State of the System Report

Fiscal Year 2011

Programming & System Analysis

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INTRODUCTION

The 2011 State of the System Report (SOS) is a compilation of the physical inventory and status of the Maricopa County Department of Transportation's (MCDOT) infrastructure. It addresses roadway congestion, traffic safety, low volume road paving, bridges, and pavement conditions. Also, included are recommendations for future improvements within each of the infrastructure categories. The SOS report has been produced annually since 1998.

EXECUTIVE SUMMARY

Congestion Management System

Current and future roadway congestion is addressed in the Congestion Management System Report (CMS). The ratio of a roadway segment's current traffic volume as compared to its physical capacity (V/C Ratio) is used to determine its congestion level. The conservative method of measuring congestion as identified in the MCDOT Roadway Design Manual is used in the report. Roadways under the jurisdiction of MCDOT were analyzed with respect to their V/C ratios and their corresponding Levels of Service (LOS). Currently 22.5% of all arterial and collector roadway segments are at 86% or higher of their physical capacity.

Safety Management System

Safety conditions on MCDOT roadways are addressed under the Safety Management System Report (SMS). This report documents the intersection safety improvements made each year and those planned for the following year. In 2011 MCDOT completed 13 intersection safety improvements and has planned an additional 10 to be completed in 2012. The SMS also tracks the overall crash rates and crash history of MCDOT's roadways. In 2008, the latest date federal crash statistics were available, the crash rate for the nation as a whole was 2.2 crashes per Million Vehicle Miles of Travel (MVMT). In 2008 the County's overall crash rate was 1.49 per MVMT, considerably below the national average.

Low Volume Road Management System

Paving Low Volume Roads is an annual budgeted activity within MCDOT's Transportation Improvement Program (TIP). Dirt roadways are selected for paving based on criteria established by the MCDOT Transportation Advisory Board and the Federal Environmental Protection Agency through the Arizona Department of Environmental Quality. Since 1983 MCDOT has paved more than 453 miles of dirt roadways.

Bridge Management System

Bridges and other structures are identified in the Bridge Management System (BMS). In 2011 MCDOT maintains 420 bridges and structures. This includes 86 bridges and 334 culverts. Three new bridges and structures were added this year and two were removed through annexations by cities and towns. Bridges and structures are categorized as Federal or Non-Federal depending on their length. Those over 20 feet in length are classified as bridges. Those under 20 feet in length are classified as structures. Federal bridges and structures are rated on a 1-100 scale using the Federal Highway Administration's rating system. Those that have a rating between 50 and 80 are eligible for federal bridge rehabilitation funds. Bridges and structures rated below 50 are eligible for federal bridge replacement funds. In 2011 MCDOT has 23 bridges and structures rated between 50 and 80 and only one bridge rated below 50. The BMS lists all of MCDOT bridges and structures as well as their ratings.

Each year MCDOT must report the physical status of their bridges to the Board of Supervisors (BOS) in accordance with the Governments Accounting Standards Board Statement 34. The physical condition of MCDOT's bridges is within the targeted bridge sufficiency ratings (BSR) adopted by the BOS.

Criteria	Target Value	Actual Value
% of Bridges and Structures with BSR > 70	min. 90%	98.33%
% of Bridges & Structures with BSR < 50	max. 3%	0.24%

Roadway Management System

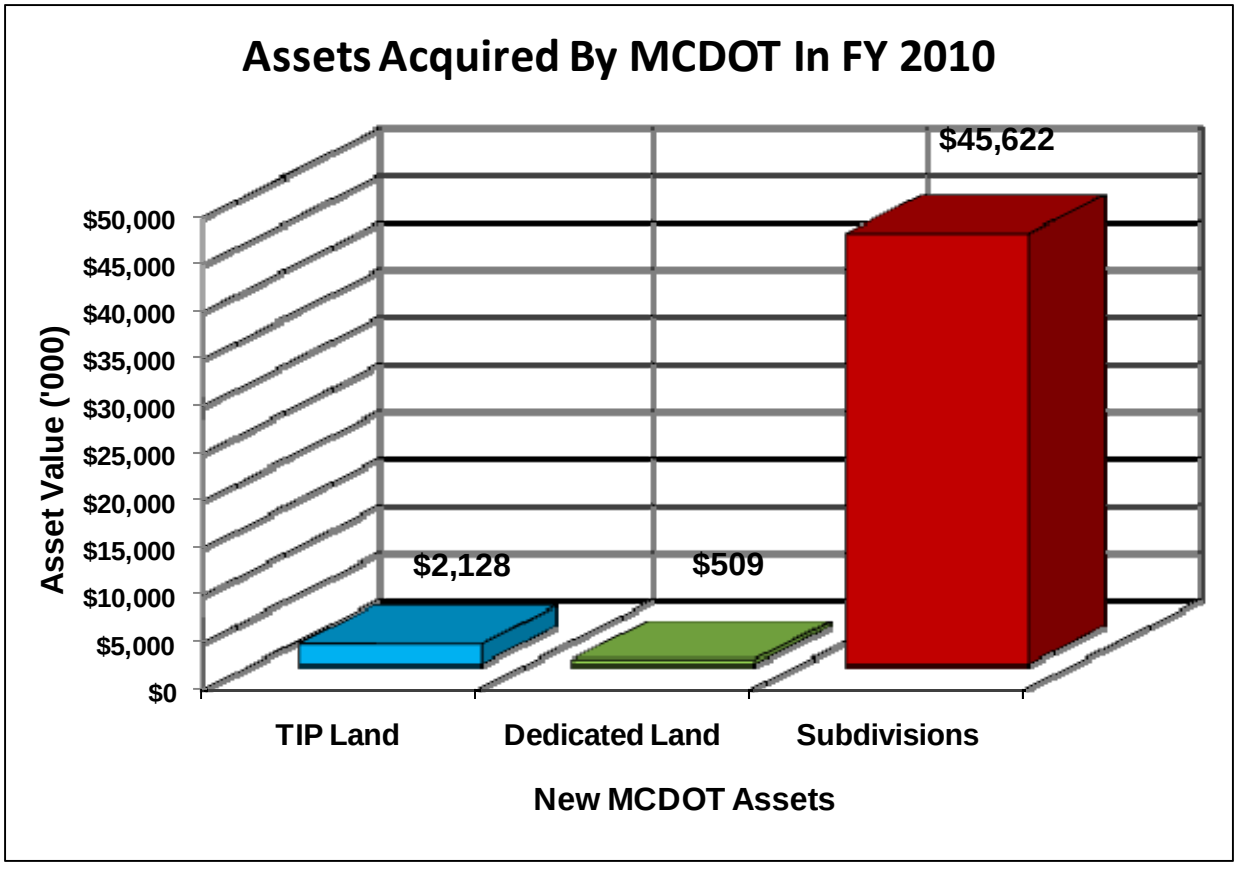
The Roadway Management System (RMS) is the pavement management program MCDOT uses to track and report on the physical attributes and conditions of all MCDOT paved roads. Two methods are used to measure a roadway's condition. The International Roughness Index (IRI) on a 1-500 scale and the Pavement Condition Rating (PCR) on a 1-100 scale. In 2011 81.01% of all roadways were rated Excellent to Good with respect to their PCR while only 0.61% were rated fair to poor. Using the IRI, 17.6% of MCDOT's roadways were rated Smooth to Very Smooth with 44.6% rated rough to very rough. This was accomplished through the adoption of a proactive pavement maintenance program designed to prolong the life of pavements and forestall the need for very expensive reconstruction as long as possible.

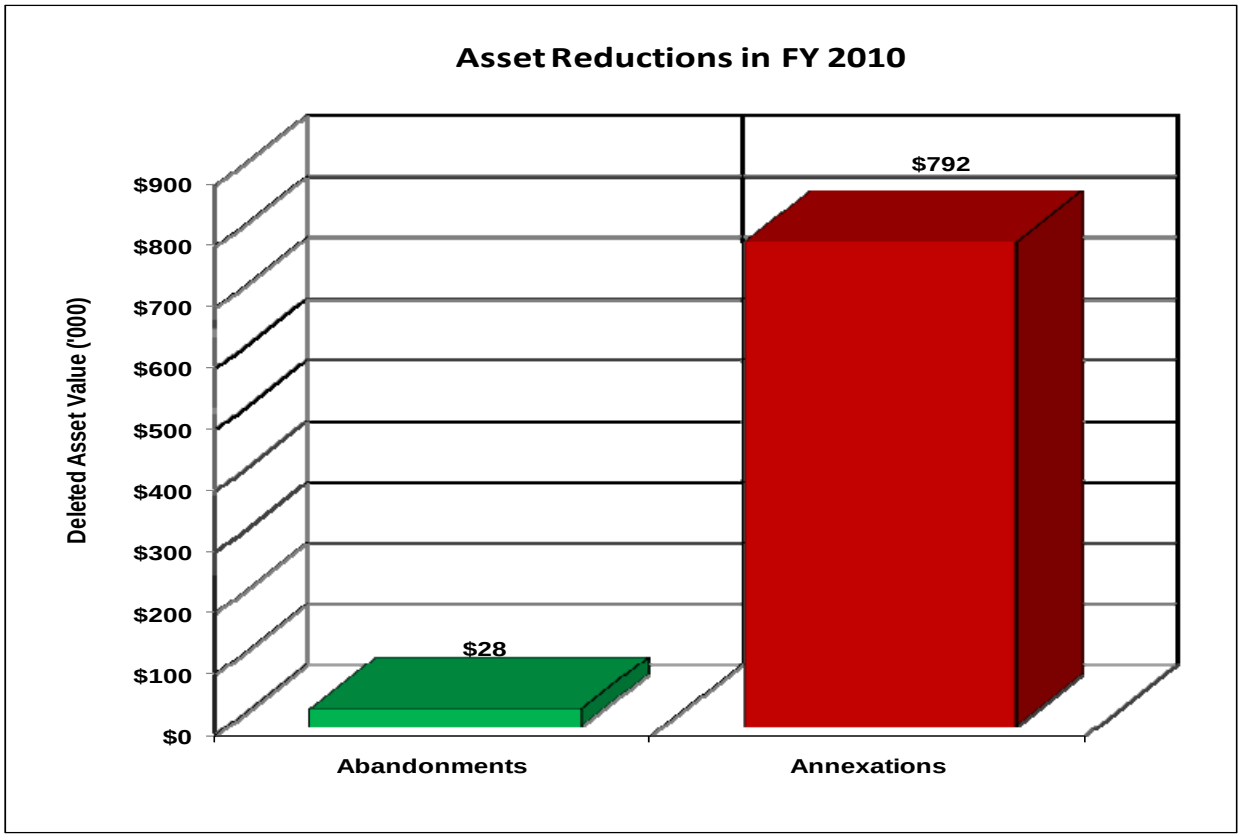
PCR Quality	PCR Range	Miles	Percent
Excellent to Very Good	> 70	901.58	81.01%
Fair to Poor	< 55	6.77	0.61%

Asset Management System

The Maricopa County and the Department of Transportation (MCDOT) maintains effective internal controls to manage its infrastructure assets, and to maintain proper records regarding the use and disposition of these assets. This is done to safeguard and maintain MCDOT's assets in order to receive the maximum benefit from these assets and to comply with State and Federal requirements regarding their use and disposition. MCDOT properly accounts each year for its infrastructure assets for financial reporting purposes in accordance with the Governments Accounting Standards Board (GASB) Statement 34.

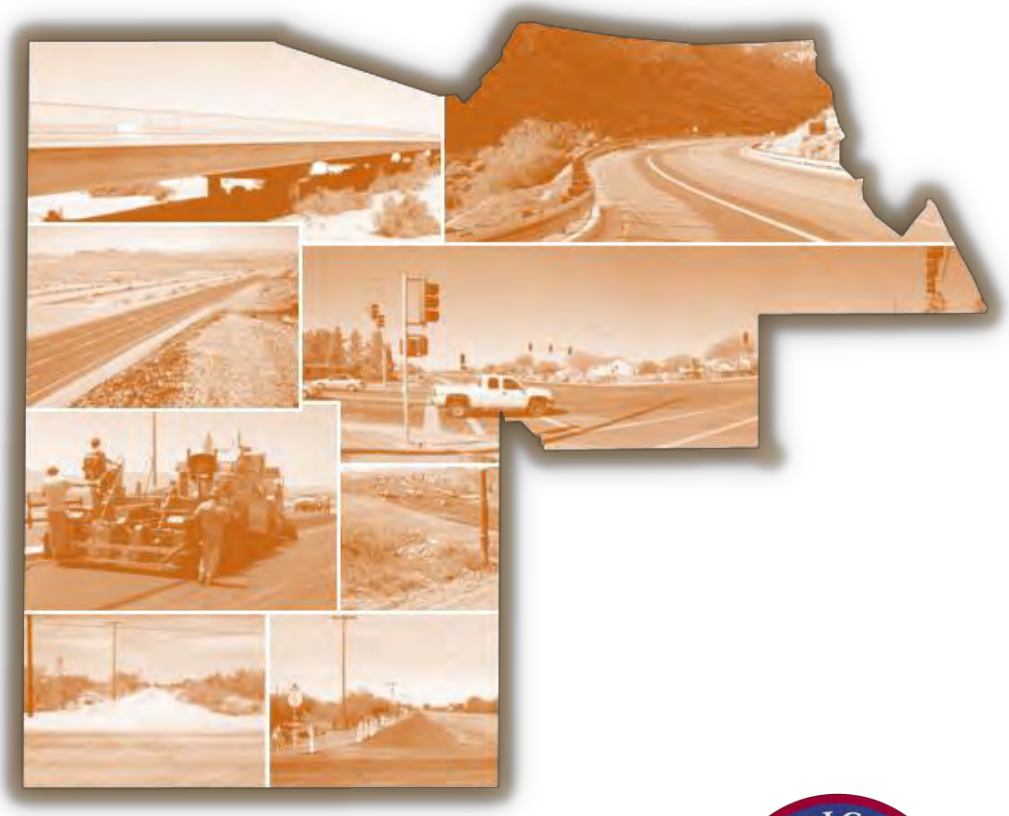
MCDOT provides transparency as to how services are provided within the organization and to the County's constituents. It is the intent of the MCDOT Planning Division and Asset Management Team to educate, inform, develop and streamline Asset Management Reporting throughout MCDOT.




Asset Reductions in FY 2010
Deleted Asset Value ('000)
$900
$800
$700
$600
$500
$400
$300
$200
$100
$0
$28
$792
Abandonments
Annexations

Congestion Management System

Fiscal Year 2011



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CONGESTION MANAGEMENT SYSTEM OVERVIEW AND BACKGROUND

Purpose of the CMS

The Maricopa County Congestion Management System (CMS) identifies existing and potential traffic congestion on Maricopa County roads.

The primary purposes for the County's CMS are:

1. To identify and measure traffic congestion on Maricopa County roads based on MCDOT's annual traffic count program.
2. To implement the goals in the County's Comprehensive Plan and the Major Streets and Routes Plan.
3. To improve the efficiency and safety of travel on Maricopa County roads.

Past MCDOT Congestion Management Efforts

MCDOT has developed and updated its CMS annually for the past 14 years. The CMS identifies congested roads based on the volume/capacity criteria established in the MCDOT Roadway Design Manual (RDM.)[1]

The adopted MCDOT Transportation System Plan (TSP) sets the overall policies, goals, and fundamental considerations for MCDOT decisions concerning current and future transportation needs and investments.

The TSP also recommends investment priorities based on three types of routes; primary, secondary and local. Much of the content of the TSP regarding CMS development and actions are a reflection of the County's Comprehensive Plan guidelines for transportation management.

CMS OBJECTIVES

Objectives Based on the Comprehensive Plan

The adopted Maricopa County Comprehensive Plan directs the management of the County's Public Works Department. The Plan calls for the coordination of development, conservation of natural resources, effective expenditures of public monies, and the promotion of the health, convenience and welfare of the County's citizens. Several objectives related to congestion are set forth in the Comprehensive Plan.

They include:

1. Reducing trips made in single occupancy vehicles.
2. Increasing transit ridership.
3. Employing technology to improve transportation facilities.
4. Identify and accommodate transportation corridors.

5. Optimize public investment.
6. Minimize travel times.

Objectives Based on the Transportation System Plan

The TSP provides guidance to manage the Maricopa County roadway network. The TSP goals set forth a vision for the planning and construction of transportation facilities in the County. The TSP includes several objectives to ease traffic congestion:

1. Roadway widening.
2. Intersection improvements.
3. Alternate route enhancement.
4. Establish parking rules that influence traffic congestion reduction.
5. Improvements to bicycle and pedestrian facilities.
6. Provide for both current and future traffic volume needs.
7. Monitor and measure congestion.
8. Help decide what improvements are needed.
9. Identify alternative actions.
10. Recommend cost-effective mitigation measures.
11. Evaluate actions related to congestion management.

CONGESTION EVALUATION PARAMETERS

Definition of Congestion

A widely accepted definition of traffic congestion is not firmly established because congestion is primarily a perceived condition rather than an absolute one. However, several definitions have been defined by various agencies.

The Federal Highway Administration's (FHWA) Interim Final Rule for the Management Systems element of the original ISTEA in 1991 defined congestion as "the level at which transportation system performance is no longer acceptable due to traffic interference."[1]

MCDOT Roadway Design Manual Definition

The MCDOT Roadway Design Manual (RDM) uses a combined functional classification and level of service (LOS) system for defining congestion. This provides a measure of congestion and the flexibility to view individual road segments based on their general characteristics and desired operation. To determine whether a segment is congested, a minimum desired LOS is first assigned based on its functional classification (Table 1). Local roads are classified at LOS A, collectors at B and C, and arterials at C and D depending on their urban or rural classification. Roadway capacities are established based on their desired minimum LOS and adjusted for their number of lanes. Their traffic volumes are then divided by their roadway capacities to see if they exceed the desired LOS.

The definition of congestion in the CMS is based on the operation of a roadway and the RDM standards. If traffic volumes exceed the RDM roadway capacity, the road is considered congested.

CMS Performance Measures

Accurate identification of congestion on roadway segments and intersections is critical to the effective management of the entire network. This CMS identifies road segments where congestion may be a problem.

MCDOT uses traffic volume to roadway capacity ratios (V/C) because they best identify congestion while satisfying County congestion management needs. These ratios typically use the average number of vehicles (in the most recent year) that travel a road per day divided by the number of vehicles that the road can reasonably handle per day, as per the RDM standards.

Area of Consideration

Geographically, the CMS is applied within the confines of Maricopa County and to roadways that are partially or completely under Maricopa County ownership or control. The MCDOT 2010 traffic count program includes counts on many of MCDOT's arterial and collector roadways.

CMS ANALYSIS PROCESS

This report uses the data from the annual 2010 MCDOT traffic count program and previous MCDOT traffic data. There were 813 arterial and collector roadway segments that were counted in 2010. Each roadway segment with a 2010 traffic count was compared to its 2006 count value. The absolute ADT increases or decreases were calculated along with each segment's positive or negative percentage change between 2006 and 2010. A roadway volume to capacity ratio was then calculated based on the number of lanes in each segment, the RDM recommended roadway capacity, and each segment's 2010 traffic count. The results are shown in Table 2.

FINDINGS AND RECOMMENDATIONS

The results of the 2010 MCDOT traffic count program are shown on Map 1. Currently 22.4% of MCDOT's arterial and collector roadway segments have a volume to capacity ratio of 0.86 or greater. This means that the 2010 traffic volumes on these roadway segments exceed 86% of the road's vehicle carrying capacity, according to the MCDOT RDM. The RDM criteria shown in Table 1 are very conservative with respect to capacity. This is done to give MCDOT ample warning of potential problems. Table 2 shows roadway segments with 2010 volume to capacity ratios > 70%.

A roadway's high V/C ratio may indicate a capacity problem. However, the solution may not be to immediately increase the capacity of the roadway. There may be multiple causes and solutions. For example, not having enough alternative routes parallel to a congested roadway may cause a temporary increase in traffic. A roadway may also be experiencing increased traffic due to construction or closures on alternative routes. Therefore, a thorough analysis of the roadway segments with high V/C ratios is required before there is a determination concerning which ones need immediate attention and which have high ratios due to other unseen or temporary factors. Detailed scoping studies may be necessary to further define solutions to the capacity problems identified in this report.

Table 1: MCDOT Roadway Design Manual Levels of Service and Volumes

Urban Roadway Level of Service and Service Volumes					
Road Classification	ADT/Lane	# Thru Lanes	2-Way ADT	Pk.Hr/ ADT%	Max Rdwy Length
Local	350	2	50 –1500	15	1,000 ft.
Minor Collector	2,500	2	500 - 5,000	12	½ mi.
Major Collector	3,500	2	600 - 8,500	10	2 mi.
Minor Arterial	5,500	4	5,000 - 35,000	8	--
Principal Arterial	7,500	6	30,000 - 60,000	8	--
Rural Roadway Level of Service and Service Volumes					
Road Classification	ADT/Lane	# Thru Lanes	2-Way ADT	Pk.Hr/ ADT%	Max Rdwy Length
Local	500	2	50- 1,500	15	1 mi.
Minor Collector	3,000	2	800 - 5,000	12	2 mi.
Major Collector	4,000	2	1,000 - 8,500	10	--
Minor Arterial	9,000	4	5,000 -35,000	10	--
Principal Arterial	10,000	4	10,000 - 40,000	10	--

[1]*Metropolitan Planning Technical Report No. 2, Congestion Management System, U.S. De*partment of Transportation Federal Highway Administration, July 1994.

Figure 1: MCDOT 2010 ADT on Arterial & Collector Road Segments

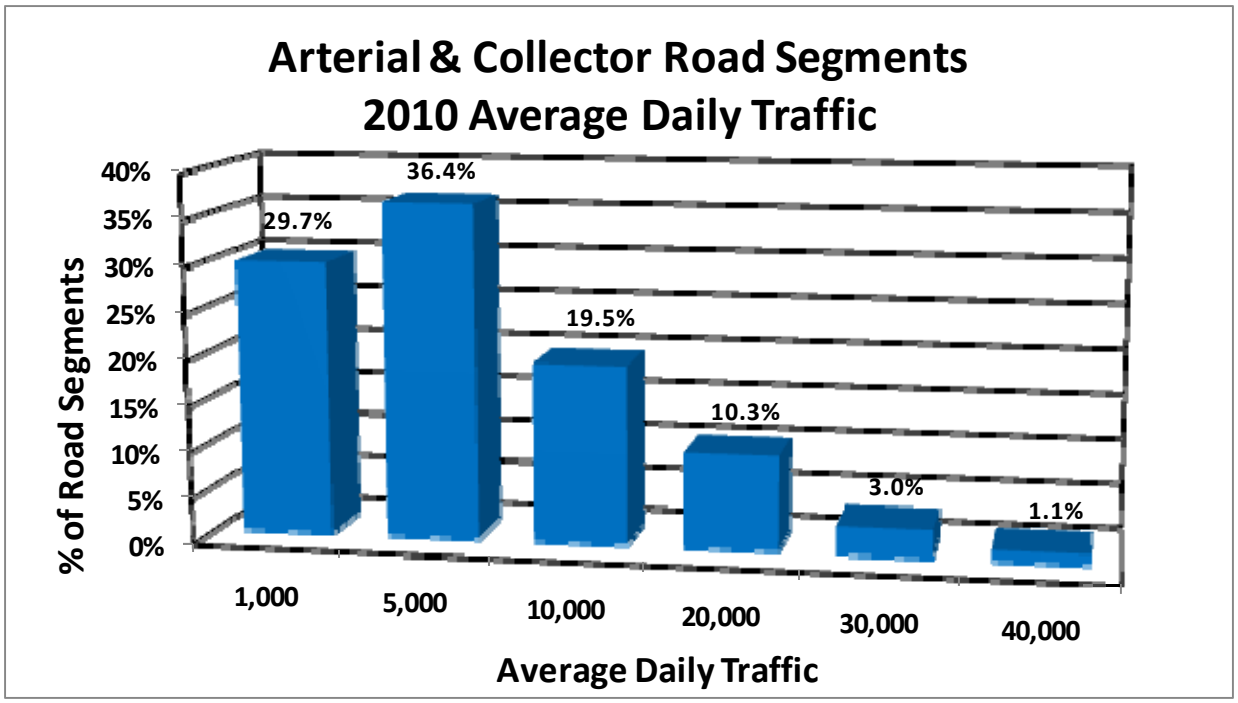


Figure 2: MCDOT 2010 Arterial & Collector Road Segments V/C Ratios

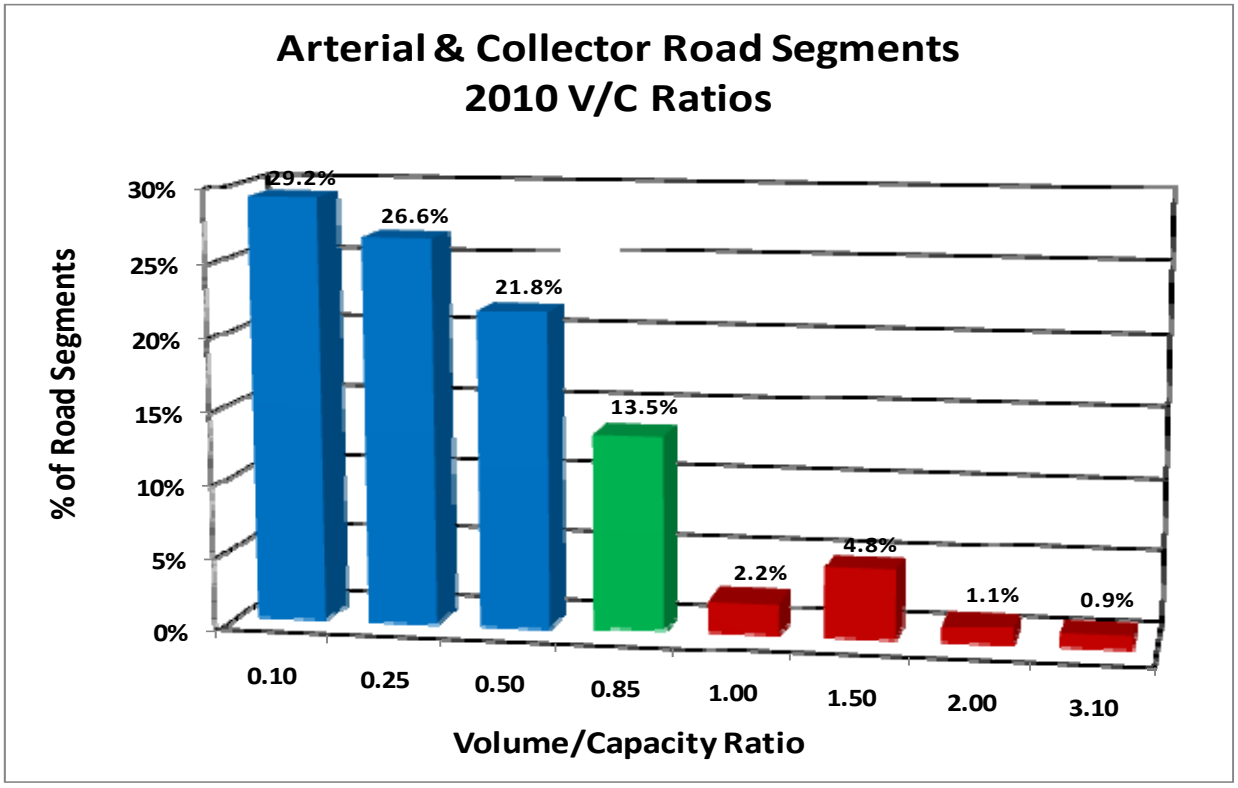


Table 2: MCDOT Roadways With V/C Ratios Greater Than 0.70

	On Road	Dir	Ref Road	Travel	V/C Ratio	Difference	ADT 2010	ADT 2006	Study Name
1	RITTENHOUSE RD	N	RIGGS RD	B	3.03	14,138	25,720	11,582	
2	RITTENHOUSE RD	N	CLOUD RD	B	2.40	12,708	20,376	7,668	
3	RIGGS RD	E	RITTENHOUSE RD	B	2.22	6,890	18,862	11,972	Riggs Road Corridor Study
4	LITCHFIELD RD	N	OLIVE AVE	B	2.16	4,611	18,369	13,758	
5	UNION HILLS DR	E	107TH AVE	B	2.15	3,074	18,272	15,198	Union Hills Dr CAR
6	GRANITE VALLEY DR	W	MEEKER BLVD	B	2.03	5,227	17,256	12,029	
7	SOUTHERN AVE	E	CRISMON RD	B	1.96	4,942	16,649	11,707	
8	WATSON RD	N	MAGNOLIA ST	B	1.78	8,269	15,132	6,863	Under Study
9	103RD AVE	N	GRAND AVE	B	1.77	-2,432	15,023	17,455	
10	111TH AVE	S	THUNDERBIRD BLVD	B	1.73	2,835	14,703	11,868	
11	LITCHFIELD RD	N	NORTHERN AVE	B	1.69	3,110	14,397	11,287	
12	67TH AVE	S	BROADWAY RD	B	1.58	-2,676	13,425	16,101	
13	EL MIRAGE RD	N	BELL RD	B	1.54	3,844	13,093	9,249	El Mirage Rd Corridor Study
14	SOUTHERN AVE	E	51ST AVE	B	1.52	-3,207	12,929	16,136	
15	NORTHERN AVE	E	LITCHFIELD RD	B	1.48	2,337	12,578	10,241	
16	CAMINO DEL SOL	S	R H JOHNSON BLVD	B	1.40	2,004	11,922	9,918	
17	UNION HILLS DR	W	107TH AVE	B	1.37	-2,101	11,641	13,742	Union Hills Dr CAR
18	67TH AVE	N	BASELINE RD	B	1.33	4,815	11,333	6,518	
19	CHANDLER HEIGHTS RD	E	COOPER RD	B	1.29	3,693	10,976	7,283	
20	67TH AVE	N	BROADWAY RD	B	1.27	-1,916	10,827	12,743	

