the project location, adding transit and demand management provisions.

A quantitative rating system for determining project priorities has been developed and is used during the TIP development process. This rating system is voluntary and is currently used as a tool to guide decision makers during the programming of transportation funds. It is important to note that if the air quality modeling results indicate a finding of nonconformance, it would be necessary to make adjustments to the TIP, because MAG cannot approve any transportation plan, program, or project which does not conform with applicable air quality plans. In this situation, results of the rating system could be used to identify such possible adjustments.

On April 12, 1995, the Arizona Department of Environmental Quality adopted transportation conformity rules as required under Section 197(c)(4)(C) of the Clean Air Act, as amended in 1990. The rules established the criteria and procedures for determining that transportation plans, programs and projects which are funded or approved under Title 23 U.S.C. or the Federal Transit Act conform with State or Federal air quality plans. The Arizona conformity rules also required MAG to develop specific conformity guidance and procedures as well as document the MAG conformity consultation process. These two reports, described below, are provided in Appendix C, Exhibits 4 and 5.

The MAG Transportation Conformity Guidance and Procedures was adopted by the MAG Regional Council on September 27, 1995 and Revised by the MAG Regional Council on March 27, 1996. This document largely addresses the process for approval of regionally significant projects by government agencies. The MAG Conformity Consultation Processes for the Maricopa County Nonattainment Area was adopted by the MAG Regional Council on February 28, 1996. This report describes processes for interagency and public consultation on air quality and transportation conformity issues for the Maricopa County area. To ensure flexibility at the local level, these two documents are not submitted, nor considered as, part of the Arizona SIP.

CHAPTER TEN

PUBLIC PARTICIPATION

The Transportation-Air Quality Guidelines for public participation are issued jointly by the U.S. Environmental Protection Agency and the U.S. Department of Transportation. These guidelines are designed to encourage an effective public participation program for the development and implementation of the State Implementation Plan (SIP). According to the guidelines, the objectives of the public participation program should be to:

1. Promote public awareness of the air pollution problem, the SIP revision process, and the effects of various transportation control measures;

2. Encourage active participation from a variety of interest groups in the plan preparation process;

3. Promote public understanding and agreement on the transportation control measures necessary to improve air quality;

4. Provide for the identification of both interested and affected constituencies;

5. Ensure that the agencies and elected officials are responsive to these constituencies; and

6. Encourage a spirit of openness and trust among elected officials, agencies, and the public.

In order to be responsive to these guidelines, the Maricopa Association of Governments has established a formal public participation program. The program includes the MAG Air Quality Technical Advisory Committee, the MAG Air Quality Policy Committee, additional Air Quality Working Groups, as necessary, the MAG Management Committee, and the MAG Regional Council. Technical support for the public participation program is provided by MAG, the Arizona Department of Environmental Quality, the Arizona Department of Transportation, and Maricopa County Environmental Services Department (see Figure 9-1). A brief description of these components of the program are described below.

DECISION MAKING STRUCTURE

The Maricopa Association of Governments has been designated as the lead planning agency for air quality planning within the Maricopa County Urban Planning Area. MAG member agencies include the twenty-four cities and towns, the Salt River Pima-Maricopa and Gila River Indian communities, Maricopa County, and the Arizona Department of Transportation. A representative from the Regional Public Transportation Authority is also

FIGURE 10-1

MAG REGIONAL AIR QUALITY PLANNING TECHNICAL PROCESS

- All MAG regional air quality plans are prepared through a coordinated effort among the Arizona Department of Environmental Quality, Arizona Department of Transportation, Maricopa County Environmental Services Department and Maricopa Association of Governments.

MAG AIR QUALITY POLICY TEAM

Composition: Director of Arizona Department of Environmental Quality; Director of Arizona Department of Transportation; Air Pollution Control Officer of Maricopa County; MAG Executive Director

- Oversees preparation of plans and overall technical planning effort
- Resolves technical problems and issues

MAG AIR QUALITY PLANNING TEAM

Composition: Staff from the Arizona Department of Environmental Quality, Arizona Department of Transportation; Maricopa County Environmental Services Department; Maricopa Association of Governments

