FISCAL YEAR

2015

STATE OF THE SYSTEM REPORT

PROGRAMMING AND SYSTEM ANALYSIS

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List of Acronyms

ADOT – Arizona Department of Transportation

ALERT – Arizona Local Emergency Response Team

AR – Asphalt Rubber

ARHM – Asphalt Rubber Hot Mix

ATIS – Advanced Traveler Information System

BIS – Bridge Investment Study

BSR – Bridge Sufficiency Rating

CAD – Computer Aided Dispatch

Chip Seal HV – Chip Seal High Volume

Chip Seal LV – Chip Seal Low Volume

CCTV – Closed Circuit Television Cameras

DCR – Design Concept Report

DMS – Dynamic Message Sign

DPS – Department of Public Safety

DSRC – Dedicated Short-Range Communications

FHWA – Federal Highways Administration

FMS – Freeway Management System

FY – Fiscal Year

GAAP – Generally Accepted Accounting Principles

GASB – Governmental Accounting Standards Board

ICM – Integrated Corridor Management

IGA – Intergovernmental Agreement

IRI – International Roughness Index

ITS – Intelligent Transportation Systems

LRP – Laser Road Profiler

LVR – Low Volume Roads

M&R – Mill and Replace

MAG – Maricopa Association of Governments

MAP-21 – Moving Ahead for Progress in the 21st Century

MCDOT – Maricopa County Department of Transportation

MDI – Model Deployment Initiative

MMITSS – Multi Modal Intelligent Traffic Signal System

MUTCD – Manual on Uniform Traffic Control Devices

MVMT – Million Vehicle Miles of Travel

NUG – National Unified Goal

O&D – Open and Declared

PCR – Pavement Condition Rating

RADS – Regional Archived Data Server

RDM – Roadway Design Manual

REACT – Regional Emergency Action Coordinating Team

RMS – Road Management System

SRPMIC – Salt River Pima-Maricopa Indian Community

SHSP – Strategic Highway Safety Plan

SMS – Safety Management System

SOS Report – State of the System Report

STSP – Strategic Transportation Safety Plan

TAB – Transportation Advisory Board

TIM Coalition – Traffic Incident Management Coalition

TIP – Transportation Improvement Program

TMC – Traffic Management Center

TOC – Traffic Operations Center

TSMO – Traffic Systems Management and Operations

TSP – Transportation System Plan

USDOT – United States Department of Transportation

V/C Ratio – Volume-to-Capacity Ratio

V/S Ratio – Volume-to-Service Ratio

VMT – Vehicle Miles of Travel

Overview

Purpose of the State of the System Report

The State of the System (SOS) Report (hereafter referred to as "Report") is a compilation of the physical inventory and status of the Maricopa County Department of Transportation's (MCDOT's) transportation system infrastructure. The transportation system includes roads, bridges, bicycle facilities, traffic signals, and other facilities. The Report documents the performance and condition of the various components of MCDOT's transportation system.

Components of the State of the System Report

The Report includes the following system components:

- Traffic Management;
- Safety Management;
- Low Volume Road Management;
- Bridge Management; and
- Road Management.

Timeframe of the State of the System Report

The Report focuses on FY 2015 (July 1, 2014 to June 30, 2015) but also includes limited information for other fiscal years in sections that discuss trends over the last several years. It is anticipated that the Report will be prepared annually moving forward.

Most of the data analyzed in the Report is aggregated by fiscal year. Notable exceptions are traffic volume count data and traffic crash data, both of which are aggregated by calendar year per industry standards. For timeframe references throughout the Report, unless the year is noted as a fiscal year (e.g., FY 2015), the year referenced is a calendar year.

County Goals and Objectives for Transportation

Comprehensive Plan Guidance

The Maricopa County Comprehensive Plan was adopted in 1997 and revised in 2002. It directs the management of MCDOT. The Comprehensive Plan helps set direction for the County's transportation system investment, and the following objectives related to the transportation system are set forth in the Comprehensive Plan:

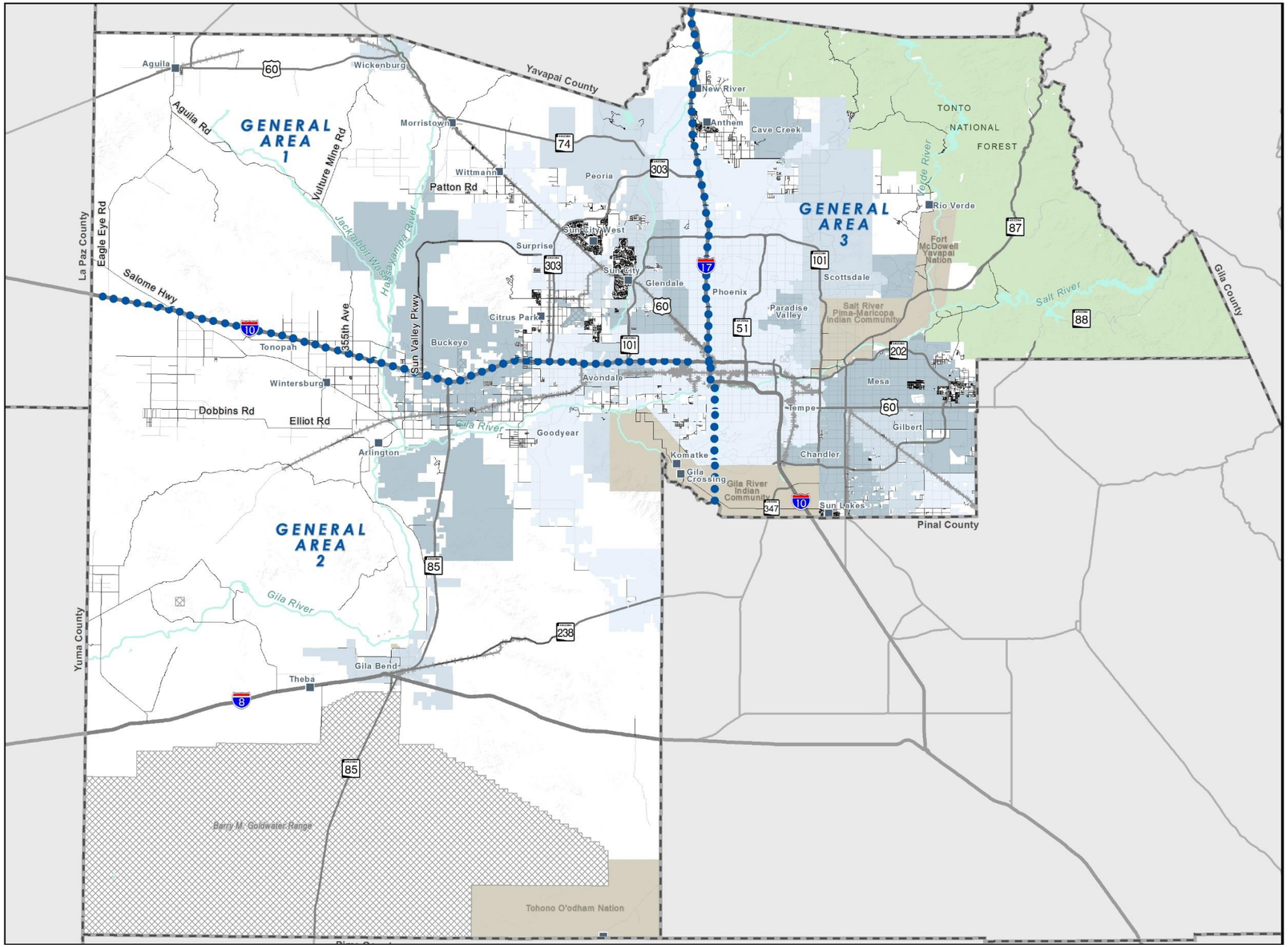
- Employ technology to improve the use of transportation facilities;
- Identify and accommodate transportation corridors;
- Optimize public investments;
- Minimize travel times;
- Reduce crashes; and
- Minimize and mitigate impacts of construction and operation.

Transportation System Plan Guidance

The Maricopa County Transportation System Plan (TSP) was adopted in 2007 and is currently being updated. The TSP sets the overall policies, goals, and fundamental considerations for MCDOT decisions concerning current and future transportation needs and investments. The TSP recommends investment

priorities based on three types of routes: primary, secondary, and local. Much of the content of the TSP reflects the County's Comprehensive Plan guidelines for transportation.

Figure 1 provides an overview of the three General Areas that are delineated in the TSP. Throughout this Report, all maps that are presented are done so in sets of three, with one map for each area depicted in Figure 1.



General Areas

- Other Communities
- Interstate
- State Route/US Highway
- County Maintained Roadway*
- Railroad
- National Forest
- Indian Reservation
- Military
- Incorporated Areas
- County Boundary

*Includes roads that are a) fully or partially owned and operated by MCDOT; or b) maintained by MCDOT through an intergovernmental agreement or through courtesy grading pursuant to Arizona Revised Statute 28-6705

0 10 20 Miles

N

Source: Maricopa County; Flood Control District of Maricopa County (FCD); Arizona Department of Transportation (ADOT); Arizona State Land Resource Information System (ALRIS)

Figure 1: Overview of General Areas of the County as Presented in the TSP

Traffic Management System

Overview and Background

MCDOT's Traffic Management System – also known as Traffic System Management and Operations (TSM&O) – includes the operations and management of traffic on Maricopa County (County) roads. For purposes of this Report, County roads are roads that are fully or partially owned and operated by MCDOT or maintained by MCDOT through an intergovernmental agreement (IGA) or through courtesy grading pursuant to Arizona Revised Statute 28-6705.

MCDOT's traffic management system includes the infrastructure, policies, and procedures in place to manage existing and future traffic congestion on County roads as well as information about traffic congestion shared with other agencies and the traveling public. This section incorporates and expands upon information provided in previous Reports in the Congestion Management System section.

Purpose of the Traffic Management System

The purpose of the traffic management system is to:

- Identify and measure traffic growth and congestion on County roads; and
- Identify and measure MCDOT improvements to traffic operations through innovation, intelligent transportation system (ITS) devices, incident management, and traveler information.

Transportation System Plan Guidance

The TSP includes several objectives related to traffic management to ease traffic congestion, which include:

- Intersection improvements;
- Alternate route enhancement;
- Identify and plan for both current and future traffic volume needs;
- Monitor and measure congestion;
- Identify alternative actions;
- Recommend cost-effective mitigation measures; and
- Evaluate actions related to congestion management.

Traffic Growth and Congestion

Existing Traffic Volumes and Historical Growth

Traffic growth and congestion are evaluated on all County roads for which traffic volume information is available from MCDOT's traffic count program. Traffic counts from 2014 are considered "existing" traffic volumes for the purpose of this Report.

Maps labeled **Figure 2** show the two-way daily traffic volume counts conducted by MCDOT on County roads in 2014. At locations where no count was taken in 2014, the most recent prior year's count is used. In locations where only one directional count was taken, the count was doubled to represent a two-way count. In rural areas, traffic volumes on County roads are generally less than 12,000 vehicles per day. In urban areas, traffic volumes on County roads are generally less than 30,000 vehicles per day. Bell Road is a notable exception at nearly 60,000 vehicles per day.

Maps labeled **Figure 3** show the average annual growth rate of the two-way daily traffic volume counts on County roads between 2010 and 2014. At locations where no traffic counts were taken in 2010 or 2014, the most recent prior year's count was used. Traffic volume growth rates vary widely across the County but are generally highest in the areas currently experiencing rapid land development.

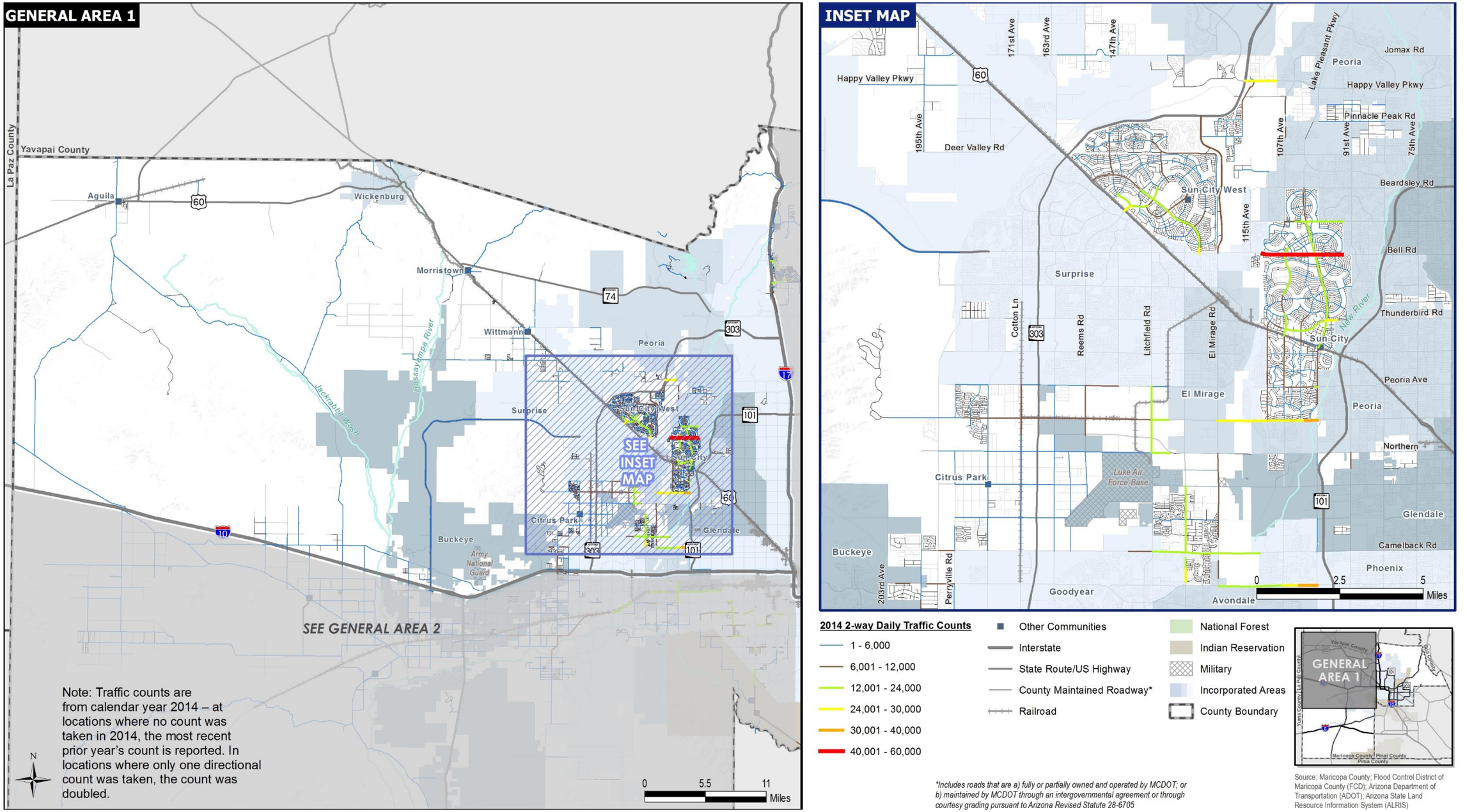


Figure 2: 2014 Two-way Daily Traffic Counts

Area 1

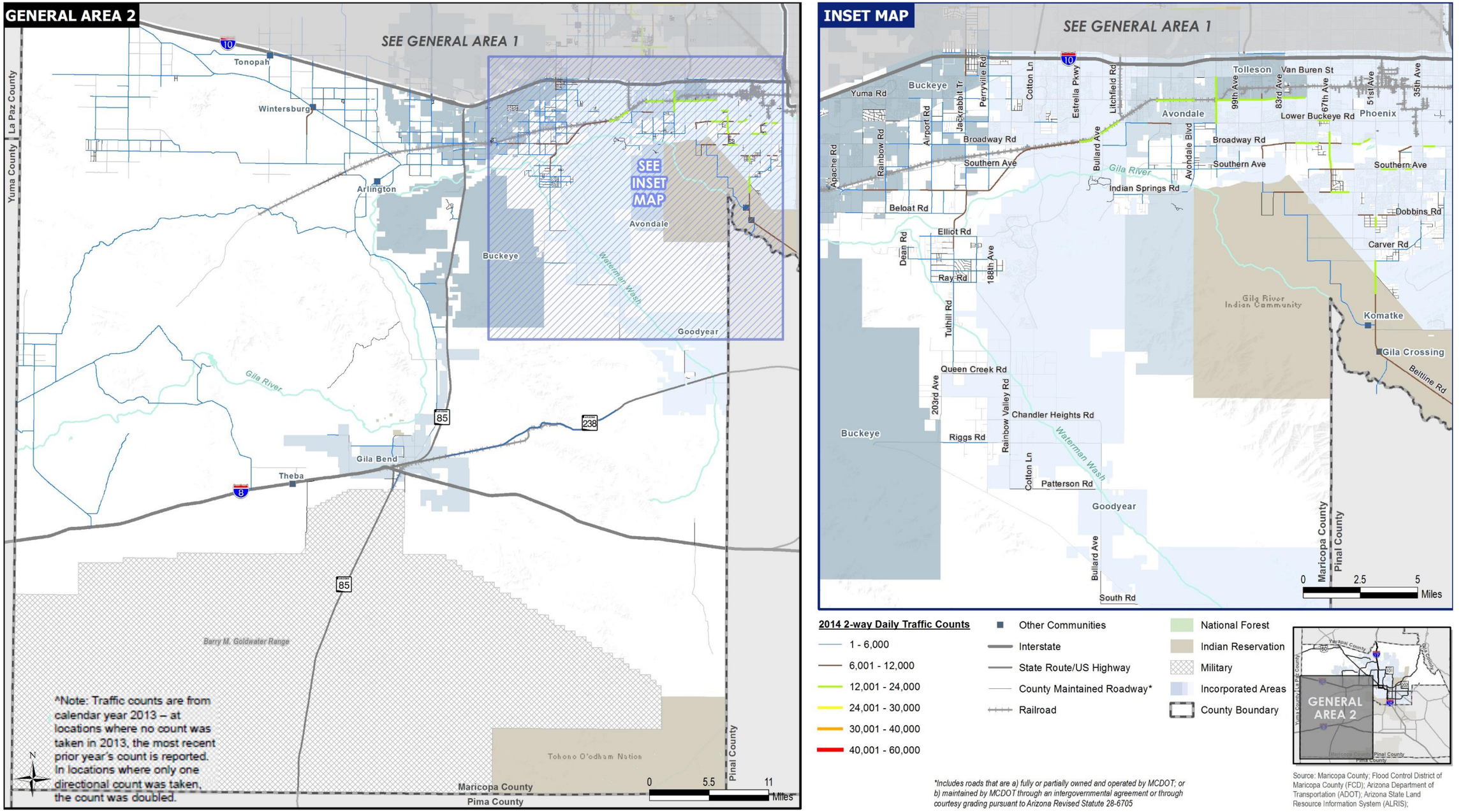


Figure 2: 2014 Two-way Daily Traffic Counts

Area 2

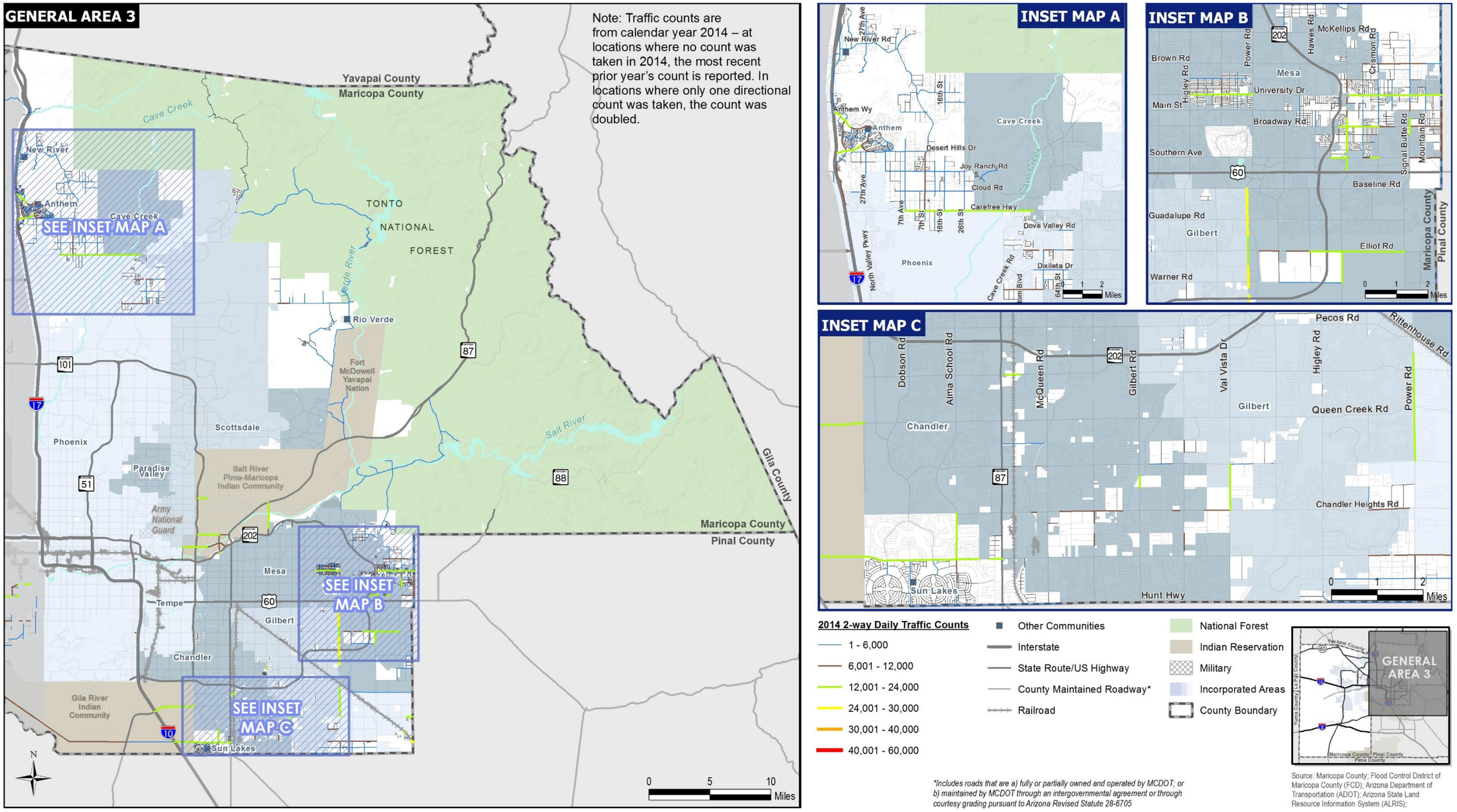


Figure 2: 2014 Two-way Daily Traffic Counts

Area 3

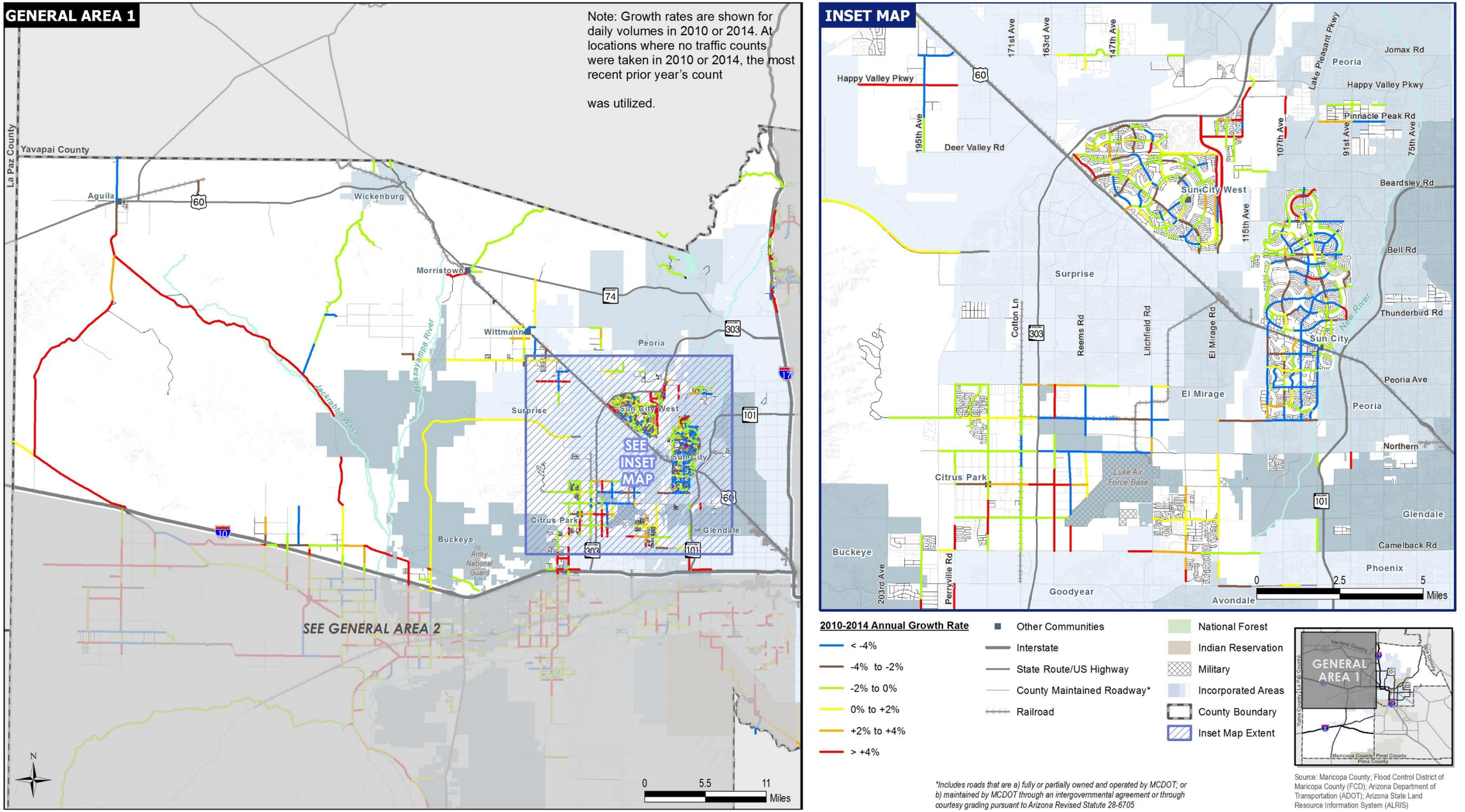
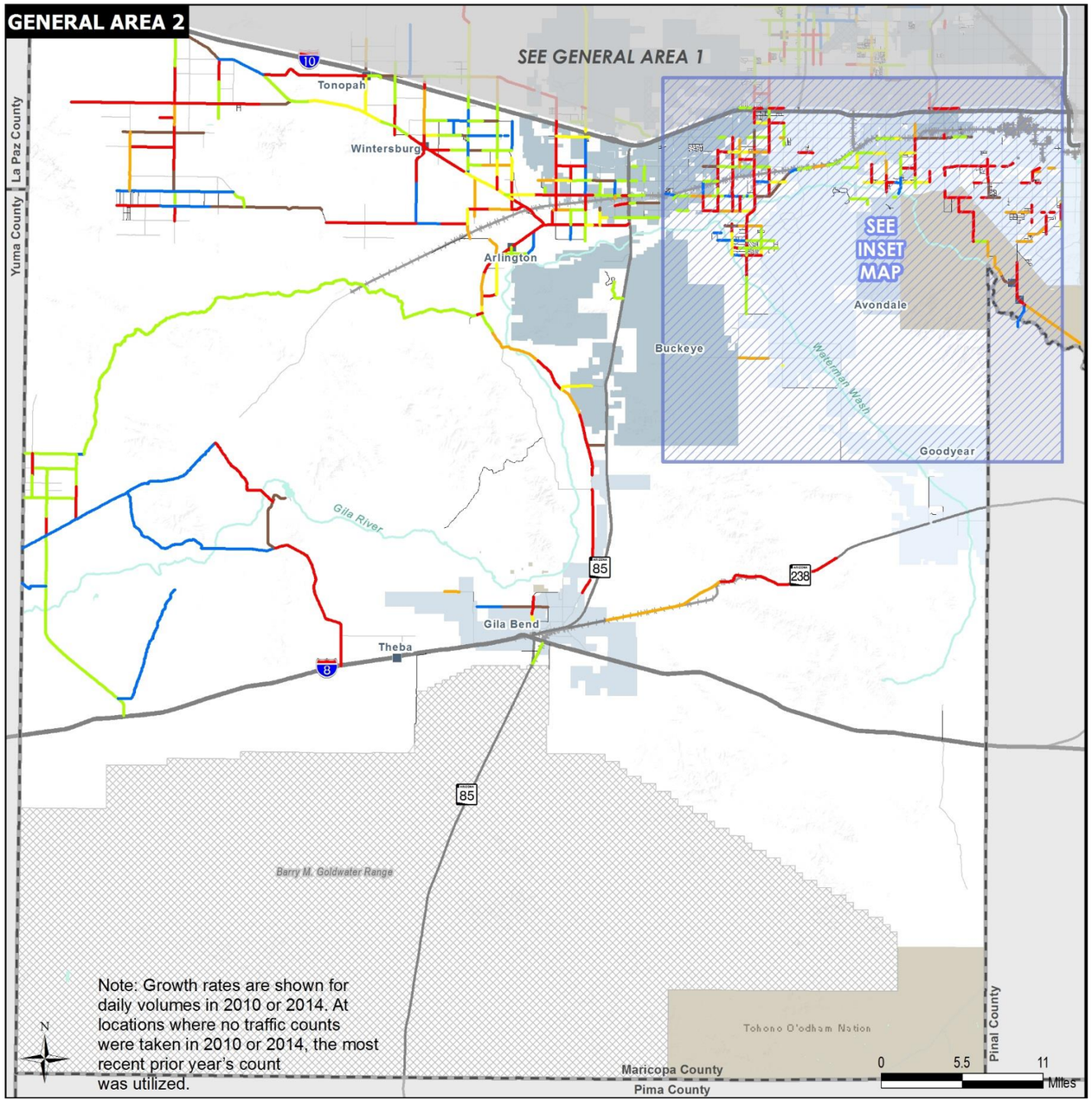
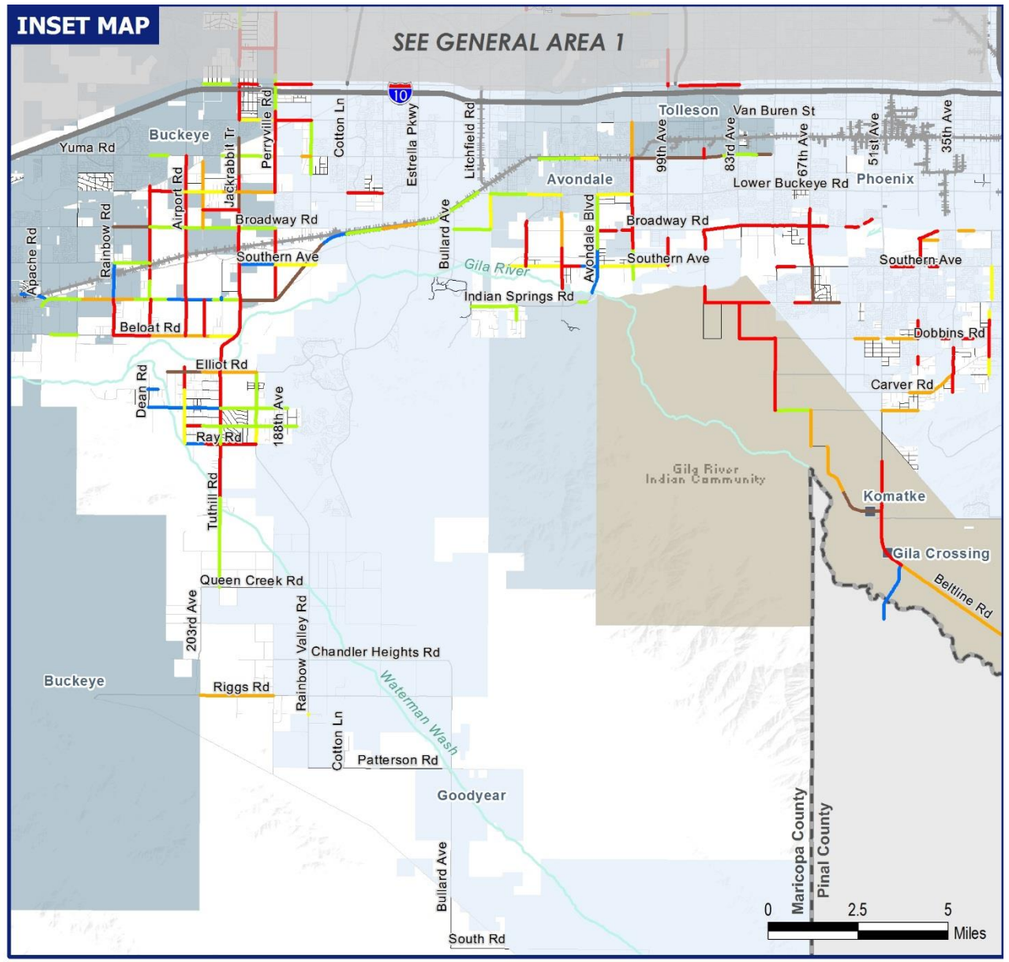


Figure 3: 2010-2014 Daily Traffic Volume Growth Rates

Area 1



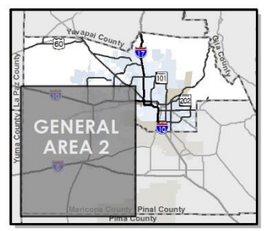


2010-2014 Annual Growth Rate

- < -4%
- -4% to -2%
- -2% to 0%
- 0% to +2%
- +2% to +4%
- > +4%

- Other Communities
- Interstate
- State Route/US Highway
- County Maintained Roadway*
- Railroad

- National Forest
- Indian Reservation
- Military
- Incorporated Areas
- County Boundary



*Includes roads that are a) fully or partially owned and operated by MCDOT; or b) maintained by MCDOT through an intergovernmental agreement or through courtesy grading pursuant to Arizona Revised Statute 28-6705

Source: Maricopa County; Flood Control District of Maricopa County (FCD); Arizona Department of Transportation (ADOT); Arizona State Land Resource Information System (ALRIS);

Figure 3: 2010-2014 Daily Traffic Volume Growth Rates

Area 2

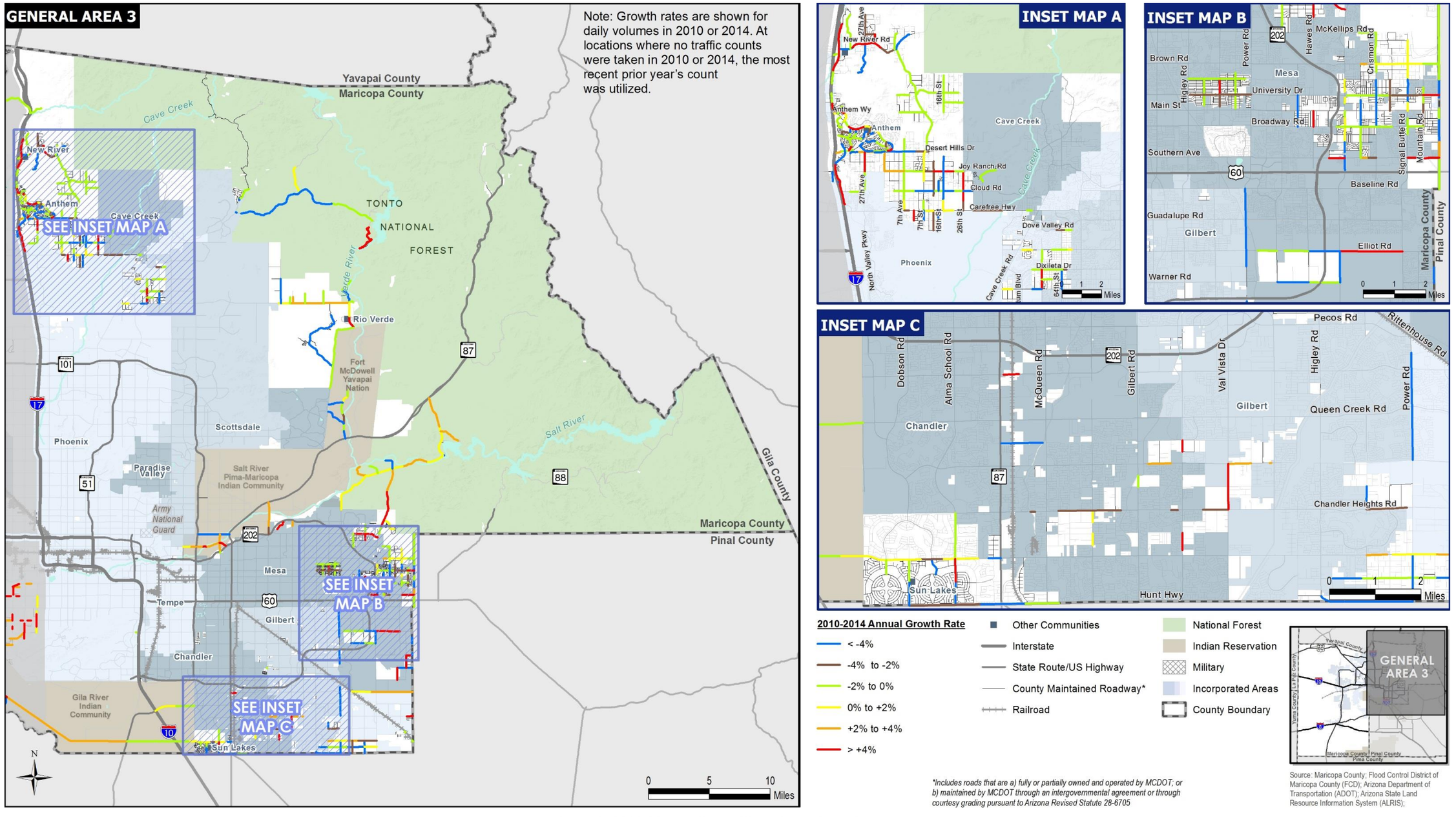


Figure 3: 2010-2014 Daily Traffic Volume Growth Rates

Area 3

Traffic Congestion Performance Measures

MCDOT has recently developed a traffic congestion performance measure known as the volume-to-service-standard-threshold (V/S) ratio. In contrast to the standard volume-to-capacity (V/C) ratio, which compares traffic volumes to road capacity, the V/S ratio compares the volume on a given road segment to the maximum volume considered acceptable by MCDOT for the characteristics of that road segment. A road segment with a V/S ratio value over 1.0 is considered to have unacceptable levels of congestion. **Table 1** lists the 50 County road segments with the highest V/S ratios. Maps labeled **Figure 4** show the V/S ratio for the road segments where 2014 traffic volume counts were available. It should be noted that the table and the figures exclude local roads. Most of the County's roads have V/S ratios well below 1.0 but there are some road segments with a V/S ratio that approaches or exceeds 1.0.