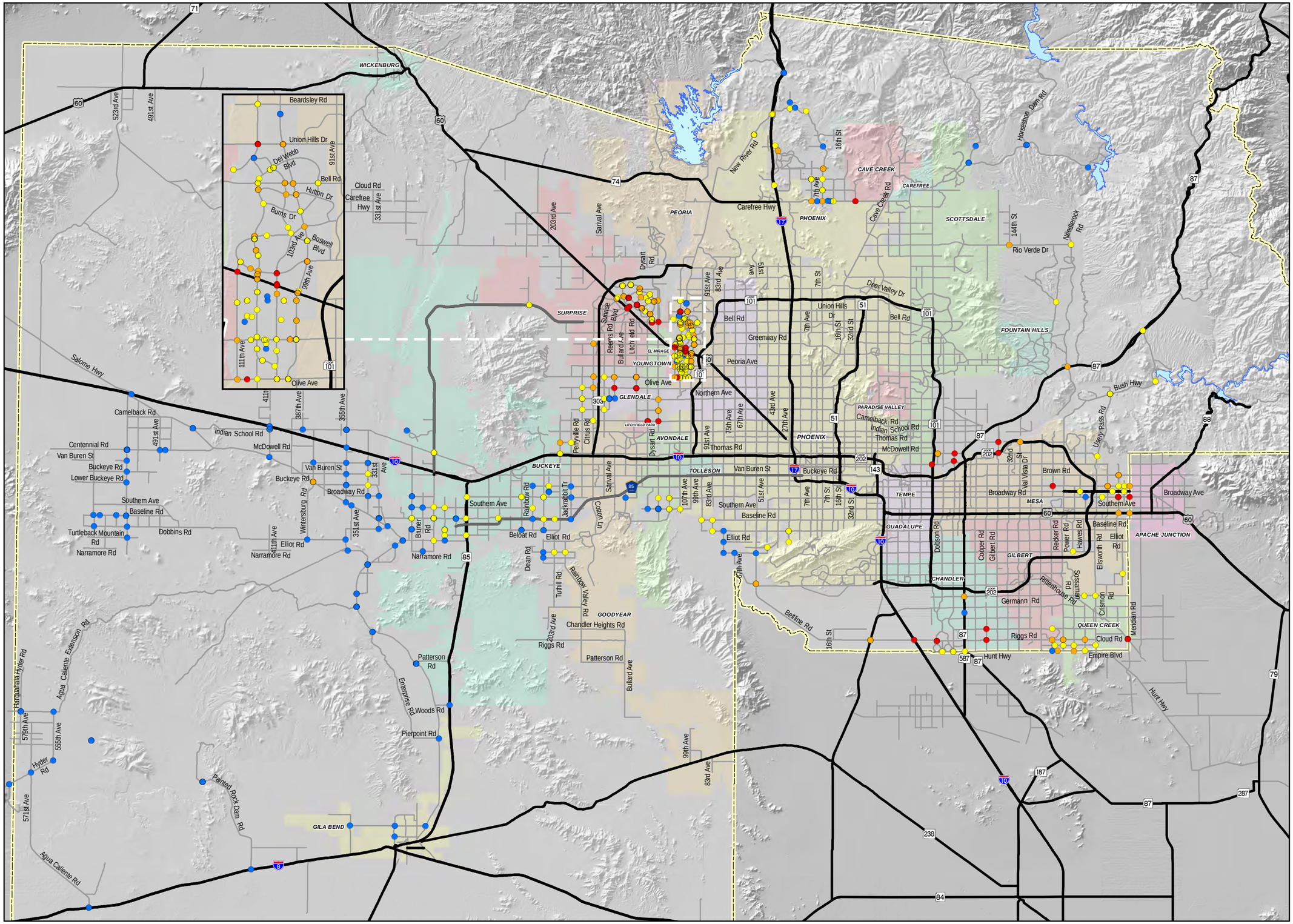
Table 2: MCDOT Roadways With V/C Ratios Greater Than 0.70 (continued)

	On Road	Dir	Ref Road	Travel	V/C Ratio	Difference	ADT 2010	ADT 2006	Study Name
21	CAMINO DEL SOL	N	R H JOHNSON BLVD	B	1.22	2,312	10,357	8,045	
22	HUNT HWY	W	SOSSAMAN RD	B	1.08	-5,509	9,171	14,680	
23	OLIVE AVE	W	99TH AVE	B	1.07	-2,779	37,595	40,374	
24	103RD AVE	N	THUNDERBIRD BLVD	B	1.05	2,147	8,966	6,819	
25	POWER RD	N	RAY RD	B	1.05	-3,460	36,650	40,110	Power Rd Corridor Study
26	MC 85	W	ESTRELLA PKWY	B	1.05	-4,500	8,883	13,383	MC 85 Corridor Study
27	MC 85	E	JACKRABBIT TL	B	1.01	-3,914	8,600	12,514	MC 85 Corridor Study
28	BEARDSLEY RD	E	128TH AVE	B	1.01	2,720	8,578	5,858	
29	INDIAN SCHOOL RD	E	COTTON LN	B	1.00	2,361	8,458	6,097	
30	OLIVE AVE	E	99TH AVE	B	0.99	-2,284	34,589	36,873	
31	COTTON LN	N	OLIVE AVE	B	0.98	2,513	8,333	5,820	
32	MC 85	W	SOUTHERN AVE	B	0.97	-3,746	8,240	11,986	MC 85 Corridor Study
33	GRANITE VALLEY DR	S	R H JOHNSON BLVD	B	0.93	2,608	7,915	5,307	
34	COTTON LN	N	WADDELL RD	B	0.89	1,834	7,585	5,751	
35	MC 85	E	RAINBOW RD	B	0.88	-1,943	7,504	9,447	MC 85 Corridor Study
36	SIGNAL BUTTE RD	N	US 60	B	0.88	-2,582	7,499	10,081	
37	MC 85	W	JACKRABBIT TL	B	0.86	-2,704	7,325	10,029	
38	OLIVE AVE	E	114TH AVE	B	0.86	-3,473	29,980	33,453	
39	ELLIOT RD	W	SOSSAMAN RD	B	0.86	2,060	7,268	5,208	Elliot Rd Corridor Study
40	BOSWELL BLVD	S	BELL RD	B	0.84	1,930	7,182	5,252	
41	PEORIA AVE	E	BULLARD AVE	B	0.83	2,135	7,073	4,938	

Table 2: MCDOT Roadways With V/C Ratios Greater Than 0.70 (continued)

	On Road	Dir	Ref Road	Travel	V/C Ratio	Difference	ADT 2010	ADT 2006	Study Name
32	MC 85	W	SOUTHERN AVE	B	0.97	-3,746	8,240	11,986	MC 85 Corridor Study
33	GRANITE VALLEY DR	S	R H JOHNSON BLVD	B	0.93	2,608	7,915	5,307	
34	COTTON LN	N	WADDELL RD	B	0.89	1,834	7,585	5,751	
35	MC 85	E	RAINBOW RD	B	0.88	-1,943	7,504	9,447	MC 85 Corridor Study
36	SIGNAL BUTTE RD	N	US 60	B	0.88	-2,582	7,499	10,081	
37	MC 85	W	JACKRABBIT TL	B	0.86	-2,704	7,325	10,029	
38	OLIVE AVE	E	114TH AVE	B	0.86	-3,473	29,980	33,453	
39	ELLIOT RD	W	SOSSAMAN RD	B	0.86	2,060	7,268	5,208	Elliot Rd Corridor Study
40	BOSWELL BLVD	S	BELL RD	B	0.84	1,930	7,182	5,252	
41	PEORIA AVE	E	BULLARD AVE	B	0.83	2,135	7,073	4,938	
42	51ST AVE	S	PECOS RD	B	0.82	-3,357	6,940	10,297	
43	THUNDERBIRD BLVD	E	99TH AVE	B	0.81	-2,583	28,482	31,065	
44	51ST AVE	S	ST JOHNS RD	B	0.81	-3,834	6,911	10,745	
45	CRISMON RD	N	UNIVERSITY DR	B	0.78	-2,495	6,598	9,093	
46	THUNDERBIRD BLVD	E	103RD AVE	B	0.77	3,364	26,985	23,621	
47	DOBBINS RD	W	27TH AVE	B	0.76	2,682	6,427	3,745	
48	BROADWAY RD	E	83RD AVE	B	0.75	-2,521	6,411	8,932	
49	RIGGS RD	E	SR 87	B	0.75	1,925	26,292	24,367	Riggs Road Corridor Study
50	BURNS DR	S	BELL RD	B	0.74	2,126	6,269	4,143	
51	128TH AVE	N	R H JOHNSON BLVD	B	0.73	2,072	6,217	4,145	
52	RIGGS RD	W	MARICOPA RD	B	0.70	-3,676	5,952	9,628	

Map 1



AVERAGE DAILY TRAFFIC COUNTS FY 2010

Average Daily

- ● 1 - 1,000
- ● 1,001 - 5,000
- ● 5,001 - 10,000
- ● 10,001 - 38,977

State Highways

Maricopa County Arterial Roadways

Arterials

Maricopa County

0 1 2 3 4 5 10 Miles

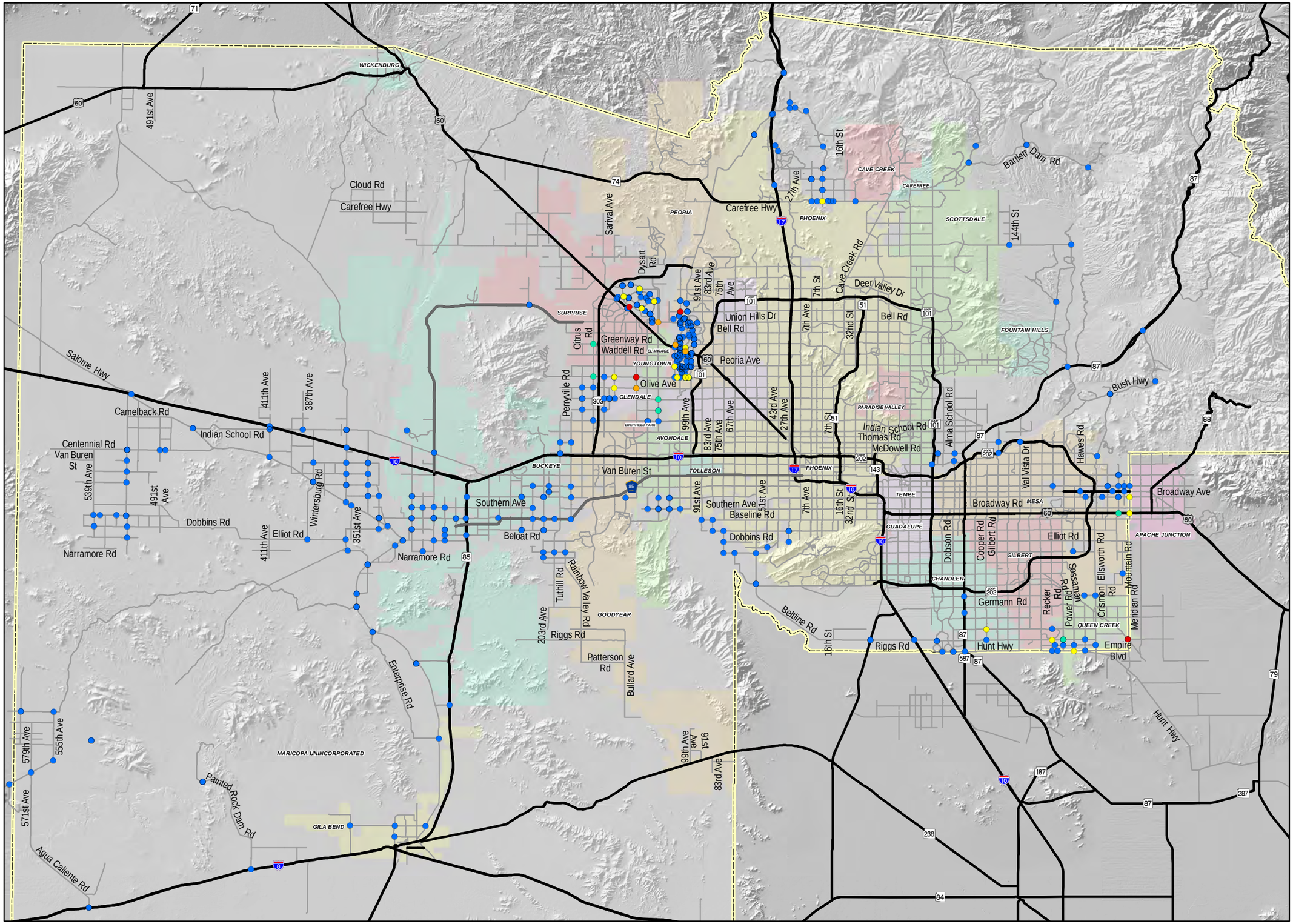
N

Produced by the Maricopa County
Public Works GIS Division

April 13, 2011

CMS 9

CONGESTION V/C RATIO FY 2010



Volume/Capacity Ratio

- 0 - 0.85
- 0.851 - 1
- 1.01 - 1.5
- 1.51 - 2
- 2 - 3.02588
- State Highways
- Maricopa County
- Arterial Roadways
- Arterials
- Maricopa County

0 1 2 3 4 5 10 Miles

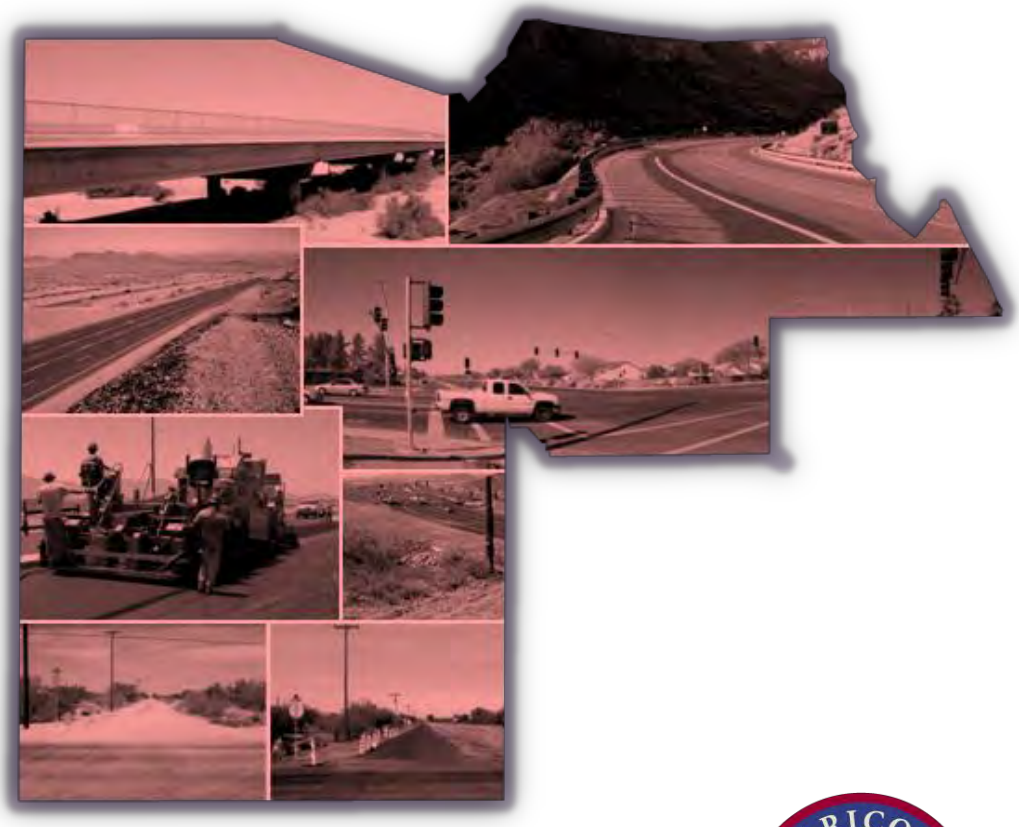
Produced by the Maricopa County Public Works GIS Division

April 13, 2011

CMS 10

Safety Management System

Fiscal Year 2011



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SAFETY MANAGEMENT SYSTEM OVERVIEW AND BACKGROUND

PURPOSE OF THE SAFETY MANAGEMENT SYSTEM

The County Safety Management System (SMS) is a systematic process that has three goals.

- Document the safety improvements made by Maricopa County to specific intersections and road segments during the previous fiscal year.
- Identify the location, type, and severity of traffic crashes in the unincorporated portions of Maricopa County.
- Report trends in traffic crashes and recommend improvements to reduce the number and rate of crashes primarily at intersections.

MCDOT Safety Management Procedures

MCDOT makes every effort to respond quickly to identified intersection or roadway safety problems. These problems are frequently identified through public complaints about unsafe roadway conditions, first-hand observation by County staff members, and by reviewing recent crash records for county roadways. When an actual problem or potential problem is encountered, a detailed engineering analysis may be conducted with recommendation made as how to mitigate the situation. These recommendations are handled in three ways. Initially, through the MCDOT maintenance process for relatively simple and inexpensive solutions. More complex problems are handled by the MCDOT's Traffic Engineering Division. Complex problems involving significant changes that require substantial funding amounts are handles through the MCDOT's Transportation Improvement Program (TIP).

ANALYSIS OF MCDOT'S SPOT SAFETY IMPROVEMENTS FOR FYS 2010

Identifying and Ranking Low Cost Intersection Safety Improvements

The Manual on Uniform Traffic Control Devices (MUTCD) is used by MCDOT as the guide to determine whether an identified safety problem meets the criteria, also known as warrants, to move forward to become a project. The MUTCD provides a guide to install multi-way stop control or traffic signals when it is determined that five or more reported crashes at an intersection have occurred in a 12-month period, and are susceptible to correction by one or more traffic control alternatives. Other warrant factors may also be used to determine if an intersection needs improvements such as signalization, additional turn lanes, or other safety items.

SAFETY AUDIT PROGRAM

MCDOT Traffic Engineering is continuing its program to identify and evaluate roadway conditions and to prioritize and schedule improvements for upcoming years. This program is a continuation, at the local level, of the recently announced MAG initiative, also known as the Safety Audit Program. This program ensures that the latest safety standards are included in the designs for new roadways. A large percentage of MCDOT roadways were constructed 20 to 30 years ago with the design standards applicable at the time. The goal of this program is to be proactive in identifying those areas where current design standards may be more applicable.

Criteria to determine priorities includes accident history, average daily traffic, roadway function, posted speed, and already scheduled transportation improvement projects. Accident history is used to determine if improvements are required along roadways. Accident locations are plotted as indicated on the Arizona Department of Transportation (ADOT) accident reports. If five or more correctable accidents are detected within a roadway segment or intersection and occur within a 12 month period during the past three years, an engineering evaluation follows to determine what action, if any, should to be taken. Once projects meet the warrants criteria, projects are typically implemented in the order in which they have been identified for improvement.

SPOT SAFETY IMPROVEMENT PROJECT ACCOMPLISHMENTS FOR FY 2009

In 2011, 13 projects were completed (Table 1). These were implemented by the MCDOT Traffic Engineering Division. Ten projects were identified in FY 2012 for completion (Table 2).

EVALUATION OF SAFETY

MCDOT is continuing its ongoing process of analyzing locations that exhibit potential safety problems. The initial step each year is to examine the location and number of crashes, crash rates, injury severity, and the types of crashes occurring on the unincorporated roadways in Maricopa County. This was done for calendar year 2006. However, in 2007 the Arizona Department of Transportation changed their policies with respect to making crash data available. The new policy is to only allow jurisdictions to download from the ADOT website their own crash data and not the data of any other jurisdiction. Therefore, the County is currently attempting to acquire permissions from all the jurisdictions in the County to share their crash data.

Table 1: Safety Improvement Projects Completed in FY 2011		
	Location	**Project**
1	Burton Avenue & 184th Avenue (Cortessa Elementary School)	School Crossing
2	Castle Hot Springs Road West & Rockaway Hills Dr	Multiway Stop
3	Daisy Mountain Drive & Dedication Way	New Signal
4	Daisy Mountain Drive & Hastings Way	New Signal
5	Daisy Mountain Drive & Meridian Drive	New Signal
6	Dobbins Road & 43rd Avenue	Multiway Stop
7	Glendale Avenue & Cotton Lane	Multiway Stop
8	Happy Valley Parkway & 115th Avenue	Signal Update
9	Lower Buckeye Road & Airport Road	Multiway Stop
10	MC 85 & Baseline Road	New Signal
11	MC 85 & Sarival Avenue	New Signal
12	Northern Avenue & Litchfield Road	Signal Update
13	Stardust Blvd. & 135th Avenue	New Signal

Table 2: Planned Spot Safety Improvement Projects for FY 2012		
	Location	**Project**
1	Banff Lane: 75th Avenue - 79th Avenue	Traffic Calming
2	Baseline Road & Miller Road	New Signal
3	Beloat Road & Jackrabbit Trail / Tuthill Road	Roadway Improvements
4	Elliot Road & Sossaman Road	New Signal
5	Fire Station Driveway - North of Sun City Blvd.	New Signal
6	Meeker Blvd. & Wilson Way	New Signal
7	Olive Avenue & Reems Road	New Signal
8	Olive Avenue & Sarival Avenue	New Signal
9	R.H. Johnson Blvd. & Trail Ridge Drive	New Signal
10	Southern Avenue & Meridian Road	New Signal

OVERALL COUNTY CRASH RATES

Table 4 shows the relationship between the vehicle miles of travel per mile of County Roadway and the total roadway miles in the County system through 2008. Data will be added to this table for 2009, 2010 and 2011 when it becomes available. This table shows that the miles of County roadways are continuously declining primarily due to annexations, while the vehicle miles of travel on these remaining roadways are constantly increasing. The net result is ever increasing in congestion on the County roads.

The overall county crash rate is the best indicator to represent the history of the entire County system. The overall crash rate measures the number of crashes per million vehicle miles of travel (VMT) per mile of County-owned roadway per year in the unincorporated portions of the County. Table 5 shows that while the overall county crash rate has annually gone up and down, overall it has declined when compared to the increase in population in the unincorporated county. Since 1998 despite an increase of more than 53,000 people, more licensed drivers, and a rising number of miles traveled on County roadways, the crash rate for many types of crashes has declined.

ARTERIAL INTERSECTION SAFETY

MCDOT has approximately 1,500 intersections on its arterial roadway system that have experienced crashes in the past three years (2006-2008). Updated data for 2009-2010 will be added to this table when it becomes available from ADOT. Each of these intersection will be evaluated based on four safety criteria and given a score between 1 and 100. The higher the score the greater the safety concern.

The criteria to be used to evaluate and produce the overall MCDOT Safety Score includes:

- Crash Frequency (CF): The total number of crashes at an intersection over a three year period (2006-2008) divided by the intersection with the highest CF value of all MCDOT intersection.

- Crash Severity (CS): Crashes are rated by injury severity, i.e., fatal, incapacitating injury, non-incapacitating injury, possible injury and property damage only. Each value is given a weight and multiplied times the number of crashes in each category. The result is divided by the intersection with the highest CS value.

- Crash Type (CT): Crashes by collision manner for 2007 and 2008 were calculated. This is based on the average per vehicle cost at each MCDOT intersection for the 11 types of collision manner as listed in the Arizona Department of Transportation's crash statistics. This value is then divided by the highest CT value for all MCDOT intersections.

- Crash Rate (CR): This is the crash rate per million vehicles entering the intersection from all approaches.

The final MCDOT safety score was calculated with crash severity given twice the weight of the other criteria.

$$\text{Safety Score} = ((CF * .20)+(CS * .40)+(CT * .20)+(CR * .20))* 100$$

It is MCDOT's intent to accurately portray each of its arterial roadway intersections fairly by using these four criteria and weighting them most heaviest for crash severity. This methodology negates the influence of any one criteria, i.e., total number of crashes or crash rates on the final score. The top 50 intersections based on their MCDOT Safety Scores are listed in table 12.

Table 3. County Crash Rates 1998-2008

Factors	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Annual County Crash Rate*	1.71	1.64	1.47	1.05	1.39	1.35	1.38	1.74	1.36	1.83	1.49
MCDOT Fatal Crash Rate**	2.52	3.07	2.34	1.54	1.56	2.02	1.99	2.13	3.03	2.64	1.40
Arizona Fatal Crash Rate**	2.15	2.18	2.08	2.08	2.17	2.10	2.02	2.03	2.08	1.70	1.53
US Fatal Crash Rate**	1.58	1.55	1.55	1.50	1.15	1.50	1.44	1.46	1.42	1.36	1.27
Single Vehicle Crash Rate	0.487	0.477	0.425	0.311	0.417	0.412	0.365	0.390	0.300	0.417	0.348
Pedestrian Crash Rate	0.016	0.017	0.008	0.012	0.014	0.011	0.012	0.012	0.013	0.015	0.011
Bicycle Crash Rate	0.022	0.022	0.014	0.011	0.014	0.015	0.016	0.020	0.014	0.023	0.018
Injury Crash Rate	0.351	0.384	0.321	0.250	0.299	0.308	0.275	0.344	0.244	0.334	0.275
Work Zone Related Rate	0.054	0.084	0.077	0.037	0.057	0.044	0.051	0.066	0.067	0.073	0.055
Total Number of Crashes	3,200	3,312	3,011	2,329	3,018	3,161	3,324	3,997	2,923	3,811	3,390
Total County Road Miles	2,822	2,768	2,719	2,680	2,644	2,629	2,597	2,567	2,426	2,423	2,419
Million Vehicle Miles/Day	5.1135	5.5277	5.6283	6.0568	5.9649	6.4016	6.6042	6.3046	5.8733	5.6989	6.2507
VMT/Mile	1,812	1,997	2,070	2,260	2,256	2,435	2,543	2,456	2,421	2,352	2,584

*** Crashes Per Million Vehicle Miles of Travel (MVMT)**

**** Crashes Per 100 Million Vehicle Miles of Travel**

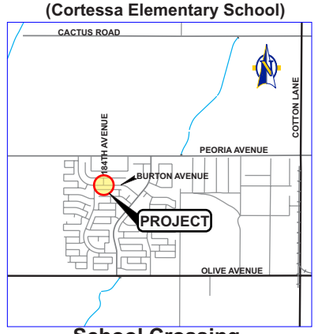
Source: Crash data is from the Arizona Department of Transportation modified by MCDOT. Crashes that did not occur on County roadways were excluded.