<u>Agency Roles</u>

- Arizona Department of Environmental Quality - air quality modeling and technical assistance, mobile source emissions research and inventory, input for the comprehensive list of measures and feasibility analysis, information, relating to the Vehicle Emission Inspection Maintenance Program, stationary and portable source control strategies, air quality research studies, State Air Quality Fund administration, adoption and Submittal of State Implementation Plans to the Environmental Protection Agency, tracking plan implementation, assurances, special purpose air quality and meteorological monitoring for plan development and compliance
- Arizona Department of Transportation - State Transportation Improvement Program, other transportation plans and programs, input for the comprehensive list of measures and feasibility analysis
- Maricopa County Environmental Services Department - stationary source emissions inventory and controls, coordinating the comprehensive emissions, inventory, air quality monitoring data, input for comprehensive list of measures and feasibility analysis, mandatory travel reduction program, trip reduction data, voluntary no drive days program, tracking plan implementation, reasonable further progress, assurances, special purpose air quality and meteorological monitoring for plan development and compliance
- Maricopa Association of Governments - demographic projections and socioeconomic data, transportation modeling, air quality modeling, Regional Transportation improvement Program, Regional Transportation Plan, other transportation plans and programs, congestion management system, conformity, input for comprehensive list of measures and feasibility analysis, development of the air quality plans, interface with state, county, and local entities, recommending future year travel reduction goals, policies, and standards to Maricopa County, assistance to Maricopa County for the mandatory travel reduction program, review reasonable further progress made to reduce air pollution and plan adjustments if necessary, review plan implementation

The technical planning work is closely coordinated with EPA Region IX staff, Federal Highway Administration, and Federal Transit Administration.

included on the MAG Management Committee. The policy development process is influenced by input from the MAG member agencies, MAG committees, local citizens, and staff. The decision making body for MAG is the Regional Council, which is composed of elected officials from the member agencies. The MAG Management Committee, which is composed of managers from the member agencies, makes recommendations to the Regional Council (see Figure 9-2).

The MAG Air Quality Policy Committee was established in 1975 and is comprised of ten elected officials, nine citizen representatives, and three ex-officio representatives. The primary role of the Air Quality Policy Committee is to provide policy guidance on regional air quality matters to the MAG Regional Council. The Committee also serves as the main mechanism for soliciting citizen input on air quality matters and conducts public hearings on revisions to the State Implementation Plan. The mailing list for the Committee includes numerous interested citizens and agency staff representatives.

The MAG Air Quality Technical Advisory Committee was established by the MAG Regional Council in 1995. The purpose of the Committee is to review and comment on technical information generated during the planning process and make technical recommendations to the MAG Air Quality Policy Committee.

PUBLIC PARTICIPATION IN THE PREPARATION OF THE MAG 1997 SERIOUS AREA PM-10 PLAN AND MAG 1997 CARBON MONOXIDE PLAN

The process used to develop the MAG 1997 PM-10 and Carbon Monoxide Plans included numerous meetings of the MAG Air Quality Technical Advisory Committee, MAG Air Quality Policy Committee, MAG Management Committee and MAG Regional Council. All of these meetings were open to public attendance. During the preparation of the PM-10 and Carbon Monoxide Plans, public hearings were conducted to solicit additional citizen input. A brief description of the Air Quality Technical Advisory and Policy Committee meetings conducted in preparing the plans is provided below.

Meetings of the MAG Air Quality Technical Advisory Committee

On February 23, 1995, the first meeting of the Air Quality Technical Advisory Committee was held to provide an Air Quality Status Report.

On May 3, 1995, a meeting of the Air Quality Technical Advisory Committee was conducted to discuss the Particulate Control Measure Feasibility Study, a Status Report on Transportation Conformity, and Major 1995-1996 Air Quality Planning Activities.

On July 6, 1995, a meeting of the Air Quality Technical Advisory Committee was conducted to review the Draft FY 1996-2000 MAG Transportation Improvement Program, 1995 Long Range Transportation Plan, and MAG Conformity Guidelines and Procedures, and receive an Update on PM-10 Reclassification.

FIGURE 10-2

MAG REGIONAL AIR QUALITY PLANNING PROCESS

MAG REGIONAL AIR QUALITY PLANNING PROCESS

Composition: Elected officials from 24 cities and towns, Maricopa County, Salt River Pima-Maricopa and Gila River Indian Communities Arizona Department of Transportation, Regional Public Transportation Authority

- Reviews all pertinent air quality data
- Formally requests that state, county, local, and other appropriate agencies implement measures in the plans
- Determines conformity, subject to the consultation procedures as provided by law (Clean Air Act § 176)
- Maintains an air quality/transportation planning process consistent with federal law

MAG MANAGEMENT COMMITTEE

Composition: Managers for 24 cities and towns, Maricopa County, Salt River Pima - Maricopa and Gila River Indian Communities, Arizona Department of Transportation, Regional Public Transportation Authority

- Reviews all pertinent air quality and transportation data
- Recommends regional air quality and transportation plans
- Recommends trip reduction goals and policies