Table 1: Highest 50 2014 Road Segment V/S Ratios

Rank	On Road	Reference Road	Number of Lanes	Daily Volume (2010)	Daily Volume (2014)	2010-2014 Daily Volume Annual Growth Rate	2014 Daily V/S Ratio
1	Rittenhouse Rd	S. of Combs Rd	2	25,720	24,342	-1.37%	1.902
2	Lower Buckeye Rd	W. of 67th Ave	2	N/A	18,901	N/A	1.853
3	Baseline Rd	E. of 64th Ave	2	20,488	18,198	-2.92%	1.784
4	67th Ave	S. of Broadway Rd	2	13,425	17,679	7.12%	1.733
5	Ocotillo Rd	W. of Meridian Rd	2	17,963	22,067	5.28%	1.724
6	51st Ave	N. of Pecos Rd	2	6,911	9,568	8.47%	1.709
7	Litchfield Rd	N. of Olive Ave	2	18,369	15,465	-4.21%	1.681
8	Elliot Rd	E. of Ellsworth Rd	2	7,268	14,460	8.99%	1.572
9	51st Ave	S. of Pecos Rd	2	6,940	8,786	6.07%	1.569
10	51st Ave	S. of Estrella Dr	2	N/A	15,938	N/A	1.563
11	Rittenhouse Rd	S. of Via de Palmas	2	20,376	19,801	-0.71%	1.547
12	Chaparral Rd	E. of SR 101	4	N/A	17,183	N/A	1.494
13	Southern Ave	W. of 47th Ave	2	12,929	19,033	10.15%	1.487
14	51st Ave	N. of Olney Ave	2	N/A	15,004	N/A	1.471
15	Granite Valley Dr	N. of Meeker Blvd	2	17,256	12,901	-7.01%	1.402
16	Southern Ave	W. of 39th Ave	2	12,929	17,471	6.35%	1.365
17	Broadway Rd	W. of 71st Ave	2	8,763	13,298	10.99%	1.304
18	Val Vista Dr	S. of Thomas Rd	2	6,617	7,263	2.36%	1.297
19	Hunt Hwy	W. of Sossaman Rd	2	9,171	7,077	-6.27%	1.264
20	67th Ave	N. of Broadway Rd	2	10,827	12,674	4.02%	1.243
21	Beltline Rd	S. of Santa Cruz Rd	2	5,924	6,897	3.88%	1.232
22	Litchfield Rd	N. of Northern Pkwy	3	18,369	15,465	-4.21%	1.227
23	Rio Verde Dr	E. of 148th St	2	6,353	6,867	1.96%	1.226
24	Val Vista Dr	S. of Ocotillo Rd	2	10,642	15,324	9.54%	1.197
25	Broadway Rd	E. of 35th Ave	2	11,526*	12,816	3.60%	1.187
26	Broadway Rd	E. of 59th Ave	2	6,199	12,013	8.64%	1.178
27	Peoria Ave	E. of 99th Ave	2	23,560	14,937	-10.77%	1.167
28	Rio Verde Dr	E. of 150th St	2	6,353	6,867	1.96%	1.164
29	Riggs Rd	W. of SR-347	2	5,952	6,456	2.05%	1.153
30	Carefree Hwy	W. of 52nd St	2	18,364	18,050	-0.43%	1.135
31	135th Ave	S. of Deer Valley Dr	2	10,607	10,345	-0.62%	1.124
32	Union Hills Dr	E. of 99th Ave	2	17,937	15,246	-3.98%	1.121
33	Baseline Rd	W. of 87th Ave	2	3,787	6,248	13.33%	1.116
34	Carefree Hwy	W. of 7th St	2	N/A	17,574	N/A	1.105
35	Carefree Hwy	W. of 3rd St	2	N/A	17,574	N/A	1.105
36	Peoria Ave	E. of 99th Dr	2	23,560	14,937	-10.77%	1.098
37	151st Ave	N. of R H Johnson Blvd	2	9,779	10,082	0.77%	1.096
38	Carefree Hwy	E. of 7th Ave	2	19,486	17,203	-3.07%	1.082
39	Indian School Rd	W. of 99th Ave	4	N/A	31,204	N/A	1.076
40	Riggs Rd	W. of 187th Ave	2	4,907	5,326	2.07%	1.065
41	Baseline Rd	W. of 87th Ave	2	3,717	5,945	12.46%	1.062
42	Bell Rd	E. & W. of Del Webb Blvd	6	58,385	57,428	-0.41%	1.048
43	91st Ave	N. of Baseline Rd	2	3,503	5,814	13.50%	1.038
44	Alma School Rd	S. of Riggs Rd	2	9,063^	10,494	15.79%	1.029
45	Bell Rd	W. of Lindgren Ave	6	64,011	52,833	-4.69%	1.026
46	Meeker Blvd	N. of Grand Ave	5	23,308	25,769	2.54%	1.023
47	Broadway Rd	E. of 83rd Ave	2	6,411	10,398	12.85%	1.019
48	Indian School Rd	W. of 100th Ave	4	N/A	31,204	N/A	1.010
49	Bell Rd	E. of 99th Ave	6	61,127	55,177	-2.53%	1.007
50	Camino Del Sol	S. of Beardsley Rd	2	9,734	9,238	-1.30%	1.004

***** *2011 count used due to no 2010 count*

^ *2013 count used due to no prior counts*

N/A indicates data is not available or applicable

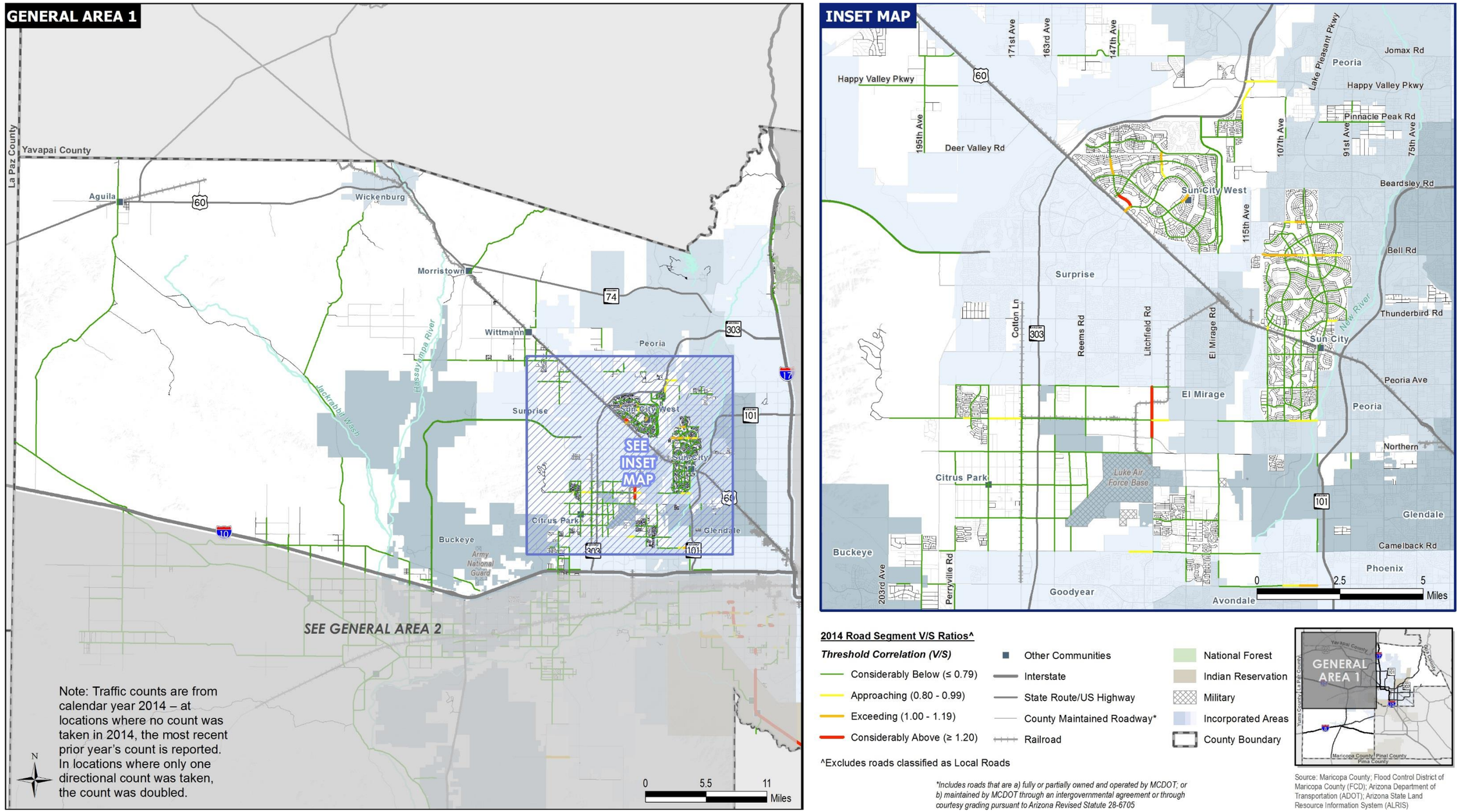
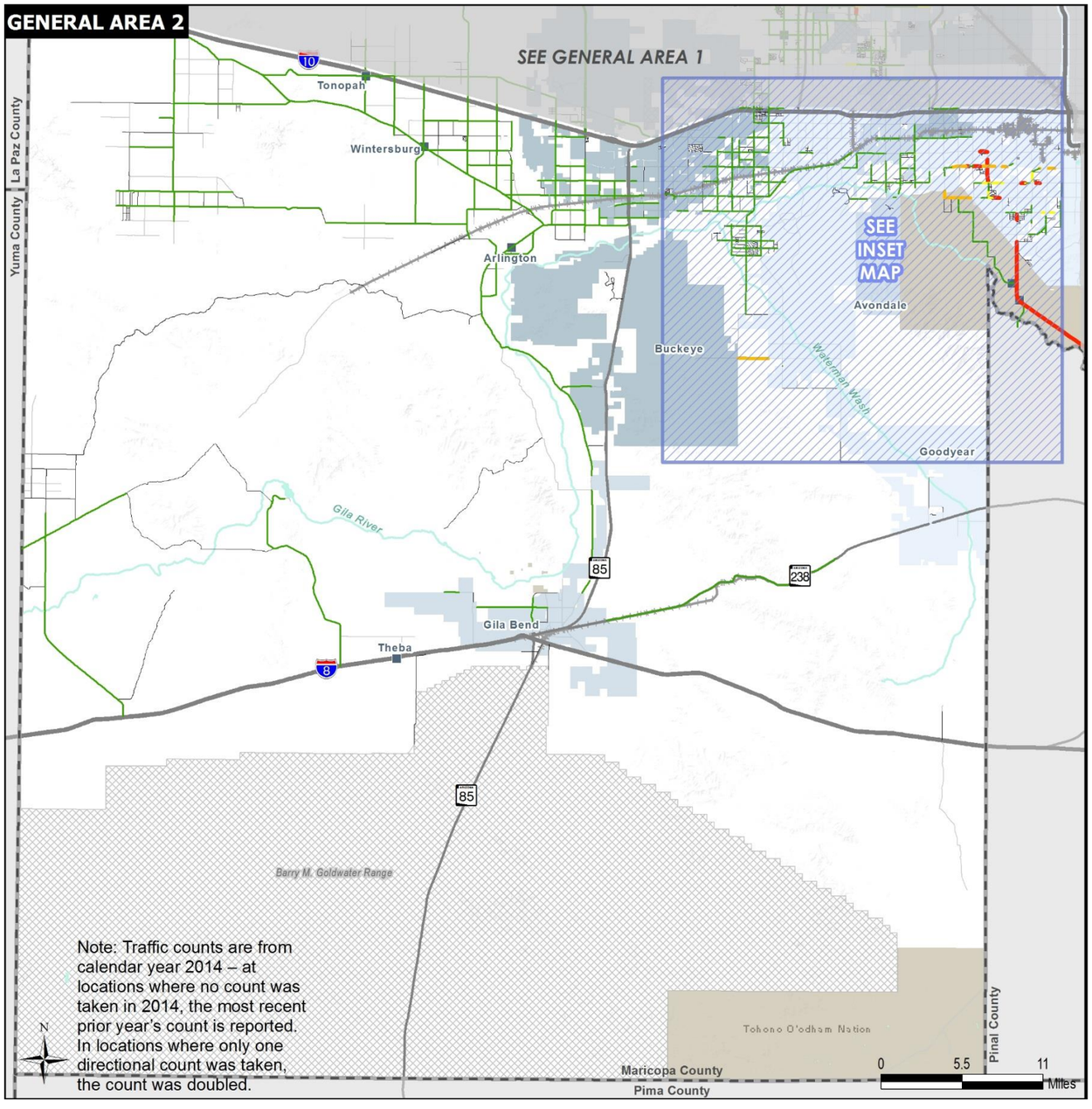
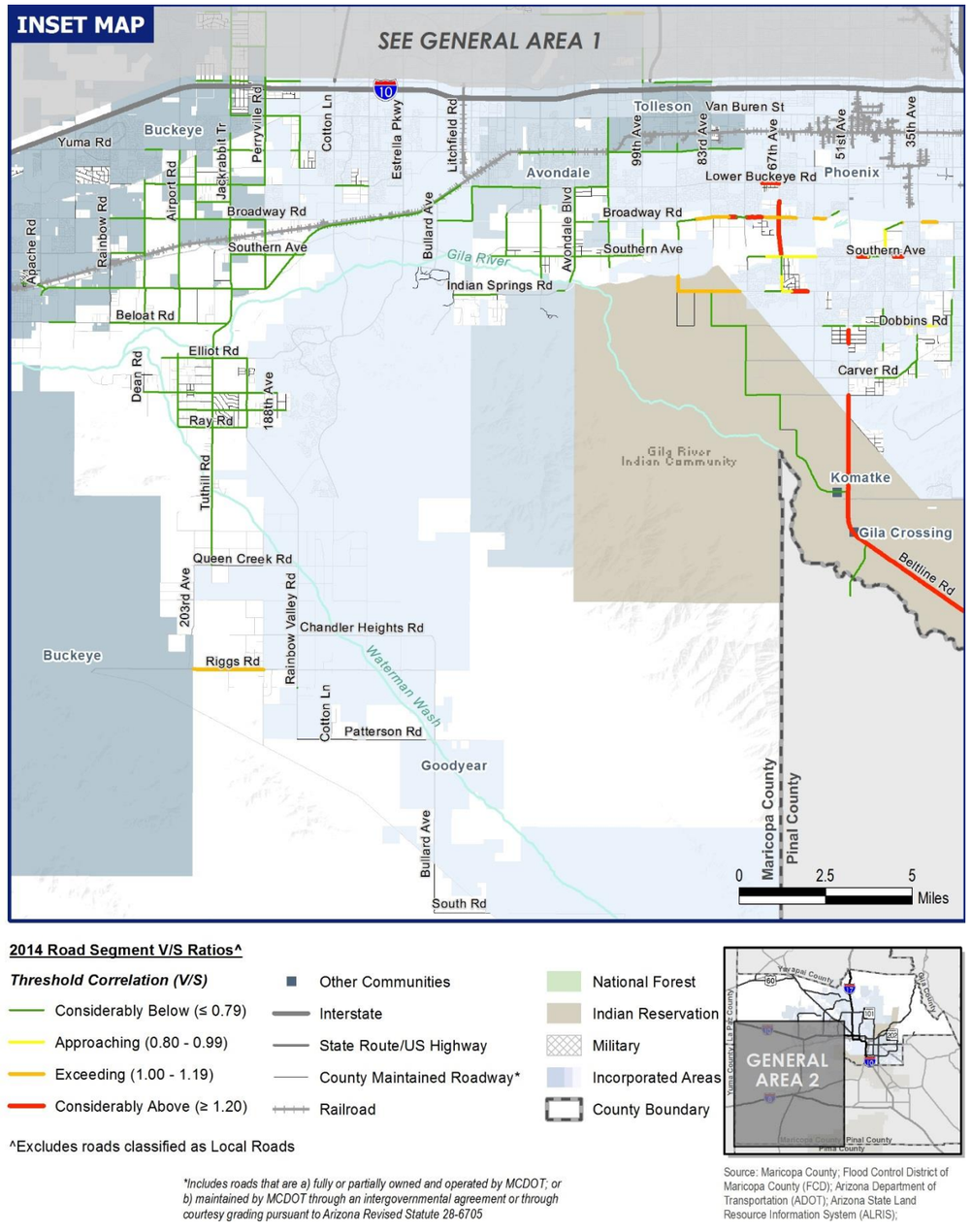


Figure 4: 2014 Road Segment V/S Ratios

Area 1





2014 Road Segment V/S Ratios^

Threshold Correlation (V/S)

- Considerably Below (≤ 0.79)
- Approaching (0.80 - 0.99)
- Exceeding (1.00 - 1.19)
- Considerably Above (≥ 1.20)

- Other Communities
- Interstate
- State Route/US Highway
- County Maintained Roadway*
- Railroad

- National Forest
- Indian Reservation
- Military
- Incorporated Areas
- County Boundary

^Excludes roads classified as Local Roads

**Includes roads that are a) fully or partially owned and operated by MCDOT; or b) maintained by MCDOT through an intergovernmental agreement or through courtesy grading pursuant to Arizona Revised Statute 28-6705*

Source: Maricopa County; Flood Control District of Maricopa County (FCD); Arizona Department of Transportation (ADOT); Arizona State Land Resource Information System (ALRIS);

Figure 4: 2014 Road Segment V/S Ratios

Area 2

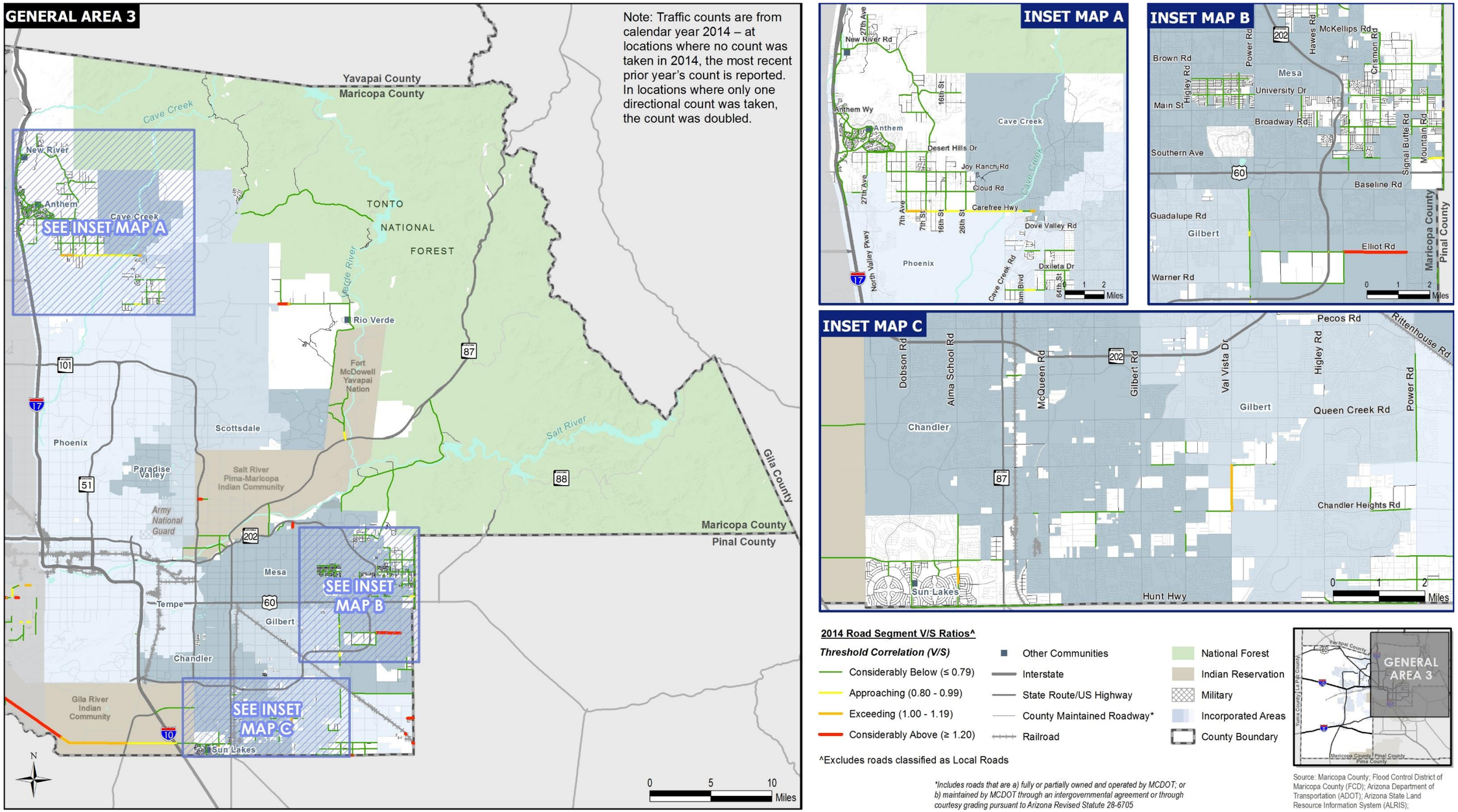


Figure 4: 2014 Road Segment V/S Ratios

Area 3

Improving Traffic Systems Management and Operations

Data Gathering and Analysis

Graphs, tables, and figures provided in this section are derived from established MCDOT reporting programs and are summarized herein. Some data sets have established goals associated with the annual collection of information while some data sets are simply reporting activity showing trending of data rather than performance compared to a specified goal. Data applies to FY 2015 unless otherwise noted.

Intelligent Transportation Systems

A network of ITS devices such as traffic signals, closed-circuit television cameras (CCTV) mounted on traffic signals, dynamic message signs (DMS), traffic detection, and communications infrastructure allows the MCDOT Traffic Management Center (TMC) to manage traffic on County roads. The operators at the MCDOT TMC use the ITS devices to monitor traffic conditions and develop signal timing plans to help relieve congestion, post messages on DMS to alert motorists to road conditions, and dispatch the County incident response team. The real-time services enabled through ITS help in reducing delays and enhancing safety. The MCDOT TMC was initially built in 1998 and moved in 2012 to a larger facility that allowed for more operational capabilities. **Figure 5** shows the original TMC and the current TMC.

Figure 5: Original MCDOT TMC (left) and Current TMC (right)

In 2015, the MAG ITS Committee approved FY 2018 Transportation Improvement Program (TIP) funds to further upgrade the MCDOT TMC.

The MCDOT TMC has access to other jurisdictions' ITS devices based on joint agreements to manage traffic and support incident and event management. MCDOT actively manages the signal system operations, provides regional monitoring of CCTV and DMS on freeways and arterials, and collects and processes data feeds for arterial and freeway traffic movement. The TMC also develops signal timing plans for MCDOT-owned traffic signals and changes/implements traffic signal timing using pre-set timing plans in response to real-time conditions. **Table 2** compares the FY 2006 and FY 2015 levels of deployment for ITS infrastructure to measure growth in ITS devices.

Table 2: Growth of ITS Features for FY 2006 and FY 2015

ITS Feature	FY 2006 Amount	FY 2015 Amount	% Growth 2006-2015
CCTV Cameras	32	56[1]	75%
DMS with Travel Time Posting Capabilities	0	5	-
Traffic Signals with Communication to TMC	36	120	233%

The MCDOT TMC operates ITS devices to manage congestion, incidents, and events on County roads. The amount of uptime of ITS devices and communications to support those activities is an important measure as it reflects the availability of the ITS infrastructure to support the management of traffic. The

[1] In FY 2015, four (4) Flood Control District crossing cameras that were previously maintained by MCDOT were no longer maintained.

MCDOT 2006 ITS Business Plan established a goal of having TMC-device communications to 95% of ITS field devices within 10 years. In 2006, 30% of field devices had communications connections. As of the end of FY 2015, 93% of field devices are connected to the TMC.

Performance of systems is critical to effective traffic management. TMC staff routinely performs system health checks and logs the status of devices and systems in the MCDOT TMC Performance Activity Log. The operators notify technical staff for troubleshooting support, if needed.

MCDOT collects data to support performance metrics established for the TMC as well as the analysis of incidents and other as-needed requests for performance reporting.

MCDOT tracks scheduled and unscheduled maintenance of MCDOT-owned traffic signals with the following goals:

- Complete preventative maintenance for 90% of all traffic signals within the monthly preset schedules; and
- Respond to 90% of unscheduled repair work within two hours of notification.

Both include a level of maintenance to traffic signals that meets all federal, state, and local standards. **Figure 6** highlights the FY 2015 performance of MCDOT signal maintenance staff in meeting the aforementioned 90% goal.

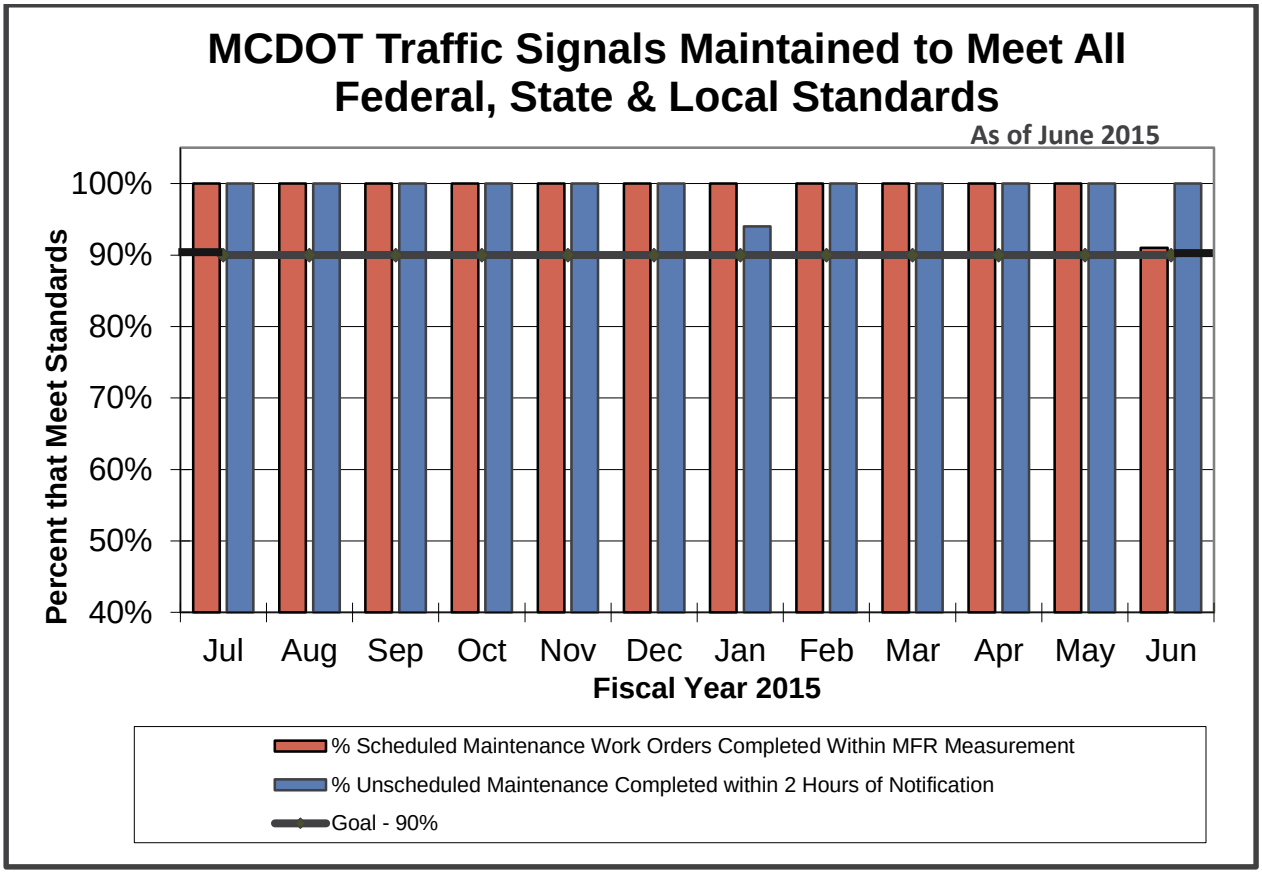


Figure 6: MCDOT FY 2015 Traffic Signal Maintenance Activities Compared to Goal

Bell Road

Bell Road has been a priority corridor for MCDOT since 2000 when a Traffic Management Study was completed between Loop 303 and Loop 101. In 2004, a Concept of Operations and ITS Operations Plan were completed that defined the roles and responsibilities of traffic, incident, and traveler information management along the corridor across the multiple jurisdictions of Surprise, the County, and Peoria.

Since 2004, ITS devices including CCTV, DMS, and fiber communications have been designed and installed in a series of three phases. In 2013, the ITS Operations Plan was updated to reflect current operating conditions as well as the formation of the Bell Road Coordination Committee for the cross-region 25-mile corridor to incorporate the Arizona Department of Transportation (ADOT), City of Glendale, City of Phoenix, and City of Scottsdale roles and responsibilities for the corridor.

Although the corridor has experienced increased average daily traffic volumes, travel times have been reduced, as shown in **Table 3** over multiple years since 2007.

Table 3: Bell Road Travel Time Performance for 2007-2014

% Change in Travel Time								
Direction	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**
AM – Eastbound (EB)*	-	-7.3%	0.0%	-6.2%	0.0%	0.0%	0.0%	1.4%
PM – Westbound (WB)*	-	-3.5%	0.0%	-24.8%	0.0%	0.0%	-9.7%	-2.7%
Combined EB & WB	-	-5.0%	0.0%	-17.4%	0.0%	0.0%	-5.3%	-.07%
Cumulative Change	**-**	**-5.0%**	**-5.0%**	**-22.5%**	**-22.5%**	**-22.5%**	**-27.8%**	**-28.5%**

** Peak Hour - Direction*

The Bell Road Coordination Committee partner agencies have been planning for multiple years for an adaptive system(s) to be implemented along strategic sections of the road. A Concept of Operations and System Requirements for four different segments along Bell Road have been developed to outline the deployment of signal control technology to the existing signal system.

In 2013, arterial travel times began to be provided along the Bell Road corridor. Third party and probe data as well as freeway detection information was used to collect and post eastbound travel times as a pilot program in the County's jurisdiction.

Incident Management

The MCDOT Regional Emergency Action Coordinating Team (REACT) is a team of personnel that dispatch to an incident scene on arterials throughout the County. REACT provides first-responder emergency services (e.g., police, fire, medical) with traffic management and control assistance so the responders can focus on their responsibilities and clear incidents quickly, thereby reducing the likelihood of secondary crashes. REACT has six IGAs with agencies throughout the Phoenix metropolitan region that cover 1,054 miles of road. These agencies include:

- ADOT;
- Glendale;
- Peoria;
- Avondale;
- Scottsdale; and
- Salt River Pima-Maricopa Indian Community (SRPMIC).

The MCDOT TMC has access to incident data on freeways from the Arizona Department of Public Safety (DPS) and the Computer-Aided Dispatch (CAD) system of the Phoenix Fire Department for arterial incidents. Incident management is one of the primary functions of the MCDOT TMC. For incidents occurring on County-owned roads and local agency-owned roads, the TMC supports the County Sheriff's Office, DPS, and local public safety agencies via alerts, closure reporting, scene monitoring through camera images (where available), and media relations (if needed).

For all incidents that have requested REACT Team response, the TMC serves as the contact in actively supporting REACT personnel as well as supporting the local agency that requested REACT support. For

larger freeway incidents, REACT may be called upon to coordinate with ALERT.

Figure 7 and **Figure 8** show data tracking completed by MCDOT for REACT team activity. To date, there have been no secondary crashes while REACT is present and established at the incident site.

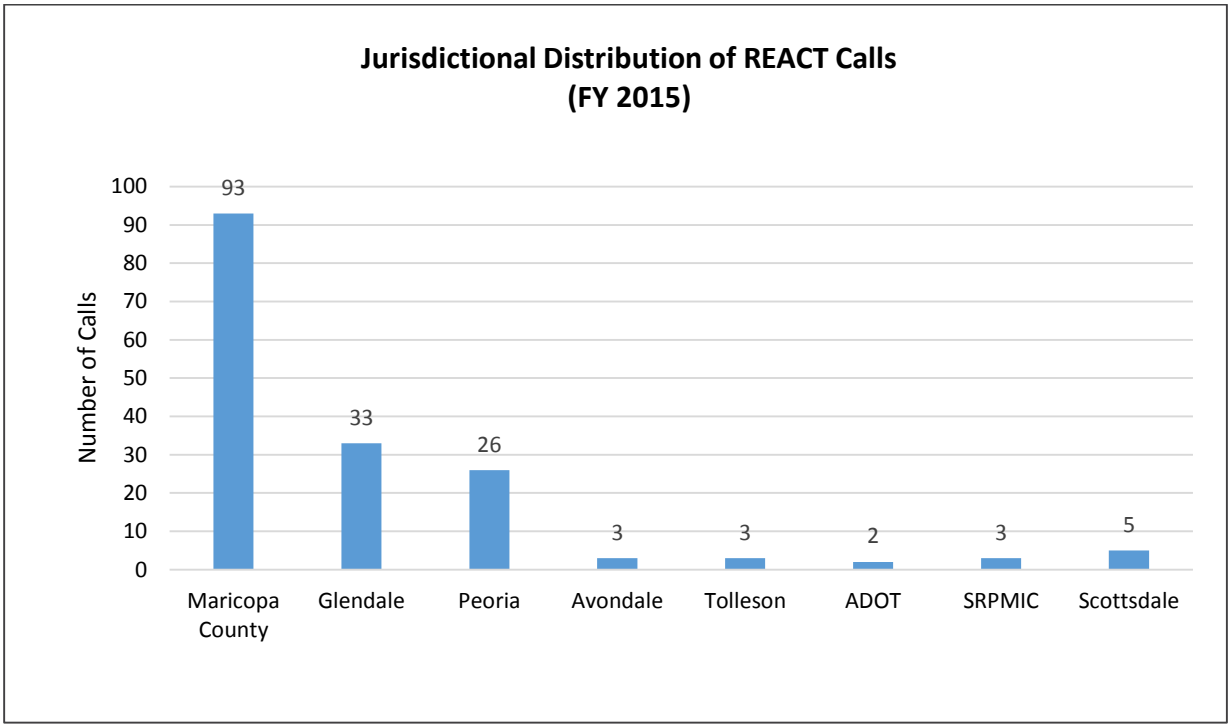


Figure 7: Jurisdictional Distribution of REACT Calls (FY 2015)

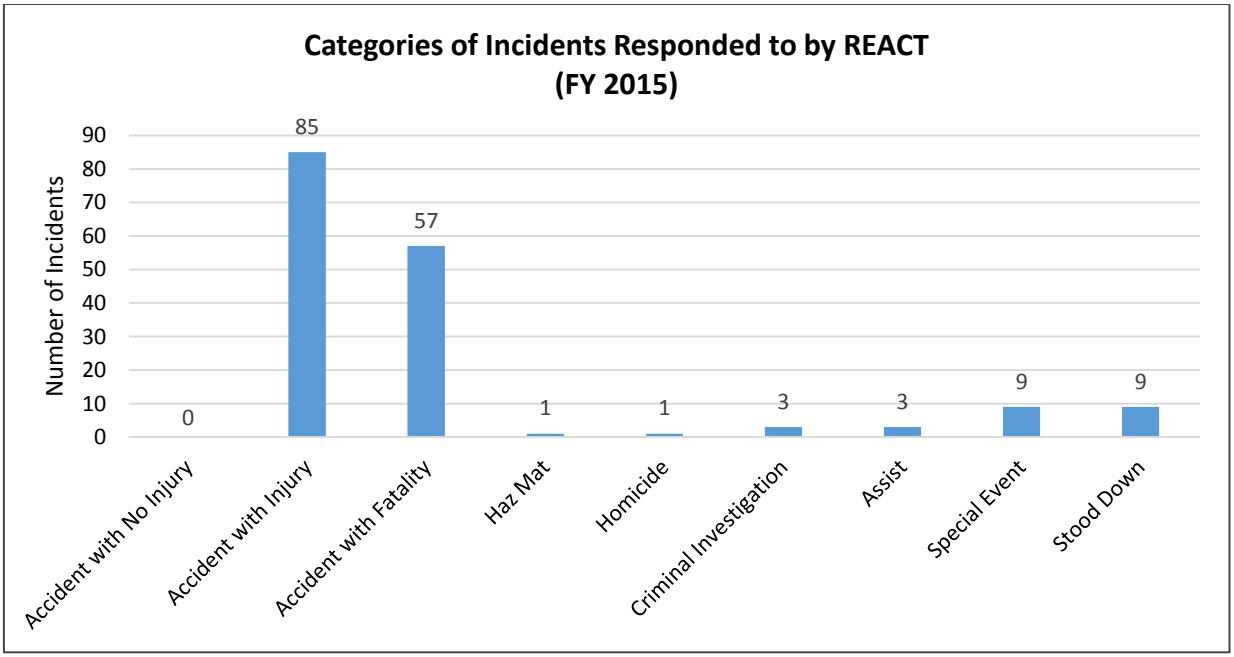


Figure 8: Categories of Incidents Responded to by REACT (FY 2015)

Traveler Information

The activities that MCDOT performs have a regional impact as the County has jurisdiction in unincorporated areas within and surrounding the Phoenix metropolitan area.

The MCDOT TMC provides various traveler information functions for the County as well as regionally. This includes e-mail traffic alerts, tweets, text alerts, data entry into MCDOT's Advanced Traveler Information System (ATIS) program for arterial incidents and events for automated posting to the statewide 511 traveler information system, and travel time messages to DMS.

As part of the Regional Rental Car Center implementation for the Phoenix Sky Harbor International Airport (shown in **Figure 9**), MCDOT developed a travel time and congestion information display system for travelers that need information to key locations in the metropolitan area. There are currently eight travel displays as part of this system located at the Rental Car Center and some key downtown public facilities.