Table 4: MCDOT Top 50 Arterial Roadway Intersection Safety Scores 2010

Rank	MCDOT Safety Score	Intersection
1	79.62	RAY RD, POWER RD
2	78.53	ELLSWORTH RD, ELLIOT RD
3	76.84	ELLSWORTH RD, BROADWAY RD
4	76.46	INDIAN SCHOOL RD, 107TH AVE
5	74.60	UNIVERSITY DR, HIGLEY RD
6	67.95	BELL RD, 99TH AVE
7	65.22	UNIVERSITY DR, ELLSWORTH RD
8	65.11	MC 85, AVONDALE BLVD
9	63.74	ELLSWORTH RD, APACHE TRL
10	62.06	RITTENHOUSE RD, CLOUD RD
11	60.38	KYRENE RD, ELLIOT RD
12	59.55	RIGGS RD, ARIZONA AVE
13	56.68	OLIVE AVE, 107TH AVE
14	54.59	DEL WEBB BLVD, BELL RD
15	52.05	OLIVE AVE, 103RD AVE
16	50.98	BELL RD, 98TH AVE
17	50.86	APACHE TRL, 80TH ST
18	49.63	OAKMONT DR, 107TH AVE
19	47.64	UNIVERSITY DR, RECKER RD
20	46.10	BASELINE RD, 67TH AVE
21	45.24	OLIVE AVE, 99TH AVE
22	44.47	OLIVE AVE, LITCHFIELD RD
23	43.09	INDIAN SCHOOL RD, 99TH AVE
24	42.96	WARNER RD, POWER RD
25	42.87	CRISMON RD, BROADWAY RD
26	42.43	OLIVE AVE, 111TH AVE
27	42.21	GREENFIELD RD, GERMANN RD
28	41.90	THOMAS RD, PIMA RD
29	41.66	POWER RD, HUNT HWY
30	41.13	ELLSWORTH RD, BROWN RD
31	41.02	OCOTILLO RD, ELLSWORTH RD
32	40.91	BOSWELL BLVD, BELL RD
33	40.87	SIGNAL BUTTE RD, BROADWAY RD
34	40.78	WILLIAMS FIELD RD, POWER RD
35	40.57	UNIVERSITY DR, 64TH ST
36	40.20	MC 85, ESTRELLA PKWY
37	40.19	PEORIA AVE, 99TH AVE
38	39.30	RIGGS RD, ELLSWORTH RD
39	38.13	ELLIOT RD, 51ST ST
40	38.10	CRISMON RD, APACHE TRL
41	37.69	BELL RD, 114TH AVE
42	37.58	PIMA RD, CHAPARRAL RD
43	36.93	RIGGS RD, POWER RD
44	36.70	INDIAN SCHOOL RD, 103RD AVE
45	36.67	SOUTHERN AVE, 35TH AVE
46	36.27	QUEEN CREEK RD, GILBERT RD
47	36.09	THUNDERBIRD BLVD, 103RD AVE
48	36.09	WILLIAMS FIELD RD, GILBERT RD
49	35.93	MERIDIAN RD, APACHE TRL
50	35.84	SOUTHERN AVE, 27TH AVE

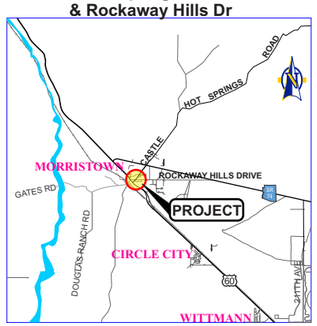
Safety Improvement Projects Completed in FY 2011

Burton Avenue & 184th Avenue (Cortessa Elementary School)



School Crossing

Castle Hot Springs Road West & Rockaway Hills Dr

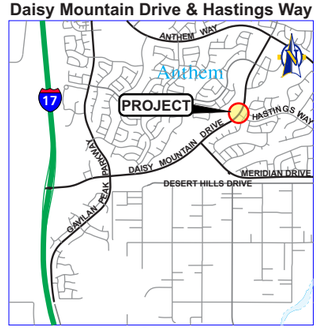


Multiway Stop

Daisy Mountain Drive & Dedication Way

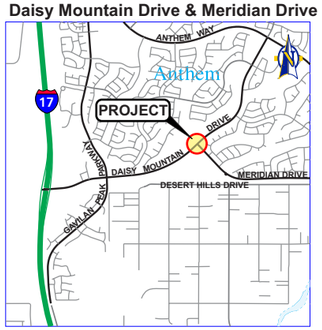
New Signal

Daisy Mountain Drive & Hastings Way



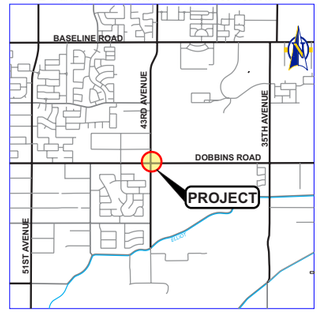
New Signal

Daisy Mountain Drive & Meridian Drive



New Signal

Dobbins Road & 43rd Avenue

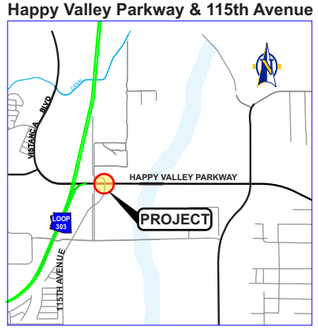


Multiway Stop

Glendale Avenue & Cotton Lane

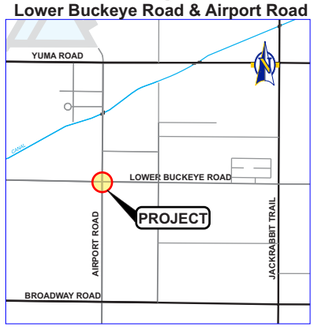
Multiway Stop

Happy Valley Parkway & 115th Avenue



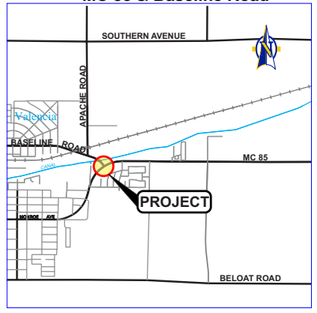
Signal Update

Lower Buckeye Road & Airport Road



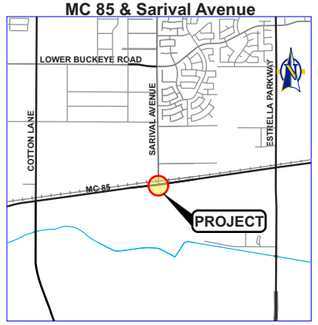
Multiway Stop

MC 85 & Baseline Road



New Signal

MC 85 & Sarival Avenue

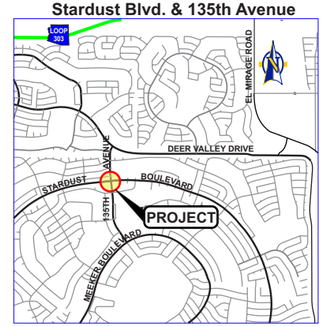


New Signal

Northern Avenue & Litchfield Road

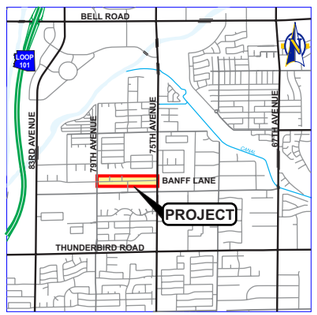
Signal Update

Stardust Blvd. & 135th Avenue



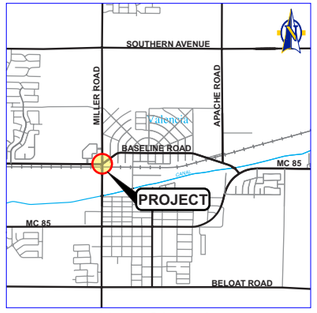
New Signal

Banff Lane: 75th Avenue - 79th Avenue



Traffic Calming

Baseline Road & Miller Road



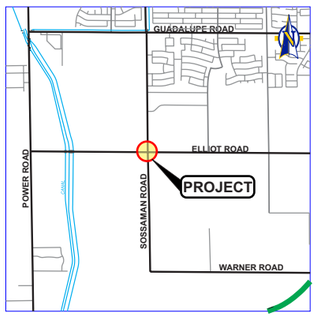
New Signal

Planned Spot Safety Improvement Projects for FY 2012

Beloat Road & Jackrabbit Trail / Tuthill Road

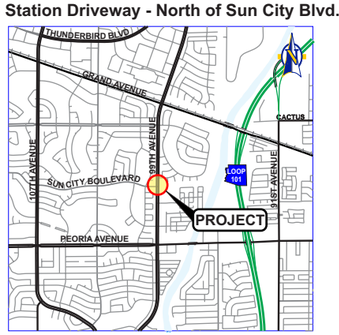
Roadway Improvements

Elliot Road & Sossaman Road



New Signal

Fire Station Driveway - North of Sun City Blvd.



New Signal

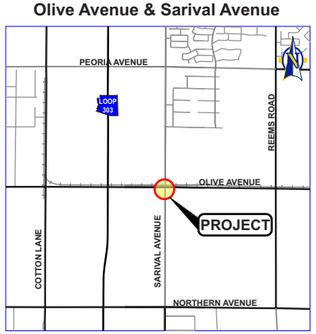
Meeker Blvd. & Wilson Way

New Signal

Olive Avenue & Reems Road

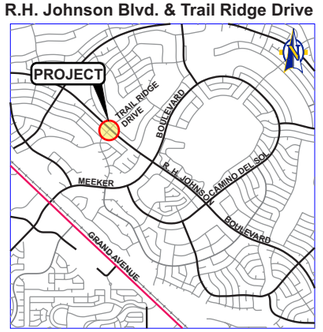
New Signal

Olive Avenue & Sarival Avenue



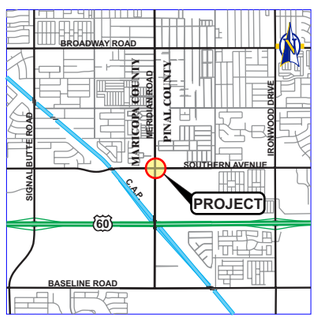
New Signal

R.H. Johnson Blvd. & Trail Ridge Drive



New Signal

Southern Avenue & Meridian Road



New Signal

Low Volume Road Management System

Fiscal Year 2011

Programming & System Analysis

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LOW VOLUME ROAD MANAGEMENT SYSTEM

The Maricopa County Department of Transportation (MCDOT) in FY 2004 initiated a formal program to pave low volume roads (LVR) in the County. A multi-year capital improvement program for paving low traffic volume dirt roadways was then created.

OVERVIEW

This report documents the number and miles of low volume roads paved by MCDOT in Fiscal Year 2011. It also provides an historical picture of all MCDOT low volume road paving since1983.

BACKGROUND

Prior to 2004 MCDOT paved low volume roads primarily based on citizen complaints and field observations by MCDOT staff. However, beginning in 2004, MCDOT initiated a program to systematically identify low volume dirt roadways for paving. Unpaved roads with high or increasing traffic volumes, safety issues, or other significant concerns were to be considered for paving. This program was to specifically address those unpaved roads that do not meet federal criteria for paving under the PM-10 (federal dust abatement) program. The Maricopa County Transportation Advisory Board (TAB) recommended to the Board of Supervisors that an annual allocation of 3 to 4 million dollars per year be set aside to in the MCDOT annual budget to pave selected LVR's.

GENERAL ROADWAY ANALYSIS

In addition to developing detailed maps and evaluation tables, a general analysis of the unpaved road system was also conducted. This included analysis of where the roads are located throughout Maricopa County. Many of these roads are located on Federal (such as BLM or Forest Service) or State lands. An environmental overview noted that due to the scattered nature of these roadways environmental concerns will vary for each segment. A few of these roads are in or near public parks and wilderness areas, and have multiple wash crossings. When recommending individual segments for paving, more detailed environmental reviews may be needed. The design criteria for paving these low volume unpaved roads provide guidance for right-of-way requirements and overall cost considerations.

COUNTY ROADWAY SYSTEM

In FY 2010 Maricopa County owned or maintained 2,353 miles of roadways. These roads are located in the unincorporated parts of the county, which includes both urban or near urban conditions as well as rural locations.

There are five different types of unpaved roads in Maricopa County. The first type is unpaved roads that are owned by the county and identified as open and declared. This

means the county owns right-of-way for these segments of road and has accepted the roadway into the County System. The second type are partially opened and declared roads. These are roads where part of the right-of-way is owned by the county. The third type are primitive roads. These roads are usually located in remote parts of the county and are accessing wilderness areas and are typically less developed than other areas. The fourth type are known as courtesy grade roads. These roads are existing unpaved roads with little or no county owned right-of-way, but maintained by MCDOT through historical precedent and allowed by state statute. The fifth type is unpaved roads not owned or maintained by the county. The table below provides a summary of these five roadway types and associated mileage of each.

Facts About County Unpaved Roads

- 803 miles of unpaved roads are within unincorporated Maricopa County.
- 166 of these miles are considered open and declared by the County.
- 218 of these miles are courtesy graded by the County.
- 7 of these miles are partially owned by the County.
- 360 of these miles are unpaved roads that are neither owned by the County nor courtesy graded by the county, but serve growing areas.
- 52 miles of these roads are primitive roads, accessing remote parts of the County.
- 597 road segments connect directly to a paved road.
- 230 miles of unpaved roads are inside the PM_{10} area and 573 miles of unpaved roads are outside the PM_{10} area.
- 164 miles of unpaved road segments are adjacent to or surrounded by an incorporated city or town boundary.

TRANSPORTATION ADVISORY BOARD EVALUATION CRITERIA

A comprehensive inventory of the unpaved roads system builds on the updated base map and centerline file created in 2008 by inserting evaluation criteria into the database for each unpaved road segment. The data for the evaluation criteria are important because it provides a descriptive picture of each unpaved road segment.

The criteria used by the TAB is listed below.

- The Board of Supervisor District the segment is located in.
- The length of the roadway segment (miles).
- Is the road segment located inside or outside the PM_{10} area?
- Is the road segment county maintained or not?
- The Major Streets and Routes Plan classification.
- The average daily traffic count.
- Does the road segment connect to an existing paved road?
- The percent of estimated right-of-way.
- Does the segment serve a public facility?
- Are there any safety concerns (high accident rate for instance)?

- The cost per mile to pave.
- The total project cost.

Additional Criteria

In addition to the TAB evaluation criteria, MCDOT staff collected data on the following information for each roadway segment:

- How many small washes cross the road segment?
- How many large washes or rivers cross the road segment?
- Are there any major utilities within close proximity?
- How many public facilities are in the vicinity of a given road segment.
- Crash data for a three year period
- The general land ownership where the road segment is located.
- The distance to the nearest paved road.
- What is the nearest or adjacent city?

LAND OWNERSHIP

Unpaved roadways in unincorporated Maricopa County are found in both urban and rural settings. Due to the growing municipal areas and annexation patterns, many pieces of unincorporated county lands are often immediately adjacent to or surrounded by cities. Analysis of the unpaved road segments revealed 235 miles of unpaved roads that are immediately adjacent to various cities and towns. In addition, there are 25 miles of unpaved roads within one mile of a jurisdiction. However, these unpaved roads are not likely to become urban in the future unless or until they are paved to a public standard.

Land ownership in Maricopa County falls into one of the following general categories: private, Bureau of Land Management (BLM), Military, National Forest, State Trust Lands, Indian Reservation, local or state parks, wilderness, and unidentified other lands. The table below shows a breakdown of land ownership type, estimated percentage of ownership within the county, and the number of miles of unpaved roads located in each type.

Land Ownership Type	Acres	%of Acres	Unpaved Mileage
Private	734,989	16.20%	546
BLM	1,606,205	35.40%	144
Military	655,332	14.44%	18
State Trust Lands	482,819	10.64%	84
Indian Reservation	268,466	5.92%	1
Local or State Parks	58,171	1.28%	9
Other	9,922	0.22%	0
Total	**4,537,393**	**100.00%**	**803**

Table 1: Low Volume Roads Completed or Underway in FY 2011							
Road Name	**From**	**To**	**Feet**	**Miles**	**Width**	**SQ Yd**	**Cost**
ROADS Paved in FY 2011 - TT317							$435,000
McNEIL ST	35TH AVE	31ST AVE	2,587	0.49	20	5,749	TIP
ROADS AWAITING ENVIRONMENTAL DECISION - TT317							$195,000
007TH AVE	HONDA BOW RD	LEANN RD	3,270	0.62	24	8,720	TIP
CAVALRY RD	7TH AVE	3RD AVE	1,320	0.25	24	3,520	TIP
ROADS AT 70% DESIGN - TT317							$93,000
11TH AVE	HONDA BOW RD	13TH AVE	2,600	0.49	20	5,778	TIP
ROADS SCOPED And To Be Paved In FY 2011 - TT318							$700,000
11TH AVE	IRVINE RD	DESERT HILLS DR	2,640	0.50	24	7,040	TIP
11TH AVE	MADDOCK RD	JOY RANCH RD	2,640	0.50	24	7,040	TIP
17TH AVE	MADDOCK RD	JOY RANCH RD	2,640	0.50	24	7,040	TIP
BRILES RD	REEMS RD	EOM	2,640	0.50	24	7,040	TIP
SHAWNEE DR	37TH AVE	35TH AVE	1,320	0.25	24	3,520	TIP
ROADS To be Paved in FY 2011 - TT319							$560,000
92ND ST/OMEGA ST	USERY PASS RD	EOM	2,350	0.45	24	6,267	TIP
94TH ST	McLELLAN RD	EOM	1,300	0.25	24	3,467	TIP
104TH ST	BROWN RD	EOM	650	0.12	24	1,733	TIP
104TH ST	BOM	McLELLAN RD	1,000	0.19	24	2,667	TIP
104TH ST	UNIVERSITY DR	QUARTERLINE RD	1,300	0.25	24	3,467	TIP
105TH ST	JENSEN RD	McKELLIPS RD	1,300	0.25	24	3,467	TIP
BOULDER DR	96TH ST	EOM	300	0.06	24	800	TIP
DENNIS ST	BOM	ELLSWORTH RD	650	0.12	24	1,733	TIP
STACEY RD	164TH ST	165TH PL	800	0.15	24	2,133	TIP

DESIGN CRITERIA

Typical roadway sections from the 2004 MCDOT Roadway Design Manual were initially used to guide the design criteria for paving a roadway. The information below provides a summary of the overall estimated ROW needs. Approximately 499 miles of unpaved roads do not have any ROW, 73 miles of unpaved roads have some percentage of required ROW, and 231 miles of unpaved roads have the entire ROW required.

Estimated Right-of-Way	Mileage
No ROW available	499
1% to 25%	7
26% to 50%	38
51% to 75%	14
76% to 99%	14
100% of needed ROW estimated	231
Total	**803**

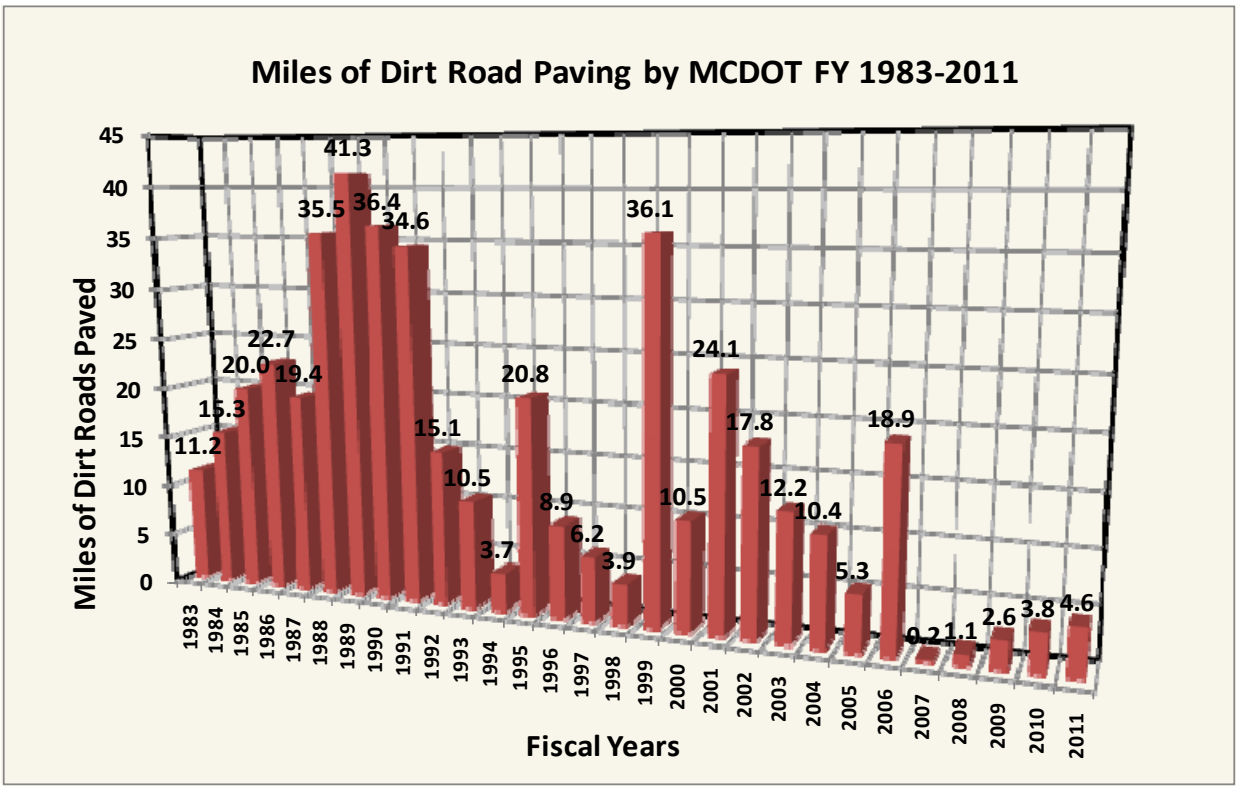
Current street functional classifications for unpaved roads are Principal Arterial, Minor Arterial, Major Collector, Minor Collector, and Rural Local. The information below provides a summary of the unpaved road mileage of each classification. The current MCDOT Roadway Design Manual recommends standards for these roadway classifications.

Classification	Mileage
Principal Arterial	1.34
Minor Arterial	16.78
Major Collector	7.69
Minor Collector	77.13
Rural Local	701.56
Total	**803.00**

COST SHARE POLICY

MCDOT will always seek financial partnering for paving a dirt road from any jurisdiction or significant commercial traffic generators adjacent to or benefiting from the project. MCDOT can only pay for HURF related expenditures. Cost sharing will be consistent with the adopted MCDOT Cost Share Policy.

Figure 1: MCDOT Dirt Road Paving History 1983-2011



Bridge Management System

Fiscal Year 2011

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INTRODUCTION

As of April 2011, Maricopa County maintains and inspects a total of 420 bridges and structure on public roads. By the Federal Highway Administration definition, 278 of these structures are qualified to be called “bridges” or “in-service” structures, meaning each of these has a length greater than 20 feet. The remaining 142 are called “off-system” structures, because their length is 20 feet or less.

DATA GATHERING AND ANALYSIS

“In-Service” and “Off-System” Structures

An “in-service” structure is described as one with an overall length greater than 20 feet, therefore qualifying the structure for federal aid, while bridge structures 20 feet or less in length are often called “off-system” or “non-federal aid” bridges. However, every structure within MCDOT’s jurisdiction is inspected in accordance to the Federal Highway Administration’s National Bridge Inspection Standards Recording and Coding Guide. This procedure allows MCDOT to maintain thorough, consistent records on each bridge and structure in the County system. The decision to maintain and inspect all of MCDOT’s structures enables MCDOT to include off-system structures when considering how to best appropriate funds and prioritize in-house projects. Due to the comprehensive data MCDOT maintains on all structures, MCDOT is readily able to evaluate its inventory as a whole, rather than being restricted to information gathered only on the in-service structures.

EVALUATION CRITERIA

In 1997 the Maricopa County Bridge Investment Study (BIS) recognized the need to evaluate bridges separately from roadway projects. The following information identifies MCDOT’s method of scoring and prioritizing bridge projects.

The following categories of bridge projects were chosen for evaluation and prioritization.

1. Replacement Projects
2. Replacement of Dip Sections with New Structures
3. Scour Protection Projects
4. New Bridge Projects (not included in major road projects)

REPLACEMENT OF EXISTING BRIDGES

During FY 2010-2011, MCDOT did not replace any existing bridge structure. A bridge should only be considered for replacement if all four of the following conditions are met:

1. The cost of rehabilitation is 55% or more than the cost of a new bridge.

2. The bridge is functionally obsolete.
3. The sufficiency rating is less than 50.
4. The Bridge Engineer agrees replacement is justifiable.

RECOMMENDATIONS FOR TIP PROGRAMMING PROCEDURES

Each year, MCDOT reviews the highest rated bridge projects from the following subcategories:

1. TIP Projects
2. Replacement of Existing Bridges
3. Replace Dip Sections with New Structures
4. New Bridge Projects (not included in major road projects)

In any given year, the budget allocation may not support inclusion of all top rated bridge projects in the Transportation Improvement Program. When this occurs, decisions are made based on the rating criteria and professional engineering judgment.

ASSET MANAGEMENT FOR BRIDGES

In 2002, MCDOT began an asset management program for its bridge inventory. To date, MCDOT's bridge and structure inventory asset valuation is estimated at $136,557,471.

SUMMARY OF THE 2010-2011 INSPECTION SEASON (8/1/10 to 6/30/11)

In the FY 2010-2011 inspection seasons, MCDOT's bridge inventory consisted of 278 in-service structures and 142 off-system structures. These numbers include eleven new structures that were added to the MCDOT inventory. Nine of these are in-service structures (concrete box culverts) and two are off-system structures (bridges)

This year seven structures were annexed or otherwise removed from MCDOT's bridge inventory. A complete summary of the activity for the 2010-2011 inspection season is included at the end of this report.

FEDERAL FUNDING ELIGIBILITY COMPARISONS

Structures Eligible for Federal Replacement Funds (SR < Than 50)

The Federal Highway Administration guidelines stipulate that when a bridge's sufficiency rating falls below a Sufficiency Rating (SR) of 50, the bridge becomes eligible for federal replacement funds. As of March 2010, Maricopa County has only one structure which has a rating below 50: the Gillespie Dam Bridge located on Old US 80 at the Gila River. This structure was originally constructed in 1927 and is on the National Register of Historic Places (NRHP). It is the only steel truss bridge in the

County.
Due to the value and importance in retaining and restoring this historical structure, the MCDOT Bridge Engineer initiated an in-depth inspection of the Old US 80 Bridge at the Gila River in 2005. The in-depth inspection report was completed in June 2007 and restoration items have been identified. Construction and rehabilitation plans were finalized in 2010 and work is anticipated to start in the Fall of 2011.

Structures Eligible for Federal Rehabilitation Funds (SR between 50 and 80)

The Federal Highway Administration guidelines stipulate that when an in-service structure's bridge's sufficiency rating falls between a score of 50 and 80, the bridge structure becomes eligible for federal rehabilitation funds. Currently, there are twenty-five structures in MCDOT's inventory that have sufficiency ratings between 50 and 80. Of these twenty-five, eighteen are in-services structures that would qualify for federal aid for rehabilitation.

After each inspection cycle the Bridge Engineer or his designee pays specific attention to all structures that had a significant change (ten points or more) in the sufficiency rating in order to determine what caused the change. Remedial action is taken as necessary. Table 1 lists the in-service structures in MCDOT's inventory that have sufficiency ratings between 50 and 80. Table 1A lists the in-service structures in MCDOT's inventory that have a sufficiency rating lower than 50. The tables also show the deficiency ratings.

POTENTIAL FEDERAL FUND PROJECTS VS. OVERALL MCDOT INVENTORY

In June 2010, the percentage of in-service structures in MCDOT's inventory that were eligible for federal funds was 6%. In July 2011, the percentage of these structures in our inventory was 4%. The vast majority of structures in Maricopa County are still in excellent condition.

NOTABLE 2010-2011 BRIDGE EVENTS

The Federal Highway Administration and all fifty states have established a goal that Load and Resistance Factor Design (LRFD) be the standard design code applied in all new bridge designs beginning in 2007. LRFD takes variability in the behavior of structural elements into account and relies extensively on the use of statistical methods to calculate design loads. MCDOT is in compliance with this goal and began using the LRFD code in new bridge designs in 2006.