MAG AIR QUALITY POLICY COMMITTEE

Composition: 10 elected officials from cities and towns and Maricopa County and 9 citizen representatives + ex-officio representatives from Arizona Department of Environmental Quality, Arizona Department of Transportation, and Maricopa County Environmental Services Department

- Reviews all pertinent air quality data from the technical planning process
- Reviews air quality research studies conducted by MAG, Arizona Department of Environmental Quality, EPA, Maricopa County Environmental Quality and Community Services Agency, etc.
- Reviews related data generated from other MAG regional planning areas such as transportation, transit, population, regional development, water quality, solid waste, etc.
- Studies in detail a comprehensive list of control measures. Data on the measures includes: description of the measures, air quality impacts, complementary measures, implementation responsibility, costs, advantages and disadvantages, etc.
- Recommends air quality measures for the plans
- Conducts public hearings on the plans
- Formally recommends regional air quality plans and control measures
- Recommends trip reduction goals and policies
- Conducts conformity reviews, subject to the consultation procedures as provided by law (Clean Air Act § 176)
- Reviews reasonable further progress made to reduce air pollution and recommends plan adjustments if necessary
- Provides input on the MAG congestion management system

MAG AIR QUALITY TECHNICAL ADVISORY COMMITTEE

ADDITIONAL WORKING GROUPS AS NECESSARY

On September 7, 1995, a meeting of the MAG Air Quality Technical Advisory Committee was conducted to discuss Enforcement of Air Pollution Control Measures, Revised MAG Transportation Conformity Guidance and Procedures, and an Air Quality Update on the potential reclassifications for PM-10 and carbon monoxide.

On November 1, 1995, a meeting of the MAG Air Quality Technical Advisory Committee was conducted to discuss Phase II of New MAG Conformity Procedures, an Air Quality Update on communications with EPA on PM-10 and nitrogen oxides, Formation of a Subcommittee on Ozone Exceedance Forecasting, and Super Bowl XXX Activities.

On December 13, 1995, a meeting of the MAG Air Quality Technical Advisory Committee was held to discuss the Conformity Analysis for the Draft 1996-2000 Transportation Improvement Program and the 1995 Long Range Transportation Plan Update, New EPA Conformity Regulations, an Air Quality Update on Carbon Monoxide Classification, Maricopa County Fireplace Ordinance, and Development of Phase II of MAG Conformity Procedures.

On January 11, 1996, a meeting of the MAG Air Quality Technical Advisory Committee was held to discuss the Draft Conformity Analysis for the 1996-2000 MAG Transportation Improvement Program and the 1995 Long Range Transportation Plan Update, Development of Phase II MAG Conformity Procedures, and Enhanced Vehicle Emissions Inspection Maintenance Program (I/M 240).

On February 8, 1996, a meeting of the MAG Air Quality Technical Advisory Committee was held to discuss MAG Conformity Consultation Processes, Revisions to the MAG Transportation Conformity Guidelines and Procedures, Air Quality and Health, and an Air Quality Update.

On March 14, 1996, a meeting of the MAG Air Quality Technical Advisory Committee was conducted to discuss Revisions to the MAG Transportation Conformity Guidelines and Procedures, Interagency Consultation on Processes Pertaining to Transportation Conformity Analysis, Interagency Consultation on Potential Regionally Significant Projects for the 1996 Conformity Analysis, Low Emission Diesel Buses, Legislative Update, and Draft Inventory Preparation Plan for the 1994 PM-10 Emission Inventory Study.

On June 5, 1996, a meeting of the MAG Air Quality Technical Advisory Committee was conducted to discuss an Air Quality Update, Court Opinion for the Particulate Plan Lawsuit, Air Quality Trend Data Comparison of the Los Angeles Area to the Maricopa Area, Governor's Air Pollution Emergency Proclamation, and Draft Final Report for the MAG Biogenic Emissions Inventory.

On July 11, 1996, a meeting of the MAG Air Quality Technical Advisory Committee was held to discuss Air Quality Plan Development, Update on the Governor's Ozone Strategies Task Force, Status Report on the Draft Conformity Analysis for the MAG

1996 Long Range Transportation Plan Update and the 1997-2001 Transportation Improvement Program, and the Particulate Control Measure Feasibility Study.

On September 5, 1996, a meeting of the Air Quality Technical Advisory Committee was held to discuss the Draft Conformity Analysis for the 1996 Long Range Transportation Plan Update and the 1997-2001 Transportation Improvement Program, Reclassification to Serious for Carbon Monoxide, Predicting Ozone Exceedances, Air Quality Bill Passed by Legislature, Particulate Monitoring Data and Microscale Field Studies, and Particulate Control Measure Feasibility Study.