Figure 9: Regional Rental Car Center at Phoenix Sky Harbor International Airport

MCDOT also operates and maintains nine DMS along Bell Road, MC-85, and McDowell Road that provide traveler information. **Table 4** shows the number of traveler information messages posted from the MCDOT TMC between FY 2011 and FY 2015.

Table 4: Traveler Information Message Posts (FY 2011 - FY 2015)

Year	Traveler Information Messages Posted	Year-to-Year % Growth
FY 2011	5,170	-
FY 2012	5,865	14%
FY 2013	6,204	6%
FY 2014	6,763	9%
FY 2015	6,879	2%

In an effort to broaden the scope and timeliness of MCDOT's overall public outreach efforts, it was formally announced on May 14, 2013 that the MCDOT TMC and REACT traffic incident management team have joined the MCDOT Public Affairs Office News Twitter feed. In addition to important news about MCDOT projects, @MCDOTNEWS Twitter followers now receive major TMC Traffic Alerts and are notified in "real time" of major incidents on Valley roads.

As of November 2, 2015, the Twitter account @MCDOTNEWS has 2,027 followers, follows 118 other agencies and media Twitter feeds for retweets, and tweets 5-25 times each day depending on the amount of incidents or news reports happening that day. Information is regularly retweeted from @ArizonaDOT and @PhxTrafficAlert.

In addition to Twitter, MCDOT also has a Facebook page on which it can provide additional traveler information. The MCDOT Facebook page, as of November 2, 2015, had 280 likes/followers and experiences around 600 visitors in any typical week.

Traffic Management Serving Regional Travel

AZTech

MCDOT serves as a program leader for the AZTech Regional Transportation Partnership. Through regional collaboration, this partnership aims to integrate and improve regional traffic management. Individual cities and towns deploy, operate, and maintain their ITS systems and equipment, and MCDOT helps to integrate these efforts to facilitate better regional traffic management and coordination. The regional AZTech activities that are coordinated through MCDOT Traffic Management Division include:

- Institutional collaboration and public-private partnerships;
- Center-Center communications infrastructure development;
- Inter-agency operations;
- Regional traveler information support; and
- Incident management.

AZTech was established in 1996 as one of four metropolitan areas selected by USDOT for the ITS Metropolitan Model Deployment Initiative (MDI). The AZTech partnership was formed as a result of this MDI to integrate the region's transportation system and give travelers up-to-the-minute traffic information through innovative partnerships among public sector and private sector technology companies. AZTech successfully completed the MDI in 2000 and has transitioned into a permanent partnership that continues to serve as a forum for innovation in transportation systems operations and management in the County.

AZTech brings together decision makers and practitioners with a consensus-based approach to traffic management. ADOT and MCDOT provide joint leadership for the AZTech program. Members include ADOT, Maricopa Association of Governments (MAG), Valley Metro, DPS, the County, cities, towns, and private partners. Members represent state and county traffic management and operations, regional transit operations, regional planning, municipal traffic and transportation agencies, state and regional law enforcement and public safety and emergency services.

MCDOT and ADOT continue their leadership roles chairing the AZTech Executive Committee, which sets strategic direction for the AZTech partnership. The AZTech Strategy Task Force is a subgroup of the Executive Committee, and is comprised of senior staff from member agencies across the region. AZTech also includes the following committees and working groups, which meet regularly and include representation from multiple partner agencies. These committees include:

- Operations Committee;
- Traffic Incident Management Coalition;
- Strategic Steering Committee;
- Advanced Traveler Information Systems Working Group; and
- TMC Operators Working Group.

RADS

In 2003, MCDOT, ADOT, and the Federal Highway Administration (FHWA) developed and implemented an innovative archive and retrieval system for ITS data. The Regional Archived Data Server (RADS) was designed to provide and maintain valid, classified ITS-derived data for use in transportation system planning and modeling. MCDOT is responsible for management and oversight of RADS, and local jurisdictions provide data as appropriate to the RADS server as shown in **Figure 10**. The RADS server is housed in the ADOT traffic operations center (TOC) and ADOT provides technical support for maintenance activities to the server. RADS has become a critical part of the region's data-sharing strategy.

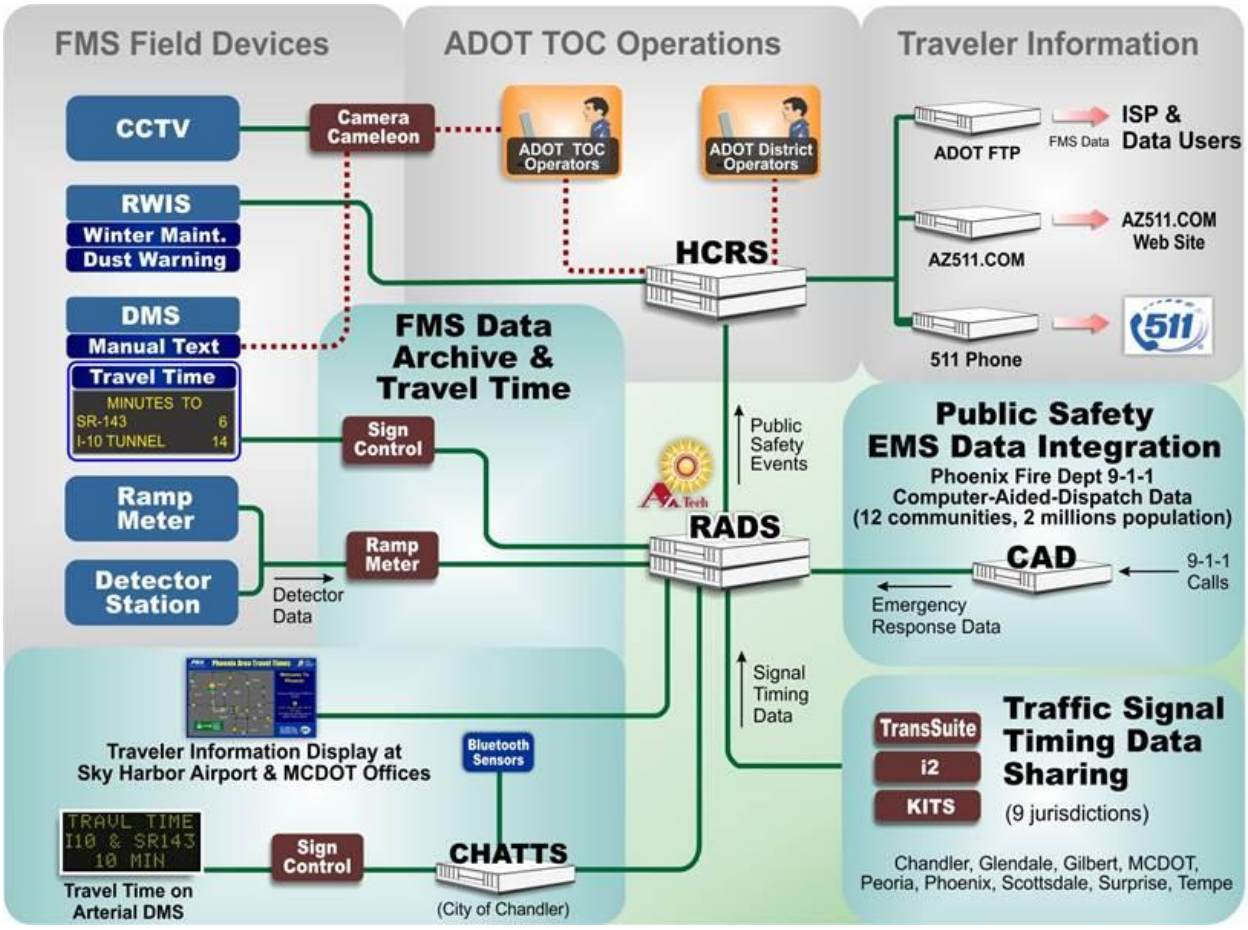


Figure 10: AZTech Regional Archived Data Center (RADS)

The system is linked with ADOT's Highway Condition Reporting System (HCRS) to provide real-time traffic data to support speed maps on the AZ511 website as well as supplemental road condition information collected from public safety agencies and local agencies not already provided through the HCRS system. RADS takes ITS data from systems throughout the Phoenix metropolitan area, stores the data in a centralized archived data server, and then makes the data available for a variety of users through a common Internet interface. Processes incorporated into the RADS system include:

- ADOT freeway management system (FMS) detector station data;
- Travel times from FMS detector station data that are displayed on freeway DMS, at the Sky Harbor International Airport Rental Car Center, and at County buildings in downtown Phoenix;
- ADOT HCRS events;
- Phoenix Fire incident data; and
- Traffic signal timing and traffic characteristic data from local jurisdictions.

A summary of RADS implementation for recent years is provided below.

Integration of third-party travel time data

- 2013: integrated third-party travel time data (Nokia/HERE) in RADS. The third-party travel time data is provided on the Traffic Message Channel, which contains pre-defined segments of roads in the County. The travel time data is updated every minute and archived in RADS.

Expansion of travel time display on DMS using RADS travel time module

- 2013: freeway DMS travel time expansion processed by RADS.
- 2013-2014: implemented DMS travel time in several jurisdictions along the Bell Road corridor. The third-party travel time data was used to compute the travel time of the corridor and post that information on the respective DMS. The jurisdictions include Surprise, Peoria, Glendale, and Sun City (managed by the County).

Assessment of RADS IT architecture

- 2013: a study was conducted to assess the IT architecture of RADS in anticipation of future growth. The study assessed the needs of RADS in terms of communications, data storage, security, and processing.

Implementation of AZTech Regional Information System (ARIS)

- 2014: MCDOT developed an advanced tool for notification and monitoring during incidents in the metropolitan area. The ARIS system uses information from RADS to display current speeds on freeways and arterials (where instrumented with detection), traffic volumes, freeway and arterial cameras, and incident status updates based on the Phoenix Fire CAD system. This helps operators receive timely notifications and understand the breadth of impact surrounding the incident location and provides a tool to manage in a cross-jurisdictional manner.

Enhancements and expanded functions

- 2015: the MAG ITS Committee approved a project for FY 2018 funding that will upgrade and enhance the RADS system to support current and future Integrated Corridor Management (ICM) needs. This includes considerations for displaying expanded arterial information, such as alternate routing, as well as additional agency connectivity to RADS.

Integrated Corridor Management

In 2014, ADOT, DPS, MCDOT, Scottsdale, ALERT, REACT, SRPMIC and MAG jointly completed an ICM Program for the Loop 101 corridor in Scottsdale. The plan includes traffic management protocols between operating and responding agencies involved in freeway re-routing of traffic and specific alternate routing options through the arterial network of Scottsdale. This Program uses a strategic combination of Scottsdale arterial signal and infrastructure control, ADOT freeway DMS messaging, ALERT freeway traffic control support, REACT arterial traffic control support, and other responding services. This ICM Program also produced a Detour Guidebook that provided specific detour planning for segments of Loop 101 through Scottsdale as well as the roles and responsibilities for each partner agency for the specific detour. An example of the Detour Guidebook is shown in **Figure 11**.

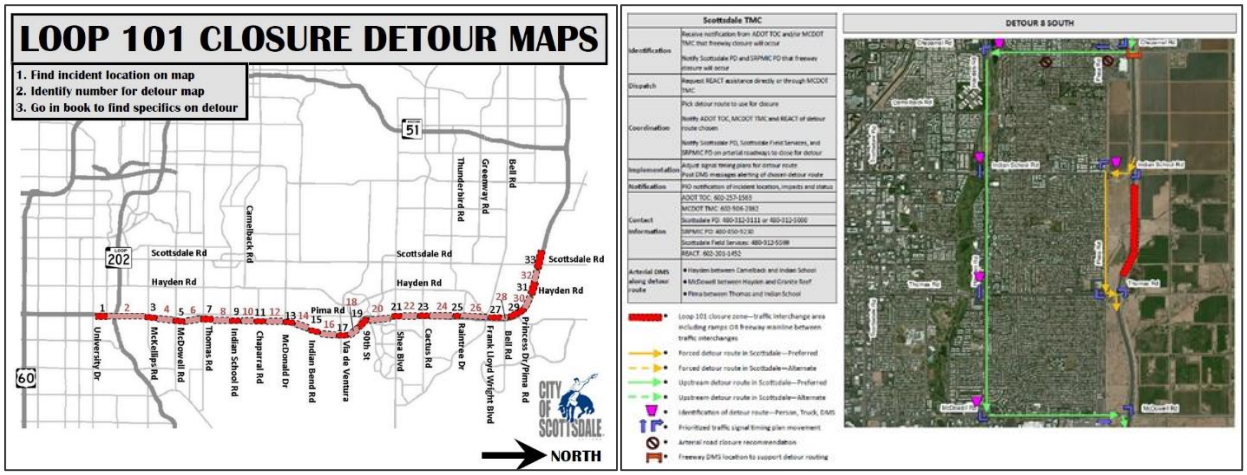


Figure 11: Example of Loop 101 Detour Maps

Since its inception, there have been a few events that required closing the Loop 101 freeway for a period of four hours for major incidents that involved extensive investigation. The partners have successfully implemented the ICM plan and traffic was diverted to an efficiently managed arterial.

In 2015, MAG received federal funding to complete the planning process for an ICM concept for the I-10 corridor between Loop 101 (Aqua Fria Freeway) in the West Valley and Loop 202 (San Tan Freeway) in the Southeast Valley that looks largely at strategies for non-recurring congestion (i.e., incidents) but will also consider strategies for recurring congestion. This project is a 24-month study that will result in a Concept of Operations, list of System Requirements and a plan for Analysis, Modeling and Simulation (AMS) to help verify and analyze the resulting concept. MCDOT will play a significant role in the development of the concept and will likely play a major role in the future implementation of the ICM concept across Maricopa County.

Traffic Incident Management

The AZTech Traffic Incident Management (TIM) Coalition was established in 2011 following TIM workshops in 2010 that addressed the need for a TIM Coalition in Arizona. Arizona DPS is the lead agency for the TIM Coalition and its members include FHWA, ADOT, MCDOT, MAG, first responders, medical examiners, towing and recovery entities, and Public Information Officers. The focus is to achieve the TIM National Unified Goal (NUG). NUG priorities include:

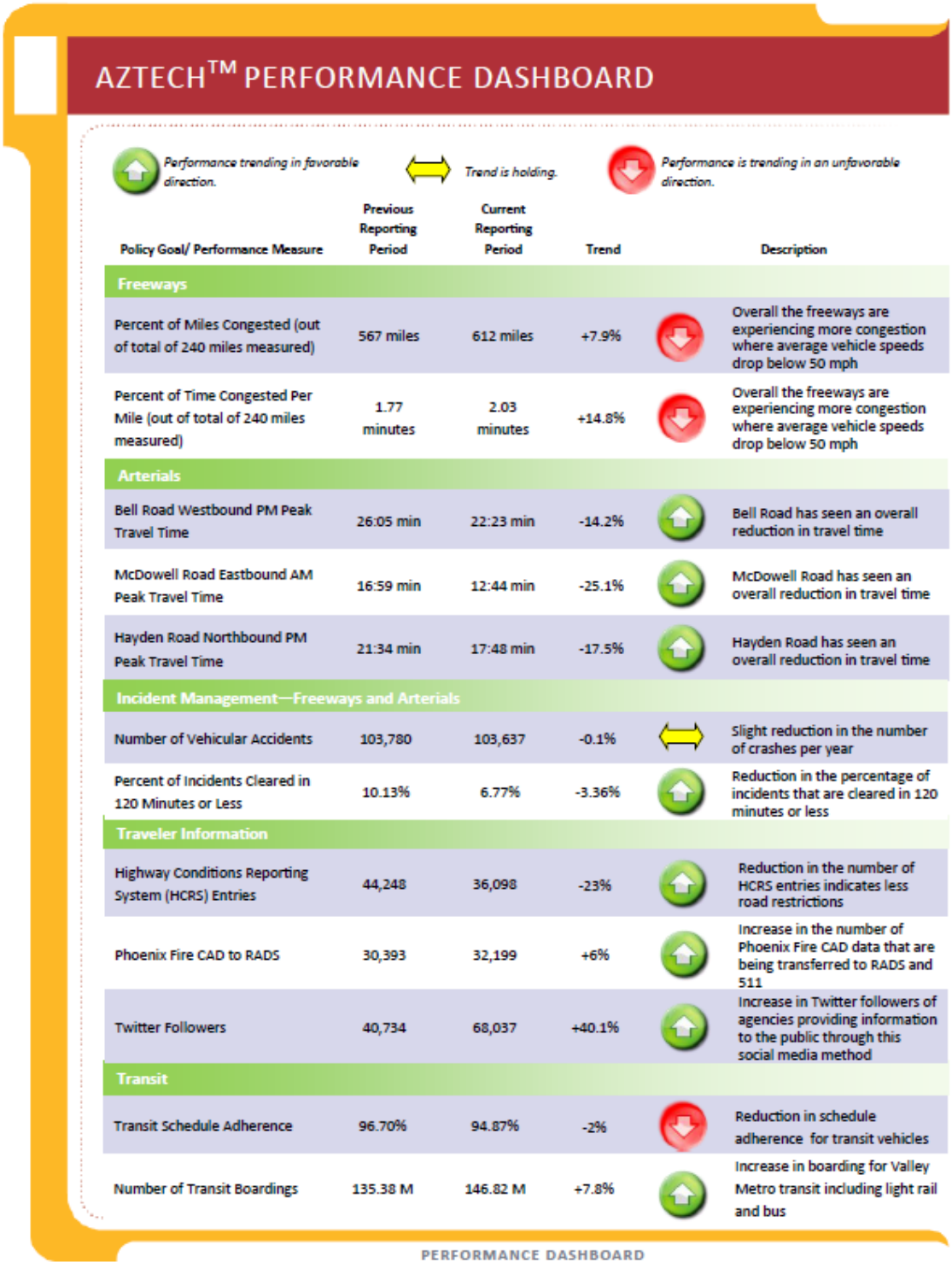
- Responder safety;
- Safe, quick clearance; and
- Prompt, reliable, interoperable communications.

The TIM Coalition has helped to improve cross-discipline communications, increase exposure to TIM training courses in Arizona, debrief secondary incidents, and conduct joint training and planning. As of July 2014, the TIM Coalition had conducted 108 TIM 4-hour classes with 2,815 first responders and produced two training videos to educate how traffic reporters play a critical role in reducing congestion and improve safety.

AZTech TM&O Performance Indicator Book

Moving Ahead for Progress in the 21st Century (MAP-21), the current highway authorization, emphasizes performance management and monitoring across multiple transportation modes. MCDOT completed its first AZTech Traffic Management and Operations Performance Indicators Book (Book) in 2011. The Book combines key regional traffic management, traffic operations, and transit performance measures that are tracked and reported throughout the Phoenix metropolitan region. The Book has been completed for years 2011 and 2013 and an update for 2015 is planned. The goal is to publish the Book every two years.

The 2013 Book identified data collection corridors in the region for measuring travel time data year-to-year. An example of the Book is shown in **Figure 12**. The Book is available electronically to a statewide and nationwide group of individuals with influence in national committees and activities. The 2015 Book is under development and is anticipated to be completed by April 2016 and published on the AZTech website.



AZTECH™ PERFORMANCE DASHBOARD

Performance trending in favorable direction. ⟺ *Trend is holding.* *Performance is trending in an unfavorable direction.*

Policy Goal/ Performance Measure	Previous Reporting Period	Current Reporting Period	Trend		Description
Freeways					
Percent of Miles Congested (out of total of 240 miles measured)	567 miles	612 miles	+7.9%	↓	Overall the freeways are experiencing more congestion where average vehicle speeds drop below 50 mph
Percent of Time Congested Per Mile (out of total of 240 miles measured)	1.77 minutes	2.03 minutes	+14.8%	↓	Overall the freeways are experiencing more congestion where average vehicle speeds drop below 50 mph
Arterials					
Bell Road Westbound PM Peak Travel Time	26:05 min	22:23 min	-14.2%	↑	Bell Road has seen an overall reduction in travel time
McDowell Road Eastbound AM Peak Travel Time	16:59 min	12:44 min	-25.1%	↑	McDowell Road has seen an overall reduction in travel time
Hayden Road Northbound PM Peak Travel Time	21:34 min	17:48 min	-17.5%	↑	Hayden Road has seen an overall reduction in travel time
Incident Management—Freeways and Arterials					
Number of Vehicular Accidents	103,780	103,637	-0.1%	⟺	Slight reduction in the number of crashes per year
Percent of Incidents Cleared in 120 Minutes or Less	10.13%	6.77%	-3.36%	↑	Reduction in the percentage of incidents that are cleared in 120 minutes or less
Traveler Information					
Highway Conditions Reporting System (HCRS) Entries	44,248	36,098	-23%	↑	Reduction in the number of HCRS entries indicates less road restrictions
Phoenix Fire CAD to RADS	30,393	32,199	+6%	↑	Increase in the number of Phoenix Fire CAD data that are being transferred to RADS and 511
Twitter Followers	40,734	68,037	+40.1%	↑	Increase in Twitter followers of agencies providing information to the public through this social media method
Transit					
Transit Schedule Adherence	96.70%	94.87%	-2%	↓	Reduction in schedule adherence for transit vehicles
Number of Transit Boardings	135.38 M	146.82 M	+7.8%	↑	Increase in boarding for Valley Metro transit including light rail and bus

PERFORMANCE DASHBOARD

Figure 12: Dashboard of the 2013 AZTech Performance Indicator Book

Innovation

MCDOT has strived to be at the leading edge of innovation in transportation both locally and nationally. This section provides a brief status update of MCDOT's lead or involvement with innovative projects and programs.

SMARTDrive

Through a federal initiative called "Connected Vehicles", the U.S. Department of Transportation (USDOT) is working to leverage ITS technology to improve traffic operations to support public safety and surface transportation mobility. MCDOT and its partners, ADOT, FHWA, and the University of Arizona, are moving this initiative forward to develop and demonstrate advanced ITS applications that integrate vehicles together with road systems in the County.

MCDOT's SMARTDrive Program℠, which originated in 2007, represents an evolution of connected vehicle research, testing and implementation in Anthem, a community in unincorporated Maricopa County. Initiated as a research project through the Arizona Transportation Research Center, SMARTDrive has successfully demonstrated live operations and connectivity in a test bed environment, and has been established as a formal test bed for other connected vehicle technology and application developers to use. A map of the existing national test beds is shown in **Figure 13**.

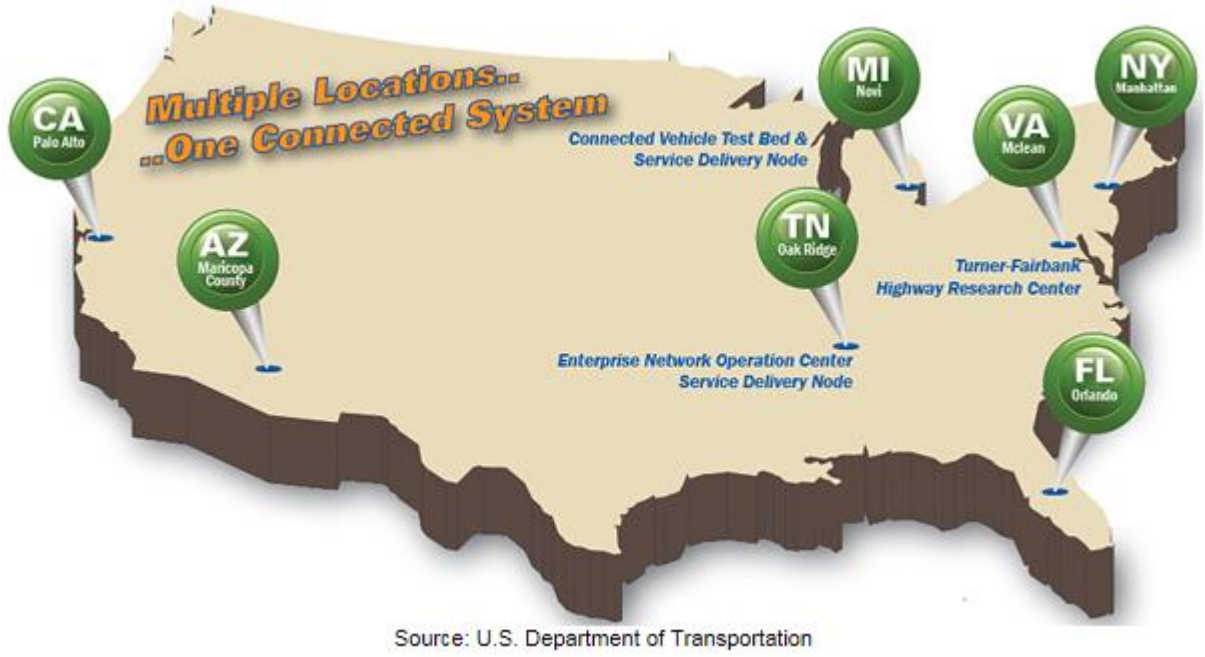


Figure 13: National Connected Vehicle Test Beds

The MCDOT SMARTDrive Test bed will continue to focus on traffic signal operations safety and mobility applications. MCDOT has deployed applications under the USDOT and Connected Vehicle Pooled Fund Program Multi Modal Intelligent Traffic Signal System (MMITSS) initiative. The test bed in Anthem will continue to be expanded on in the upcoming years and demonstrated to local, state, and national stakeholders.

Key components of the SMARTDrive demonstrations include:

- Six signalized intersections equipped with Dedicated Short-Range Communications (DSRC) Radios, WiFi and Bluetooth readers;
- Traffic signal priority application installed;
- Representative emergency vehicle and transit vehicle used to test application priority logic;

- Field test for emergency and transit applications;
- Pedestrian crosswalk application using smartphones to display crossing status; and
- Collection of detailed vehicle and traffic operations data for post-operational analysis.

As a result of these achievements and the County's commitment to ongoing innovative research, testing and implementation, the County is recognized by USDOT as one of six Connected Vehicle test beds in the nation. In 2015, the FHWA released a federal grant funding opportunity to advance Connected Vehicle implementation and MCDOT, together with ADOT and University of Arizona, submitted an application for the grant. The partners are awaiting to hear the outcome of the grant program, and in the meantime, continue to proactively develop concept and applications related to connected vehicles.

ARIZONA CONNECTED VEHICLES
Maricopa County Deployment

Safety Management System

Purpose of the Safety Management System

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

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

MCDOT Safety Management Procedures

MCDOT makes every effort to respond quickly to identified safety problems. These problems are frequently identified through public complaints about unsafe road conditions, first-hand observation by County staff members, and reviews of recent crash records for County roads. When an actual or potential problem is encountered, a detailed engineering analysis may be conducted and recommendations are made to correct the situation. These recommendations are handled in one of three ways based on the recommendation:

1. Relatively simple and inexpensive solutions are handled through the MCDOT maintenance process.
2. More complex problems are handled by the MCDOT Traffic Engineering Division.
3. Complex problems involving significant changes that require substantial funding are handled through the MCDOT TIP.

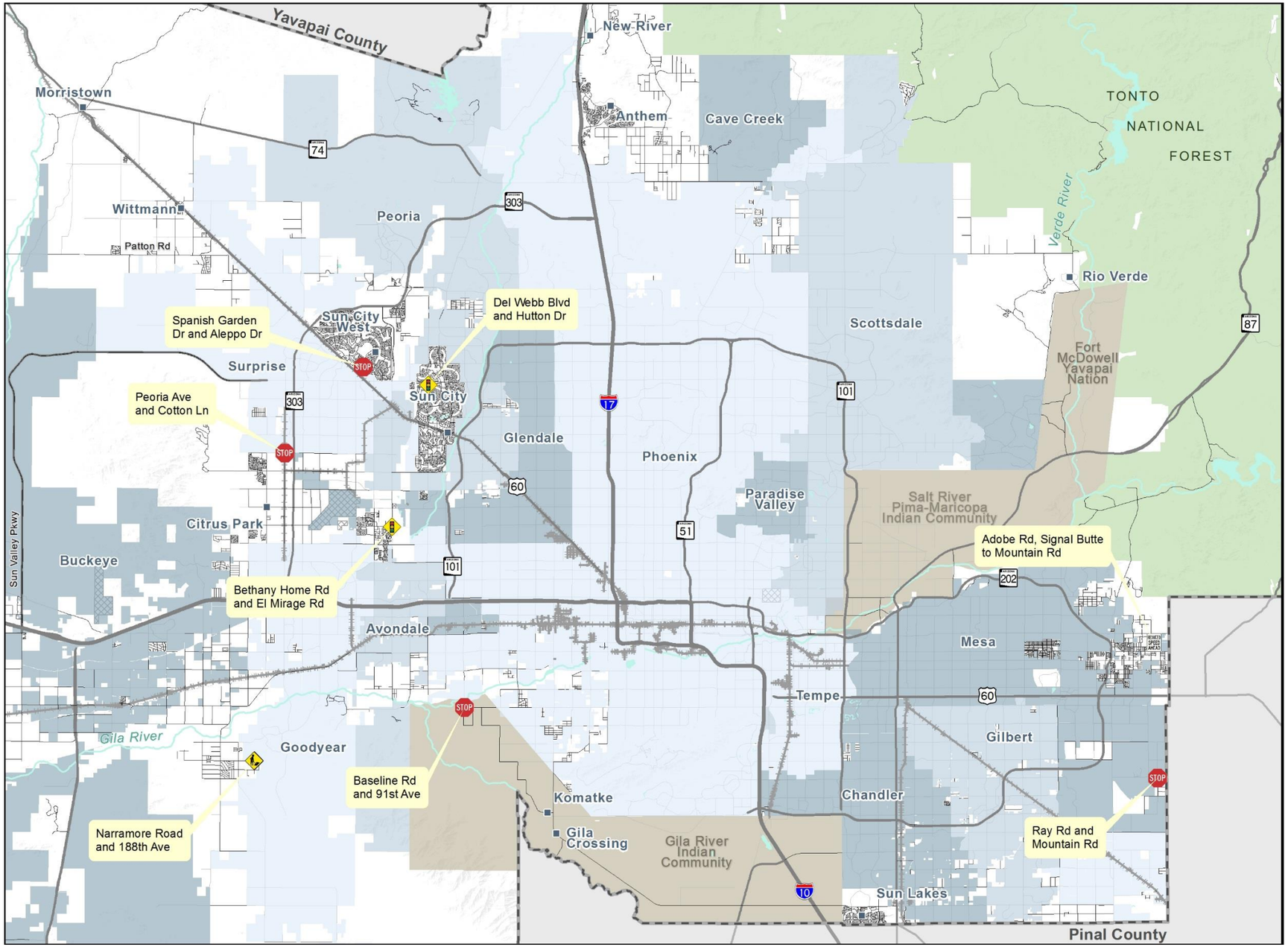
Evaluation of Safety

MCDOT Traffic Engineering is continuing its program to identify and evaluate locations with potential safety concerns and prioritize and schedule improvements for upcoming years. 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 County roads to identify locations with potential safety concerns. At these locations, crash history is used to evaluate the road and determine if improvements are required. Crash locations are plotted as indicated on ADOT crash reports. If five or more correctable crashes are detected within a road segment or intersection within a 12-month period, an engineering evaluation is conducted to determine if an action should be taken.

The Manual on Uniform Traffic Control Devices (MUTCD) provides guidance to determine if an identified safety problem meets the criteria for ('warrants') the installation of multi-way stop control or traffic signals. There are additional warrant factors that may also be used to determine if an intersection needs improvements such as additional turn lanes or other safety items. Projects that meet the 'warrant' criteria are typically implemented in the order in which they are identified. The average daily traffic, road function, posted speed, and scheduled transportation improvement projects are also used to help determine if and when improvements are required.

Spot Safety Improvement Project Accomplishments

In FY 2015, eight safety improvement projects were implemented by the MCDOT Traffic Engineering Division. The safety improvement projects that were completed in FY 2015 can be found in **Figure 14**.



FY 2015 Safety Improvements

- Guardrail Reconstruction
- New Signal
- Signal Update
- Signs/Stop Bars
- Traffic Calming

- Other Communities
- Interstate
- State Route/US Highway
- County Maintained Roadway*
- Railroad
- National Forest
- Indian Reservation
- Military
- Incorporated Areas
- County Boundary

**Includes roads that are a) fully or partially owned and operated by MCDOT; or b) maintained by MCDOT through an intergovernmental agreement or through courtesy grading pursuant to Arizona Revised Statute 28-6705*

0 5 10 Miles

N

Source: Maricopa County; Flood Control District of Maricopa County (FCD); Arizona Department of Transportation (ADOT); Arizona State Land Resource Information System (ALRIS)

Figure 14: FY 2015 Safety Improvements on County Roads

County Crash Statistics

The County crash rate summarizes the historical safety performance of the entire County-owned or maintained road system. The County crash rate measures the annual number of crashes per million vehicle miles of travel (MVMT) on the County road system. **Table 5** shows that the County crash rate in 2015 was the same as it was in 2014, and both are below the 2010-2014 five-year average.

MCDOT also tracks crash rates for crashes involving fatalities, single vehicles, pedestrians, bicycles, injuries, and work zones. Most of these crash rates decreased in 2014 compared to 2013, with the exception of the bicycle crash rate which increased in 2014 as compared to 2013. Further, all of the crash rates, except for that of bicycle crashes, are below the five-year average rate.

Table 5 also compares the number of crashes to the population in unincorporated portions of the County. The total number of crashes in the unincorporated County increased in 2014 compared to 2013. Although the unincorporated County population also increased in 2014, there was a net increase in the number of crashes per 100,000 population in 2014. Other types of crashes generally declined in 2014 compared to 2013 on a per 100,000 population basis, with crashes involving bicycles being the exception.

Safety Focus Areas

The state of Arizona has established twelve Emphasis Areas within the Arizona Strategic Highway Safety Plan (SHSP). These Emphasis areas indicate what ADOT and other state agencies are focused on in order to improve safety in the state. The twelve Arizona SHSP Emphasis Areas are:

- Speeding and Aggressive Driving;
- Impaired Driving;
- Occupant Protection;
- Motorcycles;
- Distracted Driving;
- Roadway Infrastructure and Operations Improvement;
- Age-related;
- Heavy Vehicles/Buses/Transit;
- Non-Motorized Users;
- Natural Risks;
- Traffic Incident Management;
- Inter-jurisdictional Coordination;
- Data Analysis Improvements; and
- Policy Initiatives.

Based on the Arizona SHSP initiatives, MAG developed its own set of Action Areas for the MAG Strategic Transportation Safety Plan (STSP). These Action Areas were developed to accompany and supplement the statewide Emphasis Areas, recognizing that the MAG planning area is largely urbanized while most of the State highway system traverses areas that are more rural.

Table 5: County Crash Rates 2010 - 2014

Factors	2010	2011	2012	2013	2014	2010-2014 5-Year Average	2014 vs. 5-Year Average
County Crash Rate*	1.30	1.01	1.12	1.11	1.11	1.13	-2%
County Fatality Rate**	1.13	1.49	1.26	1.61	1.55	1.41	10%
Arizona Fatality Rate**	1.27	1.39	1.37	1.39	1.24	1.33	-7%
U.S. Fatality Rate**	1.11	1.10	1.14	1.10	1.07	1.10	-3%
Single Vehicle Crash Rate*	0.255	0.214	0.238	0.229	0.208	0.229	-9%
Pedestrian Crash Rate*	0.014	0.010	0.008	0.011	0.009	0.011	-16%
Bicycle Crash Rate*	0.018	0.015	0.015	0.014	0.017	0.016	10%
Injury Crash Rate*	0.204	0.160	0.200	0.191	0.184	0.188	-2%
Work Zone Related Rate*	0.036	0.022	0.025	0.017	0.000	0.020	-98%
Total County Crashes	2,865	2,641	2,841	2,901	3,014	2,852	6%
Miles of County Owned Roads That Have Traffic Counts	1,616	1,259	1,249	1,259	1,381	1,353	2%
Total County Road Miles	2,353	2,393	2,392	2,462	2,464	2,413	2%
Million Vehicle Miles/Day	6.0543	7.1479	6.9488	7.1570	7.4437	6.9503	7%
VMT/Mile	2,573	2,987	2,905	2,907	3,021	2,879	5%
% Network with Traffic Counts	68.68%	52.61%	52.22%	51.14%	56.05%	56.14%	0%
County Population	245,801	274,673	276,634	288,366	291,033	275,301	6%
Crashes Per 100K Pop	1,165.6	961.5	1,027.0	1,006.0	1,035.6	1,039.1	0%
Fatal Crashes	24	34	27	40	36	32	12%
Fatal/100K Pop	9.76	12.38	9.76	13.87	12.37	11.63	6%
County Fatalities	25	39	32	42	42	36	17%
County Fatalities/100K Pop	10.17	14.20	11.57	14.56	14.43	12.99	11%
Single Vehicle Crashes	563	558	604	597	564	577	-2%
Single Vehicle/100K Pop	229.05	203.15	218.34	207.03	193.79	210.27	-8%
Pedestrian Crashes	30	27	21	30	24	26	-9%
Pedestrian/100K Pop	12.20	9.83	7.59	10.40	8.25	9.66	-15%
Bicycle Crashes	39	38	38	37	47	40	18%
Bicycle/100K Pop	15.87	13.83	13.74	12.83	16.15	14.48	12%
Injury Crashes	451	417	506	499	501	475	6%
Injury/100K Pop	183.48	151.82	182.91	173.04	172.15	172.68	0%
Work Zone Related	79	57	64	45	1	49	-98%
Work Zone/100K Pop	32.14	20.75	23.14	15.61	0.34	18.40	-98%

Source: Crash data is from ADOT, modified by MCDOT. Only crashes on County-owned or maintained roads are included. All data sources reflect calendar year except for mileage information which is by fiscal year.

*Crashes per MVMT
**Fatalities per 100 MVMT

MAG established the following Action Areas:

- Eliminate Death and Injury from Speeding and Aggressive Driving Behavior;
- Eliminate Impaired Driving;
- Eliminate Death and Injury Related to Intersections;
- Eliminate Death and Injury Involving Young Roadway Users;
- Eliminate Death and Injury Involving Vulnerable Road Users – Bicyclists, Pedestrians, Persons with Disabilities; and
- Improve Data Collection, Quality, Availability, Integration, and Analysis for Decision-Making.