Table 1. Structures with Sufficiency Ratings between 80 and 50

Structure No	Structure Name	Feature Carried by Structure	Deficiency	Sufficiency Rating
10516	Olive Ave RCB	Olive Ave		80
9825	Cave Creek Bridge	Carefree Hwy WB		79.92
11009	Olive Ave RCB	Olive Ave & BNSFRR		79.01
9289	RID Canal RCB	091st Ave		76.93
8554	Salt River Bridge SB	Alma School Rd		76.74
8553	Salt River Bridge NB	Alma School Rd		76.74
9859	Agua Fria River Bridge	Camelback Rd		76.69
9384	Tempe Canal Bridge WB	Broadway Rd WB	Functional	76.49
990158	Agua Fria Drain RCB	Camelback Rd		75.69
9145	Agua Fria River Bridge	Indian School Rd		75.51
9126	Drainage Ditch RCB	Bell Rd		74.94
9375	Tempe Canal Bridge EB	Broadway Rd EB	Functional	74.62
990164	Drainage Ditch RCB	Cotton Lane		74.48
7671	Wash RCB	Sun Valley Pkwy-44		73.67
10084	Cline Creek RC Arch	Circle Mtn Rd		73.57
7780	Salt River Bridge	Gilbert Rd		73.22
10405	Anthem Way RCB	Anthem Way		72.32
990143	Wash RCB	Sun Valley Pkwy-29		70.67
990169	Drainage Ditch RCB	El Mirage Rd		70.17
990172	Beardsley Canal Bridge	Indian School Rd		68.8
8570	Drainage Ditch RCB	RH Johnson Blvd		66.41
990121	RWCD Canal RCB	Queen Creek Rd		64.89
990181	Arlington V Wash Bridge	Old US 80	Structural	64.62

Table 1A. Structures with Sufficiency Ratings Lower than 50

Structure No	Structure Name	Feature Carried by Structure	Deficiency	Sufficiency Rating
8021	Gila River Bridge	Old US 80	Functional	46.5

The Gillespie Dam Bridge continues to be the only bridge currently listed in the National Register of Historic Places (NRHP). Bridge rehabilitation for this structure is programmed in the TIP in FY 2012-2016. Federal Aid will be used to finance the rehabilitation cost.

SYNOPSIS OF MCDOT'S BRIDGE PROJECTS

Bridge Projects in the MCDOT FY 2012-2016 TIP

Currently, MCDOT has seven bridge and structure projects in the TIP. These projects include bridge rehabilitation, replacement, and new bridge designs. Refer to Table 2 for a list of the projects.

Table 2. Bridge Projects in the MCDOT FY 2012 – 2016 TIP

STATUS	FEATURE	FACILITY/ FACILITIES	LOCATION	IMPROVEMENT
FY 2012 to 2016	Agua Fria Riv-er	Deer Valley Rd Bridge	El Mirage Rd to Lake Pleasant Rd	Prepare Final Design
FY 2012 to 2016	Gila River	Old US 80 Bridge	Gillespie Bridge	Bridge Rehabilitation Final Plans
FY 2012	Salt River	Gilbert Road Bridge	At Salt River	Bridge Replacement Final Design
FY 2011 to 2012	BID Canal	Miller Road Bridge	At BID Canal	Prepare Final Design
FY 2012 to 2016	Salt River	Dobson Road and McKellips Road Bridges	at Salt River	Design Concept Report for two new bridges
FY 2012 to 2016	Queen Creek Wash	Meridian Road Bridge	At Queen Creek Wash	Design Concept Report in Progress
FY 2012	Beardsley Canal	Indian School Road Box Culvert	At Beardsley Canal	Construction Plans being finalized

Status of Bridge/Structure Projects Completed in FY 2010 (July 1, 2010 – June 30, 2011)

Five bridge/structure projects (new structures, reports, or scour protection) were completed in FY 2011, as listed below in Table 3.

Table 3. Structure Projects Completed in FY 2011

New RCBs	Two new RCBs constructed on El Mirage Rd north of Bell Rd
RCB Extended	El Mirage Rd north of Bell Rd
New RCB	Deer Valley Access Rd west of El Mirage Rd
New RCB	El Mirage Rd south of Loop 303
Report	67th Avenue Box Culvert at the Salt River Scoping Study

Status of Bridge & Structure Projects Currently Under Construction

Presently, MCDOT has two new box culverts under construction and one existing box culvert is being widened and extended. In addition, there are several private development structures currently under construction. Table 4 lists the bridge projects currently under construction by MCDOT.

Table 4. Bridge Projects Under Construction by MCDOT

PROJECT LOCATION	Work Description
Ellsworth Rd Improvements	Two New Box Culverts and One Culvert Widening and Extension

Status of Bridge & Structure Projects Currently Being Designed

There are currently six bridge projects in various stages of design by MCDOT, as well as numerous structure projects within private developments in the design phase. Table 5 lists the bridge projects currently under design or in the Design Concept Report (DCR) process.

Table 5. Projects Currently in the Design Phase by MCDOT

NAME	FACILITY	STATUS
Indian School Road Box Culvert	Beardsley Canal	Construction Plans being finalized.
Deer Valley Road Bridge	Agua Fria River	Construction Plans in progress.
Dobson Road Bridge and McKellips Road Bridge	Salt River	DCR in progress.
Ellsworth Road Box Culverts	Sonoqui Wash East Branch and Sonoqui Wash	Construction completion in Spring 2011.
Miller Road Bridge Rehabilitation	BID Canal	Scoping Study completed. Construction Plans in progress.
Riggs Road Bridge	Sonoqui Wash	Construction Plans completed. Construction to begin Fall 2011.

Each year MCDOT must report to the Board of Supervisors concerning the physical condition of its bridges and structures as compared to the adopted criteria as required by the Governments Accounting Standards Board Statement 34. The latest ratings of the County's bridges and structures along with the bridge sufficiency ratings (BSR) are shown below.

Table 6. SUMMARY OF ACTIVITY FOR THE 2010–2011 BRIDGE INSPECTION

Criteria	Target Value	Actual Value
% of Bridges and Structures with BSR > 70	min. 90%	99.8%
% of Bridges & Structures with BSR < 50	max. 3%	0.24%

Summary of Structures for the 2010 - 2011 Inspection Season

Total number of structures in inventory: 420

Number of Federal Structures:	278
Number of Non-Federal Structures:	142
Number of bridges:	86
Number of culverts:	334

Total number of new structures added to database this year: 7

Total number of federal structures added to database this year: 5

Structure Number 11070 Gavilan Peak Parkway RCB (just N. of Jordan Lane)
Structure Number 11071 Deer Valley Road RCB (just N. of Existing Deer Valley Dr)
Structure Number 11105 El Mirage Rd RCB (1.7 miles N of Bell Rd)
Structure Number 11106 El Mirage Rd RCB (3.4 miles N of Bell Rd)
Structure Number 11111 Centennial Rd Bridge (5.7 miles W of Harquahala Valley Rd)

Total number of non-federal structures added to database this year: 2

Structure Number 990279 El Mirage Rd RCB (600' S. of Loop 303)
Structure Number 990280 116th St RCB at Consolidated Canal

Total number of structure replacements made this year: 0

Total number of structures removed/annexed from database this year: 7
Structure Number 7641 Bell Road Bridge at Beardsley canal - Annexed by Surprise
Structure Number 8858 Greenway Rd Bridge at Beardsley canal - Annexed by Surprise
Structure Number 10087 Germann Rd Bridge at Eastern canal - Annexed by Gilbert
Structure Number 8980 Meadowbrook Ave Bridge at Lateral 23 - Annexed by Phoenix
Structure Number 7553 Deer Valley Rd Bridge at wash - Annexed by Surprise
Structure Number 990173 Indian School Rd RCB at Lateral 23 - (not maintained by MCDOT)
Structure Number 990199 Thomas Rd RCB at Lateral 23 - (not maintained by MCDOT)

Figure 1: 2010-2011 Bridge & Structure Sufficiency Ratings

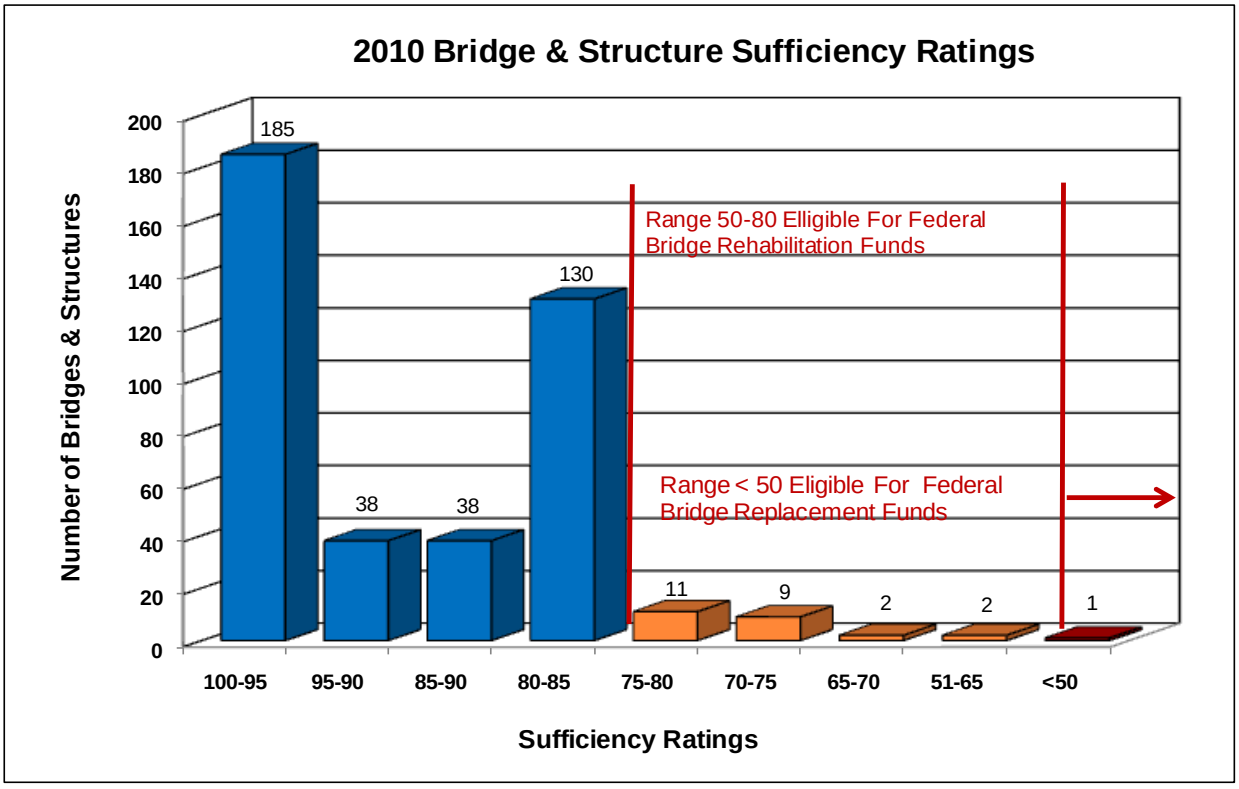


Table 7. Alphabetical Listing of All Structures in the MCDOT Bridge Inventory Database.

Structure No	Roadway	Location	Feature Intersected	Sufficiency Rating
10051	007th St	450' N/ Carefree Hwy	Desert Lk Wash S Branch	97.9
10050	007th St	0.2 mi N/ 7th St/Carefree	Desert Lake Wash	97.9
10553	012th St	N of Circle Mtn Rd	Wash	99.97
8583	059th Ave	0.5 mi S/ Buckeye Rd	RID Canal	97.15
9289	091st Ave	at McDowell Rd	RID Canal	76.93
10444	096th St	1/8 mi N/ Broadway Road	Wash	96.7
9672	099th Ave	0.5 mi N/ McDowell Rd	RID Canal	97.84
990153	099th Ave	at Concho Circle	Drainage Ditch	95.74
990151	099th Ave	200' N/ Grand	Drainage Ditch	95.65
9666	099th Ave	250' N Grand Ave	Drainage Ditch	95.65
990154	103th Ave NB	325' N/ Olive	Drainage Ditch	96.65
9677	105th Ave	at Del Webb Blvd Median	Drainage Ditch	96.94
990234	105th Pl	Quarterline Rd to Contess	Drain Ditch	96.94
9678	106th Ave	at Del Webb Blvd Median	Drainage Ditch	96.94
990257	107th Ave	0.5 mi. N of Williams Rd	Wash	99.06
9679	107th Ave	at Del Webb Blvd Median	Drainage Ditch	96.64
990280	116th Street	600’ S/ Riggs Rd	Consolidated Wash	93.59
10783	117th Ave	620' S/ Agua Fria Blvd	Wash	92.43
990265	119th Ave	0.5 mi s/ Williams Drive	Drainage Ditch	90.5
10368	129th Ave	N/ Camelback Rd	Drainage Channel	96.91
7561	138th Ave	200' W/ Camino del Sol	Drainage Ditch	96.95
990202	141st Ave	200' W/ Yosemite Dr	Drainage Ditch	96.95
10556	144th St-Rio Verde	at Windstone Trail	Wash	81.82
10554	144th St-Rio Verde	350' S of Peakview Rd	Wash	81.82
10552	144th St-Rio Verde	120' S of Dixileta Dr	Wash	81.82
10555	144th St-Rio Verde	1250' S of Dixileta Dr	Wash	81.82
990203	145th Dr	200' W/ Yosemite Dr	Drainage Ditch	96.95
990204	147th Dr	200' N/ Antelope	Drainage Ditch	96.95
10849	150th St	765' N of Rio Verde Drive	Wash	86.83
10850	150th St	1610' N of Rio Verde Dr	Wash	86.83
8571	163rd Ave	5 mi N/ US 60_Grand Ave	HaydenRhodes CAP Aque-duct	89.21
11109	203rd Place	S/ Riggs Rd	Sonoqui Wash	Under const
7582	309th Ave	S of Lower River Rd	Buckeye Canal	94.87
8576	355th Ave	7 mi N/ Indian School Rd	CAP Canal	95.93
7548	571st Ave_AguaCal Rd	9.75 mi N/ I-8 via ACRd	Gila River	98.92
990156	571st Ave_AguaCal Rd	8.5 mi N/ I-8 via AguaCal	Wash	95.92
10126	Airport Rd	1 mi N/ MC85	Buckeye Canal	98.67

Structure No	Roadway	Location	Feature Intersected	Sufficiency Rating
8001	Airport Rd	0.5 mi N/ Lower Buckeye	RID Canal	94.93
7549	Aleppo Dr	200' N/136th Dr_W/SpnGrdn	Drainage Ditch	96.77
990117	Alma School Rd	0.5 mi S/ Riggs Rd	golf cart underpass	99.6
8554	Alma School Rd	0.25 mi N/ McLellan	Salt River(S.Channel)	76.74
8553	Alma School Rd	300' S/ McKellips	Salt River(N.Channel)	76.74
990187	Amigo Dr (SCW)	at Stardust Blvd Median	Drainage Ditch	95.06
10551	Anthem Way	0.89 mi E/ Daisy Mtn Dr	Wash	99.55
990258	Anthem Way	0.53 mi E/ Daisy Mtn Dr	Wash	96.55
990259	Anthem Way	0.4 mi E/ Daisy Mtn Dr	Wash	96.55
990250	Anthem Way	370' NW of LibertyBellWay	Wash	96.38
990232	Anthem Way	.25 mi W/ Daisy Mtn Dr	Wash	96.38
990229	Anthem Way	200' W of Anthem Club Dr	Wash	95.69
990227	Anthem Way	530' E/ Navigation Way	Wash	95.69
990231	Anthem Way	220' E/ Freedom Way	Wash	95.69
990228	Anthem Way	475' E/ Venture Court	Wash	95.41
990230	Anthem Way	350' W/ Anthem Club Dr	Ped X	80.4
10405	Anthem Way	East of I-17	Wash	72.32
990184	Aurora Dr	at Stardust Blvd Median	Drainage Ditch	97.84
10163	Avondale Blvd	0.75 mi S/ Southern Ave	Gila River	99.55
990185	Ballad Dr	at Stardust Blvd Median	Drainage Ditch	97.84
8000	Baseline Rd	200' NW MC-85	Buckeye Canal	93.47
8555	Beardsley Rd	100' E/ 125th Ave	Drainage Ditch	97.44
990272	Belfair Way	just N of Meridian Drive	Wash	89.38
9126	Bell Rd	at 99th Ave	Drainage Ditch	74.94
9686	Bell Rec Center Dr	at 99th Ave Median	Drainage Ditch	96.51
990157	Beloat Rd	E/ Rainbow Rd	Buckeye Canal S. Branch	81.16
10512	Bethany Home Rd	200' E of 125th Ave	Wash	96.82
990243	Bethany Home Rd	350' E of 137th Ave	wash	85.55
990244	Bethany Home Rd	418' W of 135th Ave	Wash	85.55
9687	Boswell Blvd	at 99th Avenue Median	Drainage Ditch	99.81
9676	Boswell Blvd	at Del Webb Blvd Median	Drainage Ditch	96.68
8975	Broadway Rd	400' W/ FanninMcFar CAP	Drainage Ditch	97.41
990101	Broadway Rd	at Meridian Rd.	Drainage Ditch	96.14
990102	Broadway Rd	1000' E/ Crismon Rd	Drainage Ditch	96.14
9375	Broadway Rd EB	0.2 mi E/ Price Rd	Tempe Canal	74.62
9384	Broadway Rd WB	0.2 mi E/ Price Rd	Tempe Canal	76.49

Structure No	Roadway	Location	Feature Intersected	Sufficiency Rating
8855	Bruner Rd	0.75 mi N/ Old US-80	Buckeye Canal	98.99
9688	Burns Dr	at 99th Avenue Median	Drainage Ditch	99.66
9824	Bush Hwy	1.7 mi N/ Thomas	FanninMcFar CAP Aqueduct	96.24
990113	Bush Hwy	3.25 mi N/ McDowell Rd	Wash	95.94
7779	Bush Hwy	3.5 mi N/ McDowell Rd	Wash	95.94
9849	Bush Hwy	at Blue Point-Salt River	Salt River	92.35
9763	Bush Hwy	3.2 mi N/ McDowell Rd	Spook Hill Fldwy	85.55
9859	Camelback Rd	1.0 mi E/ El Mirage Rd	Agua Fria River	76.69
990158	Camelback Rd	0.5 mi E/ El Mirage Rd	Drainage Ditch	75.69
9689	Cameo Dr	at 99th Avenue Median	Drainage Ditch	85.85
9893	Carefree Hwy	200' W/ 24th St	Wash	98.54
10158	Carefree Hwy	W/ 16th Street	Wash	98.54
9892	Carefree Hwy	200' W/ 12th St	Wash	98.54
9891	Carefree Hwy	at 10th St	Wash	98.54
10159	Carefree Hwy	0.5 mi W/ 24th Street	Wash	95.63
10161	Carefree Hwy	0.5 mi E/ 24th Street	Apache Wash	95.63
10160	Carefree Hwy	0.25 mi E/ 24th Street	Wash	95.63
10162	Carefree Hwy EB	1 mi W/ Cave Creek Rd	Cave Creek Wash	94.64
9825	Carefree Hwy WB	1 mi W/ Cave Creek Rd	Cave Creek Wash	79.92
990269	Carlota Lane	313' W of 119th Avenue	Drainage Ditch	99.89
990256	Castano Dr	just N. of Bethany Home R	Wash	96.82
7550	Cavalcade Dr	200' E/ 141th Ave	Drainage Ditch	96.77
7898	Cave Creek PKWY	1.5 mi N/32nd St/Cloud Rd	Wash	98.86
11111	Centennial Rd	5.7 mi W/ Harquahala Val Rd	CAP Aux Canal	99.00
10240	Chambers St	0.6 mi S/ Broadway Rd	Buckeye Feeder Ditch	98.99
990116	Chandler Hts Rd	0.5 mi E/ SR-87 (AZ Ave)	Consolidated Canal	95.48
990218	Cicero St	E/ 105 St & N/ Univ Dr	Drain Ditch	96.95
10084	Circle Mtn Rd	3437' E/ New River Rd	Wash	73.57
10229	Citrus Rd	just N/ Northern Ave	Wash	80.78
10520	Clarendon Ave	just W/ 195th Ave	Drain Ditch	92.33
990261	Clearview Trail	just N/ Meridian Dr	Wash	81.72
990235	Cloud Rd	just E/ Via Puzzola	Wash	87.45
10443	Cloud Rd	500' W of 32nd Drive	Wash	86.7
990236	Cloud Rd	1000' W/ 32nd Dr	Wash	84.82
990162	Conquistador Dr	200' E/ Regal	Drainage Ditch	96.87
990163	Conquistador Dr	200' S/ Beechwood	Drainage Ditch	86.89
990107	Coralbell Ave	E/ Ellsworth & S/Broadway	Drainage Ditch (Wash)	96.85
10629	Cotton Lane	1mi. S/ MC-85	Gila River	99.93
10630	Cotton Lane	0.25 mi S/ MC-85	Buckeye Canal	98.93
990164	Cotton Lane	N/ Camelback Rd	Drainage Ditch	74.48
10062	Cottonwood Rd	N Entrance Lk Plsnt Pk	Cottonwood Creek	85.98

Structure No	Roadway	Location	Feature Intersected	Sufficiency Rating
9736	Courthouse Rd	3 mi W/ Salome Rd	Saddleback Diversn Chn	98.48
8856	Crismon Rd	500' N/ Apache Rd	CAP Canal	94.35
8761	Crismon Rd	0.25 mi N/ Brown Rd	Signal Butte Fldwy	84.17
10628	Daisy Mtn Dr	520' W/GavilanPk Pkwy	Wash	95.26
10627	Daisy Mtn Dr	0.4mi W/GavilanPkPkwy	Wash	95.26
10519	Daisy Mtn Dr	0.6 mi S of Anthem Way	Wash	91.44
10557	Daisy Mtn Dr	92' E of Dedication Trail	Wash	83.54
10559	Daisy Mtn Dr	0.36 mi NE/ Dedication Tr	Wash	83.54
10558	Daisy Mtn Dr	750' E/ Dedication Trail	Wash	83.54
990247	Daisy Mtn Dr RCB	0.52 mi S of Anthem Way	Wash	91.45
990266	Daley Lane	just e/ 123rd Avenue	Drainage Channel	96.89
7551	Dean Rd	600' N/ Lower Buckeye Rd	RID Canal	98.66
8638	Dean Rd	0.75 mi N/ MC-85	Buckeye Canal	98.52
990167	Deer Valley Dr	W/ Acapulco Drive	Golf Cart Path	96.51
990165	Deer Valley Dr	W/ Dustrytrail Blvd (SCW)	Golf Cart Path	96.32
990166	Deer Valley Dr	E/ Veterans	Golf Cart Path	85.44
10044	Deer Valley Dr	W/ 135th Ave	Golf Cart Path (SCW)	85.22
11071	Deer Valley Dri	Just N/ existing Deer Val Dr	Deer Valley Channel	81.61
990168	Desert Glen Dr	100' N/ 132nd Ave	Drainage Ditch	82.85
10787	Dysart Rd	0.25 mi. S/ Jomax Rd	Beardsley Canal	99.94
7883	Dysart Rd	0.25 mi N/ Camelback Rd	Colter Channel	98.36
990224	Dysart Rd	N/ Camelback Rd	Drain Chnl	95.36
9412	Dysart Rd	0.5 mi S/ Indian School	RID Canal	92.46
8560	Eagle Eye Rd	2 mi S/ Salome Hwy	CAP Canal	97.99
10786	El Granada Blvd	0.4 mi. N/ HappyValley Rd	Beardley Canal	99.96
10785	El Granada Blvd	0.42 mi. N/HappyValley Rd	Drainage Channel	99.96
10784	El Granada Blvd	0.18 mi. S/ Jomax Rd	Drainage Channel	96.96
9949	El Mirage Rd	0.5 mi N/ Glendale Ave	Dysart Drain	96.98
11105	El Mirage Rd	1.7 mi N/ Bell Rd	McMicken Dam Outlet Wash	96.1
11106	El Mirage Rd	3.4 mi N/ Bell Rd	McMicken Dam Outlet Wash	96.1
8561	El Mirage Rd	N/ Bell Rd	Drainage Ditch	83.95
990169	El Mirage Rd	0.25 mi S/ Beardsley	Drainage Ditch	70.17
9586	Elliot Rd	at Sossaman	Sossaman Ditch	95.26
7899	Ellsworth Rd	400' N/ Broadway	Wash	99.03
9842	Ellsworth Rd	200' S/ Apache Trail	Drainage Ditch	99.03
9895	Ellsworth Rd	0.25 mi N/ University Rd	CAP Canal	98.74
9138	Ellsworth Rd	Empire Blvd_PinalCo Line	Sonoqui Wash	90.76
11107	Ellsworth Rd	At Riggs Rd	Sonoqui Wash Each Br`	Under constr
10366	Forest Rd	1.3 mi N/ McDowell Mtn Rd	Large Wash	95.64
10367	Forest Rd	1.4 mi N/ McDowell Mtn Rd	Small Wash	93.75
990223	Forest Rd	1.3 mi N/McDowell Mtn Rd	golf cart crossing	84.29
10104	Fort McDowell Rd	just N/ Yavapai Rd	Wash	99.5

Structure No	Roadway	Location	Feature Intersected	Sufficiency Rating
8019	Ft McDowell Rd	2.25 mi N/ SR 87	Wash	86.84
11005	Gavilan Peak Pkwy	0.5 mi N of Pioneer Rd	Wash	98.8
10855	Gavilan Peak Pkwy	840' N of Daisy Mtn Drive	Wash	96.85
10384	Gavilan Peak Pkwy	300 ' N. King Drive	Wash	96.04
990233	Gavilan Peak Pkwy	1600' E/ Navigation Way	Wash	84.29
10582	Gavilan Peak Pkwy	just S of DaisyMtnDr	Deadman Wash	82.83
10397	Gavilan Peak Pkwy	W/ Navigation Way	Wash	81.58
11107	Gavilan Peak Pkwy	Just N/ Jordan Lane	Was	98.6
7554	Gemstone Dr	200' W/ 136th Dr_SCW	Drainage Ditch	89.29
10276	Germann Rd	.25 mi E/ Sossaman Rd	Drainage channel	83.89
7780	Gilbert Rd	0.5 mi N/ Thomas Rd	Salt River	73.22
990170	Granite Valley Dr	200' N/ Antelope Dr (SCW)	Drainage Ditch	96.47
8562	Greenway Rd	at 99th Ave	Drainage Ditch	88.47
10396	Happy Valley Pkwy	1.5 mi W/LkPleasant Rd	Agua Fria River	82.0
10457	Happy Valley Pkwy	2.06 mi w/ LakePleasantRd	Wash	87.77
10458	Happy Valley Pkwy	1.65 mi W/LakePleasantRd	Wash	87.77
11006	Happy Valley Rd	0.7 mi E of Dysart Rd	Trilby Wash	96.62
990255	Hastings Way	277' NW of Blaze Court	Wash	96.77
990254	Hastings Way	250' SW of Blaze Court	Wash	96.77
990249	Hastings Way	250' SE of Hickcock Trail	Wash	96.77
10518	Hemingway Lane	just E of DedicationTrail	Wash	81.73
10581	High Noon Way	just N of Kuralt Drive	Wash	96.89
9503	Higley Rd	0.5 mi S/ Germann	RWCD Canal	91.62
9668	Hutton Dr	at 99th Ave Median_SCW	Drainage Ditch	98.63
990213	I-17 Frontage Rd	S/ Meander Rd	Wash	99.59
8640	I-17 Frontage Rd	0.7 mi S/ New River	Wash	96.59
10085	I-17 Frontage Rd	1000' S/ New River Rd	New River	88.28
9145	Indian School Rd	0.5 mi E/ El Mirage	Agua Fria River	75.51
990172	Indian School Rd	at 191st Ave	Beardsley Canal	68.8
990225	Indian Springs Rd	W/ El Mirage Rd	Wash	98.68
990216	Indian Springs Rd	at 116th Ave at PIR	Pedestrian Xing	92.26
990260	Iron Horse Way	just N/ Meridian Dr	Wash	89.37
9831	Jackrabbit Trail	1000' N/ Southern Ave	Buckeye Canal	98.1
990175	Jackrabbit Trail	0.25 mi S/ SR-85	Buckeye Canal S. Branch	97.31
10088	Jackrabbit Trail	0.25 mi N/ Yuma	RID Canal	95.23
8680	Johnson Rd	0.25 mi N/ Broadway	RID Canal	98.83
10274	Jomax Rd	.25 mi W/ Grand Ave	Wash	99.91