On October 24, 1996, a meeting of the Air Quality Technical Advisory Committee was held to discuss the Draft Final Report for the MAG Aviation Air Quality Study, An Air Quality Overview, and the Particulate Control Measure Feasibility Study.

On November 6, 1996, a meeting of the Air Quality Technical Advisory Committee was conducted to discuss the MAG Brown Cloud Project, Draft Carbon Monoxide Modeling, Draft Comprehensive List of Measures for the Serious Area Particulate and Carbon Monoxide Plans, and the Governor's Air Quality Strategies Task Force.

On December 18, 1996, a meeting of the Air Quality Technical Advisory Committee was held to discuss the PM-10 24-Hour Modeling Effort, Draft Comprehensive List of Measures for the Serious Area Particulate and Carbon Monoxide Plans, and the Governor's Air Quality Strategies Task Force Report.

On December 19, 1996, a meeting of the Air Quality Technical Advisory Committee was held to discuss the Draft Comprehensive List of Measures for the Serious Area Particulate and Carbon Monoxide Plans.

On February 13, 1997, a meeting of the Air Quality Technical Advisory Committee was held to discuss the Suggested List of Measures for the Serious Area Particulate and Carbon Monoxide Plans, Maricopa County PM-10 Nonattainment Area Residential Wood-Combustion Emissions, New Carbon Monoxide Emissions Inventory, New Particulate Emissions Inventory, and MAG Particulate Control Measure Feasibility Study-Final Report.

On March 6, 1997, a meeting of the Air Quality Technical Advisory Committee was conducted to discuss the New Particulate Emissions Inventory, ADEQ Particulate Modeling and Best Available Control Measures for the 24-Hour Particulate Standard, ADEQ Voluntary Early Ozone Plan, Air Quality Modeling Status Report, and a Legislative Update.

On May 15, 1997, a meeting of the MAG Air Quality Technical Advisory Committee was held to discuss an Update on the MAG Brown Cloud Project, a Legislative Update, a Carbon Monoxide Modeling Status Report, a Particulate Modeling Status Report, Proposed Changes to the Maricopa County Trip Reduction Ordinance, and a Revised Suggested List of Measures for Particulate Matter and Carbon Monoxide.

On September 4, 1997, a meeting of the MAG Air Quality Technical Advisory Committee was held to discuss Local Measure Needed to Address Existing Unpaved Roads, Parking lots, and Vacant Lots, a Carbon Monoxide Modeling Status Report, a Particulate Modeling Status Report, New Ozone and Particulate Standards Established by EPA, Reclassification to Serious for Ozone, and the Court Ruling on the Carbon Monoxide Contingency Measures.

On October 9, 1997, a meeting of the MAG Air Quality Technical Advisory Committee was held to discuss the Draft Conformity Analysis for the MAG 1998-2002 Transportation Improvement Program and Long Range Transportation Plan Summary and 1997 Update, the Draft MAG Model Fireplace Ordinance, a Carbon Monoxide Modeling Status Report, and a Particulate Modeling Status Report.

On November 13, 1997, a meeting of the MAG Air Quality Technical Advisory Committee was held to discuss an Air Quality Update, Air Quality Monitoring Data, and the Brown Cloud Project.

On January 14, 1998, a meeting of the MAG Air Quality Technical Advisory Committee was held to discuss a PM-10 Status Report, a Carbon Monoxide Status Report, and the Governor's Air Quality Strategies Task Force.

On February 11, 1998, a meeting of the MAG Air Quality Technical Advisory Committee was held to discuss the Governor's Air Quality Strategies Task Force Proposed Recommendations, the Serious Area PM-10 Plan Most Stringent Control Measures, and a Carbon Monoxide Modeling Update.

On March 12, 1998, a meeting of the MAG Air Quality Technical Advisory Committee was held to discuss an Ozone Modeling Update, the Serious Area PM-10 Plan Most Stringent Control Measures, and a Carbon Monoxide Modeling Update.

On April 21, 1998, a meeting of the MAG Air Quality Technical Advisory Committee was held to discuss the Most Stringent PM-10 Control Measures, Proposed Moderate Area PM-10 Federal Implementation Plan for Unpaved Roads, Vacant Lots and Parking Lots, and a Legislative Update.

Meetings of the MAG Air Quality Policy Committee

On September 15, 1994, a meeting of the MAG Air Quality Policy Committee was conducted to discuss Arizona Department of Environmental Quality (ADEQ) Conformity Procedures, an EPA Proposal to Approve the MAG 1991 Plan for PM-10 and Reclassify This Area from Moderate to Serious, the Ozone Modeling Demonstration, and the Status of the Petition for Nitrogen Oxides.