Based on these two sets of emphasis/action areas, MCDOT has identified four main Focus Areas for its safety program. These Focus Areas were identified as those that MCDOT, as a transportation agency, could most directly influence and take actions to improve. The MCDOT Focus Areas are:

- Intersection Crashes;
- Fatal and Incapacitating Injury Crashes;
- Non-motorized (Bicycle and Pedestrian) Crashes; and
- Work Zone Crashes.

Intersection Crashes

Table 6 provides a summary of fatal and incapacitating injury crashes that have occurred on County roads between 2010 and 2014. Crashes include those that occurred within intersections as well as those that were not related to intersections. In total, there were 407 reported intersection crashes and 98 non-intersection crashes that were fatal or resulted in incapacitating injury over the five-year period.

The most prevalent type of fatal and incapacitating injury intersection crash was single vehicle crashes, with 33% of fatal crashes and 25% of incapacitating injury crashes being single vehicle crashes. The most prevalent type of fatal and incapacitating injury non-intersection crash was also single vehicle crashes, with 71% of fatal crashes and 46% of incapacitating injury crashes being non-intersection single vehicle crashes.

With intersection crashes being such a large percentage of total crashes, MCDOT will continue to take actions such as the current process for performing safety analyses on intersections that experience five or more reported crashes over a 12-month period.

Table 6: Intersection and Non-Intersection Fatal and Incapacitating Injury Crashes

	Intersection Crashes		Non-Intersection Crashes	
Type of Crash	Fatal (% of Total)	Incapacitating Injury (% of Total)	Fatal (% of Total)	Incapacitating Injury (% of Total)
Angle	24%	27%	0%	9%
Head On	4%	4%	0%	2%
Left Turn	10%	20%	0%	9%
Rear End	9%	15%	6%	17%
Sideswipe	1%	3%	0%	9%
Single Vehicle	33%	25%	71%	46%
Other	19%	6%	24%	9%
Total	100%	100%	100%	100%

Fatal Crashes

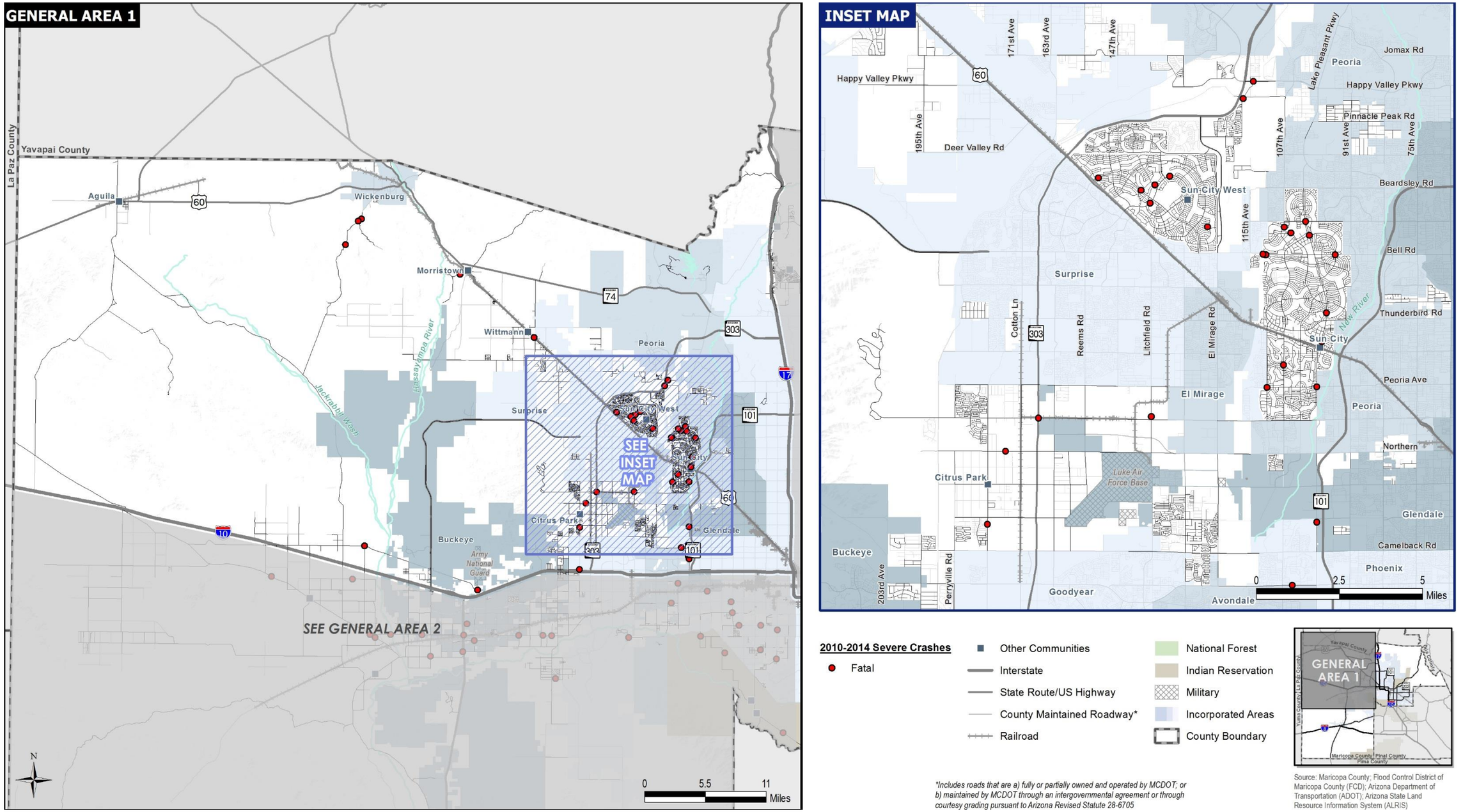
Maps labeled **Figure 15** show the number and location of fatal crashes reported between 2010 and 2014. While fatal crashes represent a small percentage of total crashes, they represent a large percentage of the societal cost in terms of medical expense and lost wages. Reducing the frequency of these high-severity crashes has become a priority at the federal, state, and local level. The County fatality rate (found in Table 5) decreased in 2014 to 1.55 fatalities per 100 MVMT compared to 1.61 in 2013, but this value is still above the historical average fatality rate of 1.41.

Bicycle and Pedestrian Crashes

Maps labeled **Figure 16** show the number and location of fatal bicycle and pedestrian crashes on County roads. While bicycle and pedestrian crashes represent a small percentage of total crashes, the likelihood of severe injury or death is high when a vehicle hits a bicyclist or pedestrian. In 2014, the bicycle crash rate for the County was 0.017 crashes per MVMT as compared to 0.014 in 2013; the pedestrian crash rate was 0.009 in 2014 as compared to 0.011 in 2013. The 2014 bicycle crash rate is higher than the five-year average while the 2014 pedestrian crash rate is lower the five-year average crash rate.

Work Zone Crashes

Figure 17 depicts fatal work zone crashes between 2010 and 2014. MCDOT places a high priority on safety in and around work zones. There was one reported work zone-related crash on MCDOT facilities in 2014. This is significantly fewer crashes than in 2013, when 45 work zone-related crashes were reported. Between 2013 and 2014, the work zone-related crash rate was reduced from 0.017 to 0.000, which is much lower than the historical average of 0.020.

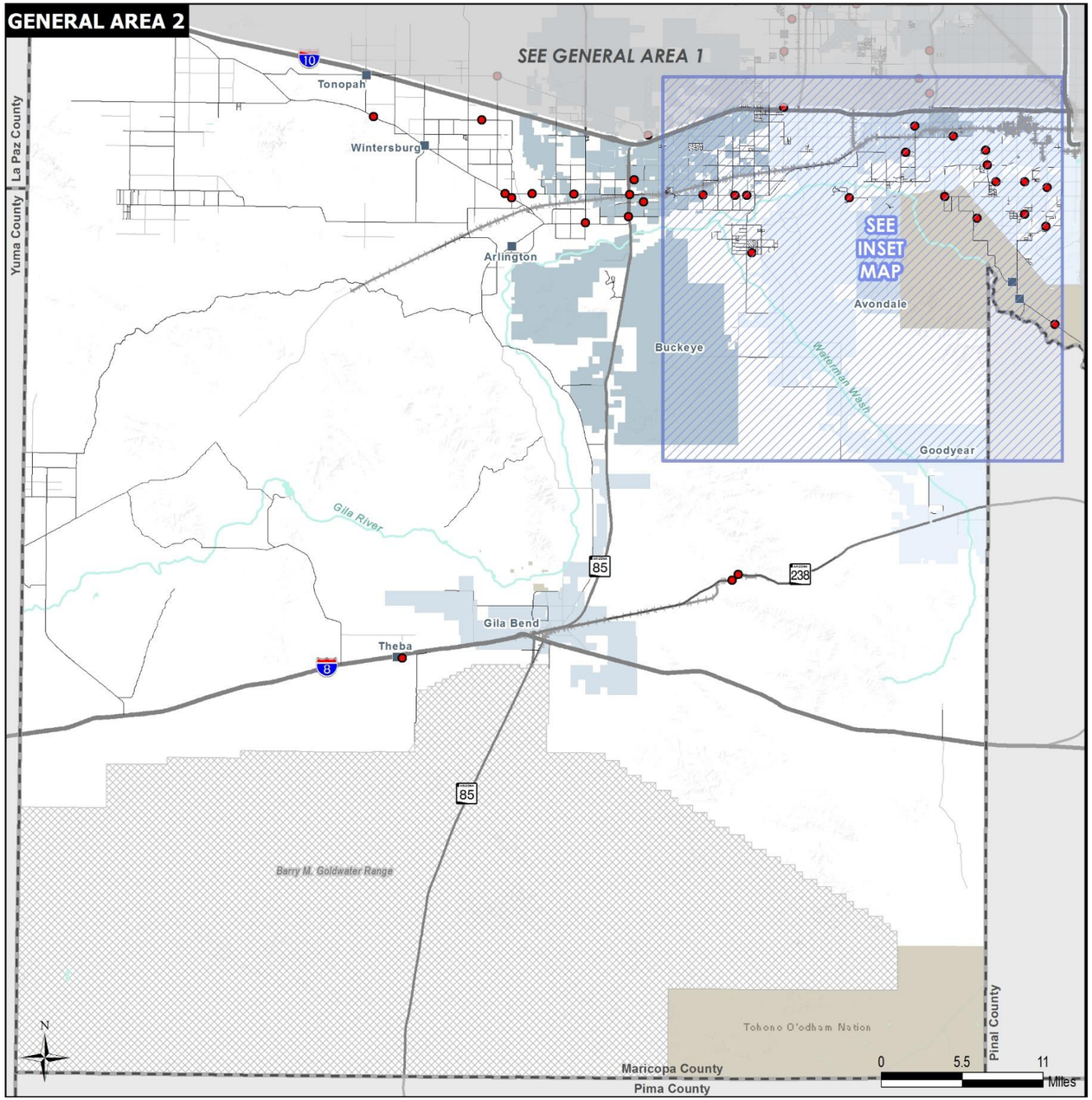


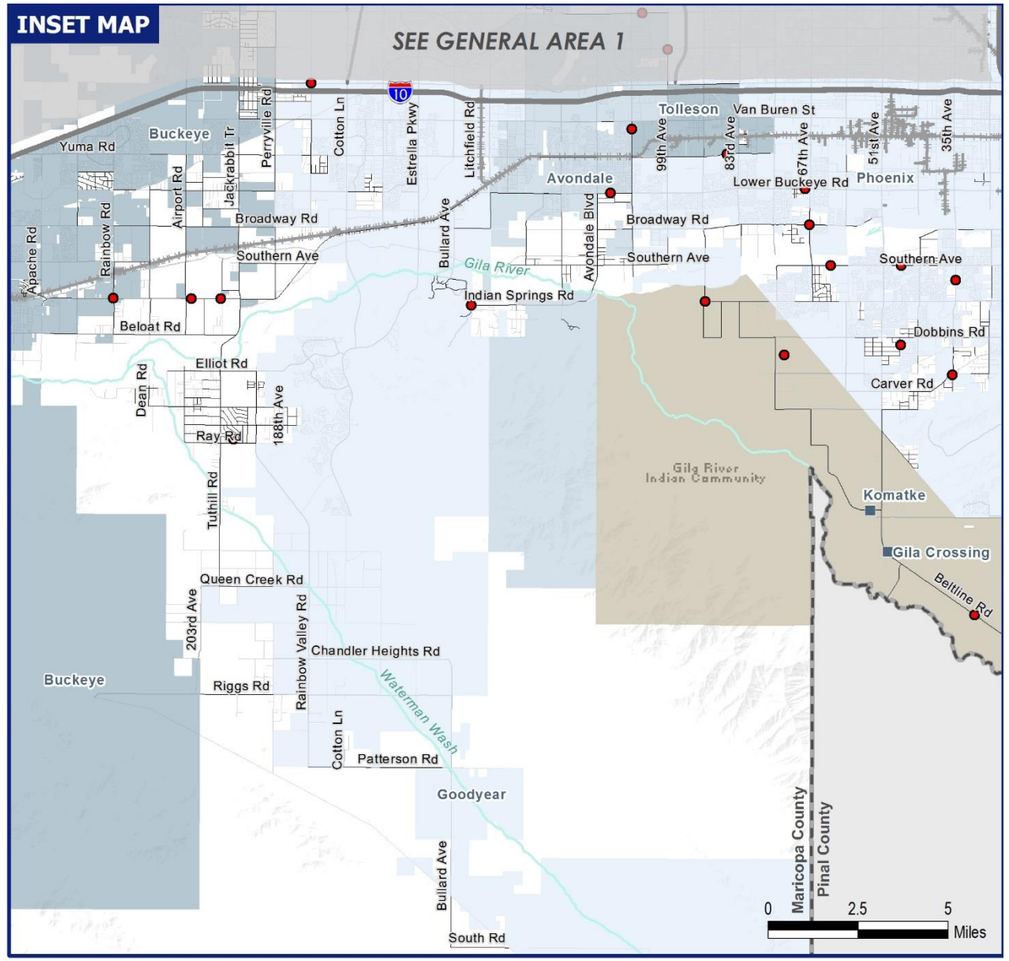
**Includes roads that are a) fully or partially owned and operated by MCDOT; or b) maintained by MCDOT through an intergovernmental agreement or through courtesy grading pursuant to Arizona Revised Statute 28-6705*

Source: Maricopa County; Flood Control District of Maricopa County (FCD); Arizona Department of Transportation (ADOT); Arizona State Land Resource Information System (ALRIS)

Figure 15: Fatal Crashes on County Roads 2010-2014

Area 1

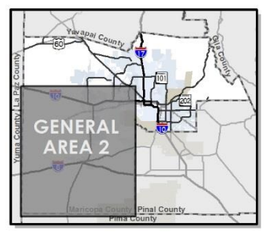




2010-2014 Severe Crashes

- Fatal

- Other Communities
- Interstate
- State Route/US Highway
- County Maintained Roadway*
- Railroad
- National Forest
- Indian Reservation
- Military
- Incorporated Areas
- County Boundary

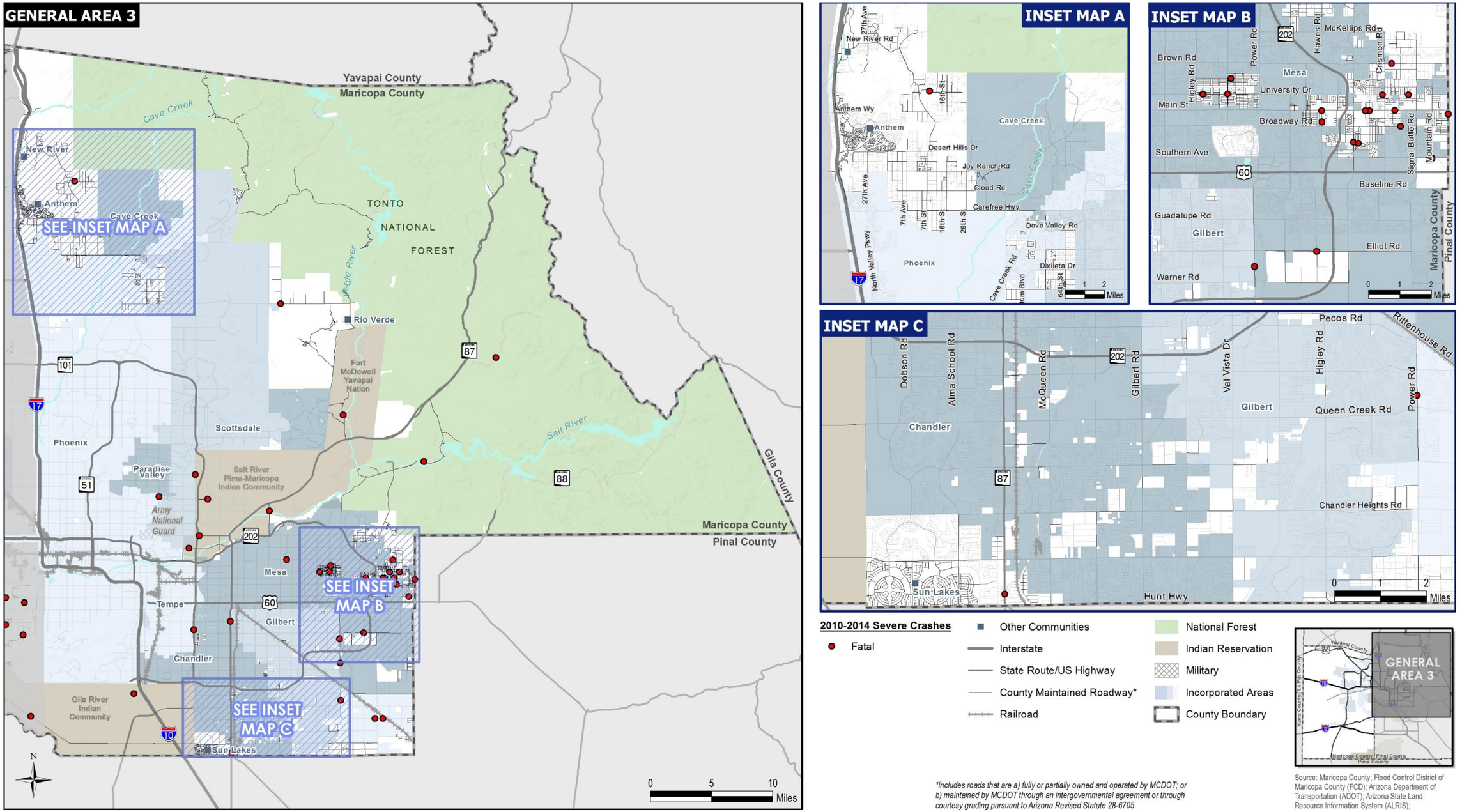


*Includes roads that are a) fully or partially owned and operated by MCDOT; or b) maintained by MCDOT through an intergovernmental agreement or through courtesy grading pursuant to Arizona Revised Statute 28-6705

Source: Maricopa County; Flood Control District of Maricopa County (FCD); Arizona Department of Transportation (ADOT), Arizona State Land Resource Information System (ALRIS);

Figure 15: Fatal Crashes on County Roads 2010-2014

Area 2

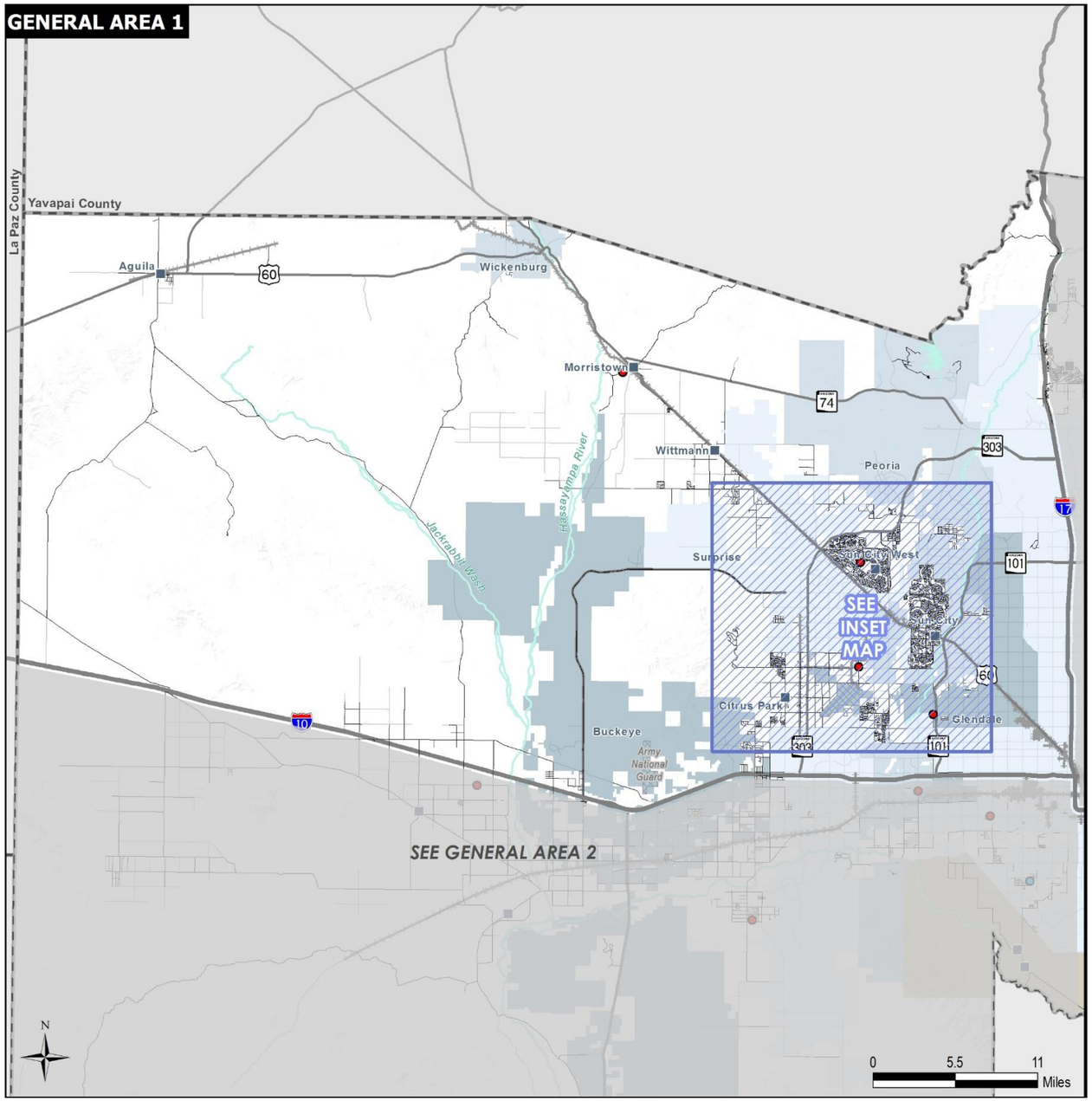


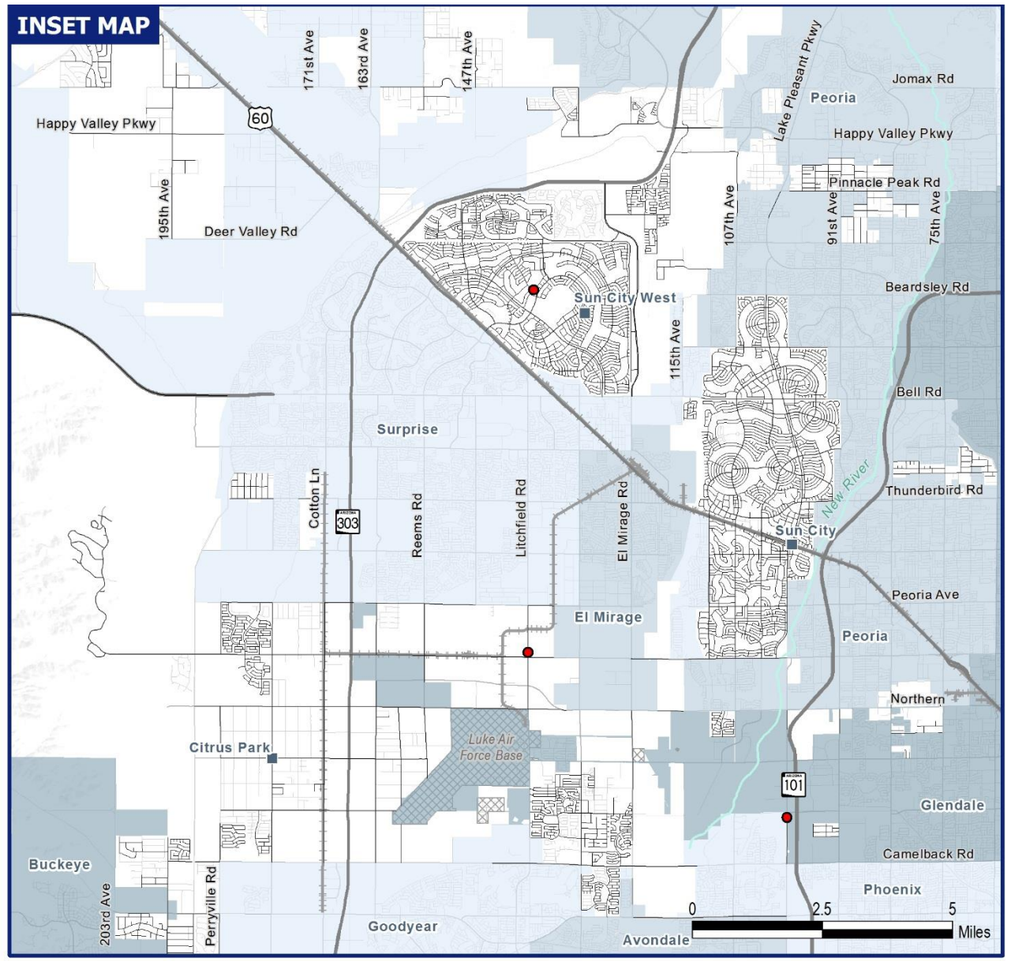
**Includes roads that are a) fully or partially owned and operated by MCDOT; or b) maintained by MCDOT through an intergovernmental agreement or through courtesy grading pursuant to Arizona Revised Statute 28-6705*

Source: Maricopa County; Flood Control District of Maricopa County (FCD); Arizona Department of Transportation (ADOT); Arizona State Land Resource Information System (ALRIS);

Figure 15: Fatal Crashes on County Roads 2010-2014

Area 3





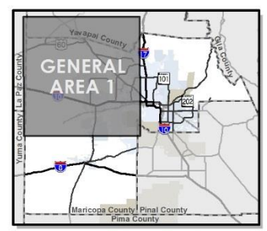
2010-2014 Bicycle and Pedestrian Crashes

Pedestrian Crashes
- Fatal

Bicycle Crashes
- Fatal

- Other Communities
- Interstate
- State Route/US Highway
- County Maintained Roadway*
- Railroad
- National Forest
- Indian Reservation
- Military
- Incorporated Areas
- County Boundary

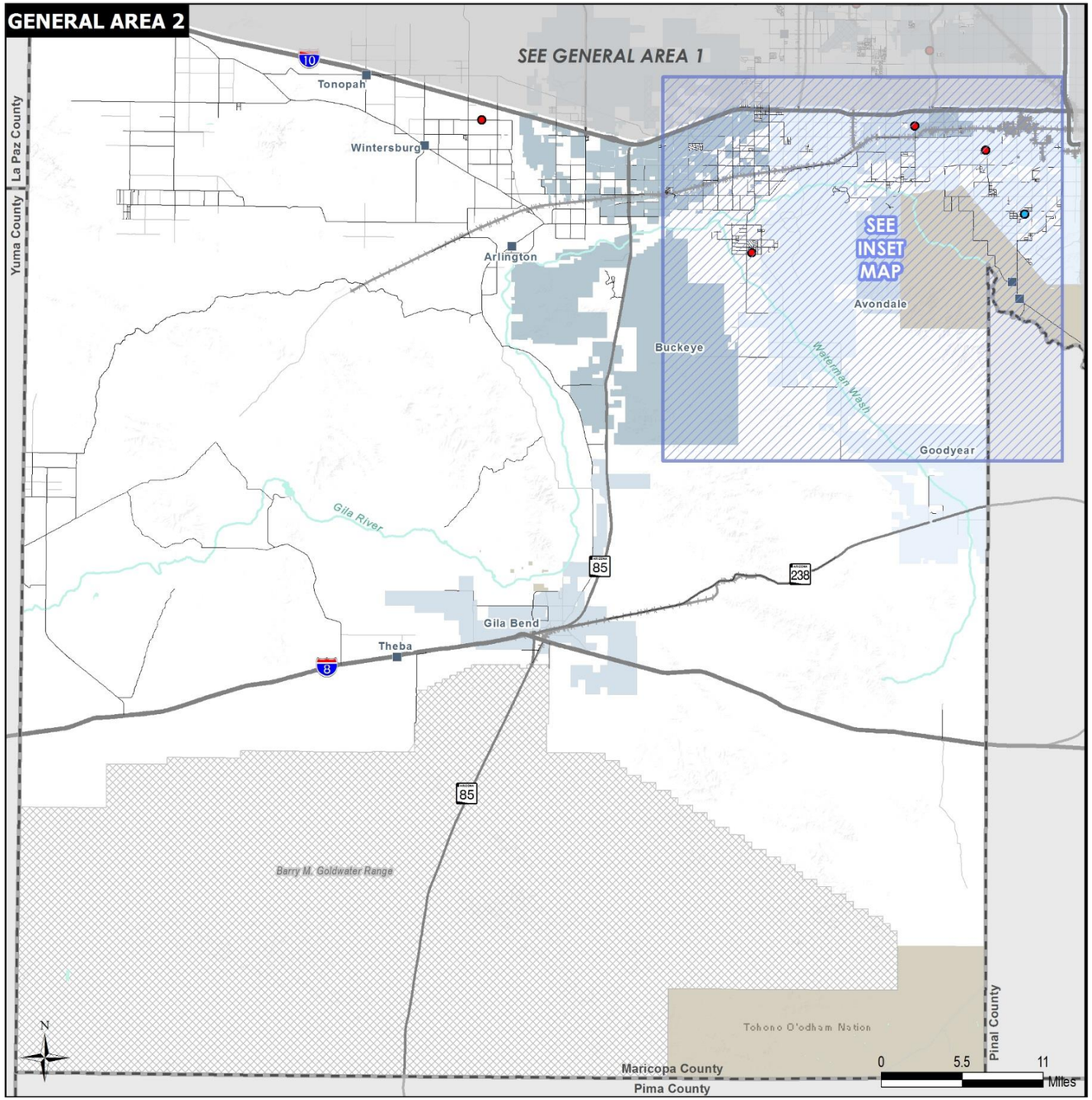
**Includes roads that are a) fully or partially owned and operated by MCDOT; or b) maintained by MCDOT through an intergovernmental agreement or through courtesy grading pursuant to Arizona Revised Statute 28-6705*

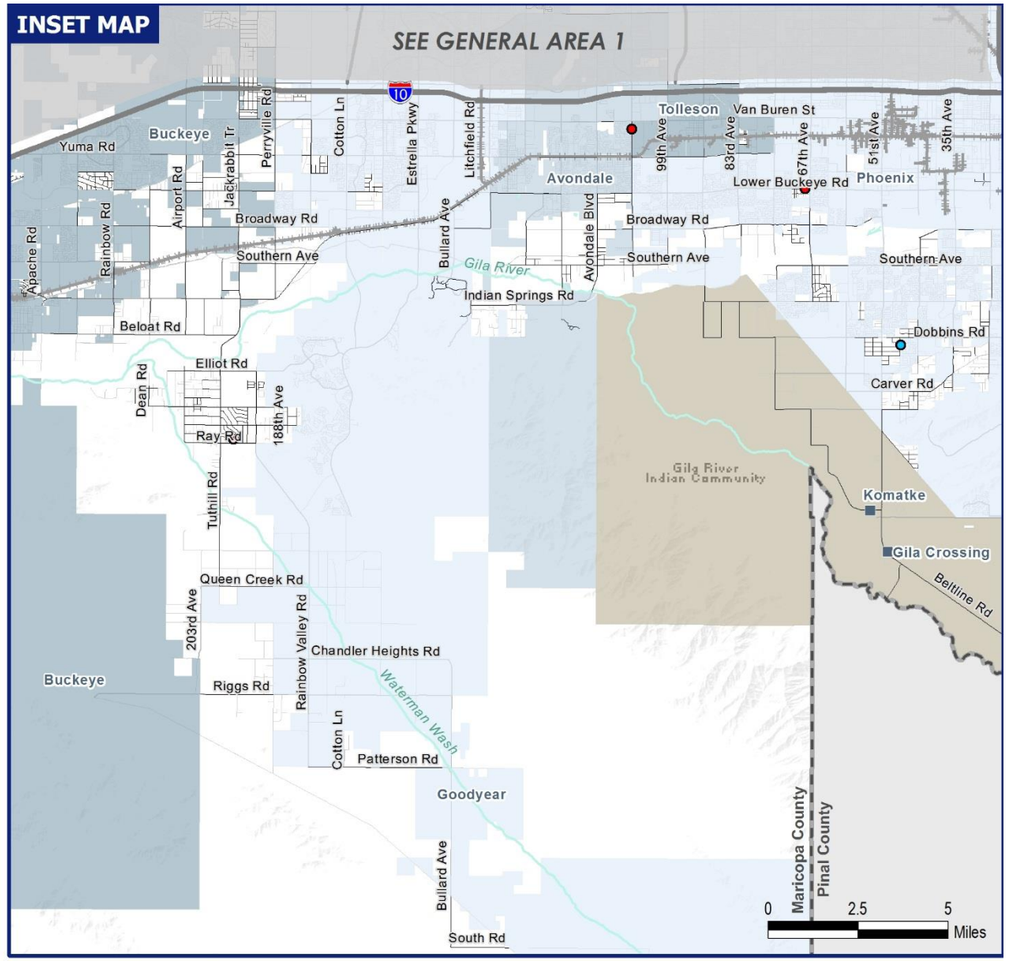


Source: Maricopa County; Flood Control District of Maricopa County (FCD); Arizona Department of Transportation (ADOT); Arizona State Land Resource Information System (ALRIS)

Figure 16: Bicycle and Pedestrian Fatal Crashes on County Roads 2010-2014

Area 1





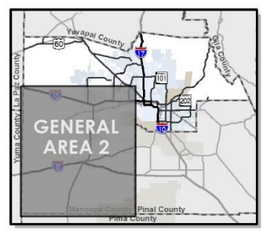
2010-2014 Bicycle and Pedestrian Crashes

Pedestrian Crashes
- Fatal

Bicycle Crashes
- Fatal

- Other Communities
- Interstate
- State Route/US Highway
- County Maintained Roadway*
- Railroad
- National Forest
- Indian Reservation
- Military
- Incorporated Areas
- County Boundary

**Includes roads that are a) fully or partially owned and operated by MCDOT; or b) maintained by MCDOT through an intergovernmental agreement or through courtesy grading pursuant to Arizona Revised Statute 28-6705*



Source: Maricopa County; Flood Control District of Maricopa County (FCD); Arizona Department of Transportation (ADOT), Arizona State Land Resource Information System (ALRIS);

Figure 16: Bicycle and Pedestrian Fatal Crashes on County Roads 2010-2014

Area 2

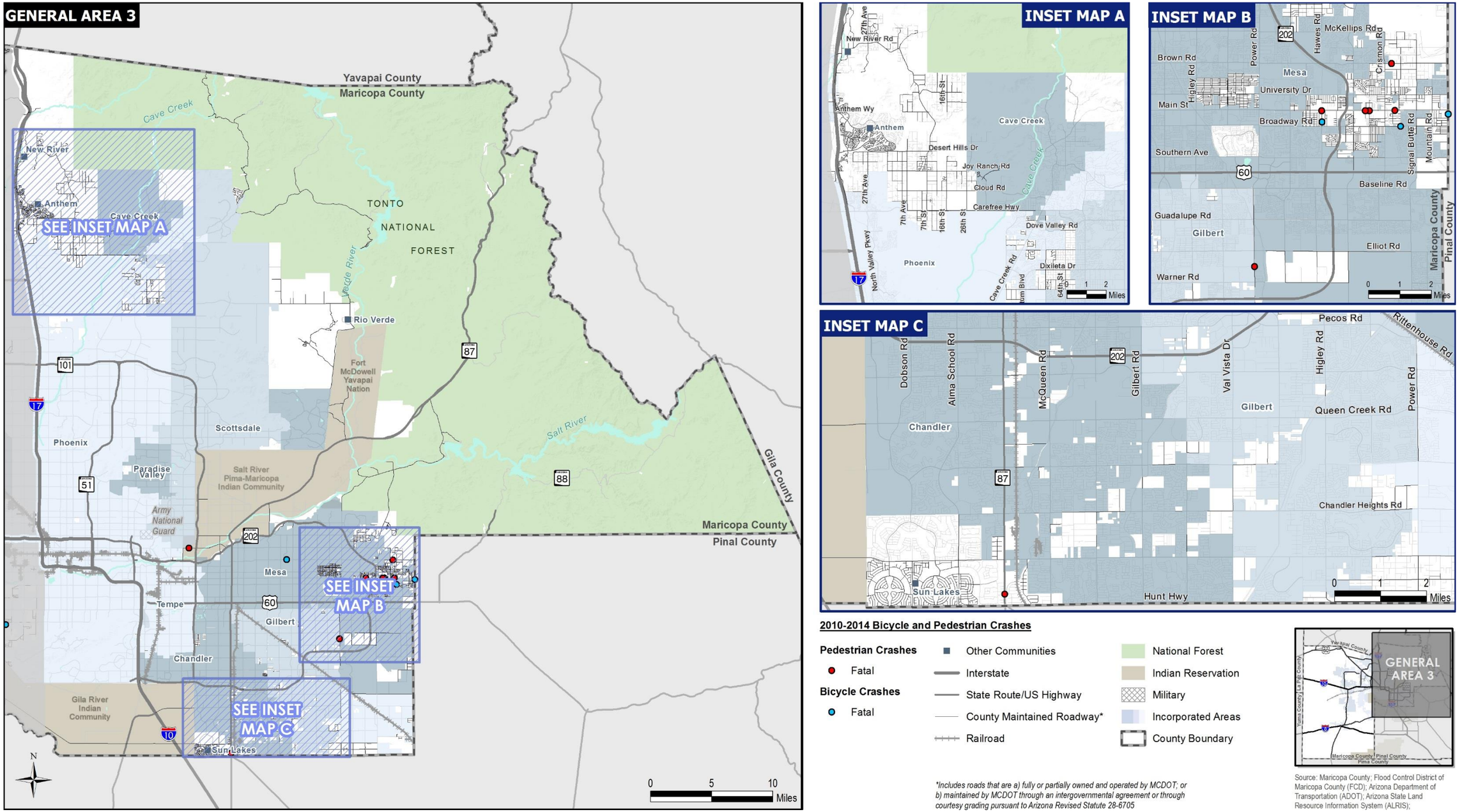
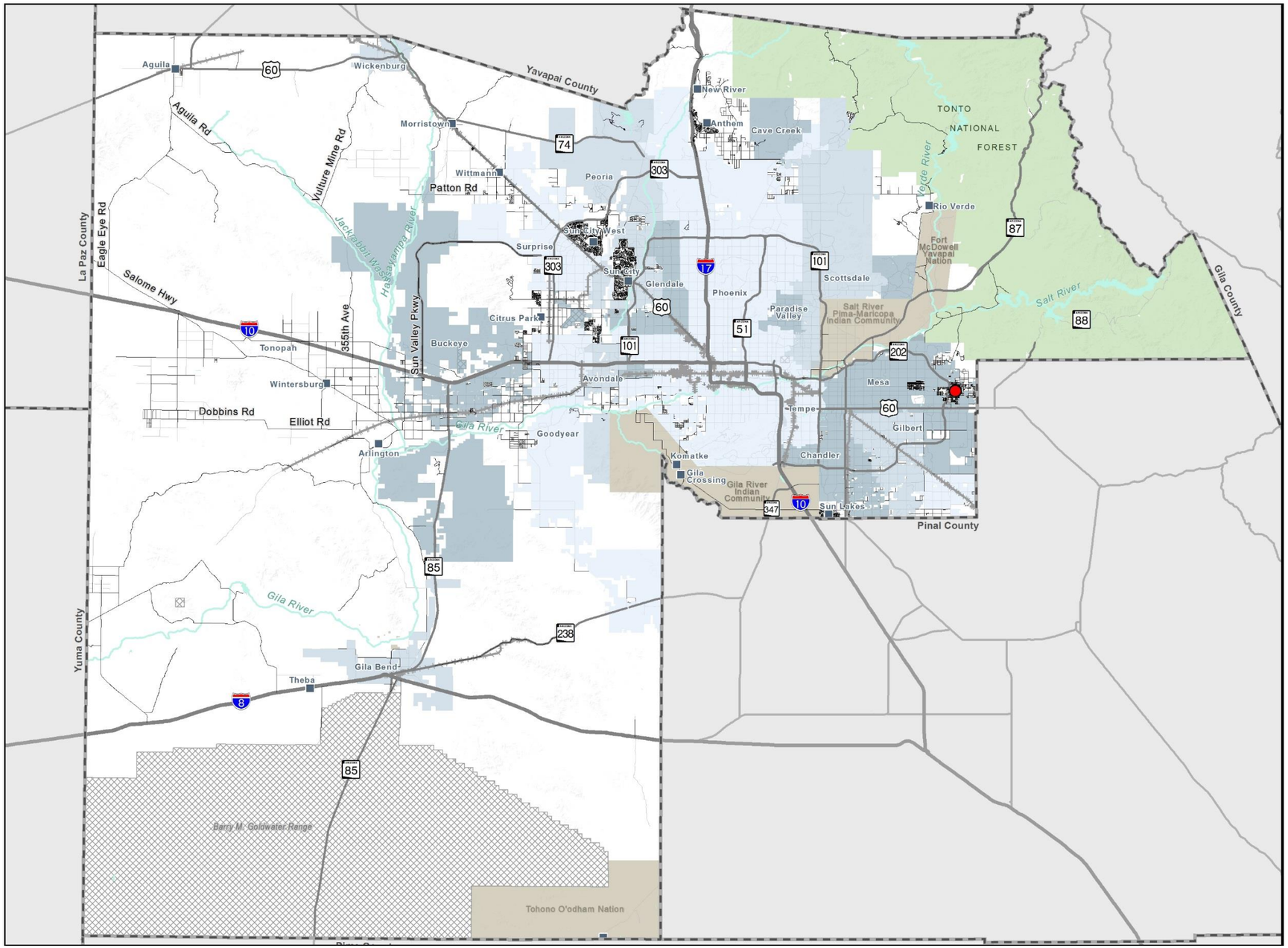


Figure 16: Bicycle and Pedestrian Fatal Crashes on County Roads 2010-2014

Area 3



2010-2014 Work Zone Crashes

- Fatal
- Other Communities
- Interstate
- State Route/US Highway
- County Maintained Roadway*
- Railroad
- National Forest
- Indian Reservation
- Military
- Incorporated Areas
- County Boundary

*Includes roads that are a) fully or partially owned and operated by MCDOT; or b) maintained by MCDOT through an intergovernmental agreement or through courtesy grading pursuant to Arizona Revised Statute 28-6705

0 10 20 Miles

N

Source: Maricopa County; Flood Control District of Maricopa County (FCD); Arizona Department of Transportation (ADOT); Arizona State Land Resource Information System (ALRIS)

Figure 17: Work Zone Fatal Crashes on County Roads 2010-2014

Low Volume Road Management System

Introduction

In FY 2000, MCDOT initiated a formal program for paving low volume roads (LVR) in the County. A multi-year capital improvement program for paving low traffic volume unpaved roads was then created and implemented. This section documents the number and miles of unpaved LVRs that were paved by MCDOT in FY 2015.