Structure No	Roadway	Location	Feature Intersected	Sufficiency Rating
10511	King Dr	180' W of Opportunity Way	Wash	89.37
990248	Laurel Valley Way	just N of Keller Drive	Wash	96.88
990177	Lk Pleasant Ent Rd	0.2 mi E/ Castle HSpr Rd	Wash	93.82
10052	Lone Mountain Rd	0.75 mi E/ 227th Ave	Wash	98.96
10053	Lone Mountain Rd	0.65 mi E/ 227th Ave	Wash	98.96
7556	Lower Buckeye Rd	1 mi W/ El Mirage Rd	AFR Diversion Channel	83.13
11110	Marsh Rd	S of Riggs Rd	Sonoqui Wash	Under constr
7901	MC 85 Hwy	0.5 mi W/ Perryville	Buckeye Canal	96.45
990127	MC-85	0.5 mi W/ Sarival	Drainage Ditch	93
10230	MC-85	0.3 mi E/ Estrella Pkwy	Bullard Wash	91.92
990220	MC-85	0.3 mi W/Estrella Pkwy	Dirt Irr Ditch	87.82
990219	MC-85	335' W/ Estrella Pkwy	Dirt Irr Ditch	87.82
990215	MC-85	Just E/ Perryville Rd	Buckeye Canal S Branch	80.9
990214	MC-85	0.25 mi E/ Perryville Rd	Buckeye Canal S Branch	80.9
990128	MC-85	0.25 mi E/ Cotton Lane	Drainage Ditch	78.24
7819	MC-85 Hwy	0.5 mi W/ El Mirage	Agua Fria River	93.97
7583	McDowell Rd	W/ Jackrabbit Tr_195th Av	Wash	99.66
990262	McDowell Rd	0.5 mi E of Hawes Rd_Mesa	Drainage Ditch	95.75
10105	McKellips Rd	0.5 mi W/ SR 101	Granite Reef Wash	98.37
10242	Meadowbrook Ave	W/ Jackrabbit Tr (195Ave)	Wash	92.93
8797	Meeker Blvd	0.5 mi S/ RH Johnson Rd	Drainage Ditch	96.19
990179	Meeker Blvd	0.75 mi S/ RH Johnson	Golf Cart Underpass	96.19
10560	Memorial Dr	480' S/ Daisy Mtn Dr	Wash	99.52
10561	Memorial Dr	0.3 mi S/ Daisy Mtn Dr	Wash	99.52
990275	Memorial Dr	270' W of Daisy Mtn Drive	Wash	96.78
10385	Memorial Dr	600' E of Gavilan Pk Pkwy	Wash	81.52
990226	Memorial Dr	170' E of Republic Way	Split Flow Wash	81.52
10388	Memorial Dr	350' E of Republic Way	Split Flow Wash	81.52
10386	Memorial Dr	1700' E of Gavilan Pk Pkw	Wash	81.52
10442	Meridian Rd	0.45 mi N/ Warner Rd	Wash	99.85
990217	Meridian Rd	1/8 mi N/ University	Drainage Ditch	96.55
10847	Meridian Rd	0.5 mi S of Warner Road	Power Line Fldwy Chnl	96.13
10846	Meridian Rd	0.5 mi S of Warner Rd	Drainage Channel	96.13
7557	Meridian Rd	0.5 mi N/ Brown Rd	Bulldog Floodway	84.98
10108	Meridian Rd	0.25 mi N/ McKellips Rd	Wash	82.93
9593	Miller Rd	0.25 mi N/ SR-85	Buckeye Canal	85.94
10778	Mingus Rd	just E/ 25th Avenue	White Spar Wash	99.96
10241	Minnezona Ave	W/ Jackrabbit Trl	Wash	96.96
10510	Missouri Ave	N/ Marshall Ave_135thAve	Wash	84.37

Structure No	Roadway	Location	Feature Intersected	Sufficiency Rating
990245	Missouri Ave	S/ Marshall Ave near 135	Wash	84.37
990246	Missouri Ave	just W of Dysart	Wash	84.28
7642	New River Rd	at 29th Ave	Wash	99.76
7643	New River Rd	0.25 mi E/ 27th Ave	Wash	99.76
10083	New River Rd	350' N/ Circle Mtn Rd	Cline Creek Wash	99.59
10021	New River Rd	0.25 mi W/ 7th Ave	Skunk Creek	98.59
10106	New River Rd	0.25 mi E/ I 17	New River	97.66
8011	New River Rd	0.25 mi E/ I 17	Wash	97.43
10086	New River Rd	100' E/ I 17 Frontage	Wash	86.31
10781	Northern Ave	1 mi W/ Perryville Rd	FRS#3 Dvrsn Chnl	93.98
10780	Northern Ave	1 mi. W/ Perryville Rd	Beardsley Wash	94.94
8565	Old Lk Plsnt Acc Rd	1 mi N/ SR-74	Wash	99.93
10507	Old SR 87	0.8 mi NW of New SR87Junc	Wash	94.52
10521	Old SR 87	1.0 mi NW of New SR87Junc	Wash	94.52
990114	Old Stage Rd	0.6 mi N/ New River Rd	Wash	86.56
990208	Old US 80	1.25 mi S/ Cactus Rose	Arlington Valley Wash	99.76
11007	Old US 80	3.5 mi S of Patterson Rd	Layton Wash	99.69
9999	Old US 80	500' E/ Salome Hwy	Hassayampa River	99.62
990155	Old US 80	0.5 mi W/ Palo Verde Rd	Buckeye Lateral	98.87
9834	Old US 80	1 mi W/ Jct SR-85	Buckeye Drain	98.62
990206	Old US 80	7/8 mi S/ Cactus Rose	Arlington Valley Wash	96.76
990205	Old US 80	0.75 mi S/ Cactus Rose	Arlington Valley Wash	96.76
990180	Old US 80	50' S/ Cactus Rose	Arlington Valley Wash	96.76
990209	Old US 80	1.5 mi S/ Cactus Rose	Arlington Valley Wash	94.76
8023	Old US 80	1 mi S/ Arlington Sch Rd	Arlington Valley Wash	95.73
8025	Old US 80	600' N/ 331st Ave	Arlington Valley Wash	95.35
10061	Old US 80	0.3 mi S/ 331th Ave	Arlington Valley Wash	89.26
990207	Old US 80	1 mi S/ Cactus Rose	Arlington Valley Wash	85.73
990181	Old US 80	0.25 mi S/ Cactus Rose	Arlington Valley Wash	64.62
8021	Old US 80	S/ Gillespie Dam	Gila River	46.5
990276	Olive Ave	800' E of Perryville Rd	Wash	96.95
8981	Olive Ave	0.8 mi E/ El Mirage Rd	Agua Fria River	91.04
10779	Olive Ave	0.49 mi. W/ Perryville Rd	Waterfall Wash	83.41
9588	Olive Ave	E/ of 99th Ave	New River	80.06
10516	Olive Ave	.5 mi W/ Perryville Rd	Wash W/ Beardsley Canal	80
11009	Olive Ave & BNS-FRR	just W of Reems Road	Reems Road Channel	79.01
10517	Osborn Rd	just W of 195th Avenue	Drain Ditch	84.72
990251	Owens Dr	E of Capra Way	Wash	89.38
7782	Palo Verde Rd	0.75 mi N/ Old US80 Hwy	Buckeye Canal	98.85

Structure No	Roadway	Location	Feature Intersected	Sufficiency Rating
9426	Palo Verde Rd	0.25 mi N/ Broadway	RID Canal	98.02
10580	Patagonia Way	N of Honor Court (Anthem)	Wash	96.89
8569	Patton Rd	1 mi W/ Grand Ave	CAP Canal	93.78
8044	Perryville Rd	0.5 mi N/ Southern	Buckeye Canal	98.86
8043	Perryville Rd	1/3 mi S/ Van Buren	RID Canal	98.7
990264	Pinnacle Peak Rd	70' w/ 121st Avenue	Drainage Ditch	85.74
990271	Plymouth Dr	just E of GavilanPkPkwy	Drainage Channel	81.73
10390	Power Rd	0.2 mi S/ Queen Creek Rd	Queen Creek	94.57
9927	Power Rd	S/ Guadalupe Rd	RWCD Canal (N. Crossing)	93.07
9928	Power Rd	S/ Guadalupe Rd	East Maricopa Fldwy	81.18
990121	Queen Creek Rd	0.3 mi W/ Higley	RWCD Canal (Gilbert)	64.89
10776	Rainbow Rd	0.5 mi S/ Southern Avenue	Buckeye Canal	98.79
8681	Rainbow Rd	1 mi N/ Broadway	RID Canal	98.66
990278	Ray Rd	900' E of Mountain Rd	Wash	96.89
990277	Ray Rd	1200' E of Mountain Rd	Wash	96.89
11008	Reems Rd	0.5 mi N of Northern Ave	Reems Road Channel	82.79
990182	RH Johnson Blvd	100' E/ 132nd Ave	Drainage Ditch	81.47
8570	RH Johnson Blvd	N/ Bell Rd	Drainage Ditch	66.41
11108	Riggs Rd	E/ Ellsworth	Sonoqui Wash	Under constr
990270	Riggs Rd	160' W of Robson Blvd	Golfcart Underpass	92.5
8038	Rittenhouse Rd	0.25 mi N/ Cloud	Queen Creek Wash	89.72
10239	Roeser Rd	0.5 mi S/ Broadway Rd	Buckeye Feeder Ditch	98.98
9669	Royal Oak Rd	at 99th Avenue Median	Drainage Ditch	96.81
9670	Royal Ridge Rd	at 99th Avenue Median	Drainage Ditch	85.78
9832	Salome Rd	8 mi W/ Harquahala Val Rd	CAP Canal	93.93
8982	Signal Butte Rd	N/ Broadway Rd	Drainage Ditch	98.44
990112	Signal Butte Rd	0.5 mi N/ Brown Rd	Signal Butte Floodway	97.85
990186	Skylark Dr	at Stardust Blvd Median	Drainage Ditch	97.81
990253	Sossaman Rd	0.3 mi N of McDowell Rd	Drain Ditch	89.38
990252	Sossaman Rd	980' N of McDowell Rd	Wash	89.38
7716	Southern Ave	.6mi E of Signal Butte Rd	CAP Drainage Channel	97.07
8884	Southern Ave	.6mi E/ Signal Butte Rd	CAP Canal (Mesa)	97.07
990108	Southern Ave	E/ Ellsworth (Mesa)	Drainage Ditch	95.88
990211	Southern Ave	0.5 mi E/ MC-85 (dirt rd)	Buckeye Canal S Branch	93.78
990222	Southern Ave	0.5 mi E/ Crismon Rd	Drainage Channel	92.28
8573	Spanish Garden Dr	200' E/ 132nd Ave	Drainage Ditch	97.75
990183	Stardust Blvd	165' S/ Yosemite Rd	Drainage Ditch	96.75
7644	Sun Valley Pkwy	300' W/ McMicken Dam	McMicken Dam Channel	99.45
7645	Sun Valley Pkwy-01	0.7 mi N/ McDowell Rd	Wash	84.67

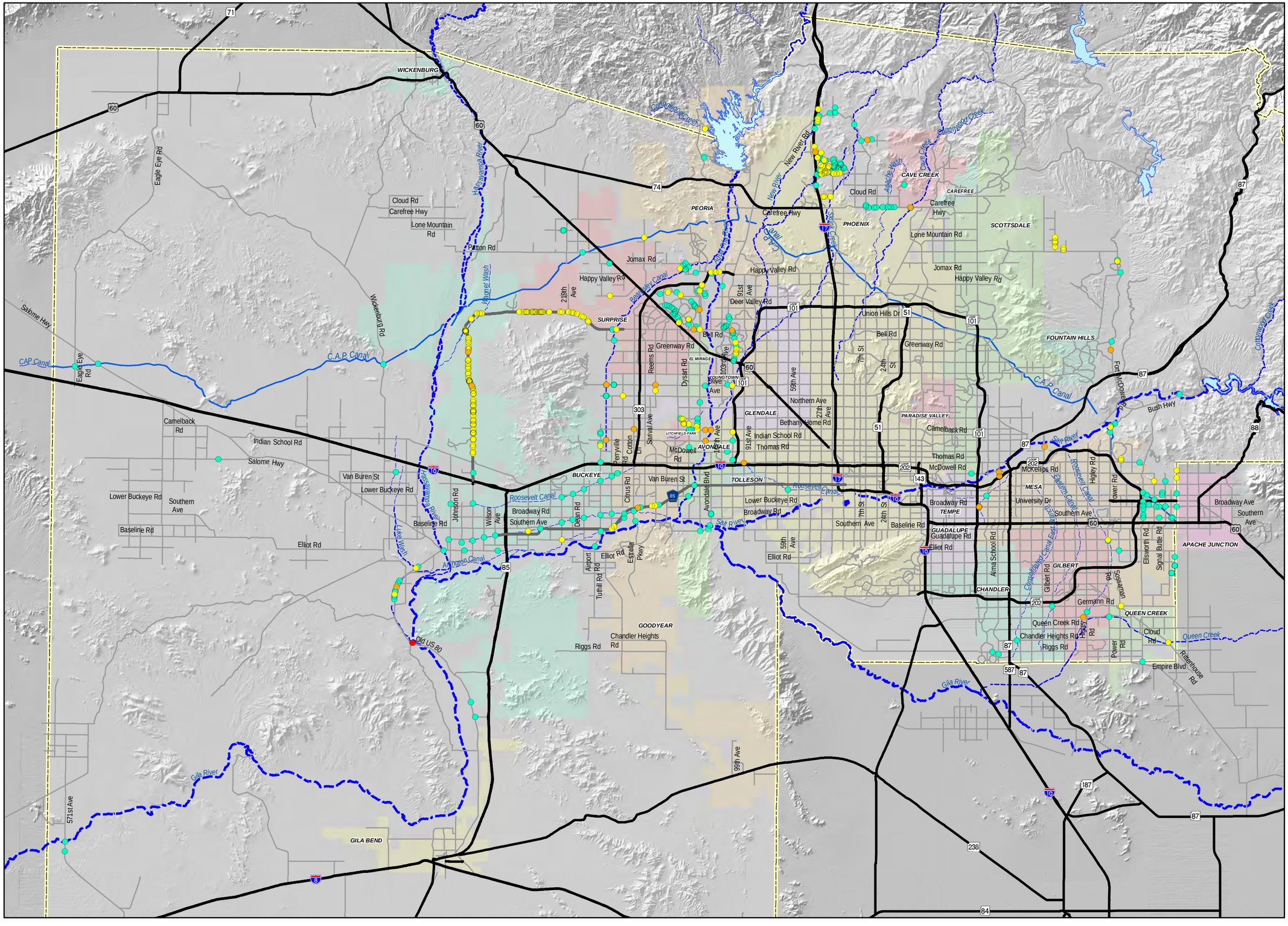
Structure No	Roadway	Location	Feature Intersected	Sufficiency Rating
7646	Sun Valley Pkwy-02	0.8 mi N/ McDowell Rd	Wash	84.67
7647	Sun Valley Pkwy-03	1.3 mi N/ McDowell Rd	Wash	84.67
7648	Sun Valley Pkwy-04	1.5 mi N/ McDowell Rd	Wash	84.67
7649	Sun Valley Pkwy-05	1.9 mi N/ McDowell Rd	Wash	84.67
7650	Sun Valley Pkwy-06	2.0 mi N/ McDowell Rd	Wash	84.67
7651	Sun Valley Pkwy-07	2.5 mi N/ McDowell Rd	Wash	84.67
7652	Sun Valley Pkwy-08	2.6 mi N/ McDowell Rd	Wash	84.67
7653	Sun Valley Pkwy-09	2.6 mi N/ McDowell Rd	Wash	84.67
990134	Sun Valley Pkwy-10	2.9 mi N/ McDowell Rd	Wash	84.67
7654	Sun Valley Pkwy-11	3.3 mi N/ McDowell Rd	Wash	84.67
7655	Sun Valley Pkwy-12	3.4 mi N/ McDowell Rd	Wash	84.67
7656	Sun Valley Pkwy-13	3.6 mi N/ McDowell Rd	Wash	84.67
990135	Sun Valley Pkwy-14	3.7 mi N/ McDowell Rd	Wash	84.67
990136	Sun Valley Pkwy-15	4.2 mi N/ McDowell Rd	Wash	84.67
7657	Sun Valley Pkwy-16	4.4 mi N/ McDowell Rd	Wash	84.67
7658	Sun Valley Pkwy-17	4.5 mi N/ McDowell Rd	Wash	84.67
7659	Sun Valley Pkwy-18	4.6 mi N/ McDowell Rd	Wash	84.67
990137	Sun Valley Pkwy-19	4.6 mi N/ McDowell Rd	Wash	84.67
990138	Sun Valley Pkwy-20	5.0 mi N/ McDowell Rd	Wash	84.67
7660	Sun Valley Pkwy-21	5.1 mi N/ McDowell Rd	Wash	84.67
7661	Sun Valley Pkwy-22	5.3 mi N/ McDowell Rd	Wash	84.67
990139	Sun Valley Pkwy-23	5.6 mi N/ McDowell Rd	Wash	81.67
7662	Sun Valley Pkwy-24	6.1 mi N/ McDowell Rd	Wash	84.67
7663	Sun Valley Pkwy-25	6.1 mi N/ McDowell Rd	Wash	84.67
990140	Sun Valley Pkwy-26	6.4 mi N/ McDowell Rd	Wash	80.67
990141	Sun Valley Pkwy-27	6.6 mi N/ McDowell Rd	Wash	81.67
990142	Sun Valley Pkwy-28	6.7 mi N/ McDowell Rd	Wash	81.67
990143	Sun Valley Pkwy-29	6.8 mi N/ McDowell Rd	Wash	70.67
990144	Sun Valley Pkwy-30	7.0 mi N/ McDowell Rd	Wash	81.67
990145	Sun Valley Pkwy-31	7.2 mi N/ McDowell Rd	Wash	81.67
990146	Sun Valley Pkwy-32	7.3 mi N/ McDowell Rd	Wash	81.67
7664	Sun Valley Pkwy-33	7.3 mi N/ McDowell Rd	Wash	84.67
7665	Sun Valley Pkwy-34	7.4 mi N/ McDowell Rd.	Wash	84.67
7666	Sun Valley Pkwy-35	7.4 mi N/ McDowell Rd	Wash	83.67
990147	Sun Valley Pkwy-36	7.6 mi N/ McDowell Rd	Wash	81.67
7667	Sun Valley Pkwy-37	8.0 mi N/ McDowell Rd	Wash	83.67
7668	Sun Valley Pkwy-38	8.1 mi N/ McDowell Rd	Wash	84.67
990148	Sun Valley Pkwy-39	8.5 mi N/ McDowell Rd	Wash	81.67
990149	Sun Valley Pkwy-40	8.6 mi N/ McDowell Rd	Wash	81.67

Structure No	Roadway	Location	Feature Intersected	Sufficiency Rating
990150	Sun Valley Pkwy-41	8.9 mi N/ McDowell Rd	Wash	81.67
7669	Sun Valley Pkwy-42	9.2 mi N/ McDowell Rd	Wash	84.67
7670	Sun Valley Pkwy-43	9.2 mi N/ McDowell Rd	Wash	84.67
7671	Sun Valley Pkwy-44	10.0 mi N/ McDowell Rd	Wash	73.67
7672	Sun Valley Pkwy-45	10.2 mi N/ McDowell Rd	Wash	81.67
7673	Sun Valley Pkwy-46	10.2 mi N/ McDowell Rd	Wash	81.67
990189	Sun Valley Pkwy-47	10.5 mi N/ McDowell Rd	Wash	81.67
990190	Sun Valley Pkwy-48	10.8 mi N/ McDowell Rd	Wash	81.67
7674	Sun Valley Pkwy-49	11.1 mi N/ McDowell Rd	Wash	81.67
7675	Sun Valley Pkwy-50	11.2 mi N/ McDowell Rd	Wash	81.67
7676	Sun Valley Pkwy-51	11.8 mi N/ McDowell Rd	Wash	81.67
7677	Sun Valley Pkwy-52	11.8 mi N/ McDowell Rd	Wash	81.67
7678	Sun Valley Pkwy-53	11.9 mi N/ McDowell Rd	Wash	81.67
7679	Sun Valley Pkwy-54	11.9 mi N/ McDowell Rd	Wash	81.67
7680	Sun Valley Pkwy-55	11.9 mi N/ McDowell Rd	Wash	81.67
7681	Sun Valley Pkwy-56	11.9 mi N/ McDowell Rd	Wash	81.67
7682	Sun Valley Pkwy-57	12.0 mi N/ McDowell Rd	Wash	81.67
990191	Sun Valley Pkwy-58	13.1 mi N/ McDowell Rd	Wash	81.67
7683	Sun Valley Pkwy-59	13.9 mi N/ McDowell Rd	Wash	81.67
7684	Sun Valley Pkwy-60	14.1 mi N/ McDowell Rd	Wash	81.67
7685	Sun Valley Pkwy-61	14.3 mi N/ McDowell Rd	Wash	81.67
990192	Sun Valley Pkwy-63	17.7 mi N/ McDowell Rd	Wash	81.67
990193	Sun Valley Pkwy-64	18.1 mi N/ McDowell Rd	Wash	81.67
7687	Sun Valley Pkwy-65	18.3 mi N/ McDowell Rd	Wash	81.67
7688	Sun Valley Pkwy-66	18.4 mi N/ McDowell Rd	Wash	81.67
990194	Sun Valley Pkwy-67	18.5 mi N/ McDowell Rd	Wash	81.67
7689	Sun Valley Pkwy-68	18.9 mi N/ McDowell Rd	Wash	81.67
7690	Sun Valley Pkwy-69	18.9 mi N/ McDowell Rd	Wash	81.67
7691	Sun Valley Pkwy-70	19.1 mi N/ McDowell Rd	Wash	81.67
990195	Sun Valley Pkwy-71	19.1 mi N/ McDowell Rd	Wash	81.67
7692	Sun Valley Pkwy-72	19.3 mi N/ McDowell Rd	Wash	81.67
990196	Sun Valley Pkwy-73	19.5 mi N/ McDowell Rd	Wash	81.67
7693	Sun Valley Pkwy-74	19.6 mi N/ McDowell Rd	Wash	81.67
7694	Sun Valley Pkwy-75	19.7 mi N/ McDowell Rd	Wash	81.67
7695	Sun Valley Pkwy-76	19.7 mi N McDowell Rd	Wash	81.67
990197	Sun Valley Pkwy-77	19.8 mi N/ McDowell Rd	Wash	81.67
7696	Sun Valley Pkwy-78	20.4 mi N/ McDowell Rd	Wash	81.67
7697	Sun Valley Pkwy-79	21.4 mi N/ McDowell Rd	Wash	81.67
7698	Sun Valley Pkwy-80	21.6 mi N/ McDowell Rd	Wash	81.67

Structure No	Roadway	Location	Feature Intersected	Sufficiency Rating
7699	Sun Valley Pkwy-81	22.1 mi N/ McDowell Rd	Wash	81.67
7700	Sun Valley Pkwy-82	22.5 mi N/ McDowell Rd	Wash	81.67
7701	Sun Valley Pkwy-83	22.6 mi N/ McDowell Rd	Wash	81.67
7702	Sun Valley Pkwy-84	22.9 mi N/ McDowell Rd	Wash	81.67
7703	Sun Valley Pkwy-85	23.4 mi N/ McDowell Rd	Wash	81.67
990198	Sun Valley Pkwy-86	23.6 mi N/ McDowell Rd	Wash	81.67
7704	Sun Valley Pkwy-87	24.1 mi N/ McDowell Rd	Wash	81.67
7705	Sun Valley Pkwy-88	24.2 mi N/ McDowell Rd	Wash	81.67
990110	Sunland Ave	E/ Ellsworth	Drainage Ditch	96.89
9683	Thunderbird Rd	at 99th Ave Median	Drainage Ditch	87.53
990200	Trail Ridge Dr	200' W/ Yosemite Dr	Drainage Ditch	96.87
8629	Turner Rd	0.5 mi S/ Baseline Rd	Buckeye Canal	99.89
8584	Tuthill Rd	0.5 mi S/ Beloat Rd	Gila River	95.61
990152	Union Hills Dr	at 99th Ave	Drainage Ditch	95.03
8862	University Dr	0.5 mi E/ Ellsworth Rd	CAP Canal	98.29
9374	University Dr	900' W/ Dobson	Tempe Canal	93.34
7706	Van Buren St	E/ SVP-Palo Verde Rd	Drainage Ditch	99.88
8881	Van Buren St	0.5 mi W/ Citrus Rd	RID Canal	98.4
8882	Van Buren St	1 mi W/ 339th Ave	Dickey Wash	90.99
990273	Venture Dr	0.46 mi. SW of Anthem Way	Wash	84.37
8983	Via Hermosa	W/ Forest Rd (Rio Verde)	Wash	99.7
990274	White Tanks Mnt Blvd	460' W of 183rd Ave	Drainage Channel	96.56
10369	Whitman Drive	600' E/ Galvin Peak Pkwy	Wash	99.85
10513	Wigwam Creek Blvd	200' SW of 124th Lane	Drain Channel	96.51
10514	Wigwam Creek Blvd	550' NW of Orange Drive	Drain Ditch	81.41
10515	Wigwam Creek Blvd	just N of Camelback Rd	Drain Ditch	81.41
8577	Wildwood Dr	200' W/ 125th Ave	Drainage Ditch	97.89
10782	Williams Dr	0.3 mi. E/ El Mirage Rd	McMicken Outfall Wash	92.17
990263	Williams Dr	at 123rd Avenue	Drainage Ditch	89.38
8578	Wilson (283rd) Ave	1 mi S/ Baseline	Buckeye Canal	98.65
9919	Woods Rd	E/ Old US-80	Gila Bend Canal	98.65
990267	Yearling Rd	0.2 mi. e/ Litchfield Rd	Drainage Channel	85.62

Map 1

BRIDGE SUFFICIENCY RATINGS
FY 2010



Bridge Locations
Sufficiency Ratings

- **< 50%**
- **50 - 80%**
- **80 - 90%**
- **90 - 100%**

State Highways
Maricopa County
Arterial Roadways
Arterials
Lakes
Rivers, Washes & Canals

Maricopa County

0 1 2 3 4 5 10 Miles

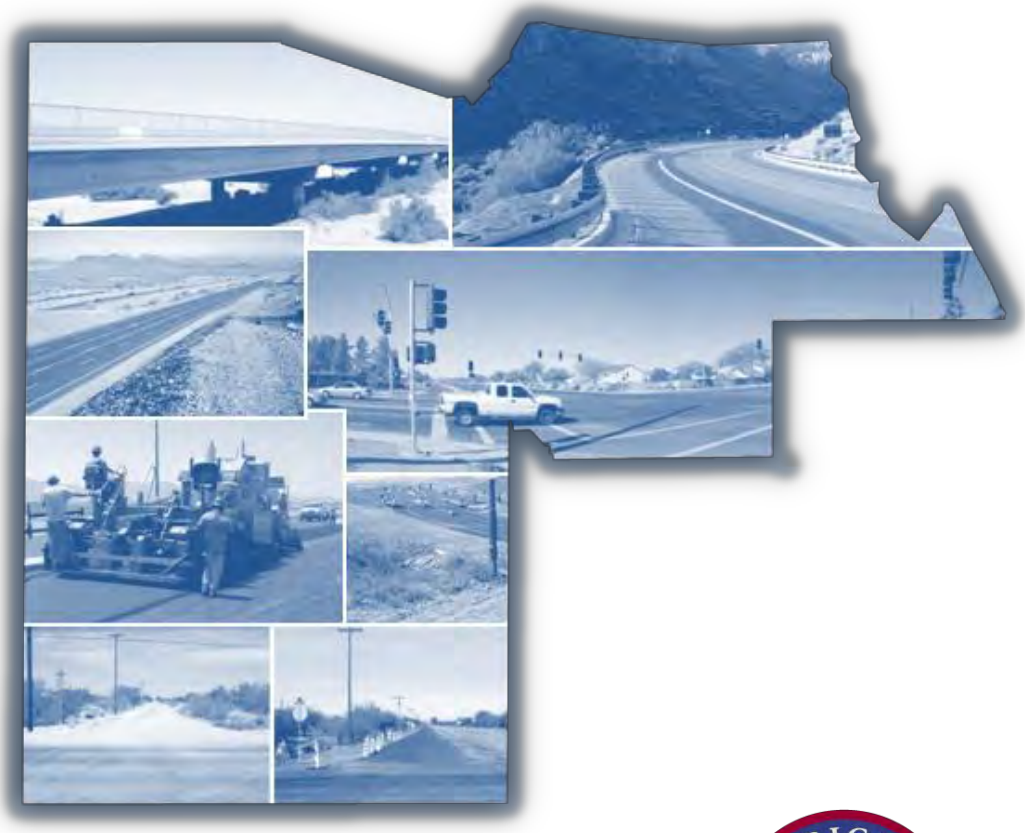
Produced by the Maricopa County
Public Works GIS Division

April 8, 2011

BMS 21

Roadway Management System

Fiscal Year 2011



Programming & System Analysis

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Introduction

Pavement maintenance is broadly identified as work accomplished to preserve or extend the pavement's life until major rehabilitation or complete reconstruction is performed. Maintenance is classified by function as either routine or preventive.