On October 13, 1994, the MAG Air Quality Policy Committee met to conduct a public hearing on the Ozone Modeling Demonstration Due to EPA By November 15, 1994 and to discuss the ADEQ Conformity Procedures.

On October 20, 1994, a meeting of the MAG Air Quality Policy Committee was held to discuss the Ozone Modeling Demonstration, Planning Activities for the Next Particulate Pollution Plan, Formation of the New MAG Air Quality Technical Advisory Committee, and ADEQ Conformity Procedures.

On November 21, 1994, a meeting of the MAG Air Quality Policy Committee was conducted to discuss the Maricopa County Residential Woodburning Ordinance, Particulate Pollution Planning Activities, Ozone Planning Activities, and Formation of the New MAG Air Quality Technical Advisory Committee.

On February 23, 1995, a meeting of the MAG Air Quality Policy Committee was held to discuss Revision to the Ozone Modeling Attainment Demonstration, the MAG Urban Form Study, and a Telecommuting and Shared Facilities Demonstration Program.

On March 9, 1995, the MAG Air Quality Policy Committee met to conduct a public hearing on the Revision to the Ozone Modeling Attainment Demonstration for the MAG 1993 Ozone Plan and Addendum.

On March 23, 1995, a meeting of the MAG Air Quality Policy Committee was conducted to discuss the Revision to the Ozone Modeling Attainment Demonstration, the EPA New Conformity Lapse Rule, and the Particulate Control Measure Feasibility Study.

On April 20, 1995, a meeting of the MAG Air Quality Policy Committee was held to discuss the Particulate Control Measure Feasibility Study, Draft Pedestrian Area Policies and Guidelines, and Status Reports on the new Air Quality Technical Advisory Committee and Transportation Conformity.

On July 20, 1995, a meeting of the MAG Air Quality Policy Committee was conducted to discuss Comments on the EPA Proposed Finding for PM-10, MAG Conformity Guidelines and Procedures, an Air Quality Update on PM-10, nitrogen oxides, conformity and ozone, Air Quality Monitoring Network and Major 1995-1996 Air Quality Planning Activities.

On September 21, 1995, a meeting of the MAG Air Quality Policy Committee was conducted to discuss Enforcement of Air Pollution Control Measures, Approval of Revised MAG Transportation Conformity Guidance and Procedures, an Air Quality Update on PM-10 and carbon monoxide, and New EPA Transportation Conformity Regulations.

On November 16, 1995, a meeting of the MAG Air Quality Policy Committee was held to discuss Development of Phase II MAG Conformity Procedures, an Air Quality Update on PM-10 and nitrogen oxides, Super Bowl Planning Activities, and Citizen Representatives on the MAG Air Quality Policy Committee.

On December 14, 1995, a meeting of the MAG Air Quality Policy Committee was conducted to discuss the Draft Conformity Analysis for the 1996-2000 MAG Transportation Improvement Program and 1995 Long Range Transportation Plan Update, New EPA Transportation Conformity Regulations, an Air Quality Update on carbon monoxide, Maricopa County Fireplace Ordinance, Development of Phase II MAG Conformity Procedures, and Citizen Representatives on the MAG Air Quality Policy Committee.

On January 18, 1996, a meeting of the MAG Air Quality Policy Committee was held to discuss Citizen Representatives on the MAG Air Quality Policy Committee, the Draft Conformity Analysis for the FY 1996-2000 MAG Transportation Improvement Program and Long Range Plan 1995 Update, Development of Phase II Conformity Procedures, and Enhanced Vehicle Emissions Inspection Maintenance Program (I/M 240).

On February 22, 1996, a meeting of the MAG Air Quality Policy Committee was conducted to discuss MAG Conformity Consultation Processes, Air Quality and Health, and an Air Quality Update on carbon monoxide.

On March 21, 1996, a meeting of the MAG Air Quality Policy Committee was conducted to discuss Revisions to the MAG Transportation Conformity Guidelines and Procedures, Interagency Consultation: Processes Pertaining to Transportation Conformity Analysis, Interagency Consultation: Potential Regionally Significant Projects for the 1996 Conformity Analysis, and Low Emission Diesel Buses.

On May 23, 1996, a meeting of the MAG Air Quality Policy Committee was held to discuss an Air Quality Update on carbon monoxide, PM-10, and ozone, Court Opinion for the Particulate Plan Lawsuit, and Air Quality Trend Data: Comparison of the Los Angeles Area to the Maricopa Area.