Background

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

Unpaved County Road System

In FY 2015, the County owned or maintained 2,454 centerline miles of roads of which approximately 398 miles are unpaved. These roads are located in the unincorporated parts of the County, which include urban or near-urban conditions as well as rural locations.

MCDOT categorizes unpaved roads into one of five categories:

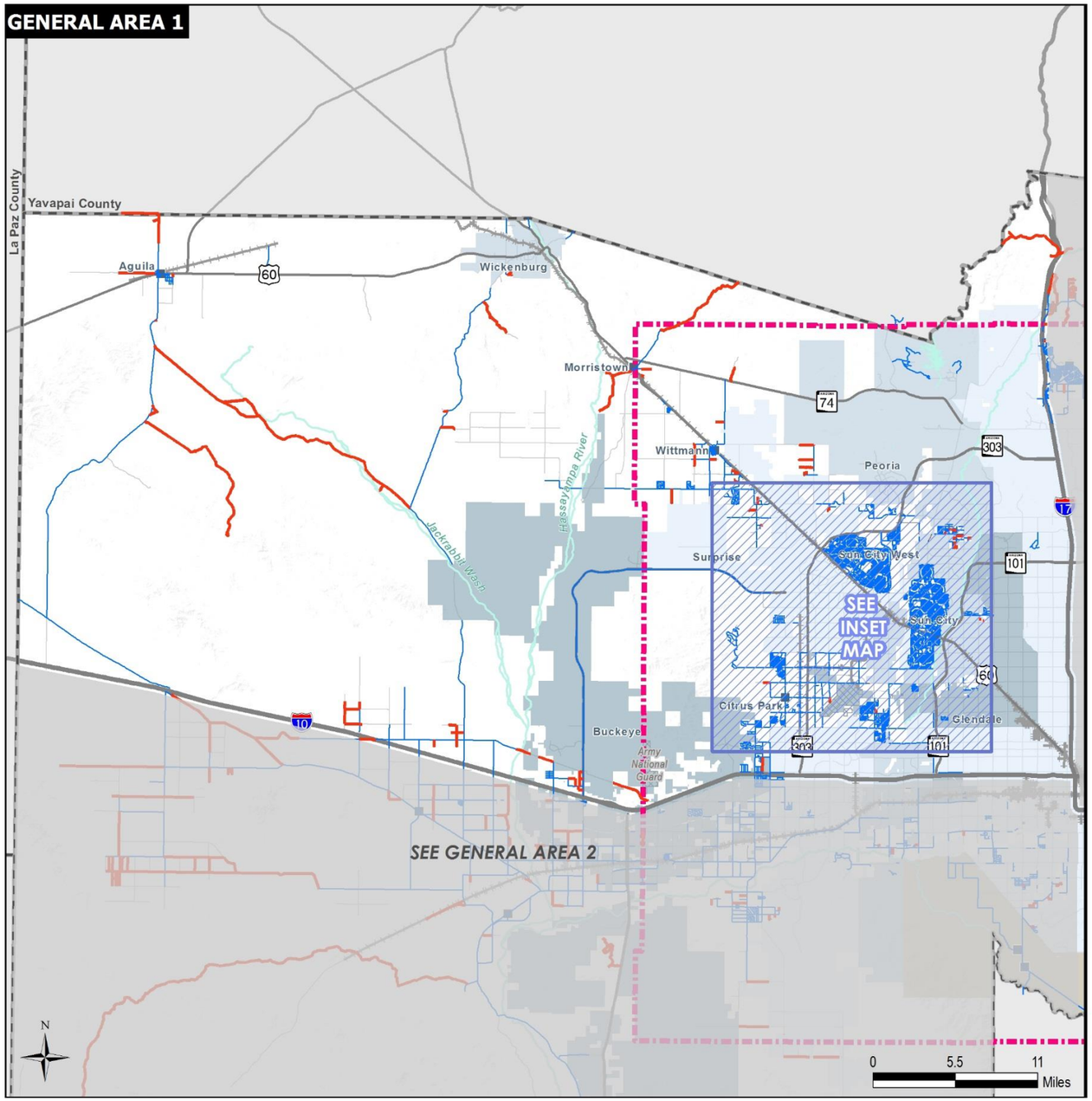
- Roads that are owned by the County and identified as open and declared (O&D) – This means the County owns right-of-way for these segments of road and has accepted the road into the County System;
- Roads that are partially opened and declared – These are roads where part of the right-of-way is owned by the County;
- Primitive roads – Roads that are usually located in remote parts of the County, provide access to wilderness areas and are typically less developed than other areas;
- Courtesy grade roads – Existing, unpaved roads that have little or no County owned right-of-way but are maintained by MCDOT through historical precedent and allowed by state statute; and
- Unpaved roads not owned or maintained by the County.

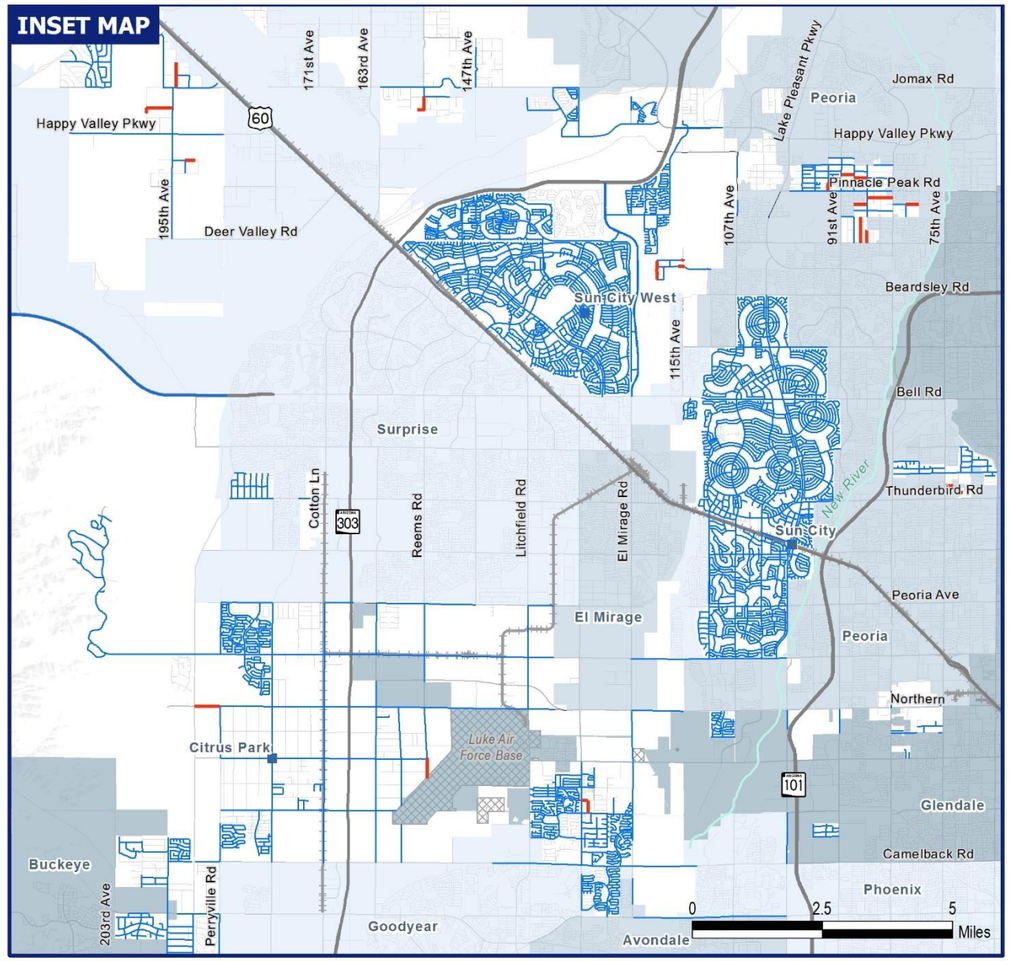
Table 7 lists the details of each of the LVRs that was paved in FY 2015.

Maps labeled **Figure 18** show the surface type (paved or unpaved) of County roads as of FY 2015 as well as the PM-10 air quality dust abatement program boundary. Most of the unpaved County roads are outside of the PM-10 area.

Table 7: Low Volume Roads Paved in 2015

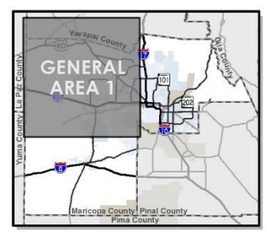
Road Name	From	To	Length (feet)	Notes
90th Place	Adobe Road	End of Maintenance	995	Project TT410 - Paved March 2015
91st Way	Adobe Road	End of Maintenance	980	
93rd Street	McLellan Road	End of Maintenance	1,175	
		PROJECT MILES =	0.60	
75th Drive	Northern Avenue	End of Maintenance	425	Project TT410 - Paved May/June 2015
193rd Avenue	Thomas Road	Catalina Drive	630	
193rd Drive	Thomas Road	Catalina Drive	630	
Loma Lane	End of Maintenance	75th Drive	330	
Southern Avenue	Buckeye Canal	1256' west of Dysart Road	1,505	
		PROJECT MILES =	0.67	
11th Avenue	Joy Ranch Road	Irvine Road	2,640	Project TT410 - Paved June 2015
Honda Bow Road	New River Road	End of Maintenance	560	
		PROJECT MILES =	0.61	
		TOTAL MILES =	1.87	





FY 2015 Road Surface Type

- Unpaved County Roads
- Paved County Roads
- PM10 Area
- Other Communities
- Interstate
- State Route/US Highway
- County Maintained Roadway*
- Railroad
- National Forest
- Indian Reservation
- Military
- Incorporated Areas
- County Boundary

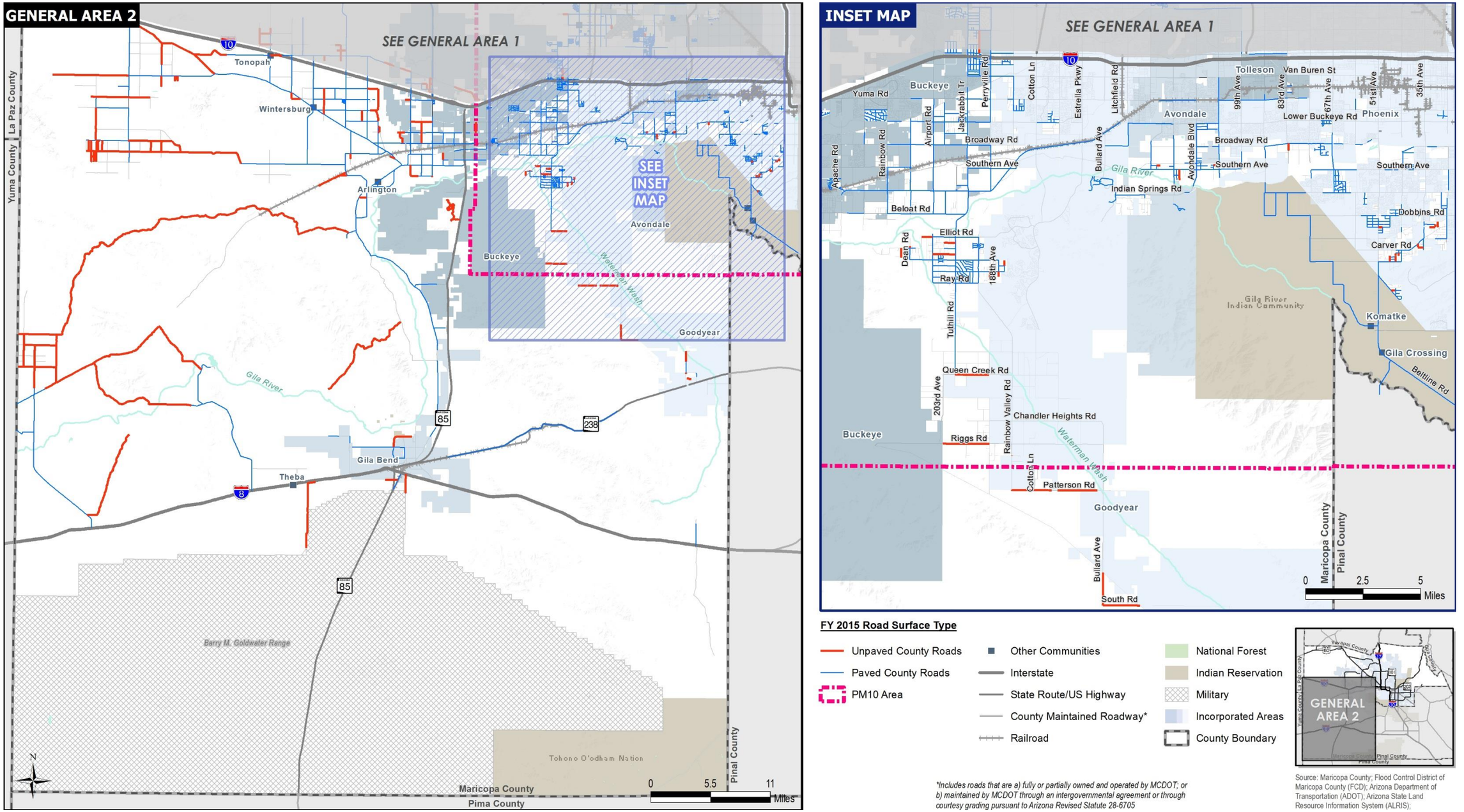


*Includes roads that are a) fully or partially owned and operated by MCDOT; or b) maintained by MCDOT through an intergovernmental agreement or through courtesy grading pursuant to Arizona Revised Statute 28-6705

Source: Maricopa County; Flood Control District of Maricopa County (FCD); Arizona Department of Transportation (ADOT); Arizona State Land Resource Information System (ALRIS)

Figure 18: Road Surface Types as of 2015

Area 1

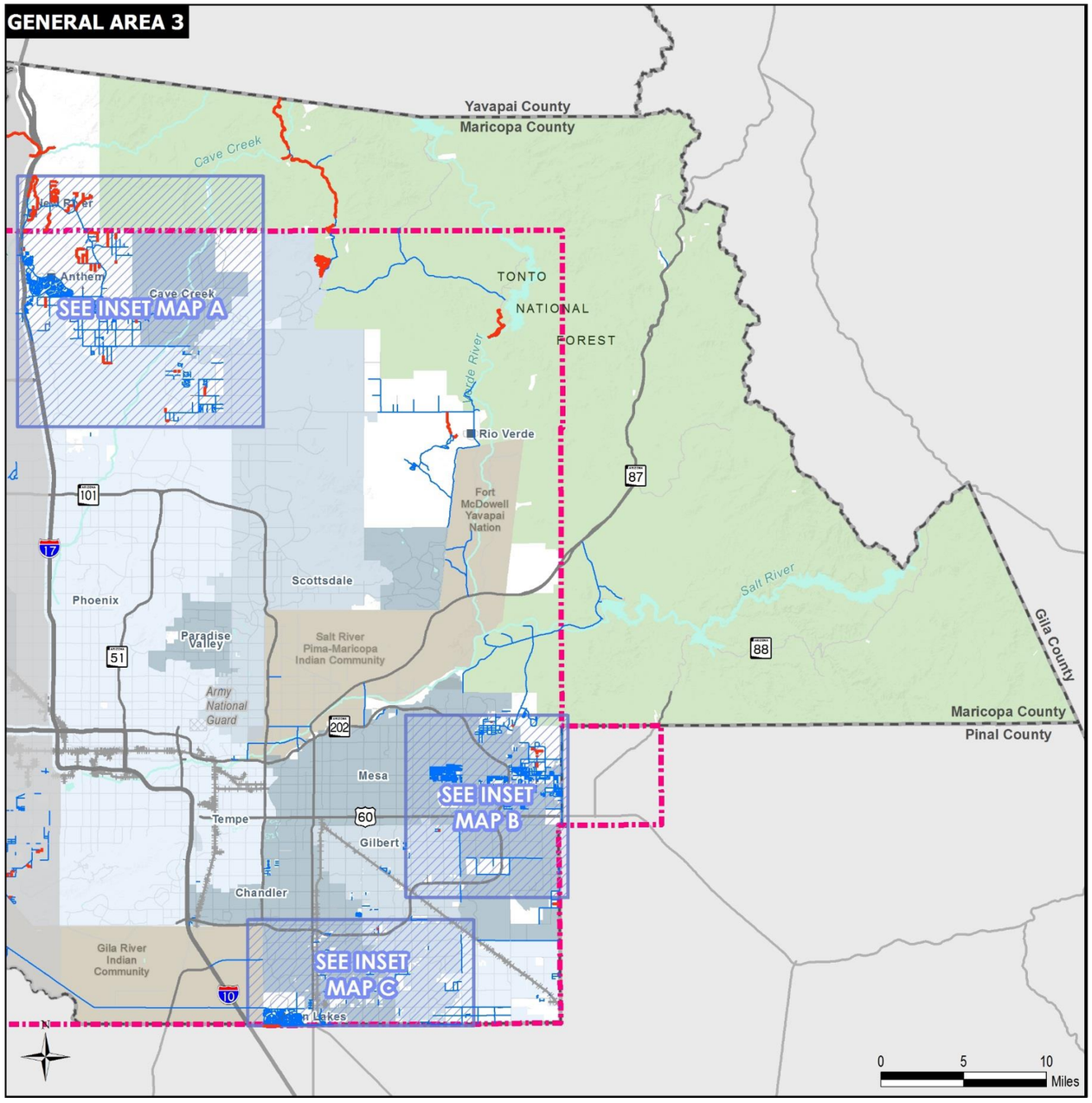


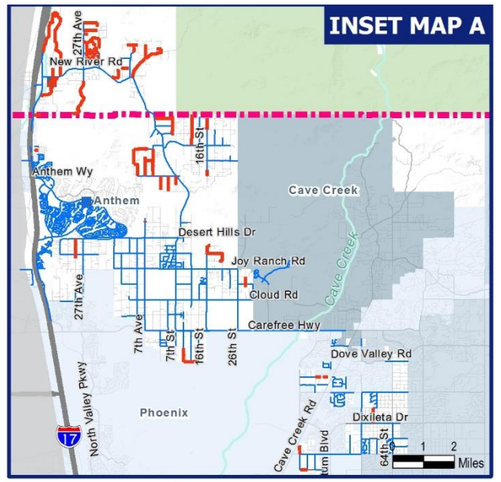
*Includes roads that are a) fully or partially owned and operated by MCDOT; or b) maintained by MCDOT through an intergovernmental agreement or through courtesy grading pursuant to Arizona Revised Statute 28-6705

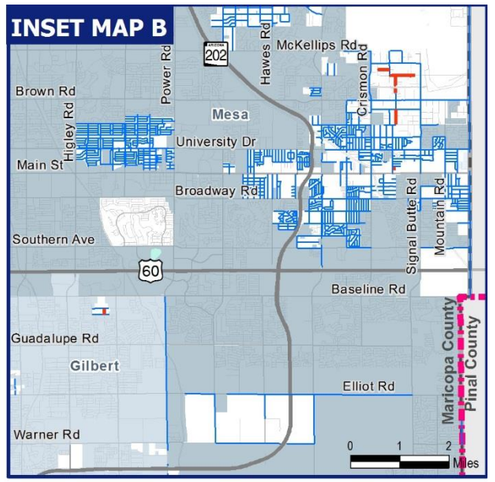
Source: Maricopa County; Flood Control District of Maricopa County (FCD); Arizona Department of Transportation (ADOT); Arizona State Land Resource Information System (ALRIS);

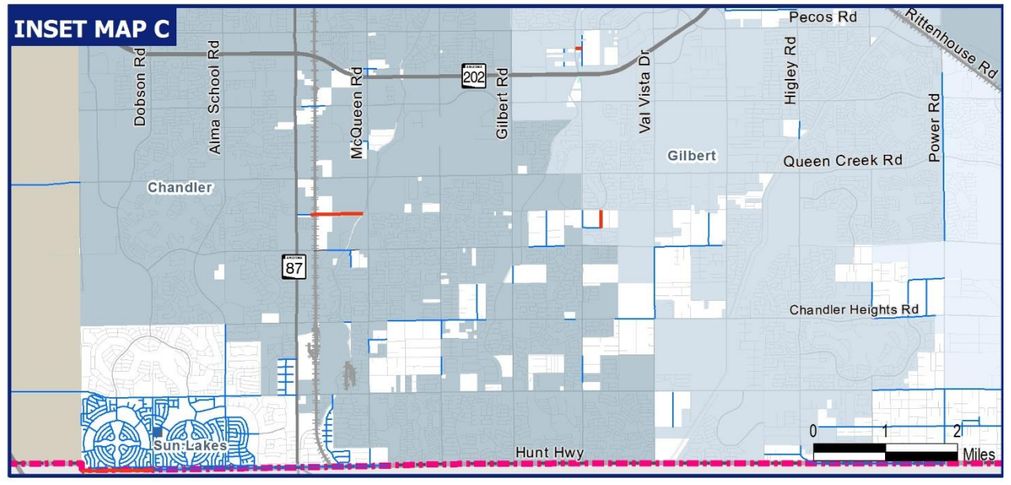
Figure 18: Road Surface Types as of 2015

Area 2









FY 2015 Road Surface Type

- Unpaved County Roads
- Paved County Roads
- PM10 Area
- Other Communities
- Interstate
- State Route/US Highway
- County Maintained Roadway*
- Railroad
- National Forest
- Indian Reservation
- Military
- Incorporated Areas
- County Boundary

*Includes roads that are a) fully or partially owned and operated by MCDOT; or b) maintained by MCDOT through an intergovernmental agreement or through courtesy grading pursuant to Arizona Revised Statute 28-6705

Source: Maricopa County; Flood Control District of Maricopa County (FCD); Arizona Department of Transportation (ADOT); Arizona State Land Resource Information System (ALRIS);

Figure 18: Road Surface Types as of 2015

Area 3

Bridge Management System

Introduction

As of June 2015, the County maintains and inspects a total of 424 structures on public roads. By the Federal Highway Administration definition, 284 of these structures are qualified to be called “bridges”, meaning the structure has a length greater than 20 feet and is qualified to receive federal aid for its maintenance. The remaining 140 are called “minor” structures with lengths of 20 feet or less.

Data Gathering and Analysis

“Bridges” and “Minor” Structures

Every structure (bridge and minor) within MCDOT’s jurisdiction is inspected in accordance with the FHWA’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 minor structures when considering how best to 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 for both bridges and minor structures.

Summary of FY 2015 Structures

Total number of structures in inventory:	424
Number of Federal Structures:	284
Number of Non-Federal Structures:	140
Number of bridges:	78
Number of culverts:	346

Total number of new structures added to the inventory this year: 9

Total number of federal structures added to the inventory this year: 7

11338 – Meridian Rd RCB at unnamed wash (N. of Southern Ave) *MCDOT TT315*
11425 – MC-85 RCB at FCD2011C015 (Loop303 Outfall Drainage) *MCDOT TC201300773*
+11361 – Williams Dr RCB at unnamed wash (no plans available)
+11362 – Parada Dr RCB at unnamed wash (no plans available)
+11363 – Tom Ryan Dr RCB at unnamed wash (no plans available)
+11364 – Via Tercero RCB at unnamed wash (no plans available)
+11365 – Dusty Trail Blvd RCB at unnamed wash (no plans available)

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

990286 – Riggs Rd RCB at unnamed wash (Intersection at Sossaman)
MCDOT TC20080348 & TC20090467
+990287 – 151st Ave RCB at unnamed wash (no plans available)

Total number of structure replacements made this year: 0

The structure 990271 had its structure number changed to a Federal structure number – 11439 – due to incorrect bridge length data entered into the bridge management software. Therefore, the structure was not replaced but received a new structure number.

Total number of structures removed/annexed from the inventory this year: 6

11008 – Reems Road RCB at Reems Rd Channel *Annexed by Glendale, June 2015*
9138 – Ellsworth Rd RCB at Sonoqui Wash *Annexed by Queen Creek, May 2015*

10517 – Osborn Rd RCB at unnamed wash	*Annexed by Buckeye, Aug. 2014*
11107 – Ellsworth Rd RCB at Sonoqui Wash	*Annexed by Queen Creek, Aug/Sep 2014*
990222 – Southern Ave RCB at unnamed wash	*Annexed by Mesa, 2014*
990257 – 107th Ave RCB at unnamed wash	*Annexed by Peoria, Aug/Sep 2014*

Number of scour critical bridges in the MCDOT Structure Inventory: 1

Gilbert Road Bridge over the Salt River - Structure Number 7780

Number of fracture critical bridges in the MCDOT Structure Inventory: 1

Old US 80 Bridge over the Gila River - Structure Number 8021

Evaluation Criteria

In 1997, the County Bridge Investment Study (BIS) recognized the need to evaluate bridges separately from road projects. The following information describes MCDOT's method of scoring and prioritizing bridge projects.

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

- Replacement Projects;
- Replacement of Dip Sections with New Structures;
- Scour Protection Projects; and
- New Bridge Projects (not included in major road projects).

A bridge should be considered for replacement if all of the following conditions are met:

- The cost of rehabilitation is 50% or more than the cost of a new bridge; and
- The Bridge Engineer agrees replacement is justifiable.

Recommendations for TIP Programming Procedures

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

- TIP Projects;
- Replacement of Existing Bridges;
- Replace Dip Sections with New Structures; and
- 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 TIP Program. When this occurs, decisions are made based on the rating criteria and professional engineering judgment.

Current Status of the MCDOT Bridge Management System

The MCDOT Bridge Management System is up-to-date, complete, and meets or exceeds all current Federal National Bridge Inspection Standards. The MCDOT Bridge Management System is included in the ADOT AASHTOWare BrM electronic database.

Asset Management for Structures

In 2002, MCDOT began an Asset Management program for its structure inventory. Through FY 2015, MCDOT's structure inventory consists of 284 bridges and 140 minor structures. In FY 2015, there were seven new/existing bridges and two new/existing minor structures added to the bridge Asset Management. There were also four bridges and two minor structures removed from the MCDOT structure inventory.

Federal Funding Eligibility Comparisons

Structures Eligible for Federal Replacement Funds (Sufficiency Rating (SR) < 50)

The Bridge Sufficiency Rating (BSR) is a rating based on multiple technical factors that measure how well a bridge performs its intended duty. Ratings range from 0 to 100, with 100 being the highest. The FHWA guidelines stipulate that when a bridge's sufficiency rating falls below a score of 50, the bridge becomes eligible for Federal replacement funds. As of July 2015, the County had no structures with a rating below 50. Maps labeled **Figure 19** provide the BSR for all bridges in the MCDOT inventory.

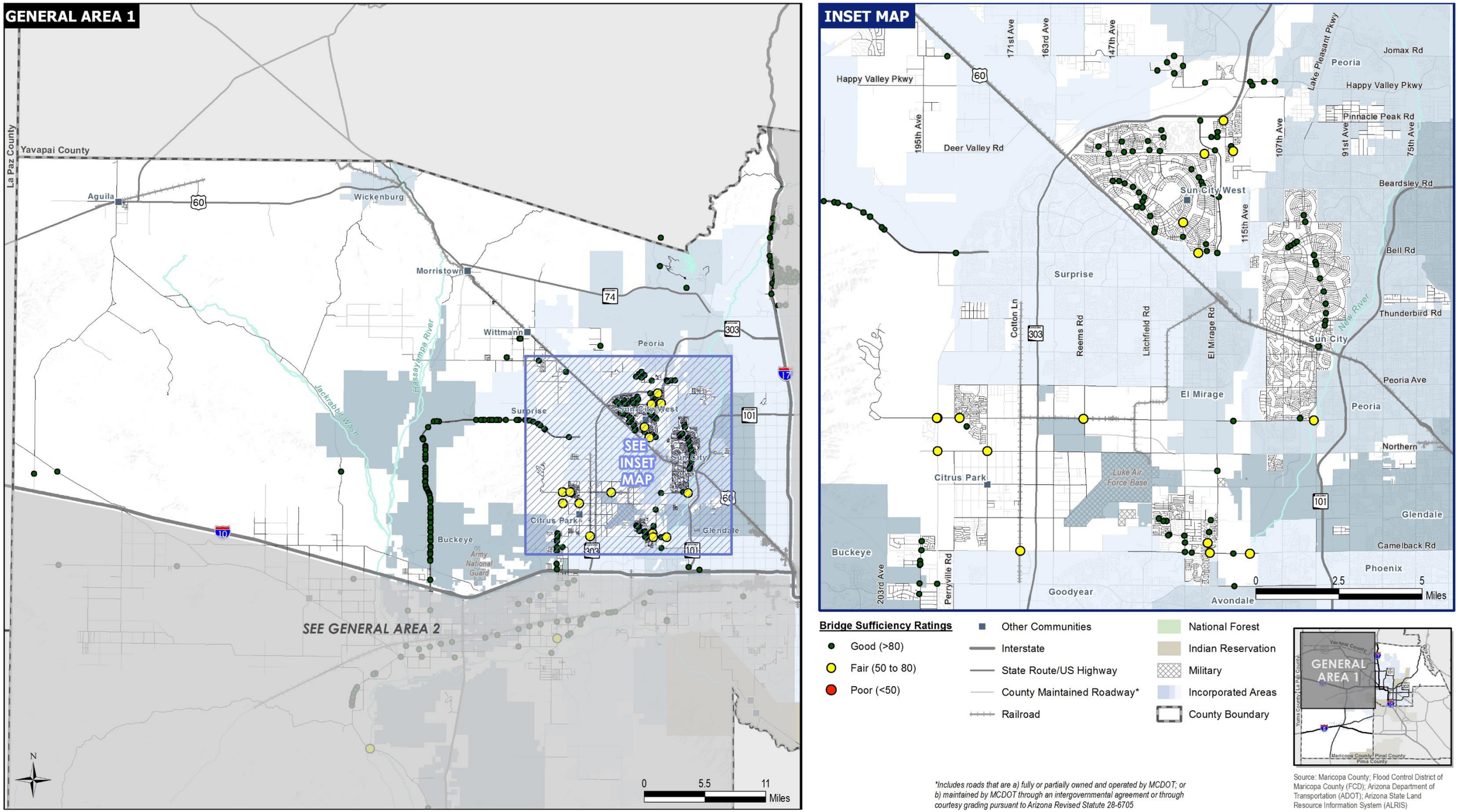
Structures Eligible for Federal Rehabilitation Funds (SR between 50 and 80)

As a general rule of thumb, if a BSR falls between a score of 50 and 80, the bridge/structure is a good candidate for federal rehabilitation funds. Currently, there are 23 federal structures in MCDOT's inventory that have sufficiency ratings between 50 and 80.

After each inspection cycle, the Bridge Engineer pays specific attention to all structures that showed a significant change in the sufficiency rating (ten points or more) from the previous year in order to determine what caused the change. Remedial action is taken as necessary. **Table 8** lists the bridges in MCDOT's inventory that have sufficiency ratings between 50 and 80. It also indicates if a structure has a deficiency, meaning that it is considered either functionally obsolete (not built to current standards) or structurally deficient (has a defect that requires attention).