Preventive maintenance preserves rather than improve the capacity or strength of the pavement structure. In order for preventive maintenance to be effective, it should be applied to structurally sound pavement, before the pavement displays significant amount of environmental distress such as raveling, oxidation, and block cracking. Timely treatments prove to be the most cost effective. While, routine maintenance more typically consists of, pothole repair, patching, sweeping and/or striping.

All roads deteriorate over time due to environmental conditions and the volume and type of traffic using the roadway. The roadways within the jurisdiction of the Maricopa County Department of Transportation (MCDOT) are maintained at a high level of service by the following County program:

- Continuously monitor and evaluate roadway conditions, roadway evaluation ratings are stored in the Road Management System (RMS) database
- Report roadway conditions to decision makers via annual reports
- Modeling pavement conditions and maintenance strategies
- Develop annual and long term maintenance plans and implement the plans as funding permits

Roadway and Pavement Evaluation Ratings

Pavement Condition Ratings (PCR)

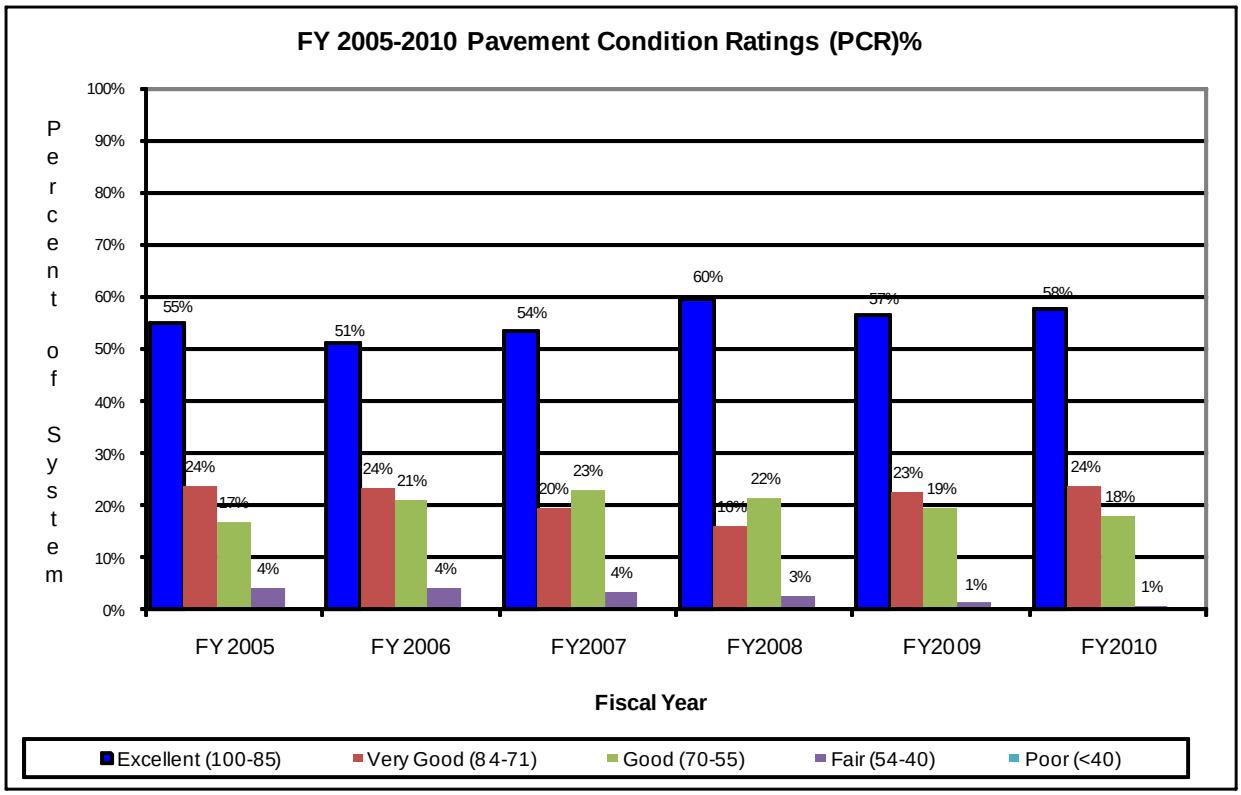
The Road Management Section evaluates pavement conditions for surface distress every 12-18 months for arterial roads and every other year for local roads. Half of the local roads are evaluated each year. The ratings range from 0 to 100 with 100 being a new pavement with no distress. The result allows for quantifying the overall pavement condition of the road network. See the Pavement Preservation Program (PPP) document for further details.

International Roughness Index (IRI)

MCDOT uses a Laser Road Profiler (LRP) equipped with triple (3) lasers, one in each wheel track and one in the mid-lane to collect IRI data. Annually the MCDOT Road Management Section collects the IRI for each arterial road segment with a length greater than a quarter of a mile. The IRI values are scored for each road segment on a scale from 1 to 500 with 500 representing an extremely rough road. IRI values are categorized by performance subgroups and the percentage of each group can be seen in Figure 2; IRI Ratings.

MCDOT utilizes the PCR and IRI ratings to forecast preventive maintenance programs and Transportation Improvement Program (TIP) planning. The consistent

Figure 1: FY 2005-2010 Pavement Condition Ratings



results of implementing preventive maintenance on MCDOT roads is evident in the following chart Figure 1: PCR Ratings, which shows the PCR quality by percentage ranking of all arterial roads in the County. The PCR data is also presented in Table 4 on page 12 of this report.

Sufficiency Ratings

The Road Management Section collects most of the details for each arterial road segment. The rating identifies how well each road segment compares to the MCDOT Roadway Design Manual (RDM) standards. Ratings for each category are combined per road segment and scored on a scale from 0 to 100, 100 representing a road in compliance with the RDM standards.

The sufficiency ratings of arterial roads are updated only after major improvements or reconstruction of the road. New construction, widening, or significant improvement to the safety issues such as, bottleneck, drainage, vertical and horizontal sight distance are required to impact the rating. Sufficiency Rating of the network is provided in Figure 3.

Figure 2: FY 2005-2010 International Roughness Index

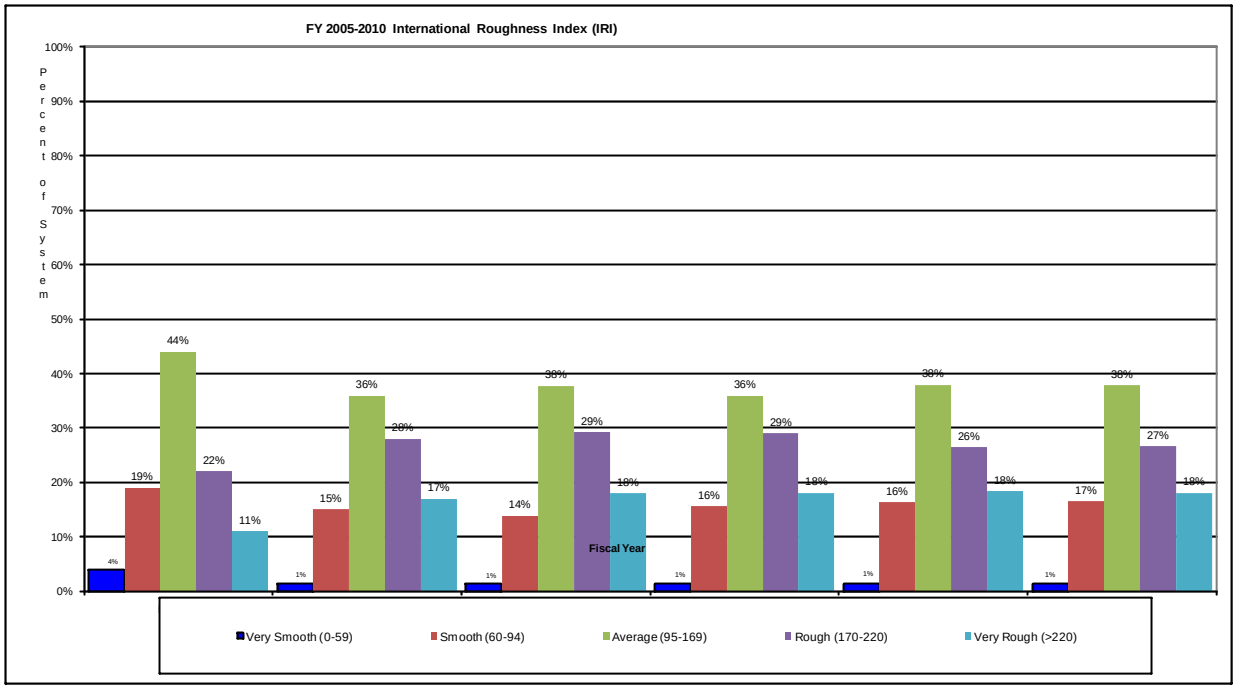
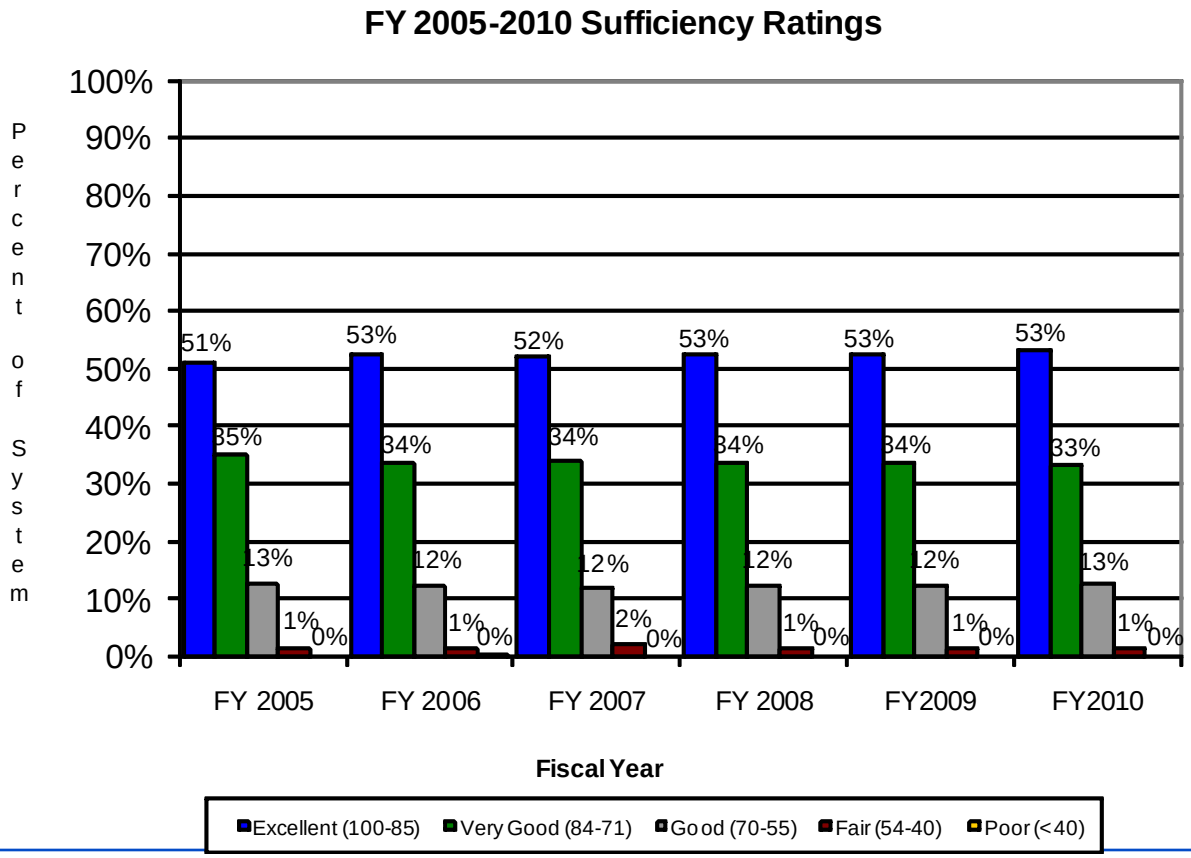


Figure 3. FY 2005-2010 Sufficiency Ratings



TRUCK TRAFFIC ON ARTERIALS AND COLLECTORS

Vehicle classification counts are conducted annually by MCDOT. The latest truck count data is shown in Figure 4. Truck traffic has declined 49% on MCDOT's arterial and collector roads since 2006. This is one indicator of the slow economy in the County. Individual yearly declines in the percent of truck traffic are shown in figure 5. The only positive aspect of this decline is that MCDOT's roadways will experience slower deterioration until the economy improves.

Figure 4: Average Percent of Trucks on Arterials & Collectors

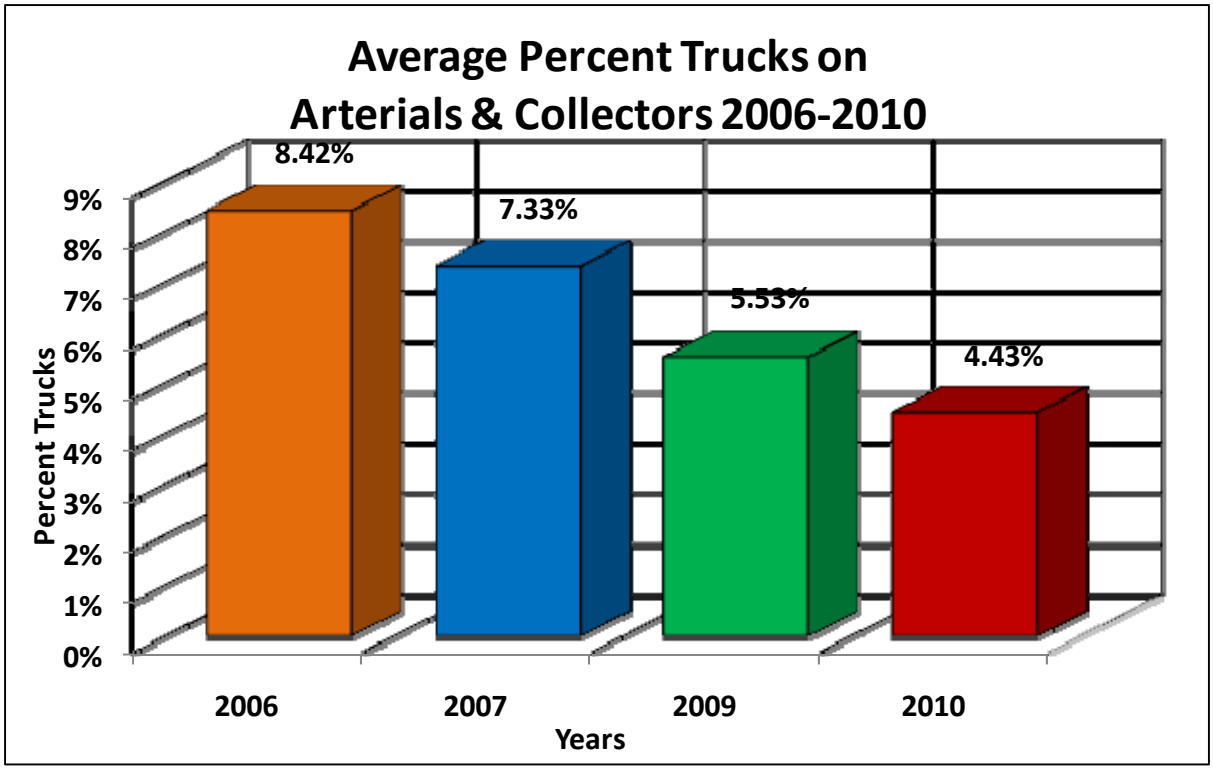
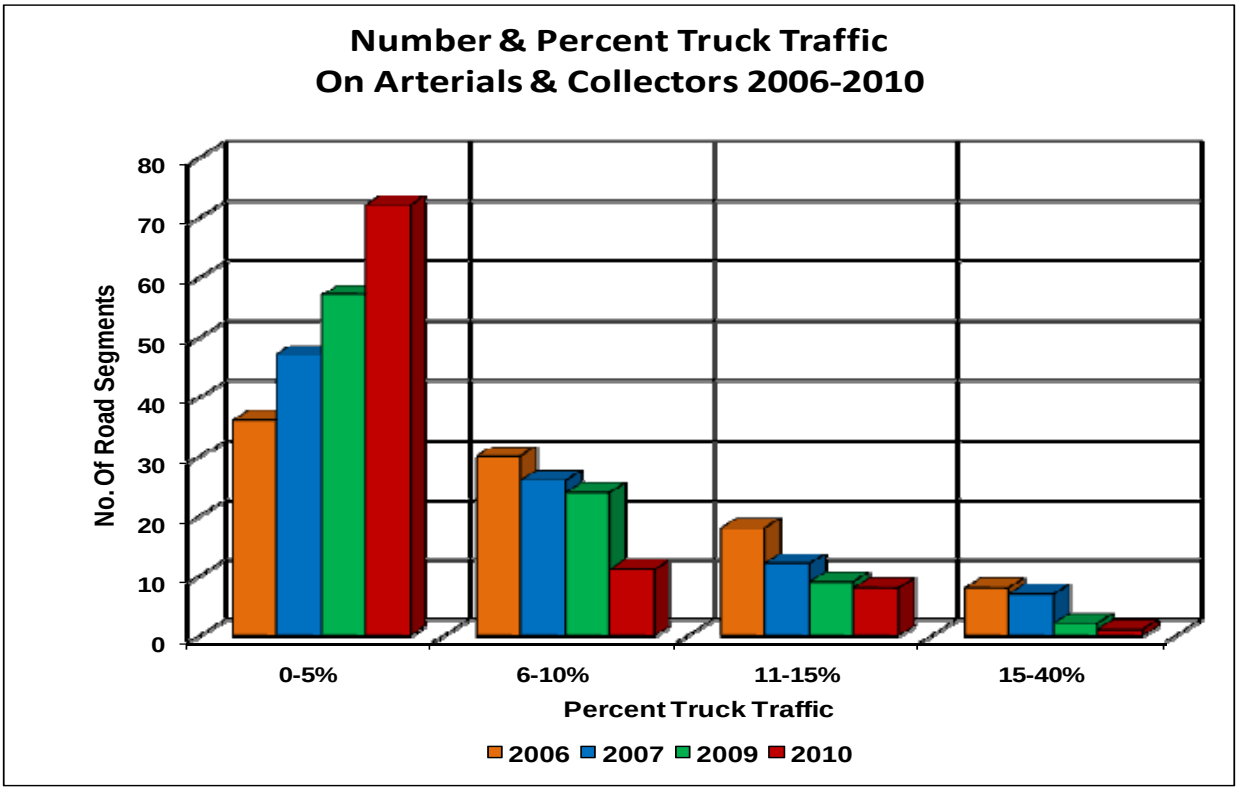


Figure 5: Yearly Percent of Trucks on Arterials & Collectors 2006-2010



Preventive Maintenance Performance

Preventive maintenance extends the life of the pavement and provides for better performance. The majority of treatments for flexible pavements involves sealing the existing surface and providing a new wearing surface for traffic. Two of the primary factors leading to the deterioration and premature failure of flexible pavements are oxidization and water environmental damage.

MCDOT has used preventive maintenance practices for decades with excellent results. Table 1 shows the break down of each treatment that is typically used, the frequency of application and the observed increase in pavement life per application.
We can see how the maintenance of the road network could fall behind with only one tenth ($10 million) of the needed amount ($95 million) funded each year. The following table Figure 11 " FY 2007 Complete Maintenance Pans & Costs" provides us with a look at the aggressive maintenance utilized last year, the type of treatments, with the associated quantities and costs.

Table 1: Preventive Maintenance Treatment Longevity

Treatment	Pavement age at time of first application (yr.)	Frequency of application (yr.)	Observed increase in pavement life (yr.)
Fog Seal/ Rejuvenate	3 to 4	3 to 4	3 to 4
Crack Filling/Sealing	8 to 10	4 to 5	4 to 5
Single Chip Seal	10 to 12	5 to 6	5 to 6
Double Chip Seal	10 to 12	5 to 6	5 to 6
Micro Surfacing	10 to 12	5 to 6	5 to 6
Slurry Seal	10 to 12	5 to 6	5 to 6
Arterial—Thin Overlay—1.5"- 2" ARHM	12 to 15	12 to 15	12+
Local—Mill & Resurface 1.5" ARHM	35+	TBD*	TBD*
* TBD—To be determined			

Preventive Maintenance Results

MCDOT currently has jurisdiction of 1112 miles (2613 lane miles.) of arterial roads, 884 miles (1856 lane miles) of local roads and 52 miles (104 lane miles) of park roads. That adds up to a total of 2048 miles of road and 4573 lane miles. In Fiscal Year 2010 we maintained 1257 lane miles of road which is equal to 27.5% of the total lane miles. The details of the completed maintenance plans are presented in Figure 4.

The cost to complete the 2010 maintenance plans was $22,327,505, while we spent $13,563,980 in 2009. The cost breakdown of all the maintenance completed is shown graphically in Figure 5. The same information is also presented in Table 2 on page 10 categorized by work order number.

These efforts resulted in network average PCR value of 82.6 for arterial roads versus 81.70 for 2009. Local roads improved the average PCR value of 91.9, versus 90.3 for 2009. Park roads rated 89.40 for 2010, park roads are a new breakout in 2010.

Pavement Preservation Plan

Pavement preservation plans are generated by application of the preservation strategy filters to the current pavement ratings in the database. Implementation of our projected maintenance plans for FY 2011 will cost $27.0 million to apply all the recommended surface treatments and existing pavement rehabilitation. While, the total network maintenance needs for the next five fiscal years (FY 2011 - 2015) are estimated at $70 million. The FY 2011 pavement preservation plans and estimated costs are provided in Figures 6 and 7.

The MCDOT maintenance funds will be enhanced in FY 2011 by the American Recovery and Reinvestment Act (ARRA) for $6.47 million and $2.5 million additional funds to be utilized in a

Table 2: FY 2010 Pavement Preservation 5 Year Summary Report

FY 2010 - Pavement Preservation 5 Year
Summary Report
7/15/2010

	FY 2009 - FY 2013		FY 2009 - FY 2010		
	5 Yr Projection - 2008		Completed		
Preservation Type	Ln Miles	Cost	Ln Miles	Cost	%
Reconstruction	15.83	$3,412,500	1.85	$465,000	14%
Arterial AR Overlay	129.51	$12,189,230	92.69	$7,700,356	63%
Local M&R	263.00	$25,058,275	314.96	$15,923,455	64%
Chip Seal HV	234.88	$3,742,328	165.77	$2,929,188	78%
Chip Seal LV	187.70	$2,990,576	152.87	$2,166,356	72%
Slurry	264.74	$5,659,845	37.97	$695,445	12%
Micro Seal	0.00	$0	29.61	$863,409	
Preservative Seal	565.00	$2,923,374	385.36	$2,198,335	75%
Crack Seal	383.66	$1,985,130	711.38	$3,414,938	172%
Pavement Preservation Totals:	**2,044.32**	**$57,961,258**	**1,892.46**	**$36,356,482**	**63%**

FY 2011 - FY 2015

	5 Yr Projection - 2010	
Preservation Type	Ln Miles	Cost
Reconstruction	12.18	$2,570,000
Arterial AR Overlay	229.89	$27,531,558
Local M&R	259.37	$11,817,465
Chip Seal HV	626.06	$11,931,122
Chip Seal LV	160.84	$3,224,500
Slurry Seal	307.43	$5,681,016
Micro Seal	0.00	$0
Preservative Seal	717.91	$4,663,373
Crack Seal	824.38	$5,028,982
Pavement Preservation Totals:	**3,138.06**	**$72,448,016**