On June 20, 1996, a meeting of the MAG Air Quality Policy Committee was conducted to discuss the Draft Final Report for the MAG Biogenic Emissions Inventory and a Status Report on the Governor's Ozone Strategies Task Force.

On July 25, 1996, a meeting of the MAG Air Quality Policy Committee was held to discuss Air Quality Plan Development, an Update on the Governor's Ozone Strategies Task Force, Status Report on the Draft Conformity Analysis for the MAG 1996 Long Range Transportation Plan Update and 1997-2001 Transportation Improvement Program, Particulate Control Measure Feasibility Study, and Carbon Monoxide Lawsuit.

On September 12, 1996, a meeting of the Air Quality Policy Committee was conducted to discuss Air Quality Plan Development, Update on the Governor's Ozone Strategies Task Force, Draft Conformity Analysis for the 1996 Long Range Transportation Plan Update and the 1997-2001 Transportation Improvement Program, Particulate Control Measure Feasibility Study, Carbon Monoxide Lawsuit, and Air Quality Bill Passed by the Legislature.

On November 14, 1996, a meeting of the Air Quality Policy Committee was held to discuss An Air Quality Overview, the MAG Brown Cloud Project, Update on the Governor's Air Quality Strategies Task Force, and Draft Comprehensive list of Measures for the Serious Area Particulate and Carbon Monoxide Plans.

On January 16, 1997, a meeting of the Air Quality Policy Committee was conducted to discuss the Governor's Air Quality Strategies Task Force Report and the Suggested List of Measures for the Serious Area Particulate and Carbon Monoxide Plans.

On March 13, 1997, a meeting of the MAG Air Quality Policy Committee was held to discuss the Draft Agricultural Measures for Possible Inclusion in the Suggested List of Measures for Particulates and Carbon Monoxide, the MAG Particulate Control Measure Feasibility Study - Final Report, ADEQ Particulate Modeling and Best Available Control Measures for the 24-hour Particulate Standard, and an Air Quality Modeling Status Report.

On May 22, 1997, a meeting of the Air Quality Policy Committee was conducted to discuss the MAG Particulate Control Measure Feasibility Study - Final Report, Update on the MAG Brown Cloud Project, Legislative Update, Carbon Monoxide Modeling Status Report, Particulate Modeling Status Report, and Revised Suggested List of Measures for Particulate Matter and Carbon Monoxide.

On September 11, 1997, a meeting of the MAG Air Quality Policy Committee was held to discuss the Local Measures Needed to Address Existing Unpaved Roads, Parking Lots, and Vacant Lots, a Carbon Monoxide Modeling Status Report, a Particulate Modeling Status Report, the New Ozone and Particulate Standards Established by EPA, Reclassification to Serious for Ozone, and the Court Ruling on the Carbon Monoxide Contingency Measures.

On October 23, 1997, a meeting of the MAG Air Quality Policy Committee was held to discuss the Draft Conformity Analysis for the MAG 1998-2002 Transportation Improvement Program and Long Range Transportation Plan Summary and 1997 Update, the Draft MAG Model Fireplace Ordinance, a Carbon Monoxide Modeling Status Report, and a Particulate Modeling Status Report.

On November 20, 1997, a meeting of the MAG Air Quality Policy Committee was held to discuss an Air Quality Update, Air Quality Monitoring Data, and the Brown Cloud Project.

On January 22, 1998, a meeting of the MAG Air Quality Policy Committee was held to discuss a PM-10 Status Report, a Carbon Monoxide Status Report, and the Governor's Air Quality Strategies Task Force.

On February 19, 1998, a meeting of the MAG Air Quality Policy Committee was held to discuss the Governor's Air Quality Strategies Task Force Proposed

Recommendations, the Serious Area PM-10 Plan Most Stringent Control Measures, and a Carbon Monoxide Modeling Update.

On Thursday, April 23, 1998, a meeting of the MAG Air Quality Policy Committee was held to discuss the Most Stringent PM-10 Control Measures, the Proposed Moderate Area PM-10 Federal Implementation Plan for Unpaved Roads, Vacant Lots, and Parking Lots, and a Legislative Update.

PUBLIC INVOLVEMENT PROCESS FOR TRANSPORTATION AND AIR QUALITY

With the passage of the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA), emphasis on public involvement in the metropolitan transportation planning process has expanded. ISTEA requires that the metropolitan planning organization, MAG, provide citizens, affected public agencies, representatives of transportation agency employees, private providers of transportation, and other interested parties, a reasonable opportunity to comment on proposed transportation plans and programs. As part of ISTEA, the Federal Highway Administration directed that the public involvement process include opportunities for interested parties to be involved in the early stages of the plan and program development and update process. In addition, the Clean Air Act of 1990 emphasized the integration of transportation and air quality plans. In response to these requirements, MAG has developed an expanded public involvement process for the annual update of the MAG Transportation and Air Quality plans and programs.