Table 8: Structures with Sufficiency Ratings between 50 and 80

Structure No	Structure Name	Feature Carried by Structure	Deficiency	Sufficiency Rating
10552	144th St-Rio Verde	144th St. RCB / Wash	-	79.81
10554	144th St-Rio Verde	144th St. RCB / Wash	-	79.81
10555	144th St-Rio Verde	144th St. RCB / Wash	-	79.81
10556	144th St-Rio Verde	144th St. RCB / Wash	-	79.81
10781	Northern Avenue	FRS#3 Diversion Channel	-	79.78
7780	Gilbert Road-FAS 229	Salt River Bridge	-	79.70
11071	Deer Valley Drive	Deer Valley Channel	-	79.60
10108	Meridian Road	Meridian Rd RCB / Wash	-	79.21
10779	Olive Avenue	Olive Avenue RCB / Wash	-	78.64
11009	Olive Avenue / BNSFRR	Reams Road Channel	-	78.36
10516	Olive Avenue	Olive Avenue RCB / Wash	-	78.00
9825	Carefree Hwy Highway WB	Cave Creek Bridge	-	77.92
10514	Wigwam Creek Blvd	Wigwam Creek Blvd RCB / Wash	-	77.37
10515	Wigwam Creek Blvd	Wigwam Creek Blvd RCB / Wash	-	77.37
9859	Camelback Road	Agua Fria River Bridge	-	77.12
9588	Olive Avenue	New River	-	76.92
10229	Citrus Road	Citrus Road RCB / Wash	-	76.75
9375	Broadway Rd Road EB	Tempe Canal Bridge EB	Functional	75.26
9384	Broadway Rd Road WB	Tempe Canal Bridge WB	Functional	75.26
8553	Alma School Road	Salt River Bridge NB	-	74.92
8554	Alma School Road	Salt River Bridge SB	-	74.92
8570	RH Johnson Boulevard	Drainage Ditch RCB	-	67.64
8021	Old US 80	Gila River Bridge	Functional	61.50

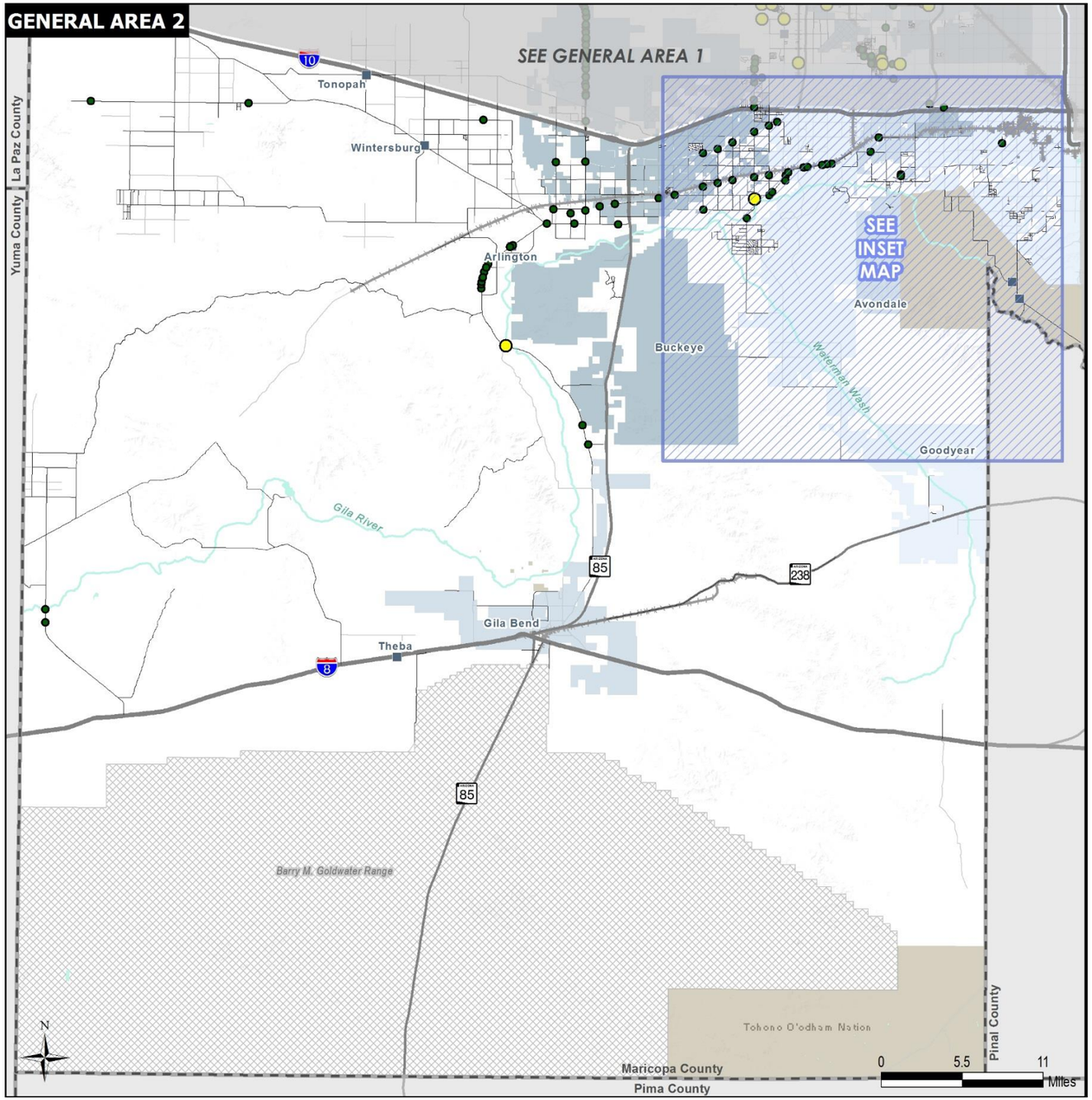


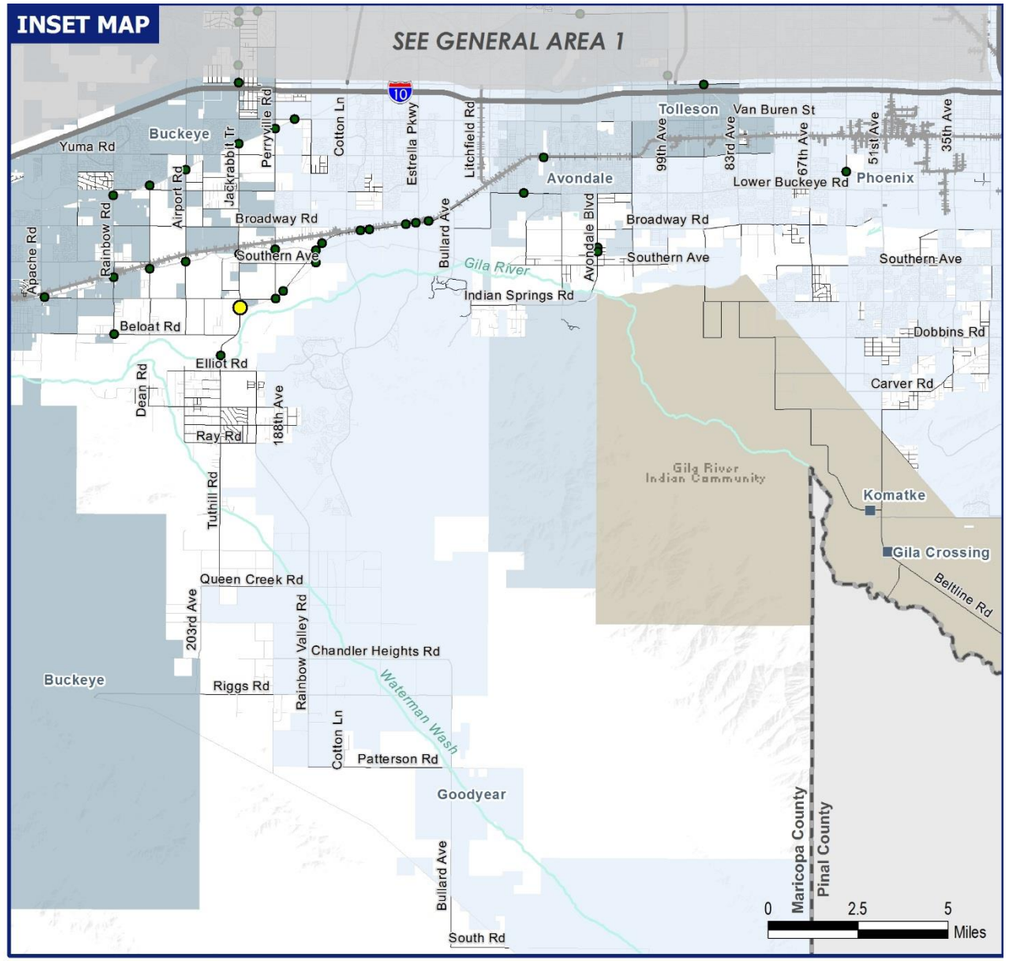
*Includes roads that are a) fully or partially owned and operated by MCDOT; or b) maintained by MCDOT through an intergovernmental agreement or through courtesy grading pursuant to Arizona Revised Statute 28-6705

Source: Maricopa County; Flood Control District of Maricopa County (FCD); Arizona Department of Transportation (ADOT); Arizona State Land Resource Information System (ALRIS)

Figure 19: 2015 Bridge Sufficiency Ratings

Area 1





Bridge Sufficiency Ratings

- Good (>80)
- Fair (50 to 80)
- Poor (<50)

- Other Communities
- Interstate
- State Route/US Highway
- County Maintained Roadway*
- Railroad

- National Forest
- Indian Reservation
- Military
- Incorporated Areas
- County Boundary

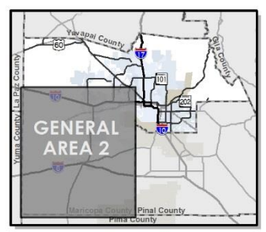


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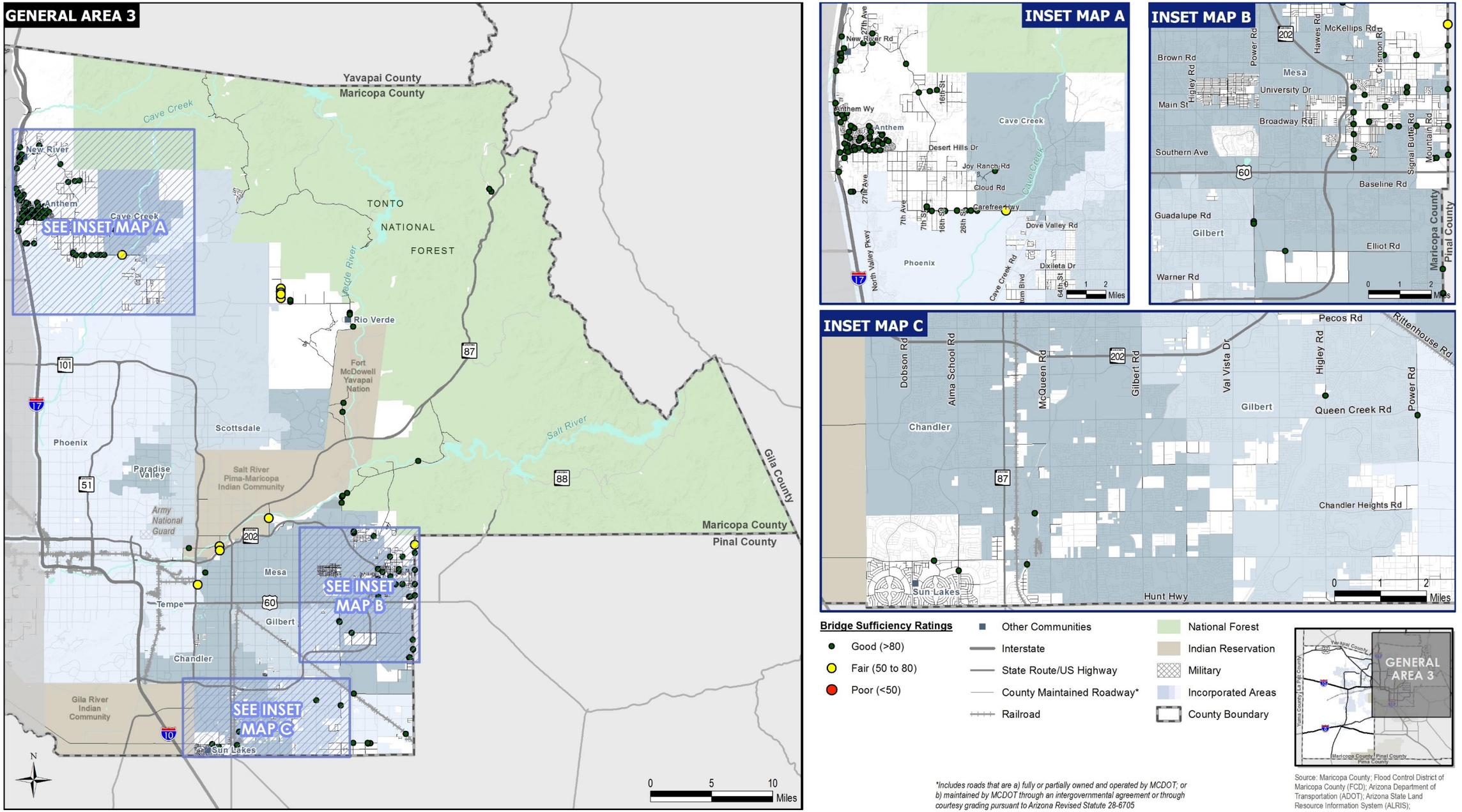
Figure 19: 2015 Bridge Sufficiency Ratings

Area 2



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Source: Maricopa County; Flood Control District of Maricopa County (FCD); Arizona Department of Transportation (ADOT); Arizona State Land Resource Information System (ALRIS);

Figure 19: 2015 Bridge Sufficiency Ratings

Area 3

Notable FY 2015 Bridge Events

Bridge Inspector Certification

MCDOT bridge engineering staff completed required certification training in compliance with the National Bridge Inspection Standards as published in the Code of Federal Regulations, 23 CRF 650, Subpart C and the ADOT Bridge Inspection Guidelines, 2011. Currently, MCDOT has four staff members who are certified Bridge Inspectors. The four staff members attended a four-day National Highway Institute training course for "Fracture Critical Inspection Techniques for Steel Bridges" to further expand the staff members' inspection credentials.

Tuthill Road Bridge

The completion of the Tuthill Road Bridge diaphragm reconstruction project was one of the most notable projects during FY 2015. The structural improvements made to the bridge's diaphragms at certain locations were needed to ensure the bridge would function as designed and be safe. The diaphragms were becoming noticeably distressed and detaching from the bridge. This was evident from spalled chunks of concrete that fell into the river bed.

Northern Parkway Program – Phase I

MCDOT managed the design and construction of three new overpass bridges and one reinforced box culvert (RBC) that were completed in FY 2014 as Phase I of a 20-year multi-phase Northern Parkway Program in partnership with MAG, El Mirage, Glendale, and Peoria. In the next phase of this project, two additional overpass bridges were completed in FY 2015. In accordance with the IGA terms, Glendale has taken over ownership and maintenance responsibilities of all of the structures constructed along Northern Parkway (from Sarival Road to Dysart Road) upon the final acceptance and conveyance of rights-of-way.

Union Hills Drive Reinforced Concrete Box Culvert Extension at 99th Avenue

The intersection improvement project at Union Hills Drive and 99th Avenue requires the concrete-lined channel along the median of 99th Avenue to be closed up between the northbound and southbound lanes. In order to close up the median and support new traffic turn lanes on 99th Avenue, the existing reinforced concrete box needs to be extended on both the north and south ends of the intersection. The MCDOT Bridge Group designed the required reinforced concrete box modification in FY 2015, while construction is scheduled for FY 2016.

Synopsis of MCDOT's Bridge Projects

Bridge Projects in the MCDOT FY 2016 - FY 2020 TIP

Table 9 provides a list of these projects currently in the TIP. These projects include bridge project scoping and new bridge designs.

Table 9: Bridge Projects in the MCDOT FY 2016 - FY 2020 TIP

Feature	Facility/Facilities	Location	Current Improvement Stage
99th Avenue Channel	Union Hills Drive	99th Avenue RCB extension	Construction
Salt River	Gilbert Road Bridge	At Salt River	Bridge Replacement Final Design
Salt River	Dobson Road, McKellips Road, and Gilbert Road Bridges	At Salt River	Design Concept Report (DCR)
Salt River	75th Avenue Bridge	At Salt River	Initial Scoping
Loop 101	Northern Avenue Parkway Phase II Overpass at Loop 101	Over Loop 101 south of current Northern Ave Loop 101 interchange	Construction

Feature	Facility/Facilities	Location	Current Improvement Stage
Agua Fria River	Northern Avenue Parkway Bridge	Northern Parkway between Dysart Rd and 111th Avenue	Construction
Dysart Road	Dysart Road Overpass at Northern Ave	Dysart Road at Northern Avenue	Design

The status of the Bridge/Structure work completed in FY 2015 is shown in **Table 10**. The bridges anticipated to be under construction in FY 2016 are shown in **Table 11** below.

Table 10: New Bridges and Bridge Improvements Completed in FY 2015

Structure No.	Project Location	Description of Work Completed
8584	Tuthill Bridge Diaphragm Reconstruction	Bridge rehabilitation project completed
N/A	Northern Parkway at Reems Road	Bridge completed
N/A	Northern Parkway at Litchfield Road	Bridge completed

Table 11: Bridges Anticipated to Be Under Construction by MCDOT in FY 2016

Project Location	Facility	Description of Work
Northern Parkway/Loop 101	Parkway Overpass	Design finalized (Est. Const. FY 2016)
Northern Parkway Bridge	Agua Fria River	Design finalized (Est. Const. FY 2016)
Union Hills Drive	99th Avenue (RCB extension)	Design finalized (Est. Const. FY 2016)

Status of Bridge and Structure Projects Currently Being Designed

There are numerous bridge projects in various stages of design by MCDOT as well as numerous structure projects within private developments in the design phase. **Table 12** lists the bridge projects currently under design or in the Design Concept Report (DCR) or scoping process.

Table 12: Projects Currently in the Design Phase by MCDOT

Name	Facility	Status
Deer Valley Road Bridges	Agua Fria River	Construction plans in progress for 2 bridges (Est. Const. FY 2017)
Dobson Road Bridge	Salt River	DCR completed
Camelback Road Bridge	Beardsley Canal	Initial Scoping in progress
McKellips Road Bridge	Salt River	DCR completed
Gilbert Road Bridge	Salt River	Identified for replacement (Est. Const. FY 2018)
Northern Parkway Overpass	Overpass at Dysart Road	Design finalized (Est. Const. FY 2017)
Rittenhouse Road Bridge	Queen Creek Wash	Initial Design phase (Est. Const. FY 2019)

Summary of Inspection Activity for FY 2015

Each year MCDOT must submit a report to the County Board of Supervisors concerning the physical condition of its bridges and minor structures as compared to the adopted criteria as required by the

Governments Accounting Standards Board (GASB) Statement 34. The latest ratings of the County's bridges and structures along with the BSR are shown below in **Table 13**:

Table 13: Summary of FY 2015 Inspection Results

Criteria	Target Value	Actual Value
% of Bridges and Structures with BSR > 70	min. 90%	99.2%
% of Bridges and Structures with BSR < 50	max. 3%	0.0%

Table 14 through **Table 17** provide a list of County bridges based on their overall length. The tables include information on each structure's sufficiency rating. An alphabetical list of all structures within the MCDOT Bridge inventory can be found in **Appendix A**.

Table 14: Listing of Span Bridges Over 600' in Overall Length

Structure No.	Road	Location	Feature Intersected	Sufficiency Rating	Length (ft.)	Structure Name
8584	Tuthill Rd	0.5 mi S/ Beloat Rd	Gila River	91.87	1,770	Gila River Bridge
9859	Camelback Rd	1.0 mi E/ El Mirage Rd	Agua Fria River	77.12	1,725	Agua Fria River Bridge
8021	Old US 80	S/ Gillespie Dam	Gila River	61.50	1,662	Gila River Bridge
9145	Indian School Rd	0.5 mi E/ El Mirage	Agua Fria River	95.52	1,623	Agua Fria River Bridge
8981	Olive Ave	0.8 mi E/ El Mirage Rd	Agua Fria River	94.27	1,504	Agua Fria River Bridge
7780	Gilbert Rd-FAS 229	0.5 mi N/ Thomas Rd	Salt River	79.70	1,302	Salt River Bridge
10396	Happy Valley Pkwy	1.5 mi W/Lake Pleasant Rd	Agua Fria River	87.13	1,256	Agua Fria River Bridge
7819	MC-85 Hwy	0.5 mi W/ El Mirage	Agua Fria River	94.12	1,203	Agua Fria River Bridge
8553	Alma School Rd	300' S/ McKellips	Salt River (N. Channel)	74.92	936	Salt River Bridge NB

Table 15: Listing of Span Bridges between 300' and 600' in Overall Length

Structure No.	Road	Location	Feature Intersected	Sufficiency Rating	Length (ft.)	Structure Name
9999	Old US 80	500' E/ Salome Hwy	Hassayampa River	99.13	483	Hassayampa River Bridge
9849	Bush Hwy	at Blue Point-Salt River	Salt River	92.59	480	Blue Point Bridge
8554	Alma School Rd	0.25 mi N/ McLellan	Salt River (S. Channel)	74.92	410	Salt River Bridge SB
10106	New River Road	0.25 mi E/ I 17	New River	96.59	407	New River Bridge
10085	I-17 Frontage Rd	1000' S/ New River Rd	New River	99.58	401	New River Bridge
10021	New River Rd	0.25 mi W/ 7th Ave	Skunk Creek	98.66	367	Skunk Creek Bridge
9825	Carefree Hwy WB	1 mi W/ Cave Creek Rd	Cave Creek Wash	77.92	354	Cave Creek Bridge
10162	Carefree Hwy EB	1 mi W/ Cave Creek Rd	Cave Creek Wash	82.92	354	Cave Creek Wash Bridge
9588	Olive Avenue	E/ of 99th Ave	New River	76.92	300	New River Bridge

Table 16: Listing of Span Bridges between 100' and 300' in Overall Length

Structure No.	Road	Location	Feature Intersected	Sufficiency Rating	Length (ft.)	Structure Name
10582	Gavilan Peak Pkwy	Just S of Daisy Mtn Dr	Deadman Wash	96.86	270	Gavilan Peak Pkwy Bridge
7548	571st Ave	9.75 mi N/ I-8 via AC Rd	Gila River	99.14	257	Gila River Bridge
9928	Power Rd	S/ Guadalupe Rd	East Maricopa Fldwy	92.38	226	E Maricopa Fldwy Bridge
10083	New River Road	350' N/ Circle Mtn Rd	Cline Creek Wash	99.66	221	Cline Creek Bridge
10390	Power Road	0.2 mi S/ Queen Creek Rd	Queen Creek	96.68	193	Queen Creek Bridge
11108	Riggs Rd	0.2 mi E of Hawes Rd	Sonoqui Wash	97.22	191	Riggs Rd Bridge
8038	Rittenhouse Rd	0.25 mi N/ Cloud	Queen Creek Wash	85.52	180	Queen Creek Wash Bridge
8862	University Drive	0.5 mi E/ Ellsworth Rd	CAP Canal	98.57	146	CAP Canal Bridge
8884	Southern Ave	0.6 mi E/ Signal Butte Rd	CAP Canal (Mesa)	97.41	145	CAP Canal Bridge
9832	Salome Rd	8 mi W/ Harquahala Valley Rd	CAP Canal	94.46	124	CAP Canal Bridge
8569	Patton Rd	1 mi W/ Grand Ave	CAP Canal	94.07	119	CAP Canal Bridge
8856	Crismon Rd	500' N/ Apache Rd	CAP Canal	94.70	109	CAP Canal Bridge
9895	Ellsworth Rd	0.25 mi N/ University Rd	CAP Canal	98.24	106	CAP Canal Bridge
9824	Bush Hwy	1.7 mi N/ Thomas	FanninMcFar CAP Aqueduct	97.08	105	CAP Canal Bridge
10230	MC-85 Hwy	0.3 mi E/ Estrella Pkwy	Bullard Wash	91.24	103	MC-85 Bridge

Table 17: Listing of Span Bridges Under 100' in Overall Length

Structure No.	Road	Location	Feature Intersected	Sufficiency Rating	Length (ft.)	Structure Name
8576	355th Avenue	7 mi N/ Indian School Rd	CAP Canal	90.60	90	CAP Canal Bridge
8571	163rd Avenue	5 mi N/ US 60_Grand Ave	HaydenRhode CAP Aqueduct	93.80	88	CAP Canal Bridge
7883	Dysart Rd-FAS 547	0.25 mi N/ Camelback Rd	Colter Channel	94.65	86	Colter Channel Bridge
8560	Eagle Eye Rd	2 mi S/ Salome Hwy	CAP Canal	96.88	86	CAP Canal Bridge
8881	Van Buren St	0.5 mi W/ Citrus Rd	RID Canal	97.62	87	RID Canal Bridge
10061	Old US 80	0.3 mi S/ 331th Ave	Arlington Valley Wash	90.05	84	Arlington Valley Bridge
9834	Old US 80	1 mi W/ Jct SR-85	Buckeye Drain	97.99	82	Buckeye Drain Bridge
7898	Cave Creek Pkwy	1.5 mi N/32nd St/Cloud Rd	Wash	93.76	80	Wash Bridge
10787	Dysart Road	0.25 mi. S/ Jomax Rd	Beardsley Canal	99.99	76	Dysart Road Bridge
9949	El Mirage Rd	0.5 mi N/ Glendale Ave	Dysart Drain	96.82	75	El Mirage Drain Bridge
9927	Power Rd	S/ Guadalupe Rd	RWCD Canal N. Crossing)	92.38	69	RWCD Canal (N) Bridge
10786	El Granada Blvd	0.4 mi. N/ Happy Valley Rd	Beardsley Canal	99.99	65	El Granada Blvd Bridge
7901	MC 85 Hwy	0.5 mi W/ Perryville	Buckeye Canal	97.25	56	Buckeye Canal Bridge
8000	Baseline Rd	200' NW MC-85	Buckeye Canal	95.14	55	Buckeye Canal Bridge

Structure No.	Road	Location	Feature Intersected	Sufficiency Rating	Length (ft.)	Structure Name
7557	Meridian Rd	0.5 mi N/ Brown Rd	Bulldog Floodway	97.37	54	Bulldog Fldwy Bridge
9375	Broadway Rd EB	0.2 mi E/ Price Rd	Tempe Canal	75.26	50	Tempe Canal Bridge EB
9384	Broadway Rd WB	0.2 mi E/ Price Rd	Tempe Canal	75.26	50	Tempe Canal Bridge WB
10776	Rainbow Road	0.5 mi S/ Southern Avenue	Buckeye Canal	97.59	48	Rainbow Road Bridge
9503	Higley Rd	0.5 mi S/ Germann	RWCD Canal	89.84	44	RWCD Canal Bridge
9919	Woods Rd	E/ Old US-80	Gila Bend Canal	97.42	44	Gila Bend Canal Bridge
10126	Airport Rd	1 mi N/ MC85	Buckeye Canal	97.77	43	Buckeye Canal Bridge
8001	Airport Rd	0.5 mi N/ Lower Buckeye	RID Canal	97.53	41	RID Canal Bridge
9593	Miller Rd	0.25 mi N/ SR-85	Buckeye Canal	98.62	40	Buckeye Canal Bridge
8044	Perryville Rd	0.5 mi N/ Southern	Buckeye Canal	97.90	39	Buckeye Canal Bridge
7582	309th Avenue	S of Lower River Rd	Buckeye Canal	97.95	39	Buckeye Canal Bridge
8638	Dean Rd	0.75 mi N/ MC-85	Buckeye Canal	97.86	39	Buckeye Canal Bridge
10847	Meridian Rd (Mesa)	0.5 mi S of Warner Road	Power Line Fldwy Chnl	93.10	39	Meridian Rd Bridge
8043	Perryville Rd	1/3 mi S/ Van Buren	RID Canal	97.82	38	RID Canal Bridge
7551	Dean Rd	600' N/ Lower Buckeye Rd	RID Canal	97.56	37	RID Canal Bridge
7782	Palo Verde Rd	0.75 mi N/ Old US80 Hwy	Buckeye Canal	97.84	37	Buckeye Canal Bridge
9672	99th Ave	0.5 mi N/ McDowell Rd	RID Canal	96.23	37	RID Canal Bridge
9831	Jackrabbit Trail	1000' N/ Southern Ave	Buckeye Canal	97.52	37	Buckeye Canal Bridge
9374	University Dr	900' W/ Dobson	Tempe Canal	95.39	36	Tempe Canal Bridge
10088	Jackrabbit Trail	0.25 mi N/ Yuma	RID Canal	96.62	36	RID Canal Bridge
8583	59th Ave	0.5 mi S/ Buckeye Rd	RID Canal	98.14	34	RID Canal Bridge
8681	Rainbow Rd	1 mi N/ Broadway	RID Canal	97.46	34	RID Canal Bridge
8629	Turner Rd	0.5 mi S/ Baseline Rd	Buckeye Canal	99.97	33	Buckeye Canal Bridge
10239	Roeser Rd	0.5 mi S/ Broadway Rd	Buckeye Feeder Ditch	93.08	32	Roeser Rd Bridge
10240	Chambers Street	0.6 mi S/ Broadway Rd	Buckeye Feeder Ditch	93.08	32	Chambers St Bridge
8578	Wilson (283rd) Ave	1 mi S/ Baseline	Buckeye Canal	97.99	32	Buckeye Canal Bridge
11111	Centennial Rd	5.7 mi W/ Harqua. Val. Rd	CAP Aux Canal	95.15	32	Centennial Rd Bridge
9426	Palo Verde Rd	0.25 mi N/ Broadway	RID Canal	97.37	31	RID Canal Bridge
8680	Johnson Rd	0.25 mi N/ Broadway	RID Canal	99.86	28	RID Canal Bridge
8855	Bruner Rd	0.75 mi N/ Old US-80	Buckeye Canal	97.99	28	Buckeye Canal Bridge
990181	Old US 80	0.25 mi S/ Cactus Rose	Arlington Valley Wash	84.96	18	Arlington V Wash Bridge

Road Management System

Introduction

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

Preventive maintenance preserves rather than improves the capacity or strength of the pavement. In order for preventive maintenance to be effective, it should be applied to structurally sound pavement before the pavement displays significant environmental distress such as raveling, oxidation and block cracking. Timely treatments prove to be the most cost effective.

Routine maintenance typically consists of pothole repair, patching, sweeping and/or striping of pavement.

All roads deteriorate over time due to environmental conditions and the volume and type of traffic using the road. However, the roads within the jurisdiction of MCDOT are maintained at a high level of service because of a County program that includes the following procedures:

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

Summary of MCDOT Paved Facilities

In 2015, MCDOT had jurisdiction of 922 miles (1,895 lane miles) of local roads and 1,078 miles (2,586 lane miles) of major roads (arterial and collector). This breakdown can be seen in **Table 18** and **Figure 20**, which compare the MCDOT road composition between FY 2011 and FY 2015. In total, MCDOT owned and maintained 1,999 centerline miles of local and major roads in FY 2015, which equates to 4,481.15 lane miles. For comparison, in FY 2014, MCDOT maintained 4,471.50 lane miles of road.

Table 18: Miles of MCDOT Paved Roads FY 2011 - FY 2015

Road Classification	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	Difference 2011-2015
Local	898	910	912	915	922	24
Minor Collector	389	390	315	314	310	-79
Major Collector	274	272	266	266	265	-9
Minor Arterial	359	358	342	342	338	-21
Principal Arterial	158	164	164	164	164	6
TOTAL	2,070	2,094	1,999	2,001	1,999	-71

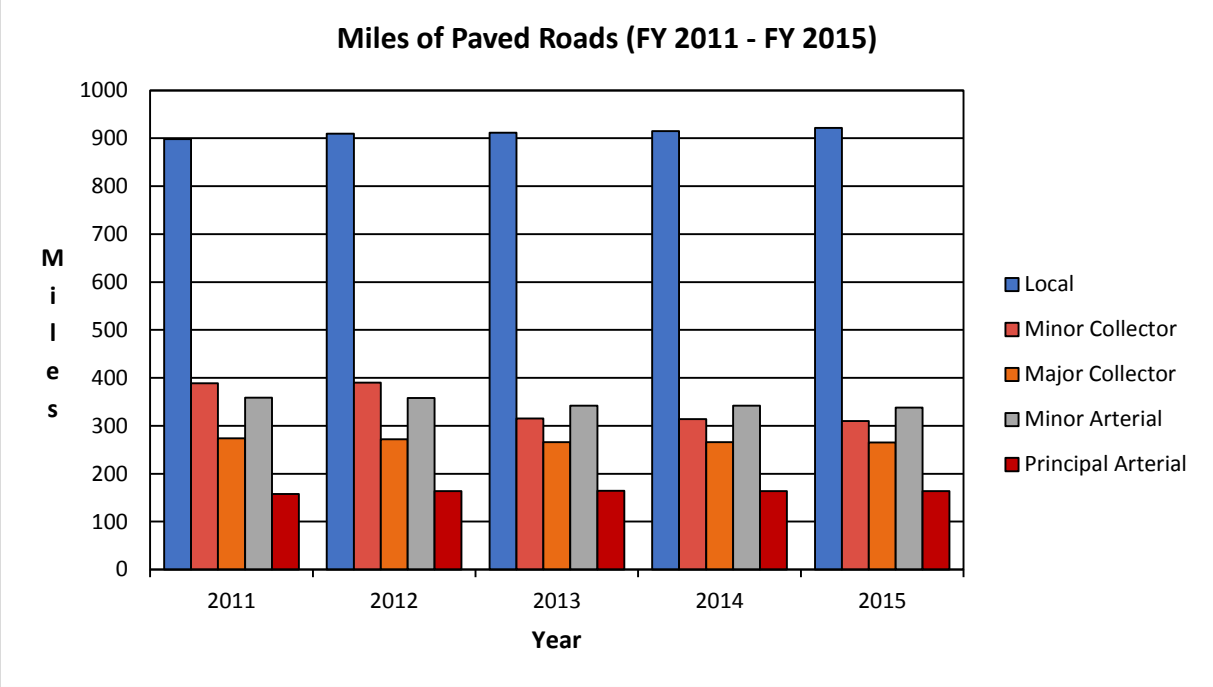


Figure 20: Miles of Paved Roads owned by MCDOT (FY 2011 - FY 2015)

Road and Pavement Evaluation Ratings

The following section describes the type of pavement evaluations and ratings that are conducted as part of MCDOT's routine pavement maintenance.

Pavement Condition Ratings (PCR)

The Road Management Section evaluates pavement conditions for surface distress every 12-18 months for arterial and collector roads and every other year for local roads, with half of the local roads evaluated each year. The resulting Pavement Condition Ratings (PCR) range from 0 to 100, with 100 being new pavement or pavement with no distress. The results help to quantify the overall pavement condition of the road network.

The consist positive results from preventive maintenance on MCDOT roads is evident in **Figure 21**, which shows the FY 2011-2015 PCR quality by percentage ranking of all arterial roads in the County. Maps labeled **Figure 22** show the PCR for every County-owned arterial road. The PCR data is also presented as part of the Annual Network Rating Summary, which is found later in this section. MCDOT utilizes the PCR ratings to forecast preventive maintenance programs and for TIP planning.