Figure 6: FY 2010 Completed Maintenance Mileage

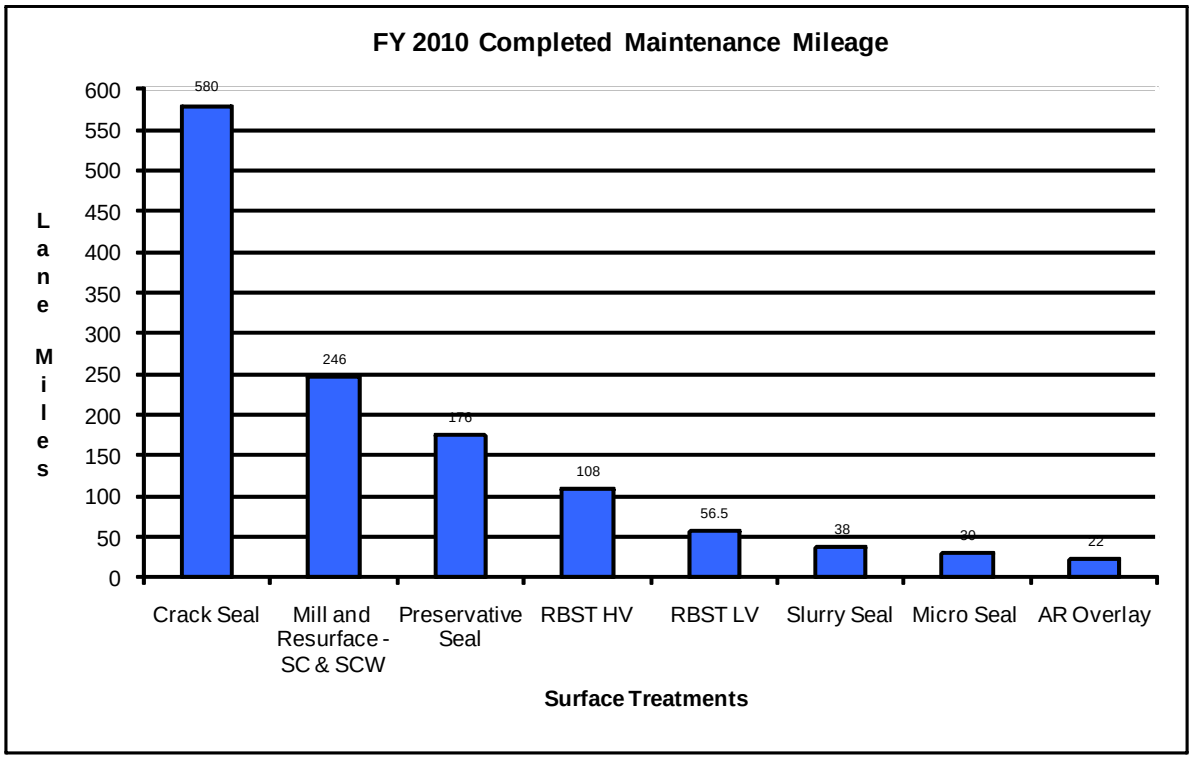


Figure 7: FY 2010 Maintenance Costs

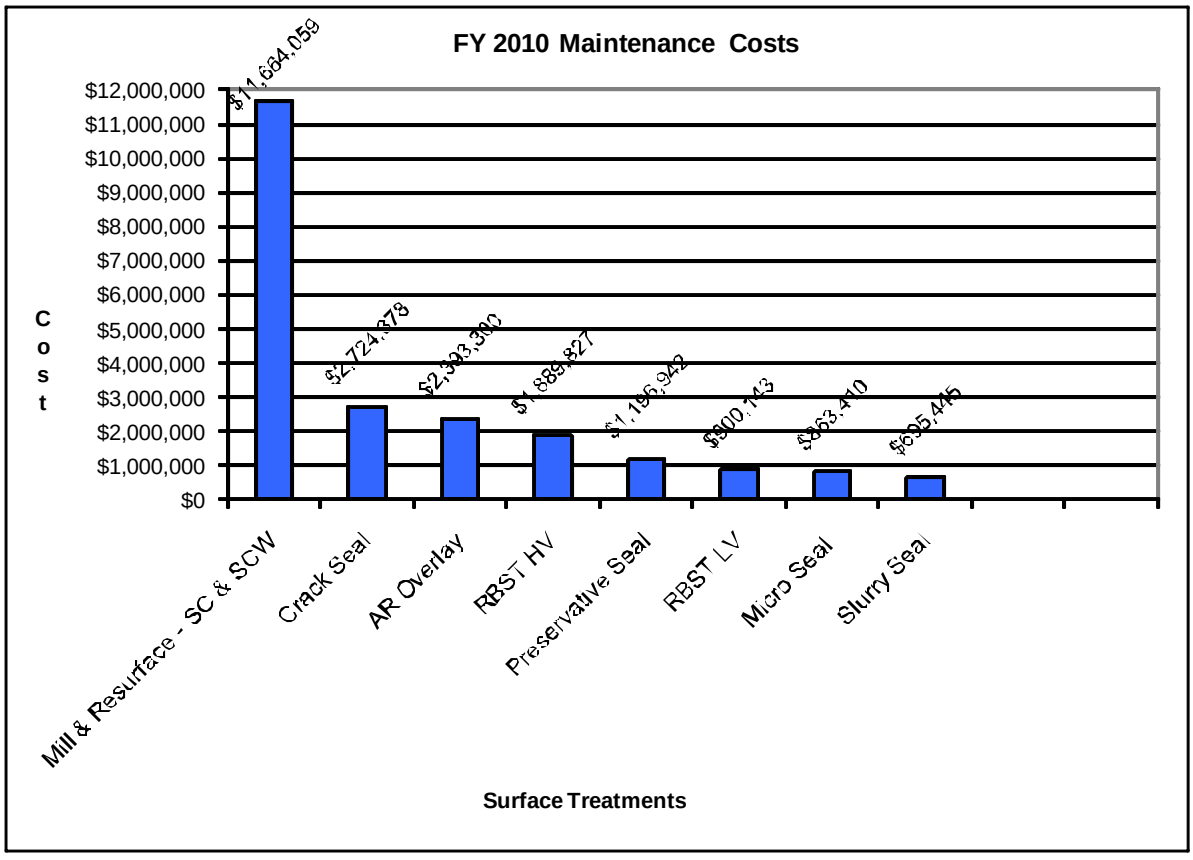


Table 3: Miles of MCDOT Paved Roads FY 1996-2010

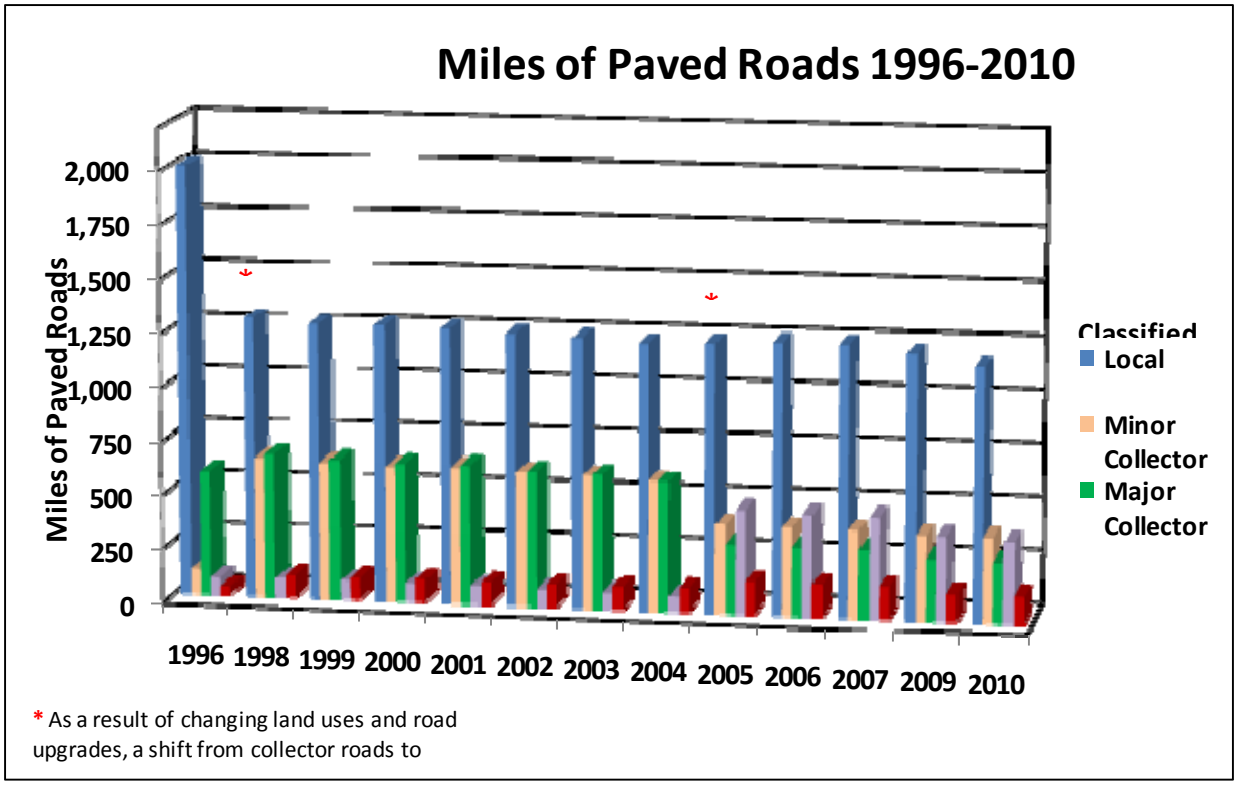
Miles of MCDOT Paved Roads FY 1996-2010

Classification	1996	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2009	2010	Diff
Local	1,998	1,305	1,281	1,284	1,276	1,262	1,254	1,236	1,246	1,258	1,258	1,227	1,179	-819
Minor Collector	123	652	639	630	635	621	616	602	411	406	404	391	390	267
Major Collector	583	669	654	645	648	630	622	601	318	314	315	287	282	-301
Minor Arterial	86	88	87	85	85	78	73	69	484	473	472	389	376	290
Principal Arterial	39	108	106	105	104	105	105	109	150	150	150	125	126	87
TOTAL	2,829	2,822	2,769	2,750	2,749	2,696	2,670	2,618	2,608	2,601	2,600	2,419	2,353	-476

Note: As a result of changed land usages and road upgrades, a shift from collector roads to arterial roads occurred.

In 1997 and 2005 MCDOT roads were reclassified accordingly as seen in the above table.

Figure 8: Miles of Paved Roads 1996-2010



1.5” asphalt rubber overlay program. Furthermore, we are going to fund $5.30 million for a mill and resurface plan for Sun City West MRS 1. There will be $2.20 million of arterial AR overlays, $2.25 million for crack sealing, $2.5 million dollars for chip seal, $1.20 million for preservative seal and $0.88 million for slurry seal. There will be 13 programs in all executed this year. See Table 4: FY 2011 Pavement Preservation Plan for the details.

Summary

FY 2010 has been a very successful year for pavement preservation group and the Operations Division. We have completed 16 of 17 programs this year with an expenditure of $22,327,505 and only the 2010 ARRA AR Overlay being delayed due to federal requirements is still in progress.

All the effort this year has resulted in an improvement in the network average PCR value of 82.6 for arterial roads and PCR value of 91.9 for local roads. The results of the FY2010 pavement preservation program show the network is improving from 2009 85.56 PCR to 2010 86.80 and a 1.5% improvement. If additional funding becomes available we will consider accelerating our preventative maintenance plans for more crack seal, slurry seal, chip seal and mill and overlay projects to improve the quantity of MCDOT roads.

In 2008, it was projected that the pavement preservation and preventative maintenance needs for the five- year period of FY 2009 to 2013 would be $57.9 million to keep the county roadway system at the then existing serviceability level. In the past two fiscal years, FY2009 and 2010, MCDOT has completed pavement preservation and preventative maintenance projects for a total amount of $36.4 million, or 63 percent of the projection. Furthermore, due to the dynamic nature of the roadway system, in FY 2010 the projected needs for pavement preservation and preventative maintenance were identified to be $72.5 million for the next cycle of five fiscal years, FY2011 to 2015. See Table 2: Pavement Preservation 5 Year Summary Report for details.

Figure 9: FY 2011 Pavement Preservation Plan

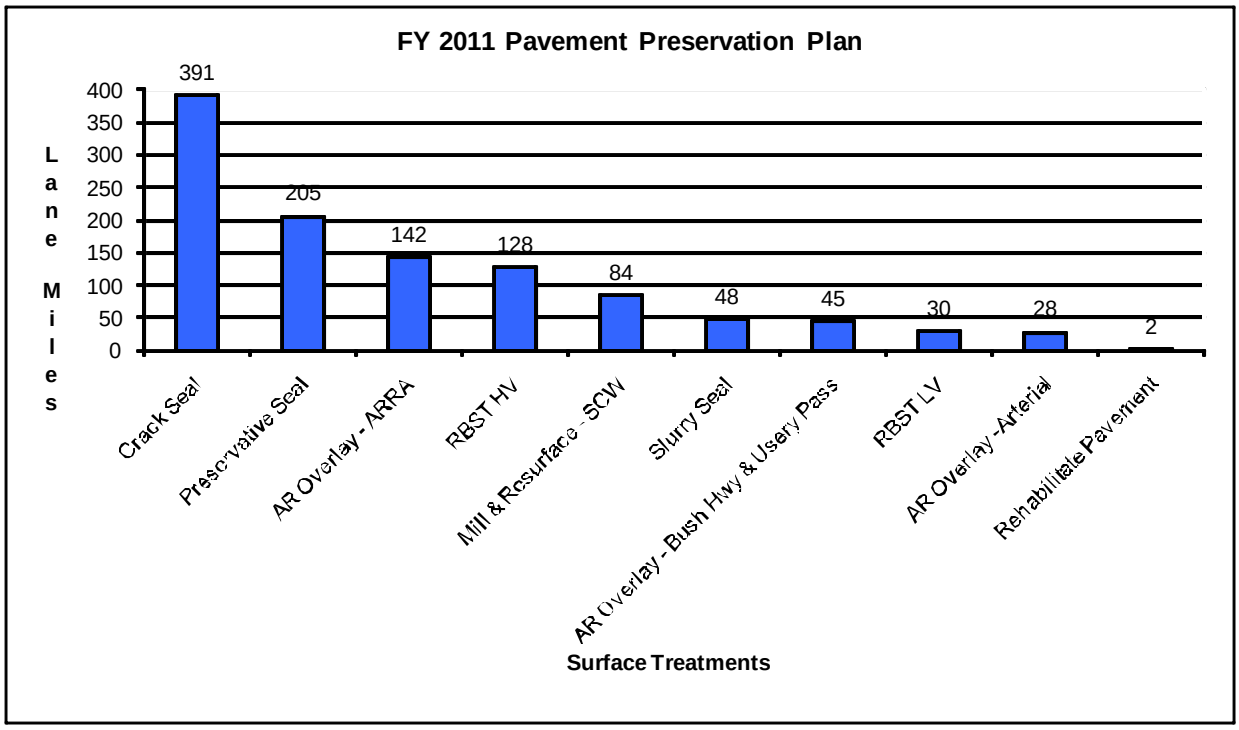


Figure 10: FY 2011 Estimated Maintenance Cost

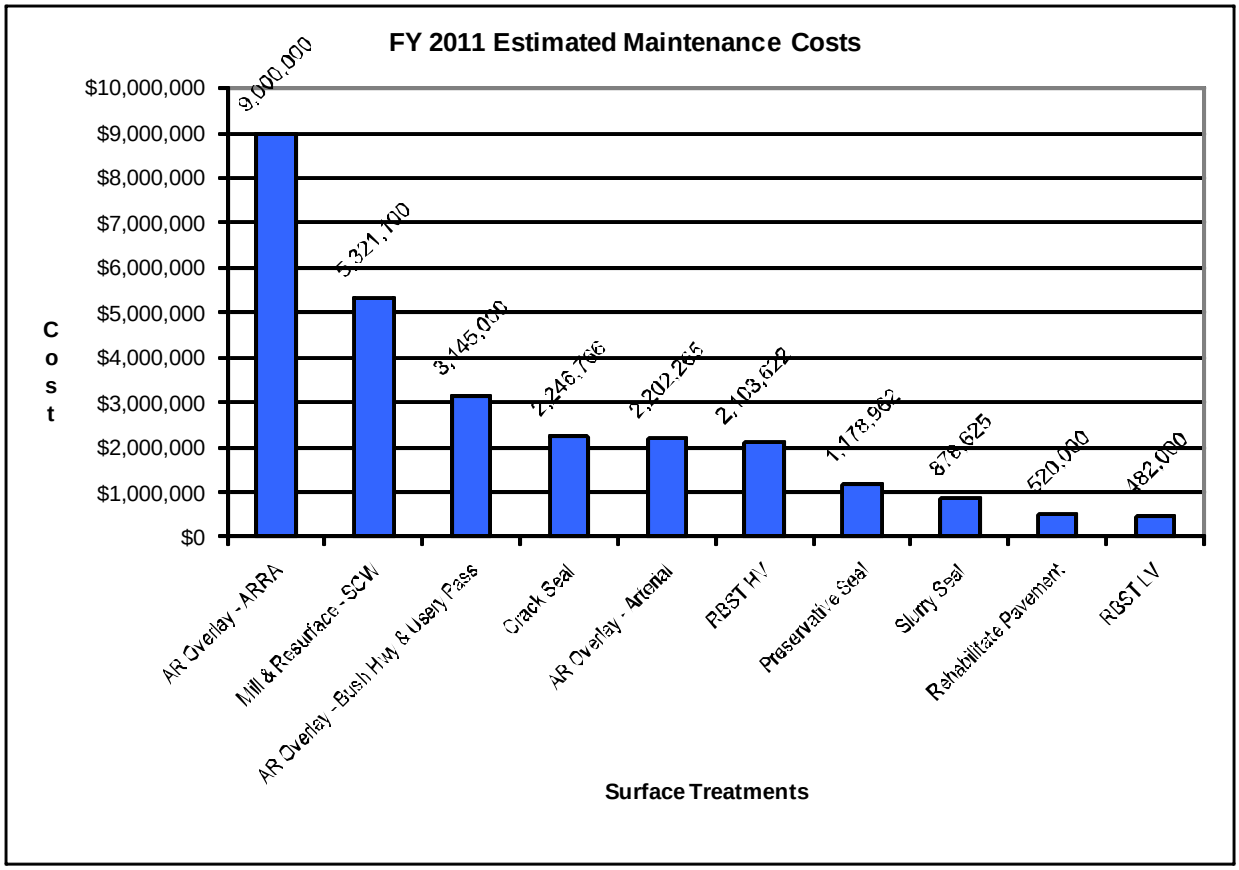


Table 4: FY 2010 Completed Maintenance Plans

MCDOT Pavement Management Program
Road Management System

FY 2010 Completed Maintenance - RMS

Project Name	WO#	Cost/SY	SY	Ln Miles	Total Cost
2010 - AR Overlay	30050068	$ 13.00	184,100	22.42	$2,393,300.00
2010 - Chip Seal HV	30050069	$ 1.94	459,050	55.89	$890,557.00
2010 - Chip Seal LV	30050069	$ 1.94	463,991	56.49	$900,142.52
2010 - Slurry Seal	30050070	$ 2.23	311,859	37.97	$695,445.57
2010 - Preservative Seal - Local - TRMSS	30050071	$ 0.94	1,009,514	122.92	$948,943.16
2010 - Crack Seal - All	30050072	$ 0.52	993,097	120.92	$516,410.44
2010 - Micro Seal	30050080	$ 3.55	243,214	29.61	$863,409.70
2010 - Crack Seal - All	30050081	$ 0.46	1,113,921	135.63	$512,403.66
2010 - Crack Seal - All	30050082	$ 0.50	1,267,200	154.29	$633,600.00
2010 - Chip Seal HV	30050083	$ 2.33	428,871	52.22	$999,270.29
2010 - Preservative Seal - Local - TRMSS	30050084	$ 0.65	360,740	43.92	$234,481.00
2010 - Crack Seal - All	30050093	$ 0.51	32,690	3.98	$16,671.90
2010 - Preservative Seal - Local - TRMSS	30068006	$ 0.18	75,100	9.14	$13,518.00
2010 - Sun City - MRS 3	TT174	$ 5.74	662,719	80.69	$3,804,007.06
2010 - Sun City - MRS 4	TT175	$ 5.79	1,357,522	165.29	$7,860,052.38
2010 - Crack Seal - All	TT175	$ 0.77	1,357,522	165.29	$1,045,291.94
		Project Maintenance Totals		1,256.68	$22,327,504.62
			TIP Funding:		$12,709,351.38
		Operations Funding:			$9,618,153.24

Table 5: FY 2011 Pavement Preservation Plan

FY 2011 - Pavement Preservation Plan

Status Update 06.30.2010

Project Name	WO #	Cost/SY	SY	Ln Miles	Needs Cost	ARRA Budget
Fiscal Year 2011						
Reconstruct 2 Ln	300500XX	$26.00	20,000	2.44	$520,000	
Arterial - AR Overlay	30050087	$9.80	224,772	27.37	$2,202,766	
Arterial - AR Overlay - Bush Hwy & Usery Pass	TT---	$8.50	370,000	45.05	$3,145,000	$3,145,000
AR Overlay - ARRA Funds	TT322 & 326	$7.75	1,167,647	142.17	$9,049,264	$9,049,264
Mill & Resurface - Sun City West - MRS 1	TT343	$7.75	686,594	83.60	$5,321,104	
Mill & Resurface - Sun City West - MRS 2	TT---	$0.00	721,818	87.89	$0	
Mill & Resurface - Sun City West - MRS 3	TT---	$0.00	523,281	63.71	$0	
RBST - High Volume - Plan 1 Fall - Low Bid	30050086	$2.00	681,000	82.92	$1,362,000	
RBST - Low Volume - Plan 1 SE Fall - Low Bid	30050086	$2.00	158,500	19.30	$317,000	
RBST - High Volume - Plan 4 - Spring JOC	30050088	$2.00	370,811	45.15	$741,622	
RBST - Low Volume - Plan 4 - Spring JOC	30050088	$2.00	82,500	10.05	$165,000	
Slurry Seal - Plan 1	30050092	$2.25	390,500	47.55	$878,625	
Preservative Seal - Arterial -	30050091	$0.75	401,656	48.90	$301,242	
Preservative Seal - Local - Plan 1	30050091	$0.75	1,282,575	156.16	$961,931	
Crack Seal - Plan 1 - Article 5	30050089	$0.65	1,933,000	235.36	$1,256,450	
Crack Seal - Plan 2 - JOC	30050090	$0.65	1,276,665	155.44	$829,832	
Pavement Preservation Totals:			**10,291,319**	**1,253.05**	**$27,051,836**	**$12,194,264**
			TIP Funding:		$5,321,104	
			Ops Funding:		$9,536,468	
		Additional Funding Required:			**$12,194,264**	

Project Name	WO #	Cost/SY	SY	Ln Miles	Needs Cost
Fiscal Year 2012					
Reconstruct 2 Ln ***	300500XX	$25.00	*20,000*	2.44	$500,000
Arterial Thin AR Overlay	TT---	$8.00	200,000	24.35	$1,600,000
Mill & Resurface - Sun City West - MRS 2	TT---	$9.00	721,818	87.89	$6,496,362
Mill & Resurface - Sun City West - MRS 3	TT---	$9.00	523,281	63.71	$4,709,529
RBST - HV - FY11-2 608k & FY11-3 1.23m	300500XX	$2.25	1,840,000	224.04	$4,140,000
RBST - LV - FY11-2 290k & FY11-3 40k	300500XX	$2.25	330,000	40.18	$742,500
Slurry Seal - FY 11-2	300500XX	$2.25	420,000	51.14	$945,000
Preservative Seal - Arterial FY11	300500XX	$0.75	600,000	73.05	$450,000
Preservative Seal - Local FY11-2	300500XX	$0.75	1,200,000	146.11	$900,000
Crack Seal - Plan	300500XX	$0.70	561,000	68.31	$392,700
Micro Seal - Sun Valley Parkway	TT286	$2.50	1,114,396	135.69	$2,785,990
Pavement Preservation Totals:			**7,530,495**	**916.90**	**$23,662,081**
			TIP Funding:		$15,591,881
			Ops Funding:		$8,070,200
		Additional Funding Required:			

Table 6: FY 2010 Annual Network Rating Summary

MCDOT Pavement Management Program

Road Management System

FY 2010 Annual—Network Rating Summary

Arterial

	2006	2007	2008	2009	2010
Average PCR	80.55	80.52	82.04	81.73	82.61
Average IRI	162.02	165.17	163.50	163.80	163.09
Mileage	1213.37	1132.23	1100.18	1102.45	1112.54
PCR 100-85	623.30	602.88	655.57	646.28	636.02
PCR 84-70	284.67	221.15	177.67	200.90	260.19
PCR < 55	49.22	43.56	28.50	18.76	6.77
Miles above 70	907.97	824.03	833.24	847.18	896.21
% above 70	**74.8%**	**72.8%**	**75.7%**	**77.0%**	**81.0%**
% below 55	**4.1%**	**3.8%**	**2.6%**	**2.0%**	**1.0%**

Local

	2006	2007	2008	2009	2010
Average PCR	88.51	89.54	89.18	90.32	91.93
Mileage	840.86	808.33	806.64	885.31	884.09
PCR 100-85	525.42	587.38	597.49	721.16	724.48
PCR 84-70	254.94	181.21	173.76	136.03	119.62
PCR < 55	3.95	1.55	1.30	1.30	5.10
Miles above 70	780.36	768.59	771.25	857.19	844.10
% above 70	**92.8%**	**95.1%**	**95.6%**	**96.8%**	**98.5%**
% below 55	**0.5%**	**0.2%**	**0.2%**	**0.1%**	**0.6%**

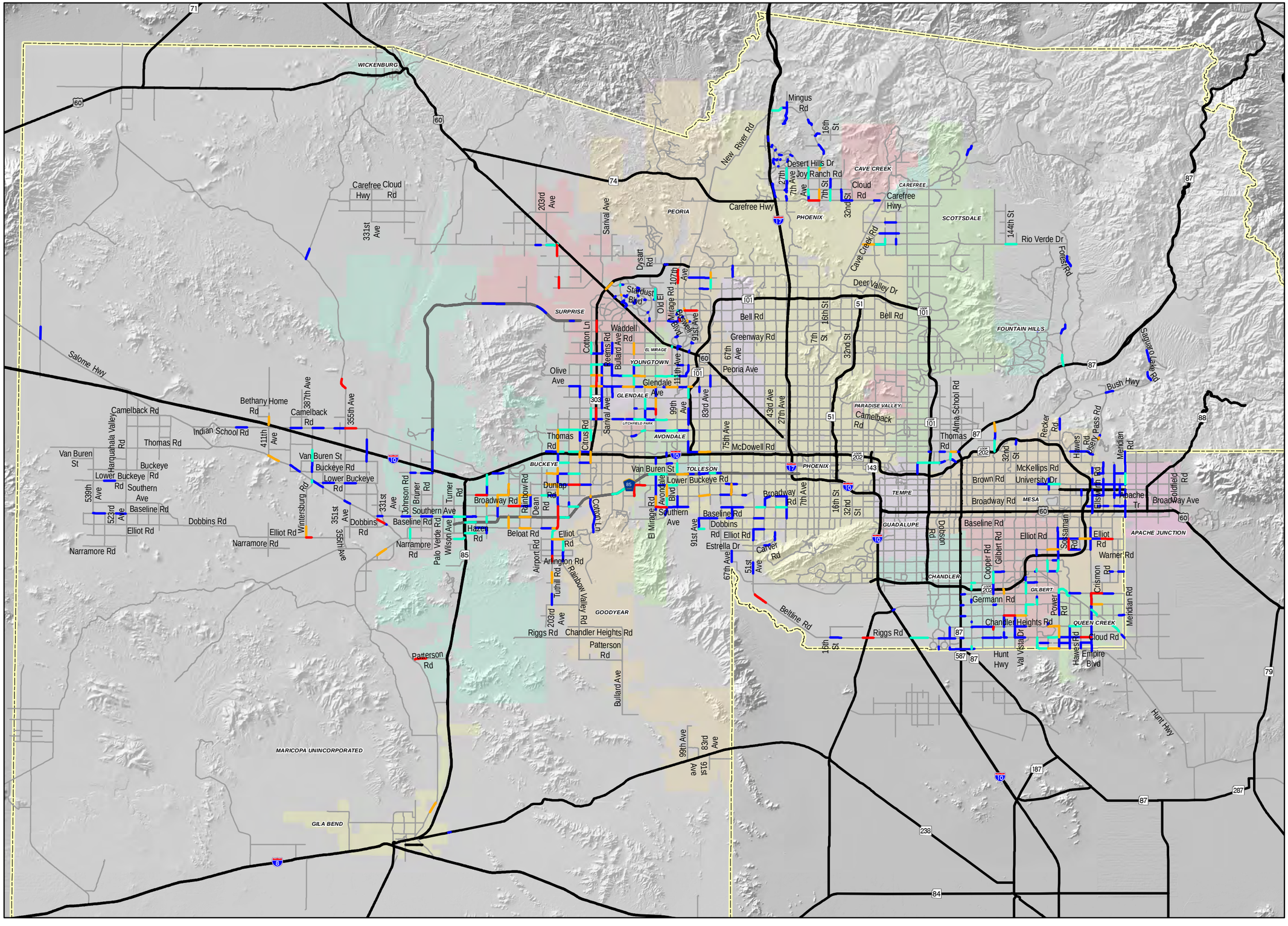
Park

	2006	2007	2008	2009	2010
Average PCR	0.00	0.00	0.00	0.00	89.39
Mileage	0.00	0.00	0.00	0.00	52.11
PCR 100-85	0.00	0.00	0.00	0.00	44.97
PCR 84-70	0.00	0.00	0.00	0.00	5.46
PCR < 55	0.00	0.00	0.00	0.00	1.30
Miles above 70	0.00	0.00	0.00	0.00	50.43
% above 70	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**97.0%**
% below 55	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**3.0%**

Network Totals

Network Avg PCR	**83.81**	**84.28**	**85.06**	**85.56**	**86.80**
Network % above 70	**82.19%**	**82.07%**	**84.14%**	**85.74%**	**87.41%**
Network % below 55	**2.59%**	**2.32%**	**1.56%**	**1.01%**	**0.64%**

Note: FY data is typically selected from June 30th or the last work day of the fiscal year.