The key elements of the public involvement process include holding a series of public meetings, providing presentations on regional transportation issues to interested parties, conducting public surveys, and informing the public by newsletters and press releases. The Arizona Department of Transportation (ADOT) and the Regional Public Transportation Authority (RPTA) have agreed to participate in many of these key elements. The public involvement process is divided into four phases: early input; mid-phase; final; and continuous. The following paragraphs describe these phases.

Early Input

ISTEA regulations propose that the metropolitan planning process include provisions to ensure early and continuing public involvement in the development of plans and programs. The early input or initial phase of the MAG public involvement process involves holding multiple, informal open house meetings and making presentations to various regional modal, air quality and community organizations.

Informal open house meetings on the 1998-2002 Transportation Improvement Program and the 1997 Long Range Transportation Plan Update were held on October 28, 29, and 31, 1996. Comments received during the early input meetings were summarized and responses prepared. A summary report was provided to the MAG Management Committee, the MAG Regional Council, and interested citizens.

Mid-Phase

The mid-phase of the public involvement process includes the annual MAG/ADOT/RPTA Public Meeting and a second round of public meetings which focuses on the annual financial report. The MAG/ADOT/RPTA joint open houses were held on February 25 and 27, 1997, to address regional transportation issues. Presentation boards were displayed at the meeting. During the meetings, brief presentations were made by MAG, ADOT, and RPTA staff and time was dedicated to public comments.

In accordance with House Bill 2278, annual public hearings on the status of the MAG Freeway Program are held after the issuance of the annual fiscal status report. Public meetings on MAG transportation and air quality plans and programs are held in conjunction with these annual public hearings. The report and comment period for the Fiscal Analysis Unit Report are in the format of a public hearing and are preceded by an open house on transportation and air quality plans and programs. This public hearing was held on February 26, 1997.

The public comments received at the mid-phase meetings were summarized and reported to the MAG Management Committee and Regional Council in February 1997. After the draft 1997 update of the Plan and 1998-2002 TIP were prepared, the Regional Council was requested to approve the draft plan and program for conformity analysis in March 1997.

Final Phase

During the final phase, a newsletter was mailed and a public hearing was held. A newsletter summarizing the MAG transportation and air quality plans and programs was sent to all meeting participants. A summary report of the comments received during the initial and mid-phase was incorporated into the newsletter. In addition, the newsletter informed individuals about the upcoming public hearing.

In accordance with federal regulations, a public hearing on air quality conformity is required prior to the adoption of transportation plans and programs. Formal comments received during the 30-day comment period and at the public hearing have been summarized and answered. Results of this public hearing are provided to the MAG Management Committee, the MAG Regional Council, and interested citizens. After the public hearing, the Management Committee and Regional Council are asked to approve the annual update of the Long Range Transportation Plan and the TIP, as well as the findings on the conformity analysis.

Open houses for the 1997 Long Range Transportation Plan Update, the 1998-2002 Transportation Improvement Program, and the 1997 Air Quality Conformity Analysis were conducted in Glendale, Mesa, Phoenix, and Scottsdale during October 1997. The 30-day comment period for the final phase commenced on September 12, 1997. The public hearing was conducted on October 14, 1997. Comments and responses have been summarized and forwarded to the MAG Regional Council.

Continuous

The continuous phase of the public involvement process occurs throughout the annual update of MAG transportation plans and programs. Elements of this phase include making requested presentations, conducting public opinion surveys, issuing press releases, providing periodic progress reports to agency boards, and conducting open meetings.

MAG receives requests for presentations on transportation plans throughout the year. This includes requests from local social, political, and business groups. Efforts are made to accommodate these requests.

Public opinion surveys include focus groups, needs assessments, and surveys of citizens. In addition, survey tools are used to measure the opinion of individuals who attend meetings and presentations.

Press releases are issued on the public involvement process and on the transportation and air quality plans and programs. The public information officers from MAG member agencies are made aware of the public involvement process and assist in providing this information to their local media. Newspapers which focus on issues impacting minority population are contacted and efforts are made to publish articles in these media.