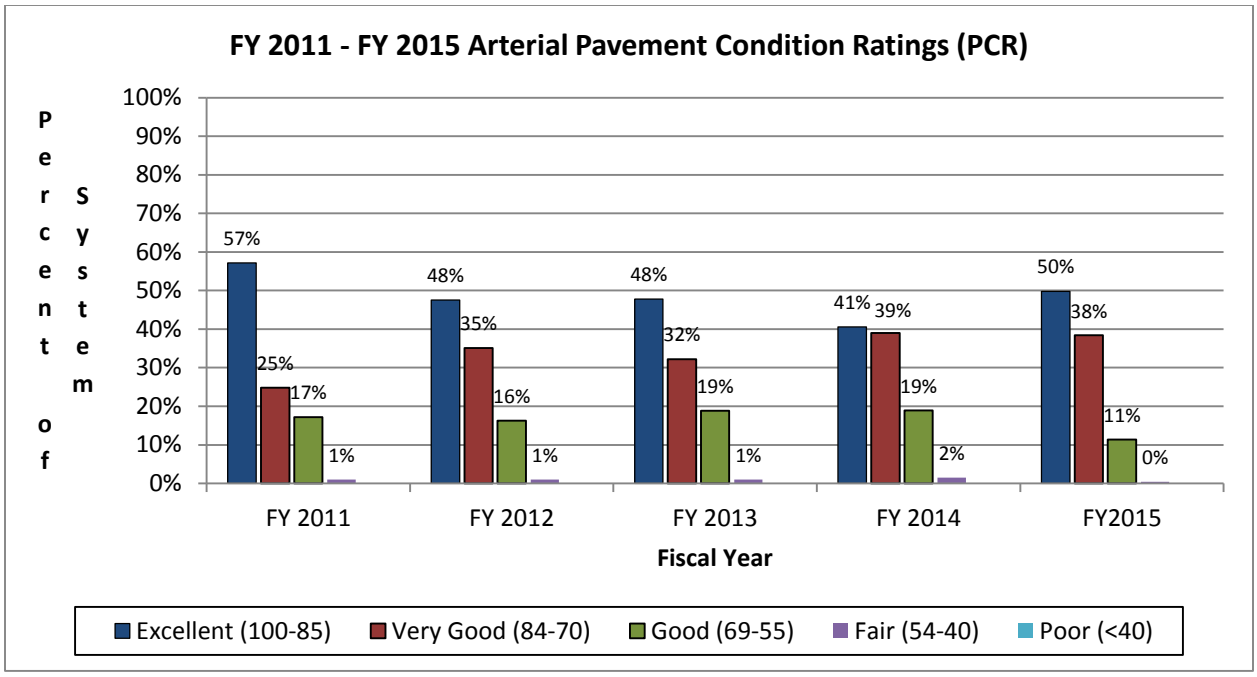
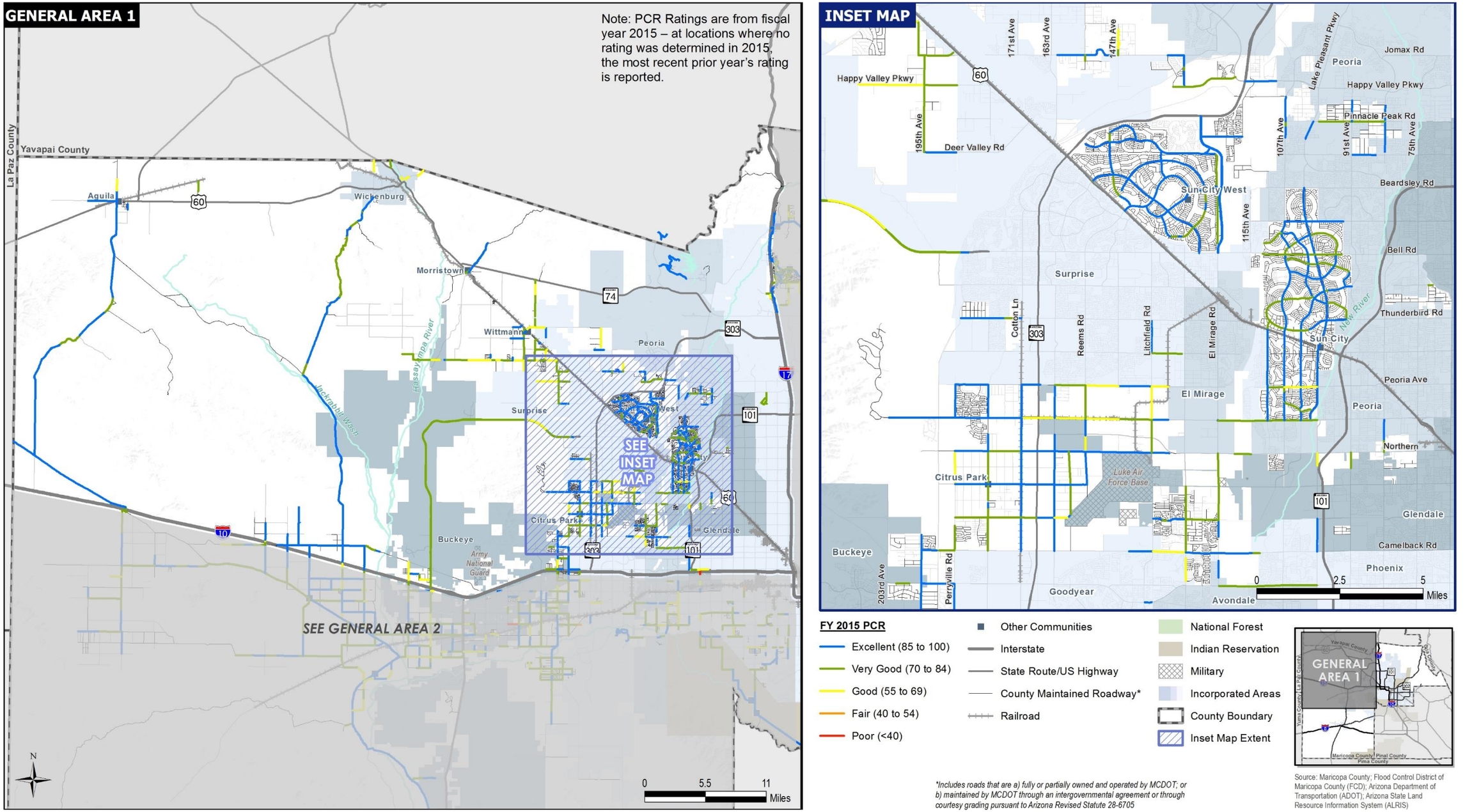


Figure 21: FY 2011 - FY 2015 PCR for County Arterial Roads



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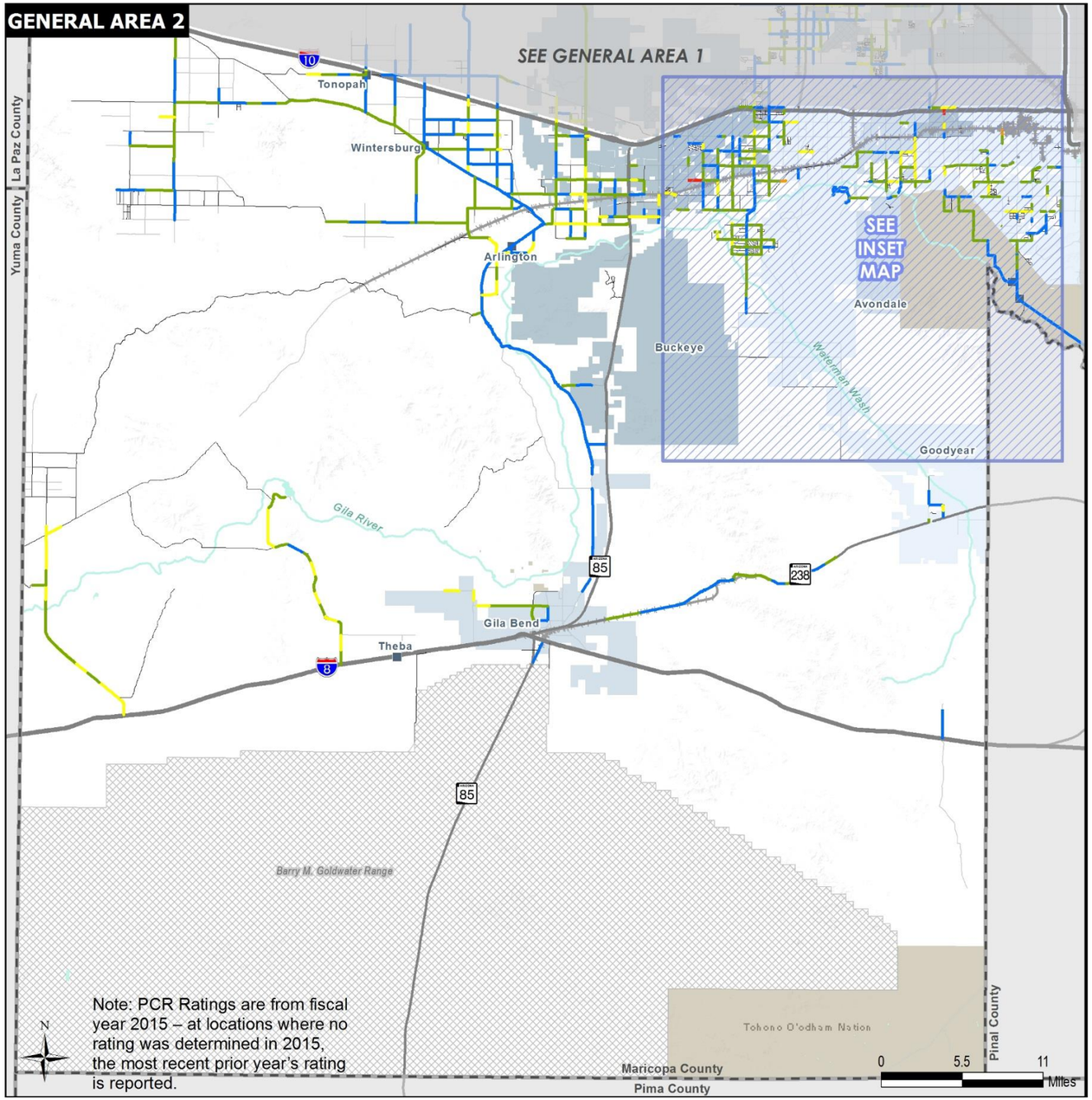
Source: Maricopa County; Flood Control District of Maricopa County (FCD); Arizona Department of Transportation (ADOT); Arizona State Land Resource Information System (ALRIS)

Figure 22: FY 2015 PCR for County Arterial Roads

Area 1



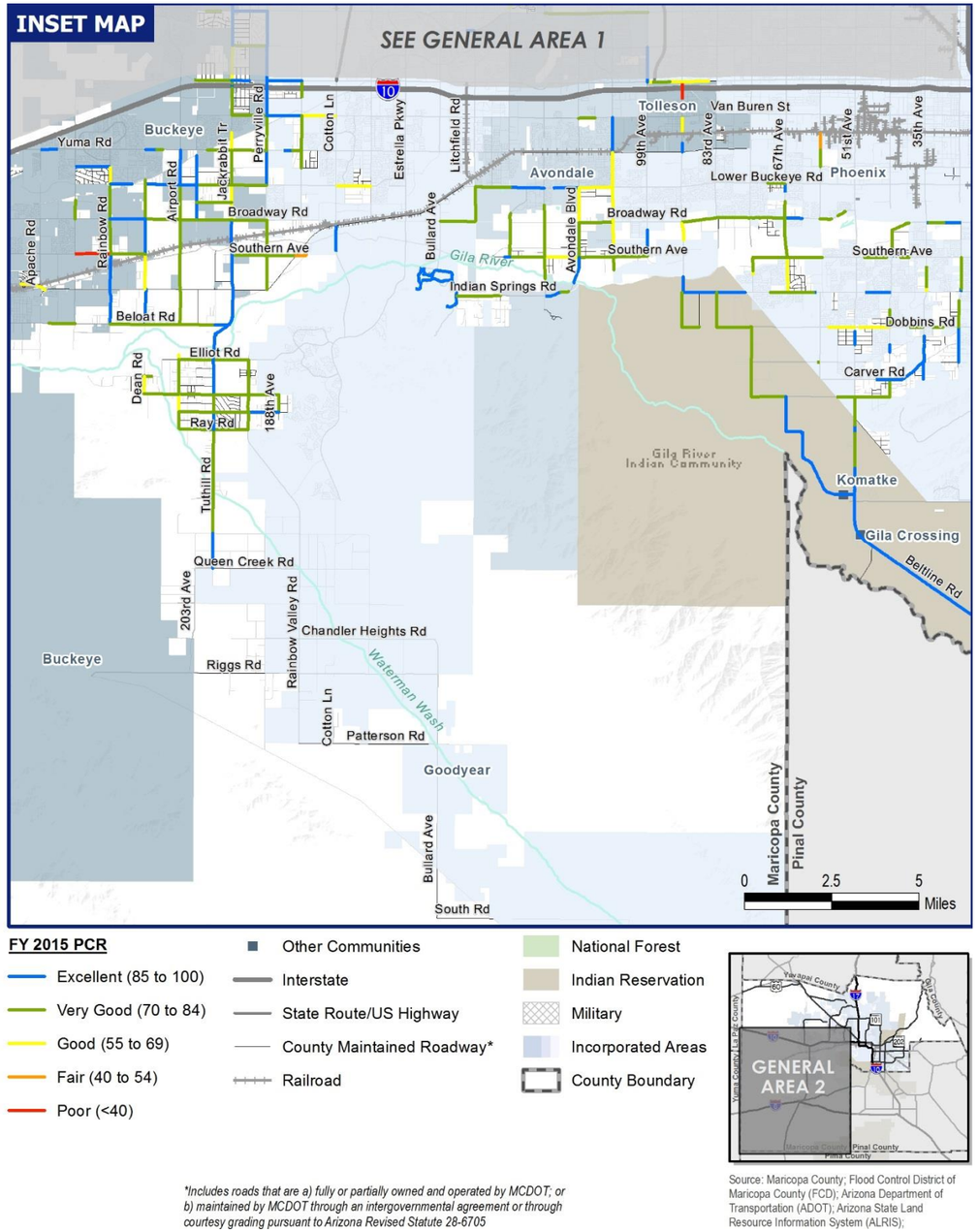


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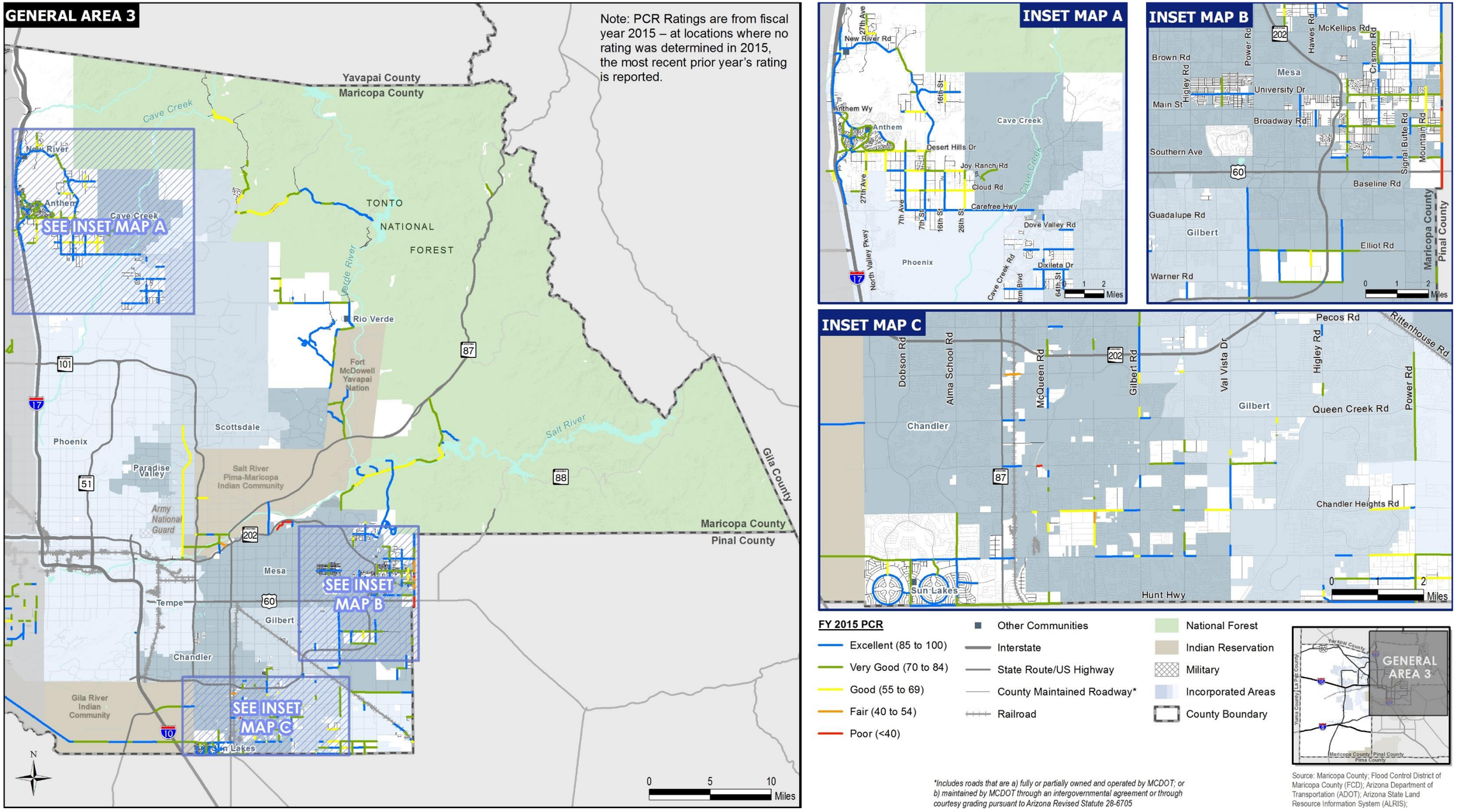
Figure 22: FY 2015 PCR for County Arterial Roads

Area 2



*Includes roads that are a) fully or partially owned and operated by MCDOT; or b) maintained by MCDOT through an intergovernmental agreement or through courtesy grading pursuant to Arizona Revised Statute 28-6705

Source: Maricopa County; Flood Control District of Maricopa County (FCD); Arizona Department of Transportation (ADOT); Arizona State Land Resource Information System (ALRIS);

Figure 22: FY 2015 PCR for County Arterial Roads

Area 3

International Roughness Index (IRI)

To collect International Roughness Index (IRI) data, MCDOT uses a Laser Road Profiler (LRP) equipped with three lasers, one in each wheel track and one in the mid-lane. Annually, the MCDOT Road Management Section collects the IRI for each arterial road segment with a length greater than a quarter mile. The IRI values are determined 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 for the years between FY 2011 and FY 2015 can be seen in **Figure 23**. Maps labeled **Figure 24** show the IRI for every County arterial road. MCDOT utilizes the IRI ratings to forecast preventive maintenance programs and TIP planning.

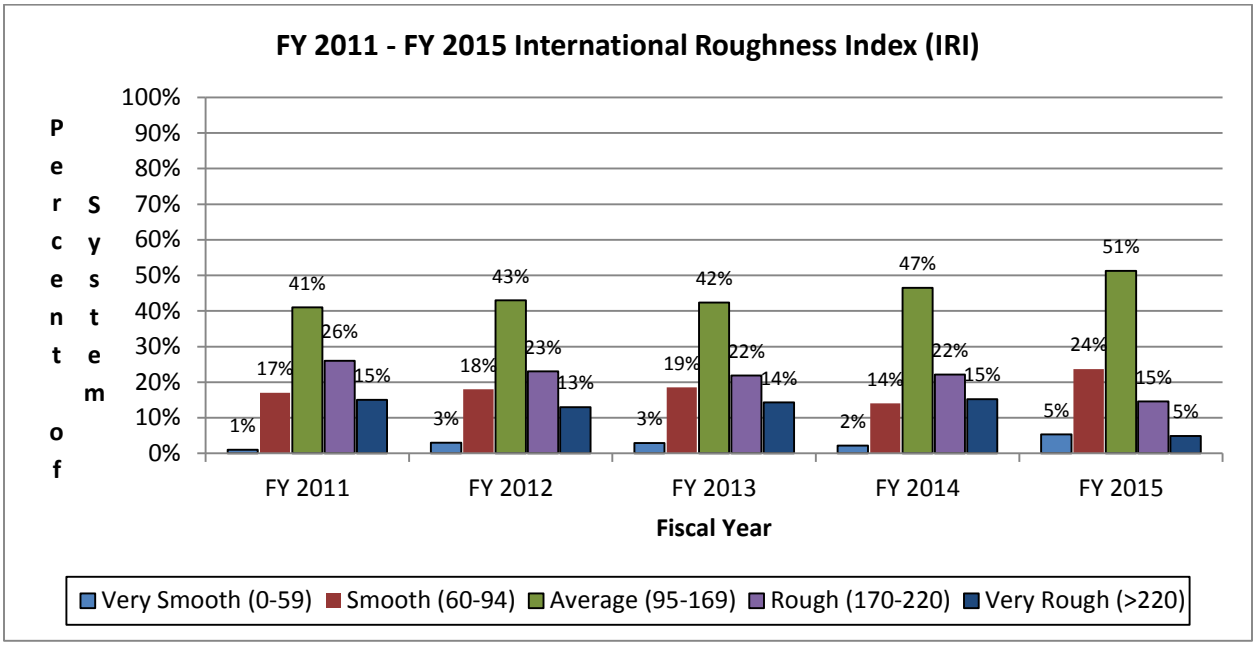
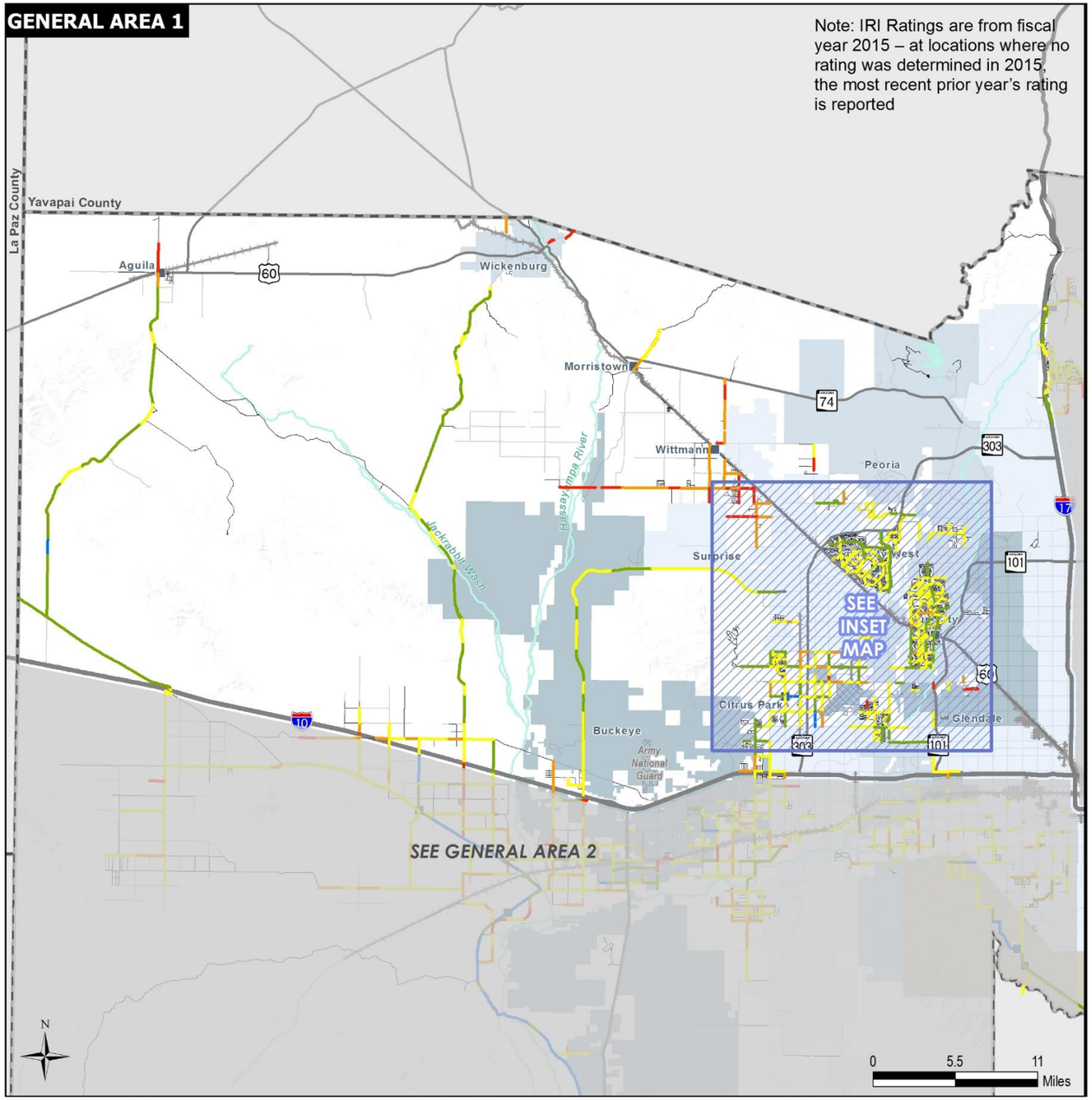
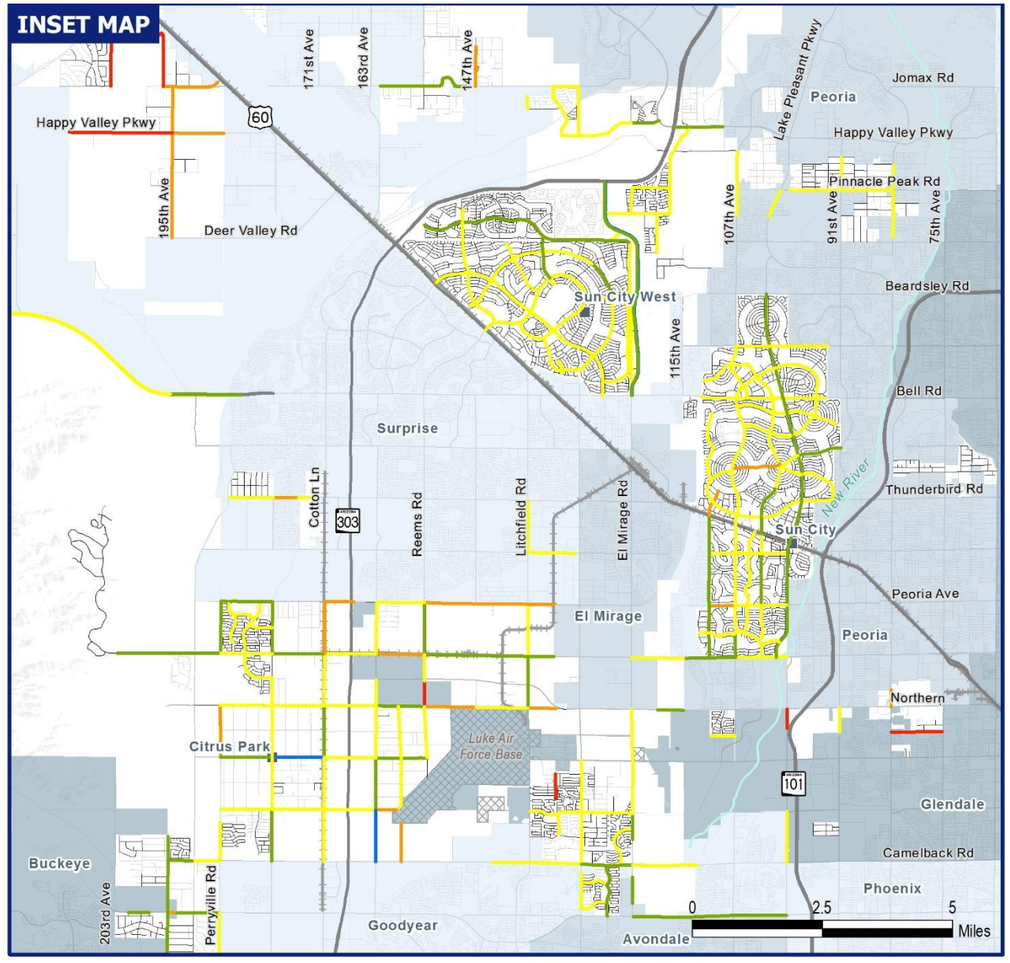


Figure 23: FY 2011 - FY 2015 IRI for County Arterial Roads



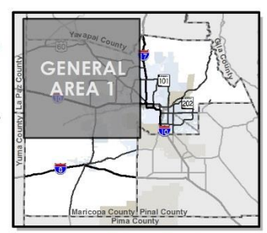


FY 2015 IRI Rating

- Very Smooth (0 to 59)
- Smooth (60 to 94)
- Average (95 to 169)
- Rough (170 to 220)
- Very Rough (>220)

- Other Communities
- Interstate
- State Route/US Highway
- County Maintained Roadway*
- Railroad

- National Forest
- Indian Reservation
- Military
- Incorporated Areas
- County Boundary
- Inset Map Extent



*Includes roads that are a) fully or partially owned and operated by MCDOT; or b) maintained by MCDOT through an intergovernmental agreement or through courtesy grading pursuant to Arizona Revised Statute 28-6705

Source: Maricopa County; Flood Control District of Maricopa County (FCD); Arizona Department of Transportation (ADOT); Arizona State Land Resource Information System (ALRIS)

Figure 24: FY 2015 IRI for County Arterial Roads

Area 1

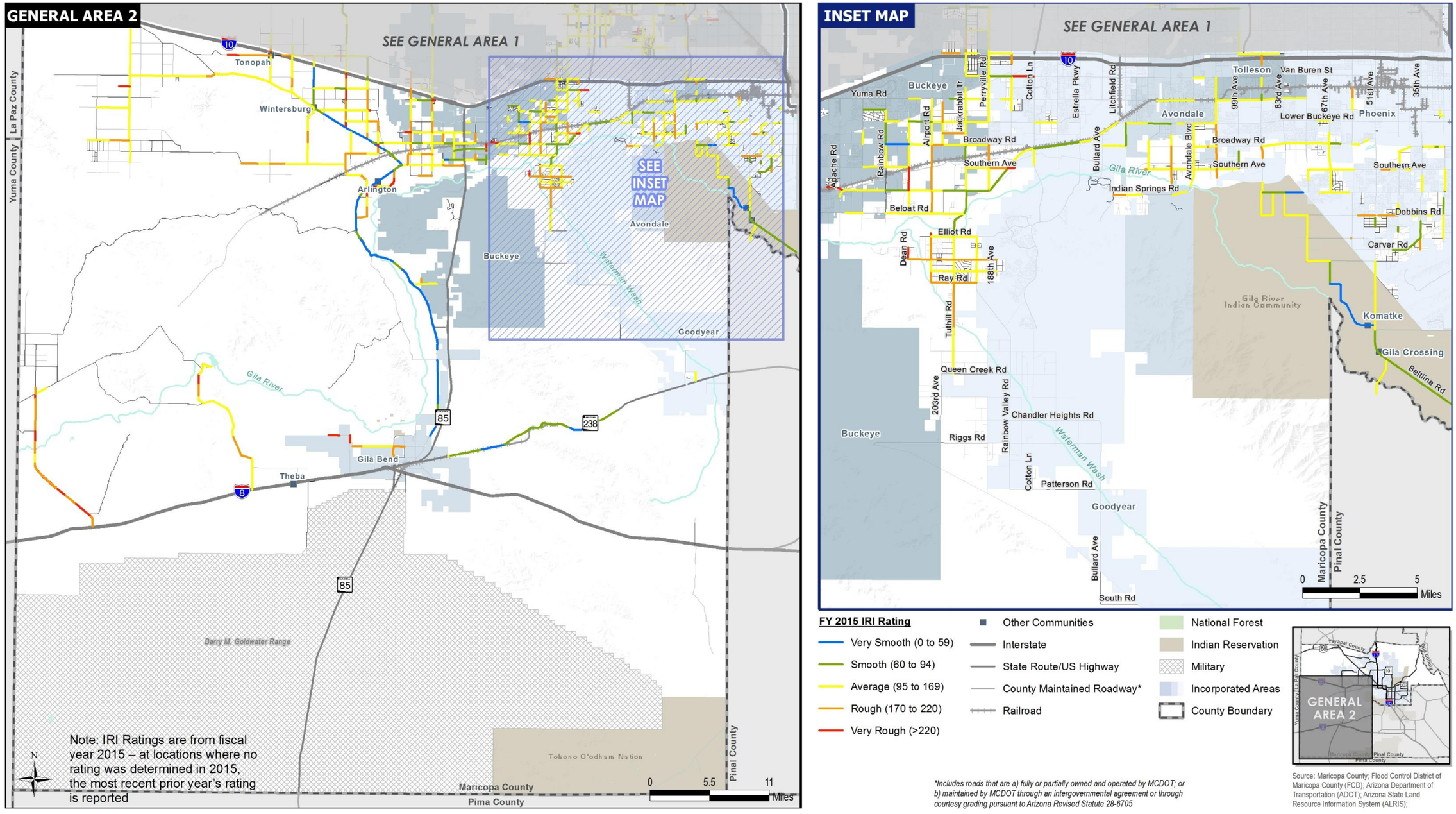
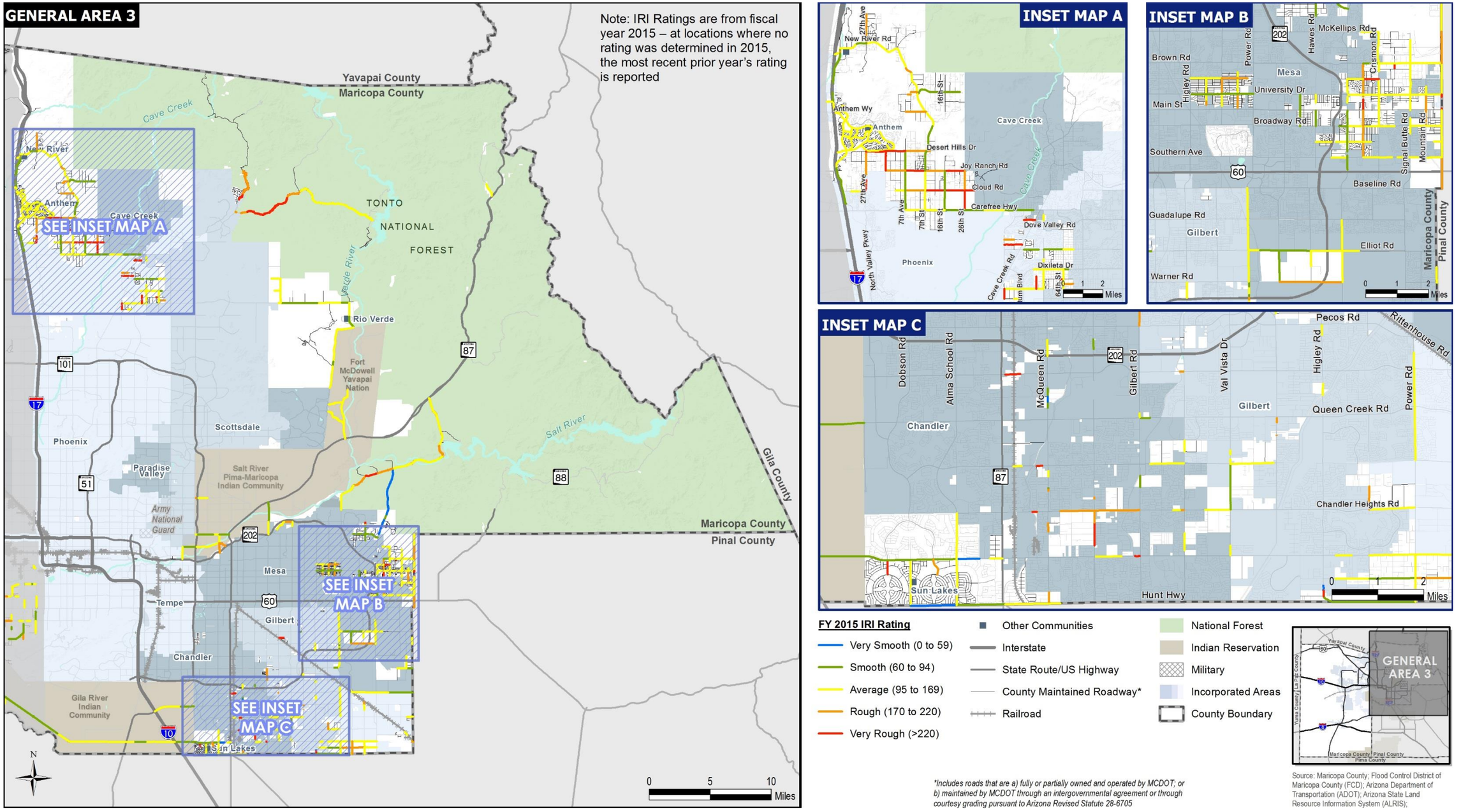


Figure 24: FY 2015 IRI for County Arterial Roads

Area 2



*Includes roads that are a) fully or partially owned and operated by MCDOT; or b) maintained by MCDOT through an intergovernmental agreement or through courtesy grading pursuant to Arizona Revised Statute 28-6705

Source: Maricopa County; Flood Control District of Maricopa County (FCD); Arizona Department of Transportation (ADOT); Arizona State Land Resource Information System (ALRIS);

Figure 24: FY 2015 IRI for County Arterial Roads

Area 3

Sufficiency Ratings

The Road Management Section identifies a sufficiency rating for each arterial road segment when it is initially constructed. 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, with 100 representing a road in compliance with the RDM standards.

The sufficiency ratings of arterial roads are updated only after major improvements are made to the road or the road is reconstructed. New construction, widening, or significant improvements to roads to address safety issues such as bottlenecks, drainage, and vertical and horizontal sight distance will all impact the road's sufficiency rating. The Sufficiency Ratings of the MCDOT road network between FY 2011 and FY 2015 are provided in **Figure 25**. Maps labeled **Figure 26** below show the sufficiency ratings of every County arterial road.