Map 1

Large Trucks as a Percentage of Traffic Volume 2006

Trucks as a Percentage of Traffic Volume (2006)

🟦	0 - 5%
🟩	6 - 10%
🟧	11 - 15%
🟥	> 15%
	Maricopa County
	Arterial Roadways
	State Highways
	Arterials
	Maricopa County

0 1 2 3 4 5 10 Miles

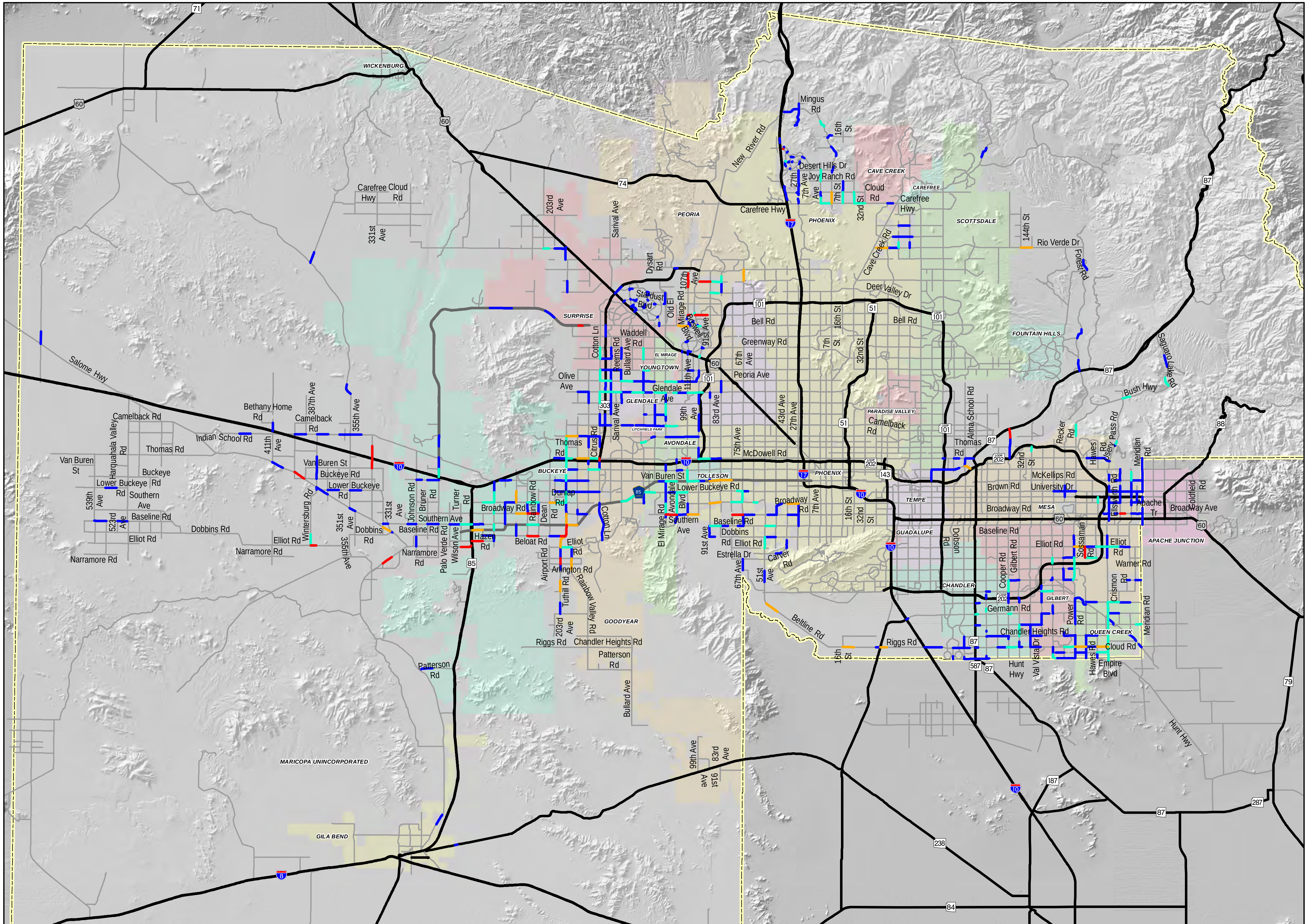
Produced by the Maricopa County
Public Works GIS Division

April 13, 2011

RMS 15

Map 2

Large Trucks as a Percentage of Traffic Volume 2007



Trucks as a Percentage of Traffic Volume (2007)

- 0 - 5%
- 6 - 10%
- 11 - 15%
- > 15%

Maricopa County

- Arterial Roadways
- State Highways
- Arterials
- Maricopa County

MARICOPA COUNTY ARIZONA

0 1 2 3 4 5 10 Miles

N

Produced by the Maricopa County Public Works GIS Division

April 13, 2011

RMS 16

Map 3

Large Trucks as a Percentage of Traffic Volume 2009

Trucks as a Percentage of Traffic Volume (2009)

- 0 - 5%
- 6 - 10%
- 11 - 15%
- > 15%

Maricopa County

- Arterial Roadways
- State Highways
- Arterials
- Maricopa County

0 1 2 3 4 5 10 Miles

Produced by the Maricopa County Public Works GIS Division

April 13, 2011

RMS 17

Map 4

Large Trucks as a Percentage of Traffic Volume 2010

Trucks as a Percentage of Traffic Volume (2010)

- 0 - 5%
- 6 - 10%
- 11 - 15%
- > 15%

Maricopa County

- Arterial Roadways
- State Highways
- Arterials
- Maricopa County

012345 10 Miles

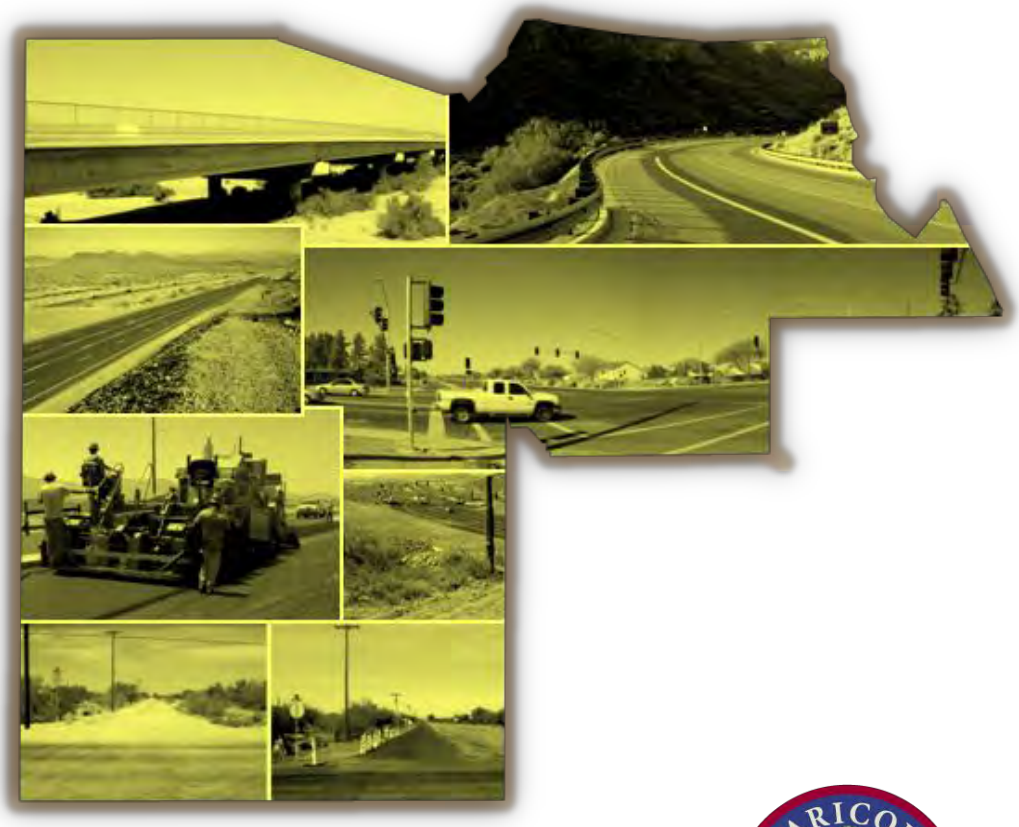
Produced by the Maricopa County Public Works GIS Division

April 13, 2011

RMS 18

Asset Management System

Fiscal Year 2011



Programming & System Analysis

www.maricopa.gov

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INTRODUCTION

The Maricopa County and the Department of Transportation (MCDOT) maintains effective internal controls to manage its infrastructure assets, and to maintain proper records regarding the use and disposition of these assets. This is done to safeguard and maintain MCDOT's assets in order to receive the maximum benefit from these assets and to comply with State and Federal requirements regarding their use and disposition. MCDOT properly accounts each year for its infrastructure assets for financial reporting purposes in accordance with the Governments Accounting Standards Board (GASB) Statement 34.

MCDOT provides transparency as to how services are provided within the organization and to the County's constituents. It is the intent of the MCDOT Planning Division and Asset Management Team to educate, inform, develop and streamline Asset Management Reporting throughout MCDOT.

Background

Maricopa County adopted the GASB (Governmental Accounting Standards Board) Statement 34, titled *Financial Statements and Management's Discussion and Analysis for State and Local Governments*, model. This was done in June 15, 2001 order to be in compliance with GAAP (Generally Accepted Accounting Principles).

GASB has established GAAP for both state and local governments. GAAP sets the criteria that government must follow in order to obtain a "clean opinion" from auditors. A clean opinion means that an agency has good credit. This is very important when a government agency wants to issue bonds, obtain financing for long-term construction projects, and performance bonds. GASB approved its Statement 34 in June 1999. It was the first time government entities were requested to report the value of their infrastructure assets and develop methods and procedures for asset management similar to private businesses. The goal of GASB 34 is to have financial statements reflect the actual financial health of all government entities. Governments that do not comply with GAAP may pay more to issue debt because the bonding rating agencies will not be able to determine the actual financial health of the entity.

Maricopa County is still refining its asset infrastructure reporting procedures, internal controls, and how it assesses its non-TIP related assets. This is in response to three consecutive "adverse opinions" from the State Auditor General's Office, which identified these three areas of concern.

Real Estate

The Real Estate Division is responsible for property management and acquisitions, on behalf of Public Works. All land rights activity is validated by resolutions, deeds, or

Board of Supervisors Approvals.

The primary function of the Real Estate Division concerns the acquisition of right of way for capital projects in the MCDOT TIP and the Flood Control District (FCD) CIP. The Real Estate Divisions also tracks and/or processes municipal annexations, road declarations, road abandonments and excess land sales. Real Estate also maintains the records and documentation of these activities. The Board of Supervisors authorizes MCDOT and FCD projects by adoption of resolutions authorizing the departments to spend money to acquire right-of-way and construct and maintain projects, thus adding value to the respective asset management inventory

In FY 2010 Maricopa County added $48.2 Million in Land assets to its infrastructure inventory. The predominate means of adding to County assets has been the acceptance of subdivision plats and their associated infrastructure. The acceptance of subdivisions into the MCDOT system results in 95% of additional land added to MCDOT's inventory. Annexations by county municipalities is the primary means of land asset reductions to the MCDOT Inventory.

Traffic Signals

Traffic signals are typically part of a TIP project or acquired via the acceptance and opening and declaring a subdivision or other development. When part of a TIP project,

Figure 1: Assets Acquired by MCDOT in FY 2010

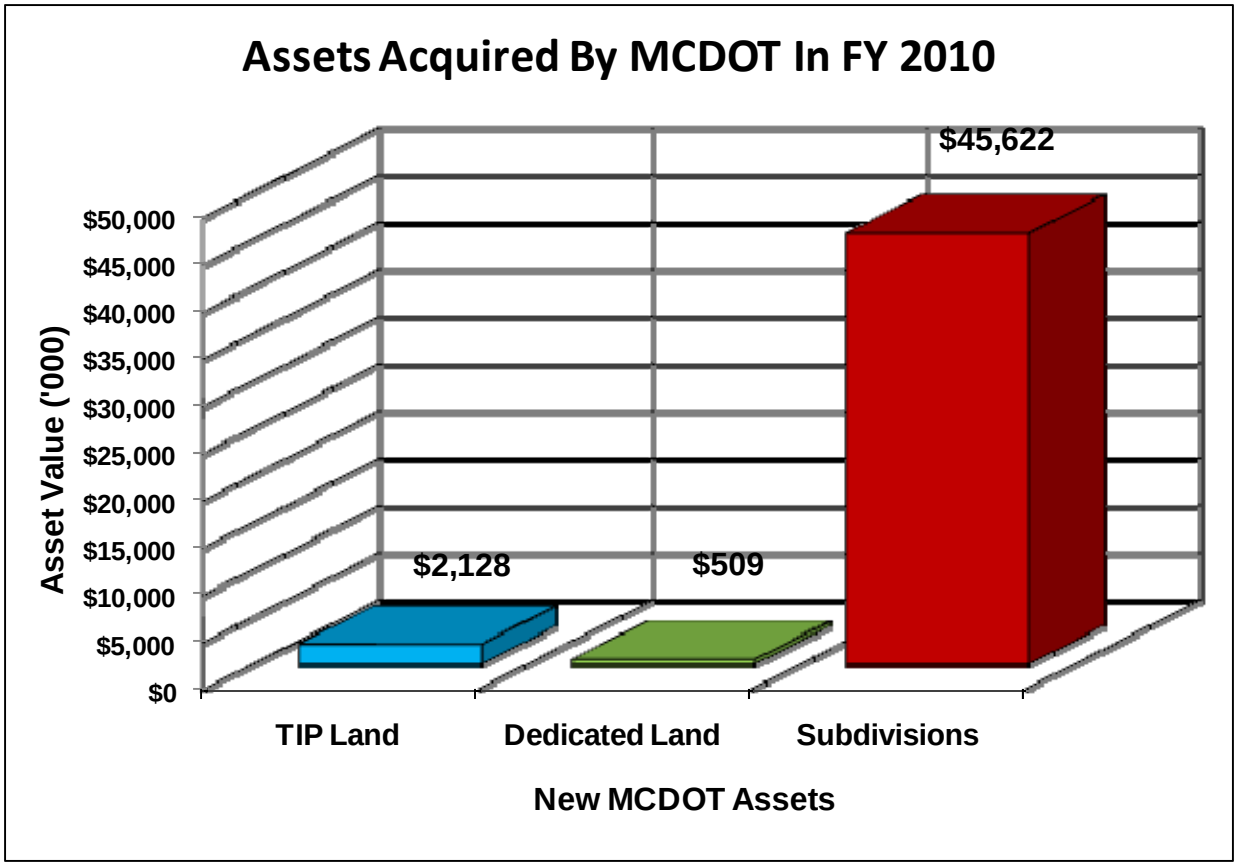
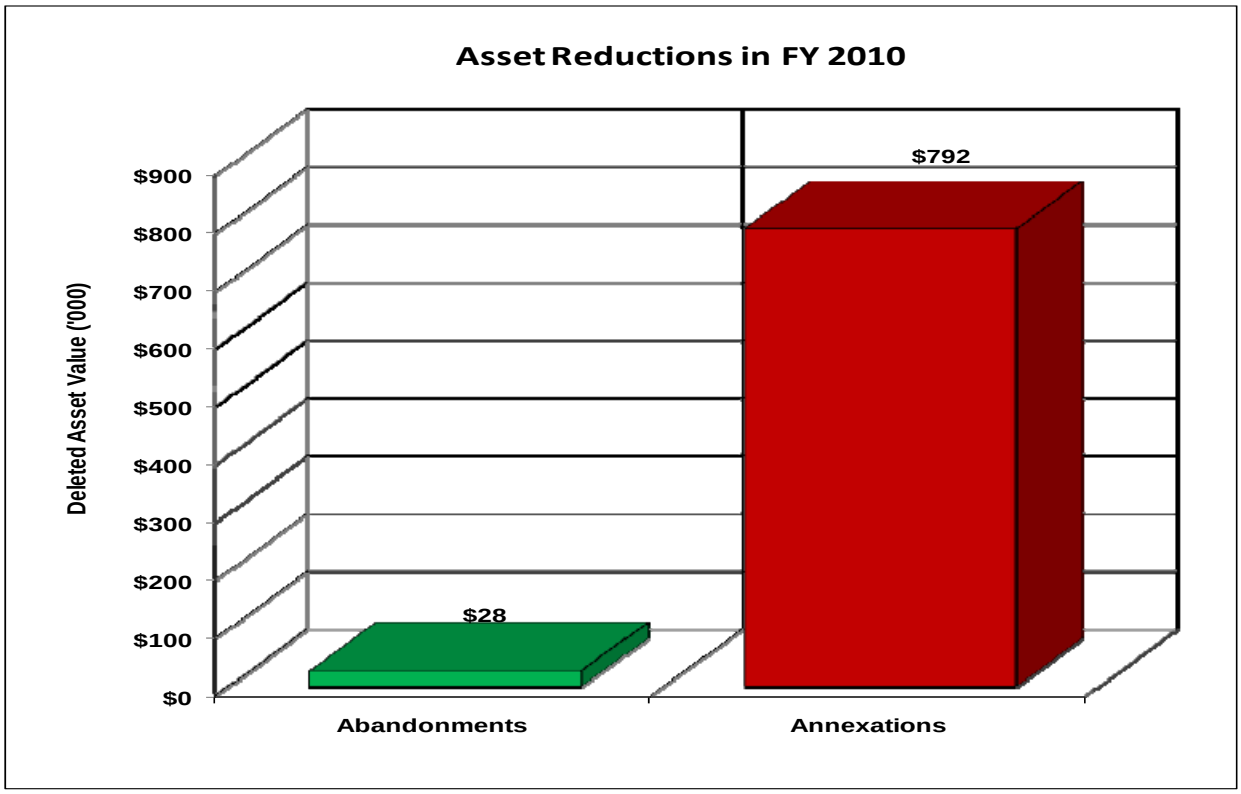


Figure 2: Asset Reductions in FY 2010



signals are added into the MCDOT inventory on the date the signal is switched on. MCDOT issues a letter of completion when a signal is turned on. The Board of Supervisors then approves the acceptance of the signal into the MCDOT inventory. Signals are deleted from the MCDOT inventory when they are annexed by an incorporated jurisdiction.

Bridges & Structures

The MCDOT Engineering Division is responsible for the design and inspection of all bridges and structures under County ownership. State and Federal Mandates require MCDOT to track and inspect its approximately 427 bridges and structures.

Structures acquired via the Board of Supervisors open and declare (O&D) process are typically from the acquisition of subdivisions or by MCDOT constructing the bridge or structure. The value of each bridge or structure is determined by the current MCDOT unit cost calculation (updated every 2 years).

Planning

The MCDOT Planning Division annually collects information on new and deleted MCDOT assets from each of the MCDOT divisions. Each identified new asset is assigned a dollar value and reported in the Consolidated Annual Financial Report (CAFR). Assets that are removed from the MCDOT inventory are also reported in the

CAFR as dollar deletions. The MCDOT Planning Division provides the Maricopa County Department of Finance a copy of the infrastructure inventory each year with the updated additions and deletions. This information is audited annually by the State Auditor General's Office.

Development Services

The MCDOT Development Services section issues construction permits and provides oversight of roadway and structure construction conducted by governmental agencies and private developers. The Development Services Section insures that contractors have a valid construction permit and conform to the Uniform Standard Specification for Public Works Construction published by MCDOT.

The permit records kept by Development Services provide the detailed paper trail necessary for documenting all new assets built in the unincorporated county and either donated to or acquired by MCDOT.

Transportation Improvement Program (TIP)

The Transportation Improvement Program is a collaborative effort between all the MCDOT divisions. The TIP projects are identified, budgeted, and timelines are created for major construction projects. Projects are added to the TIP based on scoping studies, engineering judgment, project schedules, or budgets are initially presented to an internal MCDOT committee and then to the Transportation Advisory Board for recommendations to the Board of Supervisors.

Projects can include transportation studies, improvements to structures, new traffic signals, low volume road paving, ant the new or reconstruction of roadways. Not all of the projects result in an addition to MCDOT infrastructure inventory. Non-capital projects such as planning studies and feasibility studies are expensed rather than being included as a physical asset. Other projects may be jointly funded through intergovernmental agreements where MCDOT shares the project costs and another municipality retains jurisdiction over the completed project.

Once a project is completed, MCDOT prepares correspondence to the contractor and MCDOT internal customers officially ending the project. Only when a project is completed and inspected is the asset accepted into the MCDOT asset inventory.

Figure 3: FY2010 Transportation Improvement Program Disposition

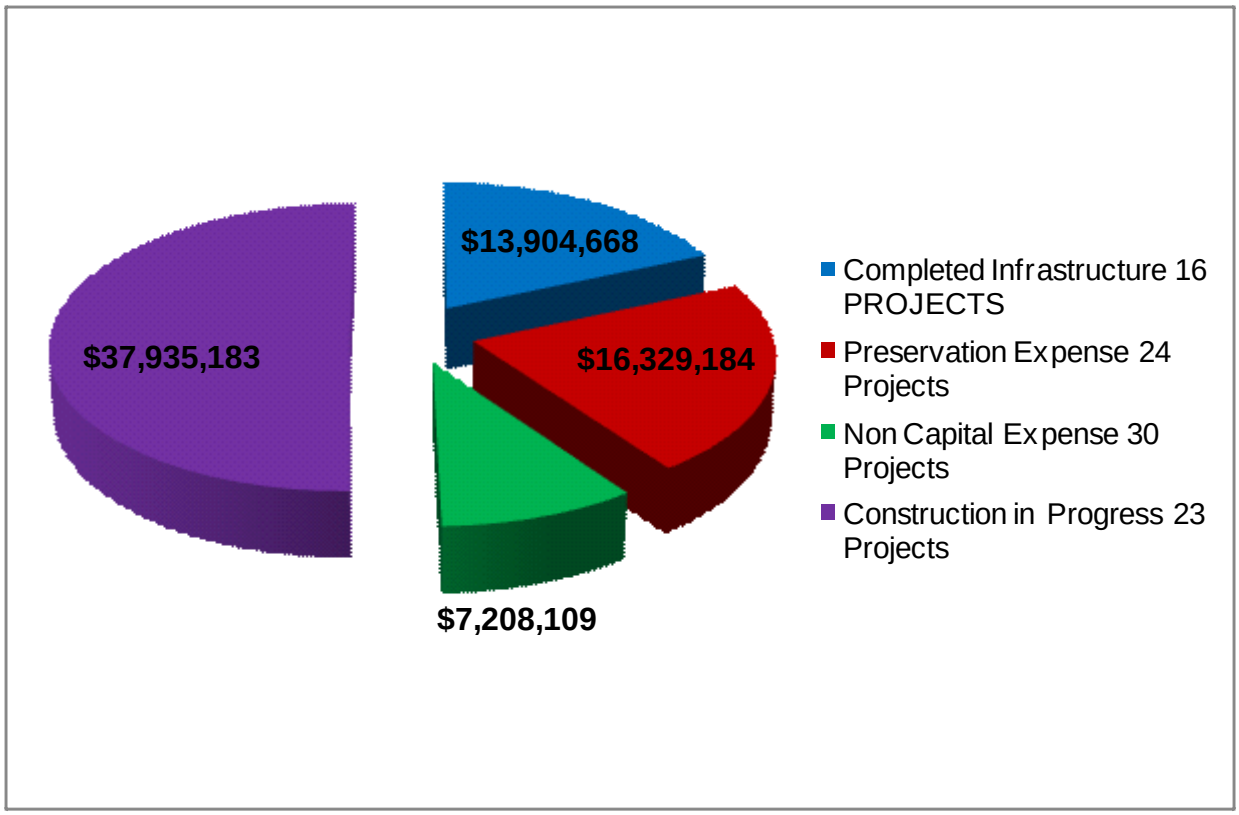
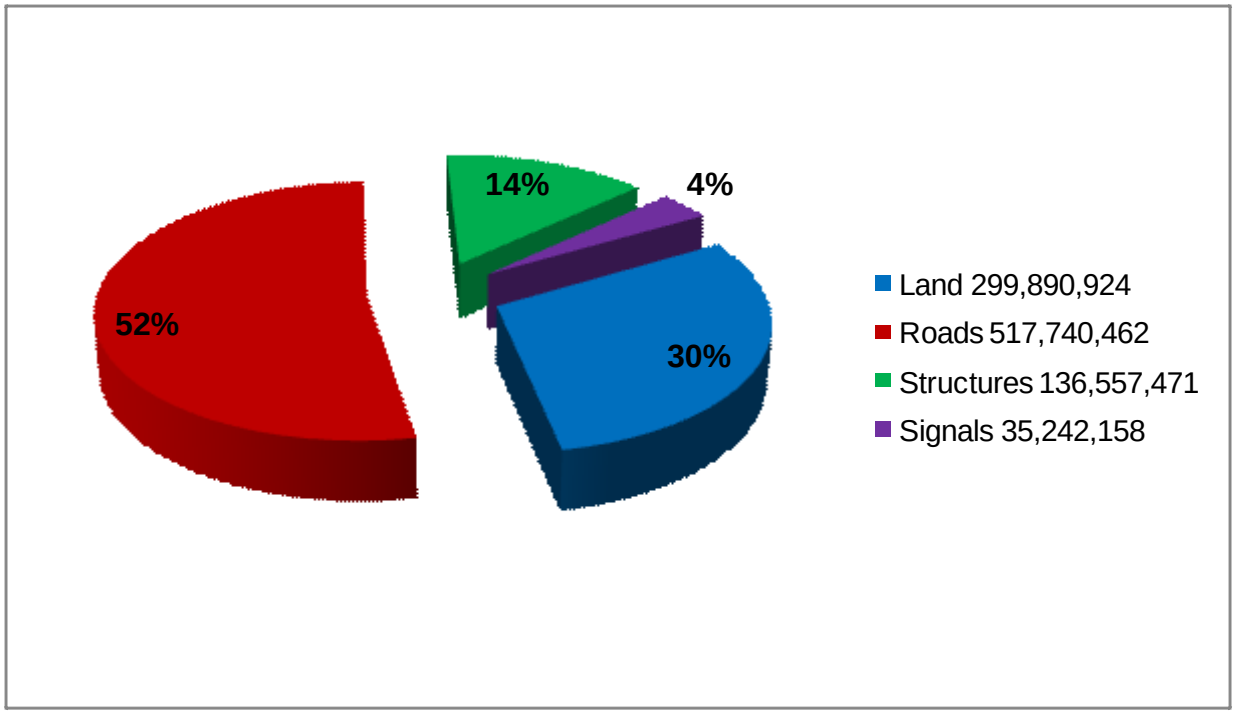


Figure 4: Maricopa County FY10 Assets Value Added



RECOMMENDATIONS FOR IMPROVEMENT

Data Integration and Agency Collaboration

Many challenges have been identified from MCDOT's recent audit findings. MCDOT is making significant efforts to improve the accuracy of its asset management reporting in response the findings of the State Auditor General. In order to develop an effective Asset Management System, enhanced collaboration is needed between all MCDOT Divisions and the County Department of Finance.

Data Integration:

The Maricopa County Department of Transportation has experienced three adverse opinions by the State Auditor General's Office concerning our asset management practices. These opinions are primarily based on the lack of adequate internal controls with respect to accounting for MCDOt's assets. Increased data Integration between all MCDOT divisions would allow MCDOT the capacity to establish necessary controls and monitor progress.

The annual MCDOT asset data collected needs to become more "Business Intelligent." A systematic approach to data collection must be addressed by each division with fixed timelines. This should involve all MCDOT divisions and result in each adopting common procedures and coordinating their recordkeeping and data collection efforts more effectively.

Each MCDOT division typically supports their own unique databases. These are effective in satisfying their personal and customer needs bur are much less effective in sustaining an Asset Management System. These individual databases are sometimes large and somewhat disjointed from the collective needs of MCDOT's asset reporting requirements. A proposed Asset Management Team could coordinate and implement a common data field system within each database that would allow linkages between all other division databases.

To this end, the MCDOT Infrastructure Technology Center (ITC), has taken the first step in developing a "Business Intelligence" tool to capture MCDOTS Assets. The MCDOT RoadRunner database is now the repository for most of the infrastructure data. Improving the RoadRunner Database to accept each division's data automatically should be a top priority at MCDOT.

MCDOT Management has to lead the efforts to change the corporate environment relating to asset management. Upper management involvement will help to break down the division barriers and encourage success of a project of this magnitude. The ultimate success of a comprehensive data integration process depends on the encouragement and cooperation of all the decision makers within MCDOT.

Benefits

The benefits of creating an integrated asset management system are numerous. The U.S. Department of Transportation, Federal Highway Administration, Office of Asset Management lists the following as benefits of Data Integration:

Availability/Accessibility –	Data is easily retrieved, viewed, queried, and analyzed by anyone in the agency in a more user friendly form.
Timeliness -	Data can quickly update and therefore are generally current. Normally in combined or linked databases only one update is necessary. In addition, databases are time stamped to keep track of when they were created, modified, or updated.
Accuracy Correctness - and Integrity	Data are commonly free of errors because the integrity of the databases is upheld in an integrated environment. Likewise, processes exist for automatic or convenient error checking and verification to help maintain the quality of the data during data entry and access.
Consistency and Clarity -	Specified data have a clear and unique definition throughout the agency, thereby avoiding or eliminating confusing and conflicting meaning and usage of data.
Completeness-	All available information associated with the assets, including historical and recently collected data can be found in the database. In addition, missing records or data fields are easily identified and flagged by the data management process.
Reduce Duplication -	Identical Data are not stored in multiple, disparate locations. Integration reduces the need for multiple updating and ensures that everyone has access to the same data.
Faster Processing - and Turnaround Time	Less time is spent on consolidating and transmitting data to various users in the agency. The integration data environment also supports faster data manipulation, allowing multiple users to conduct separate analysis concurrently.
Lower Data Acquisition- and Storage Cost	Data are not collected and processed twice, and are consolidated and stored at locations in the agency that provide optimal convenience and ease of maintenance.
Informed and - Defensible Decisions	Highly organized, comprehensive databases allow users to drill down through successive levels of detail for any given asset. This depth provides more information to support recommendations and allow users to conduct different types of analysis using various subsets or combinations of data.
Integrated Decision Making-	One of the greatest benefits of data integration is that it permits decision-support analysis throughout the transportation system, from the field to the executive level (vertically) and across divisions within and outside the organization (horizontally).

Planning Division

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