TITLE VI CONSIDERATIONS

Title VI of the Civil Rights Act of 1964 prohibits discrimination on the basis of race, color and national origin by recipients and sub-recipients of federal funds and prohibits exclusion from participation in, denial of benefits, or being subjected to discrimination under any program or activity receiving federal financial assistance. Additional federal and state laws and directives prohibit discrimination on the basis of age, gender, handicap or disability. The Executive Order on Environmental Justice encourages consideration of environmental justice concerns, especially the impact of programs and activities on low-income and minority populations. The Act and its related laws and directives hereinafter are called, collectively, *Title VI*.

The Maricopa Association of Governments (MAG) is responsible for incorporating Title VI requirements and environmental justice concerns in its planning and programming processes, and the enforcement of statewide compliance, including the MAG region, is the responsibility of ADOT. MAG's policy is to assist ADOT in its compliance efforts.

MAG has developed a draft Information and Reporting Program in cooperation with the Federal Highway Administration (FHWA) and the Arizona Department of Transportation (ADOT) as part of ADOT's Title VI Plan. The MAG Information and Reporting Program depicts what MAG will do, how it will be done, and how activities will be monitored in relation to Title VI requirements. MAG is committed to policies that will ensure equal opportunity and programs that comply with Title VI.

The Maricopa Association of Governments (MAG), is a voluntary association of local governments in Maricopa County, Arizona, whose members are the twenty-four

incorporated cities and towns, Maricopa County, the Salt River Pima-Maricopa Indian Community and the Gila River Indian Community. A representative of the Arizona Department of Transportation Board (ADOT) and a representative of the Citizens' Transportation Oversight Committee (CTOC) are members of the MAG Regional Council. MAG receives funds from a variety of sources, including direct federal, indirect federal, and state and local government funds.

Historically, the MAG Human Services Planning Program has considered the needs of populations vulnerable to discrimination or exclusion. These populations may be described by minority race or ethnicity, low income, functional limitations or disabilities, or advanced age (60 years or older). Program activities intentionally solicit public input, participation and feedback regarding local needs.

Public Involvement Process

MAG currently conducts activities to encourage public participation in its decisions. These activities include open houses, community meetings, and presentations to local committees. This open process offers complete information on plans, timely public notice, public access to decisions, and opportunities for early and continuing involvement. In addition to general public involvement processes, the MAG Human Services Planning Program solicits input from local minority populations and people in under served communities. The processes and findings of the Human Services Planning Program are integrated into MAG's planning programs, and members of the MAG Human Services Planning Program staff are part of the MAG Title VI team.

MAG targeted known potential populations that could be affected by proposed policies of this plan. Each entity or individual was sent a personal invitation to comment on the draft plan (see Appendix C, Exhibit 7).

Information Dissemination

MAG employs a strategy of expanded information dissemination and public access to plans and decisions. Copies of studies and reports are placed in public libraries in the region as standard procedure.

MAG committee meetings are conducted in accordance with the Open Meeting Law, and thus provide citizens public opportunities to comment before meetings of MAG technical and policy committees. Alternative formats, accessible meeting locations and accessible meeting times are encouraged for MAG meeting planning.

MAG houses numerous records of data, statistics and information. Data collection, analysis and portrayal methods and products are evaluated periodically. Program area managers assess MAG's available data sources for relevance to Title VI requirements not less often than annually.

These partnerships will continue in the form of periodic meetings and communications with ADOT, the Regional Public Transportation Authority (RPTA), and MAG member agencies. MAG maintains an open dialogue with the ADOT Office of Civil Rights.

MAG has partnered with the Arizona Department of Economic Security for human services planning since 1976. The MAG human services planning process enhances the organization's consideration and participation of minority, poor and other population groups in developing regional plans and projects.

CHAPTER ELEVEN

COMMITMENTS FOR IMPLEMENTATION OF THE MAG 1998 SERIOUS AREA CARBON MONOXIDE PLAN

This Chapter, contained in accompanying documents, includes resolutions from the MAG member agencies and other implementing entities. The resolutions indicate specific commitments to implement various control strategies. Each jurisdiction determines which measures are feasible for implementation by that jurisdiction. Legislation passed by the Arizona Legislature is also included in the accompanying documents.

Generally, the authorities of cities and towns to implement the types of measures that they have committed to in their respective resolutions are provided under A.R.S. § 9-240 Powers of Common Council. The general authorities of the county to implement the measures in the commitments are provided under A.R.S. § 11-251 and A.R.S. § 49-478. Copies of these local and county government authorities are included in the commitments document of the Particulate Plan.

Specifically, the commitments contain a description of the measure which will be implemented, the implementation schedule, authority of the entity for implementation, the financial resources necessary to put the measure in place, and the monitoring program designed to track implementation. The commitments document also contains the measures which jurisdictions found not to be feasible and the corresponding rationale. Regulations and ordinances are also included.