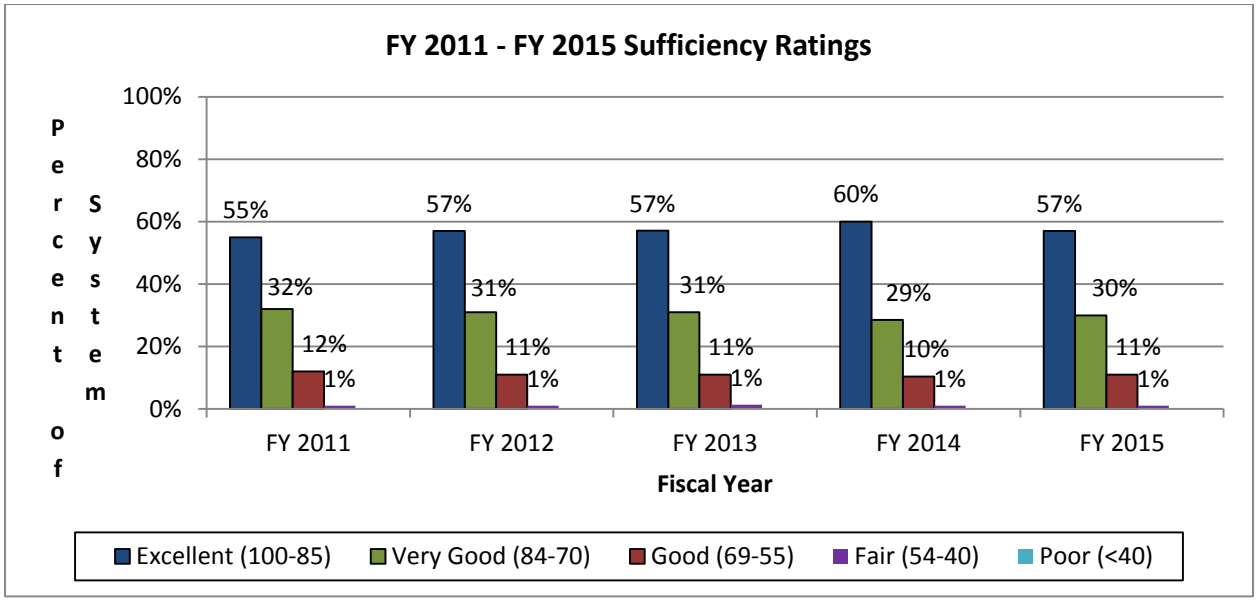
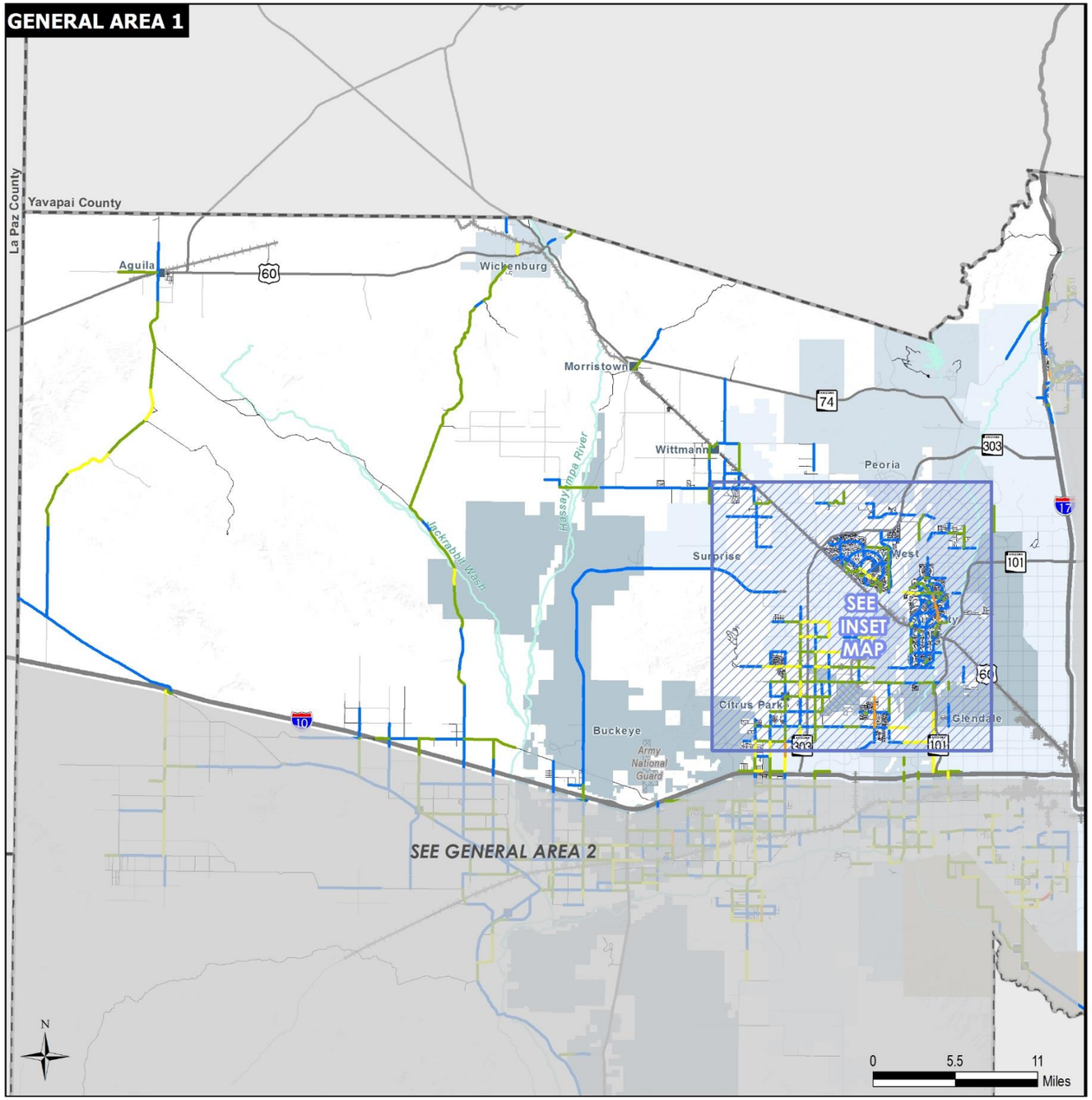
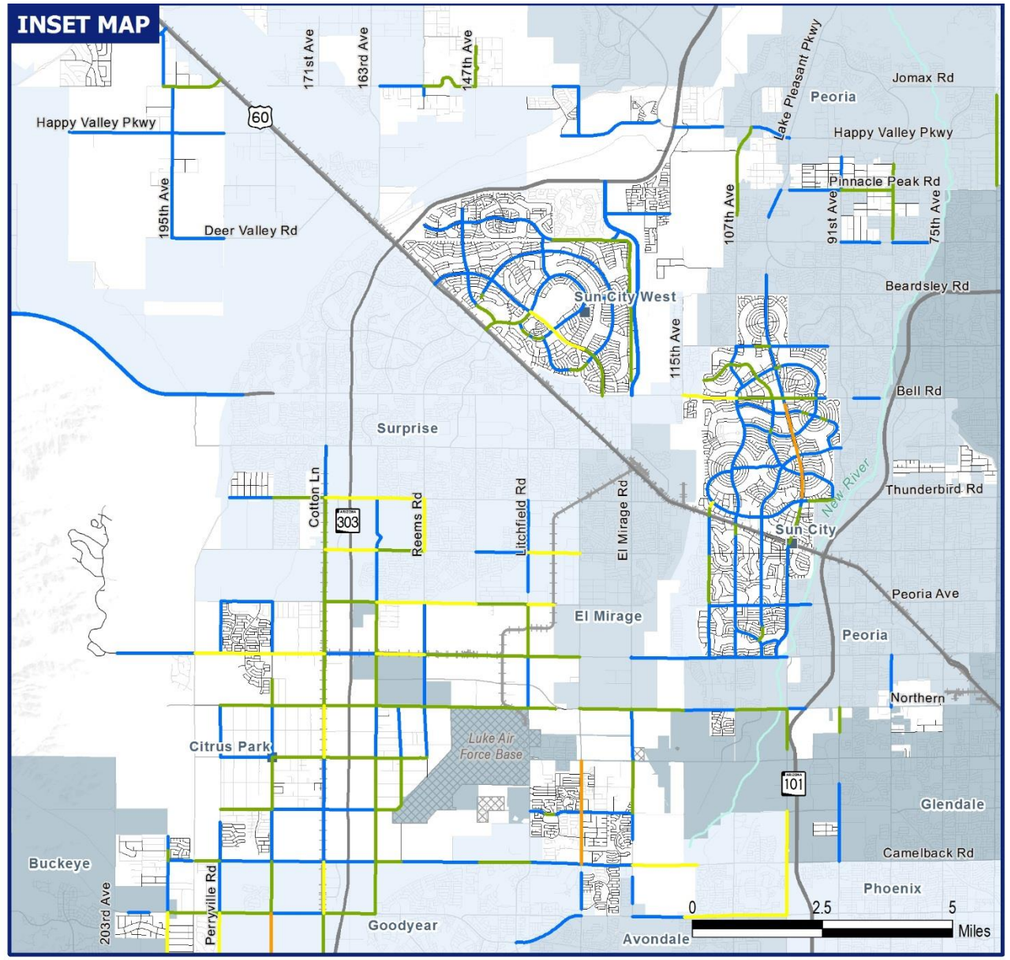


Figure 25: FY 2011 - FY 2015 Sufficiency Ratings for County Arterial Roads



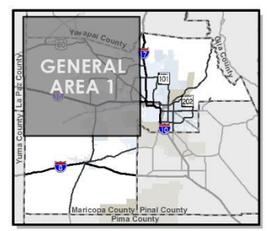


FY 2015 Road Sufficiency Rating

- Excellent (85 to 100)
- Very Good (71 to 84)
- Good (55 to 70)
- Fair (40 to 54)
- Poor (<40)

- Other Communities
- Interstate
- State Route/US Highway
- County Maintained Roadway*
- Railroad

- National Forest
- Indian Reservation
- Military
- Incorporated Areas
- County Boundary

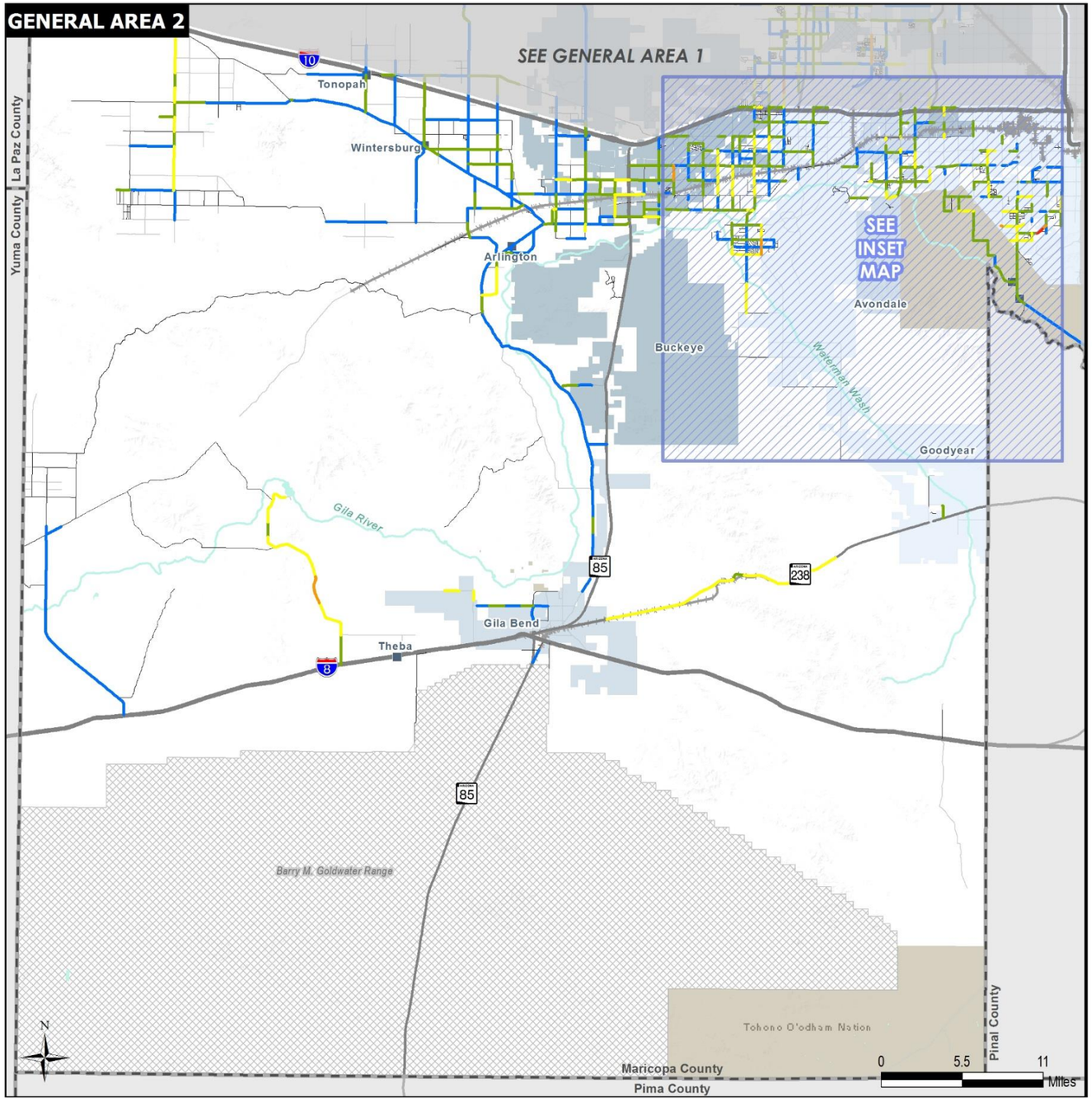


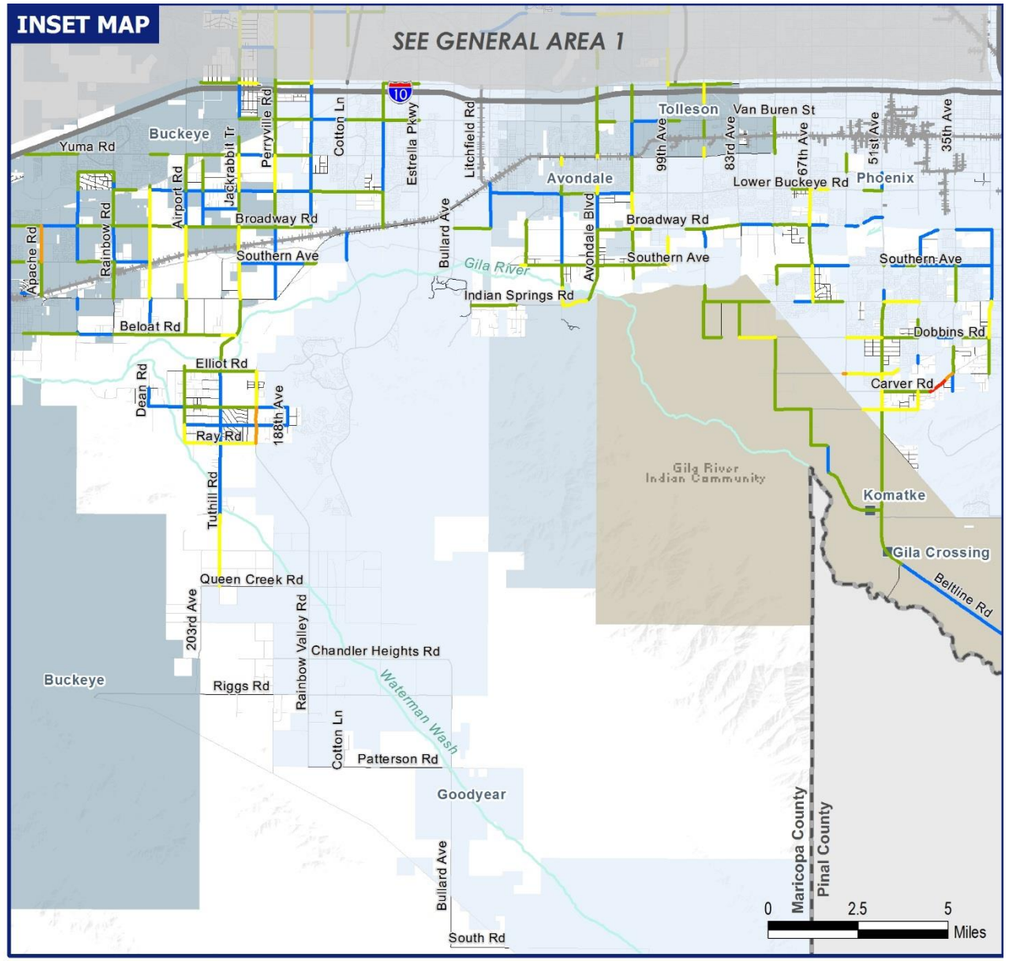
*Includes roads that are a) fully or partially owned and operated by MCDOT; or b) maintained by MCDOT through an intergovernmental agreement or through courtesy grading pursuant to Arizona Revised Statute 28-6705

Source: Maricopa County; Flood Control District of Maricopa County (FCD); Arizona Department of Transportation (ADOT); Arizona State Land Resource Information System (ALRIS)

Figure 26: FY 2015 Sufficiency Ratings for County Arterial Roads

Area 1





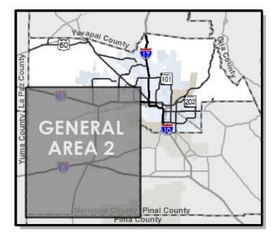
FY 2015 Road Sufficiency Rating

- Excellent (85 to 100)
- Very Good (71 to 84)
- Good (55 to 70)
- Fair (40 to 54)
- Poor (<40)

- Other Communities
- Interstate
- State Route/US Highway
- County Maintained Roadway*
- Railroad

- National Forest
- Indian Reservation
- Military
- Incorporated Areas
- County Boundary

*Includes roads that are a) fully or partially owned and operated by MCDOT; or b) maintained by MCDOT through an intergovernmental agreement or through courtesy grading pursuant to Arizona Revised Statute 28-6705



Source: Maricopa County; Flood Control District of Maricopa County (FCD); Arizona Department of Transportation (ADOT), Arizona State Land Resource Information System (ALRIS);

Figure 26: FY 2015 Sufficiency Ratings for County Arterial Roads

Area 2

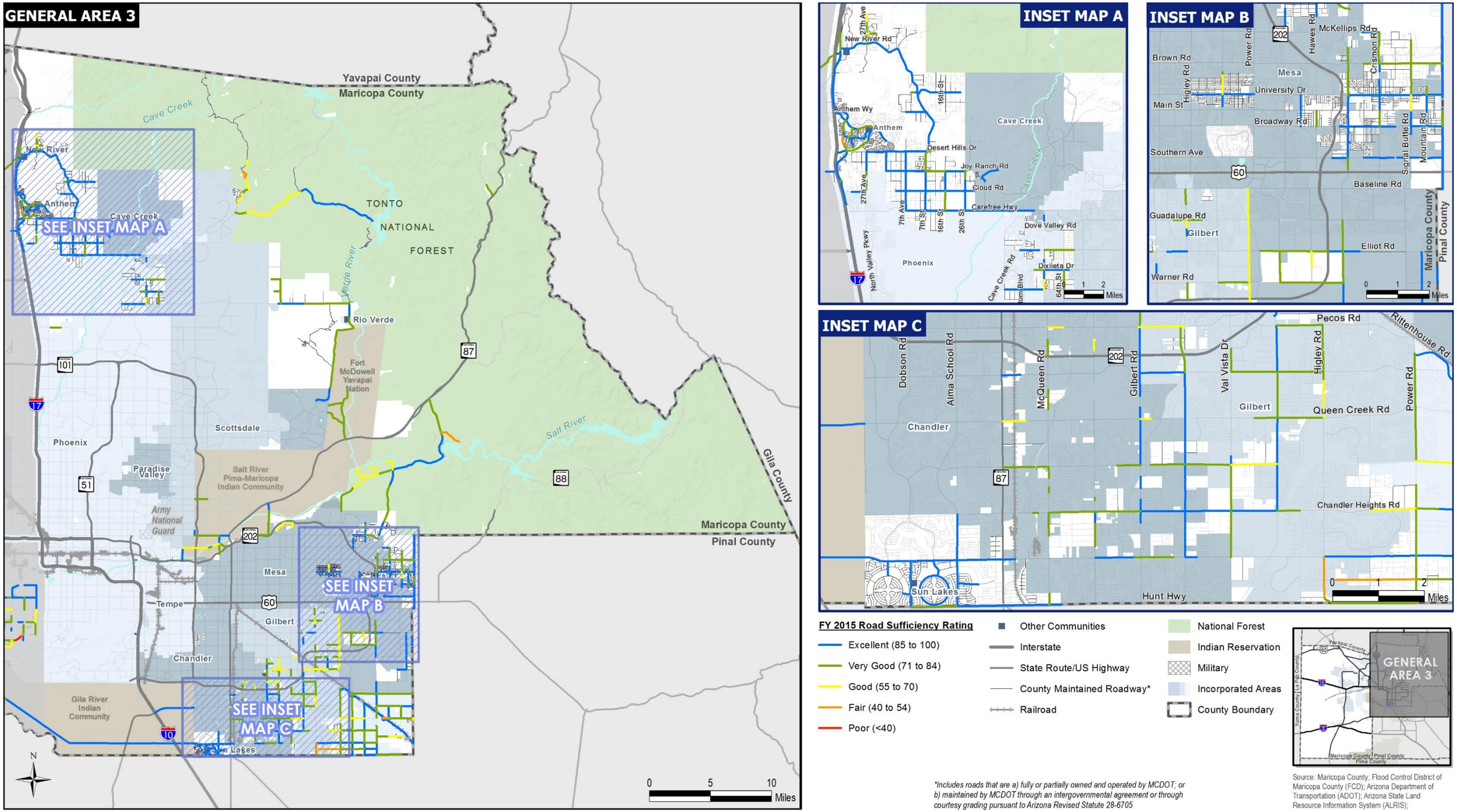


Figure 26: FY 2015 Sufficiency Ratings for County Arterial Roads

Area 3

Preventive Maintenance Procedures

Preventive maintenance extends the life of the pavement and provides for better road performance. The majority of treatments for pavement involves sealing the existing surface and providing a new wearing surface for traffic.

MCDOT has used preventive maintenance practices for decades with excellent results. **Table 19** shows the breakdown of each treatment that is typically used, the frequency of application, and the observed increase in pavement life per application.

Table 19: Preventive Maintenance Treatment Longevity

Treatment	Pavement Age at Time of First Application (year)	Frequency of Application (year)	Observed Increase in Pavement Life (year)
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” Asphalt Rubber Hot Mix (ARHM)	12 to 15	12 to 15	12
Local—Mill & Resurface 1.5” ARHM	35+	To be determined	To be determined

FY 2015 Pavement Preservation Results

A maintenance plan was established that identified the major projects that were needed to maintain the integrity of the MCDOT owned roads in 2015. A summary of the completed maintenance projects in FY 2015 can be found in **Table 20**. The cost to complete the FY 2015 maintenance plan was approximately $17.16 million. As a comparison, MCDOT spent $12.68 million to complete the FY 2014 maintenance plan.

Table 20: FY 2015 Completed Maintenance Plans

Project Name	WO#	Cost per Square Yard (SY)	Square Yards (SY)	Lane Miles	Total Cost
2015 - Crack Seal - MPC15	MPC01	$ 0.32	1,956,780	238.25	$ 626,169.63
2015 - Crack Seal - MPC15	MPC02	$ 0.32	334,231	40.69	$ 106,953.92
2015 - Chip Seal LV - Beltline, Riggs, 51st Ave, Meridian	MPH01	$ 2.00	320,519	39.03	$ 641,038.44
2015 - Chip Seal HV - Locals - Cape Seal	MPH02	$ 2.50	226,095	27.53	$ 565,236.98
2015 - Chip Seal HV - Eagle Eye - Vulture Mine - Patton	MPH02	$ 2.50	799,649	97.36	$ 1,999,122.50
2015 - Micro Seal - Cape Seal	MPM15	$ 2.92	230,524	28.07	$ 673,129.15
2015 - Preservative Seal - Locals TRMSS	MPP15	$ 0.35	1,358,855	165.44	$ 475,599.15
2015 - Slurry Seal	MPS15	$ 1.75	326,208	39.72	$ 570,864.74
2015 - Micro Seal - Cape Seal	MPS15	$ 2.92	2,050	0.25	$ 5,986.64
2015 - AR M&R - Meridian Rd - T468	T468	$ 12.87	44,595	5.43	$ 573,939.07
2015 - 2" AC Ovl Superpave - Germann Rd	T471	$ 16.60	30,672	3.74	$ 509,158.85
2015 - AR Overlay - SR 303/Northern Pkwy Area - T472	T472	$ 10.50	273,129	33.25	$ 2,867,853.24
2015 - AR M&R - McDowell Rd	T475	$ 13.00	29,307	3.57	$ 380,991.00
2015 - Rehab - Old US 80 - T494	T494	$ 52.00	16,931	2.06	$ 880,394.84
2015 - Mesa Locals #1 - Rehab TT434	TT434	$ 18.50	264,121	32.16	$ 4,886,229.62
2015 - AR M&R - Arterials	TT469	$ 12.50	32,864	4.00	$ 410,800.00
2015 - AR M&R - Arterials	TT470	$ 12.50	51,366	6.26	$ 642,069.50
2015 - Mesa Locals #1 - Rehab TT434 - Coralbell Ave - 93rd to 95st	TT485	$ 73.50	4,748	0.58	$ 348,978.00
Project Maintenance Totals			6,302,644	767.39	$ 17,164,515.25
TIP Funding:					$ 11,500,414.12
Operations Funding:					$ 5,664,101.14

In FY 2015, MCDOT's pavement preservation group and the Operations Division completed 18 programs with an expenditure of $17,164,515.25. **Figure 27** and **Figure 28** break down the FY 2015 completed projects and costs by the type of surface treatment that was performed. As can be seen in Figure 27, the most prevalent road improvement undertaken in 2015 was the crack seal, with 279 miles of road undergoing a crack seal treatment. However, the type of surface treatment that resulted in the largest cost in FY 2015 was the pavement rehabilitation projects, which cost MCDOT more than $6 million. This is despite the fact that there were only 35 miles of road that underwent rehabilitation.

Table 21 shows the overall Network Rating Summary for FY 2015, which shows the results of the preventive maintenance efforts by evaluating the road system's PCR and comparing it to previous years. The results of the FY 2015 pavement preservation program show that the network is being successfully maintained. It can be seen that the effort in FY 2015 resulted in improvement of the network, as the 2015 average PCR value was higher than in FY 2014 for arterial roads (82.78 versus 79.40), the PCR of park roads remained the same (89.63) and the average PCR of local roads showed minimal decline (92.07 versus 93.27). If additional funding becomes available, MCDOT can consider accelerating the preventative maintenance plans for more crack seal, slurry seal, chip seal and mill and overlay projects to improve the quality of MCDOT roads and reduce more costly maintenance in the future.

Maps labeled **Figure 29** show the pavement maintenance activities that have been undertaken on County roads in FY 2015. These maps also show the MCDOT-delineated maintenance areas.

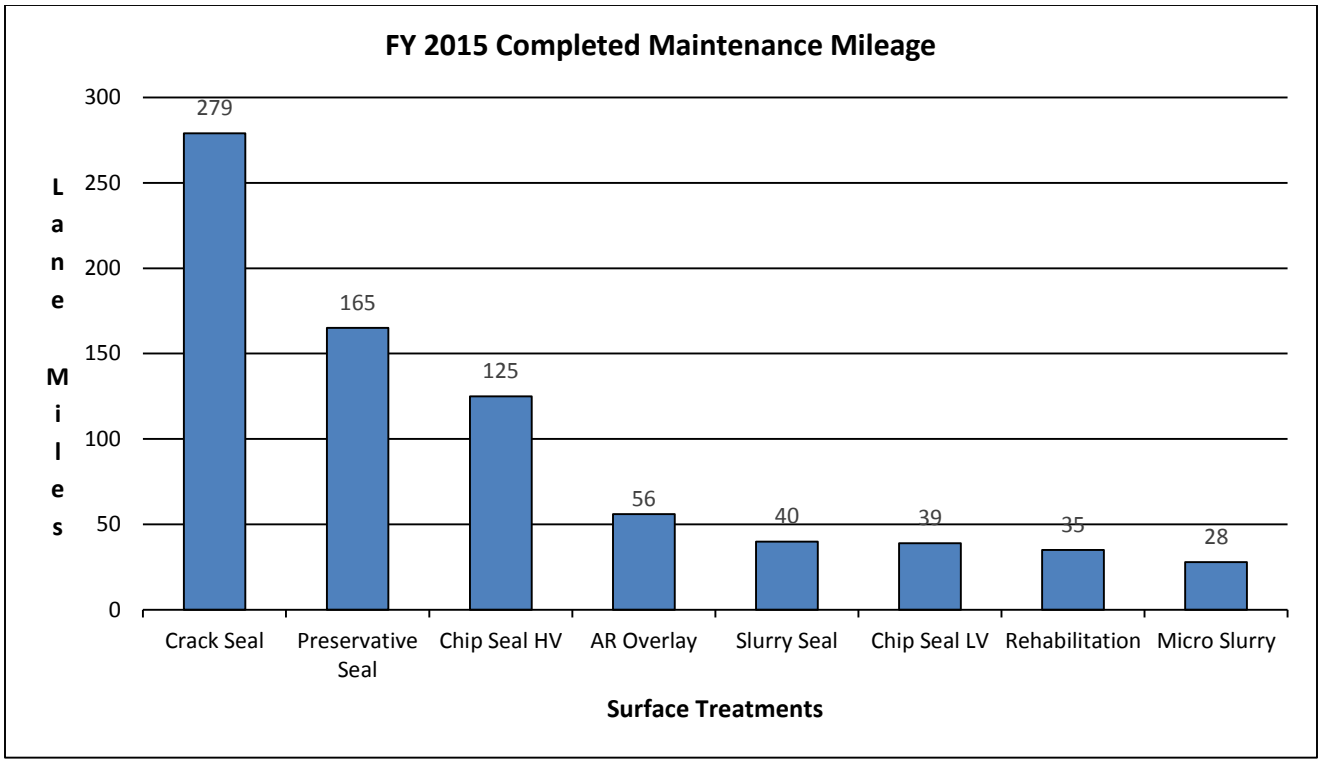


Figure 27: FY 2015 Completed Maintenance Mileage

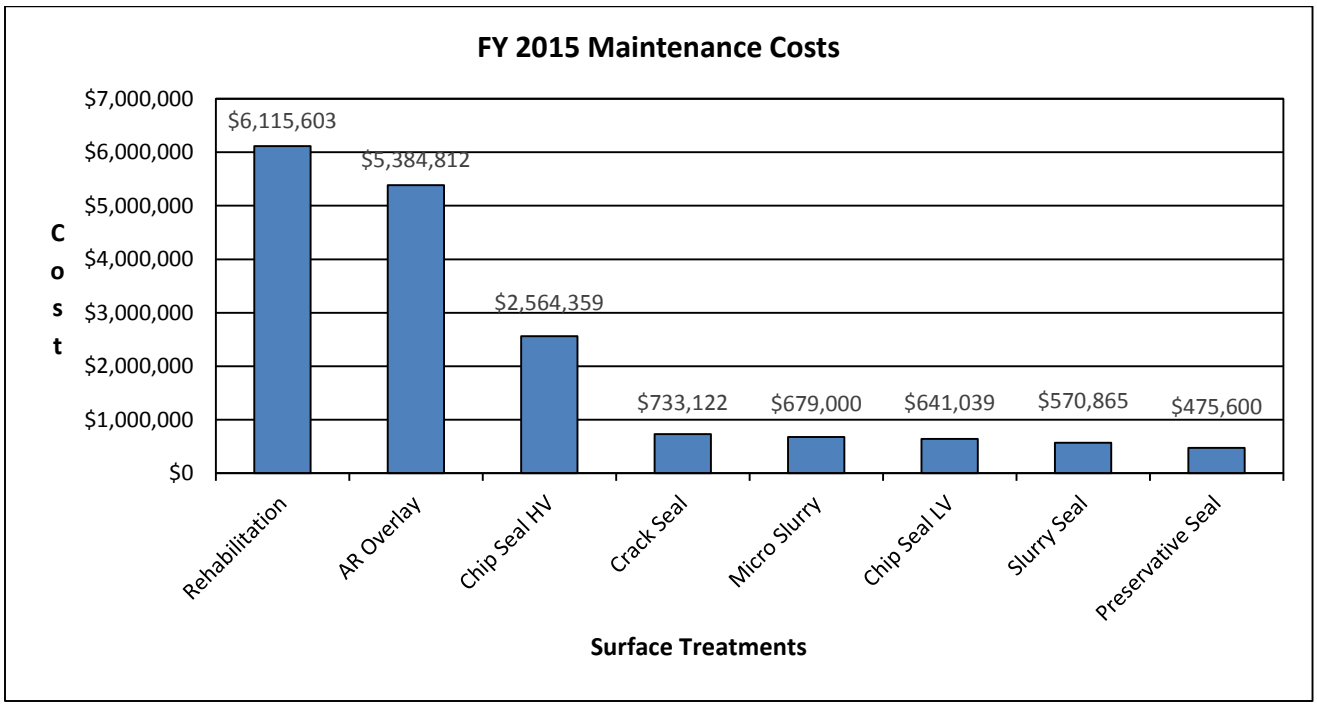


Figure 28: FY 2015 Maintenance Costs

Table 21: FY 2011 - FY 2015 Annual Network Rating Summary

Arterial					
Fiscal Year	**2011**	**2012**	**2013**	**2014**	**2015**
Average PCR	81.96	81.84	80.67	79.40	82.78
Average IRI	157.08	149.9	150.52	154.44	128.01
Mileage	1,119.18	1,123.14	1,087.43	1,084.28	1,077.14
PCR 100-85	631.09	517.28	519.82	438.75	535.43
PCR 84-70	273.28	387.14	349.61	423.64	412.70
PCR < 55	8.03	12.28	12.36	17.02	4.53
Miles above 70	904.37	904.42	869.43	862.39	948.13
% above 70	82.00%	83.00%	79.90%	79.50%	88.20%
% below 55	1.00%	1.10%	1.10%	1.60%	0.4%
Local					
Fiscal Year	**2011**	**2012**	**2013**	**2014**	**2015**
Average PCR	92.53	93.62	93.26	93.27	92.07
Mileage	897.68	910.02	912.27	920.97	922.17
PCR 100-85	751.23	815.22	834.21	852.88	846.47
PCR 84-70	103.18	61.99	51.98	42.22	55.40
PCR < 55	5.03	1.26	1.24	0	0.00
Miles above 70	854.41	877.21	886.19	895.1	901.87
% above 70	98.70%	98.40%	99.00%	99.40%	99.40%
% below 55	0.60%	0.10%	0.10%	0.00%	0.00%
Park					
Fiscal Year	**2011**	**2012**	**2013**	**2014**	**2015**
Average PCR	89.61	89.63	89.63	89.63	89.63
Mileage	54.97	56.54	56.36	58.18	58.18
PCR 100-85	45.22	44.97	44.97	44.97	44.97
PCR 84-70	5.46	5.46	5.46	5.46	5.46
PCR < 55	1.3	1.3	1.3	1.3	1.30
Miles above 70	50.68	50.43	50.43	50.43	50.43
% above 70	97.00%	97.50%	97.50%	97.50%	97.50%
% below 55	3.00%	2.50%	2.50%	2.50%	2.50%
Network Totals					
Fiscal Year	**2011**	**2012**	**2013**	**2014**	**2015**
Network Average PCR	86.74	87.18	86.5	85.88	87.14
Network % above 70	87.34%	87.67%	87.84%	87.62%	92.37%
Network % below 55	0.69%	0.71%	0.72%	0.89%	0.28%

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

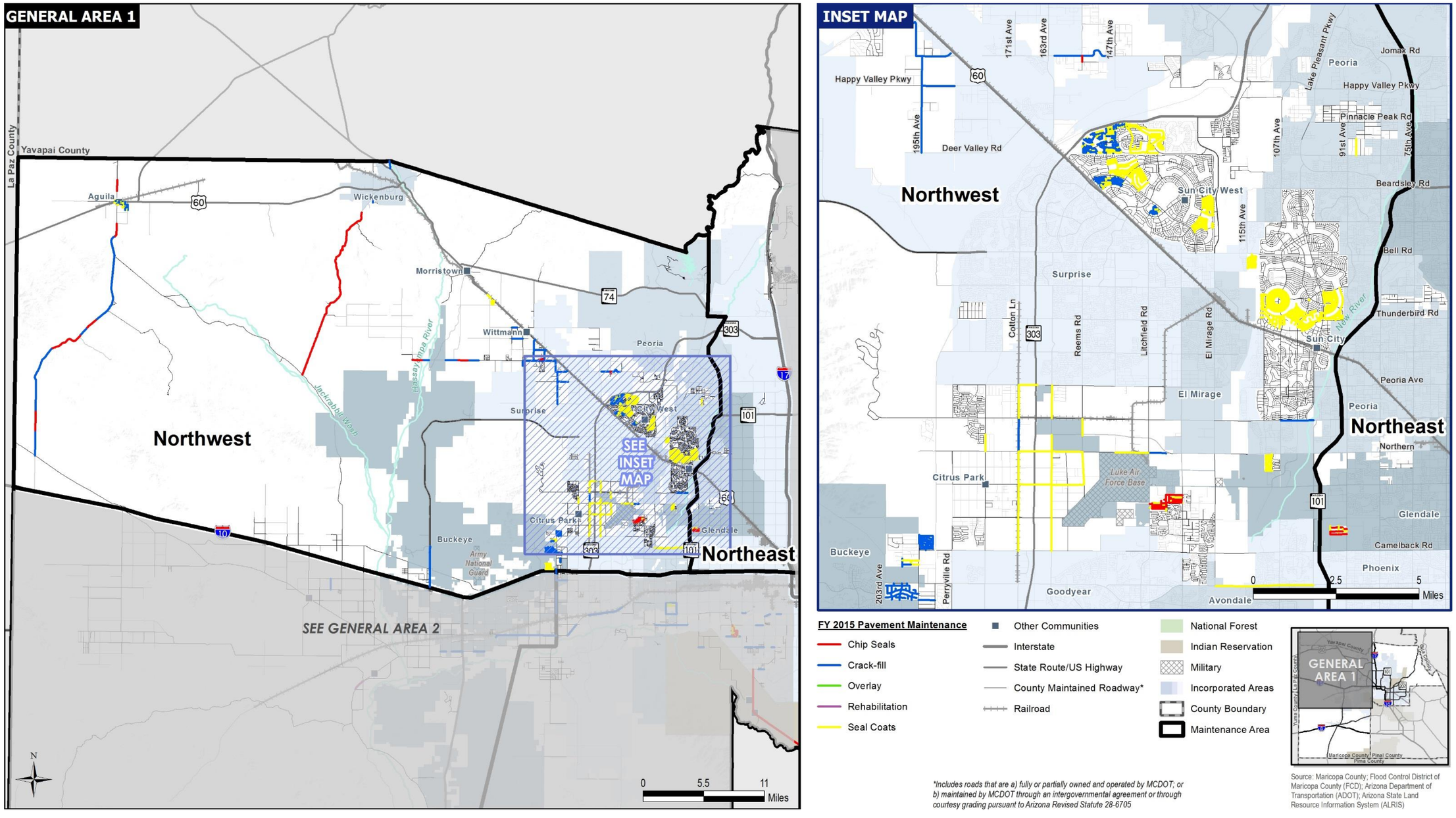


Figure 29: FY 2015 Pavement Maintenance Activities

Area 1

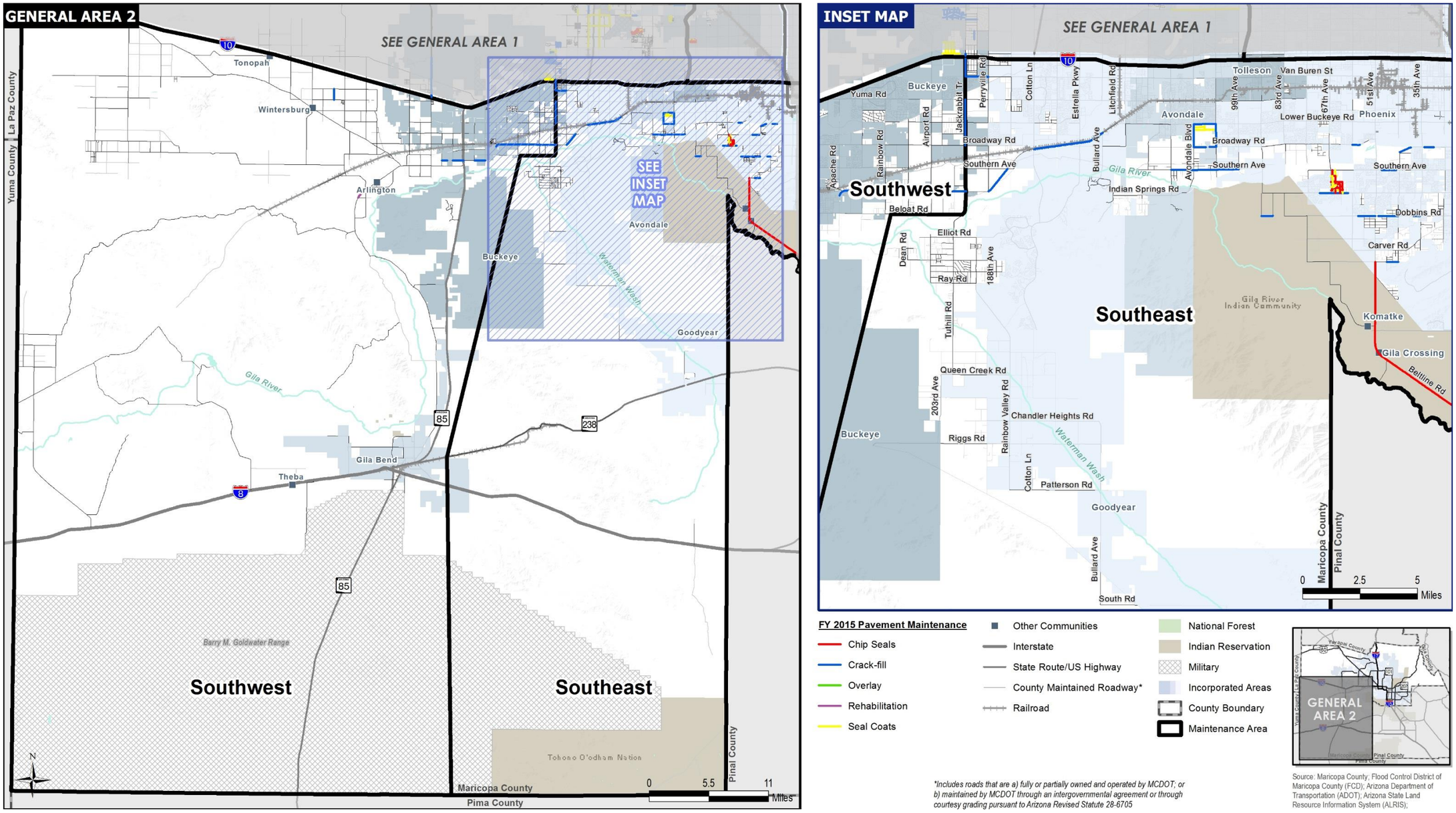
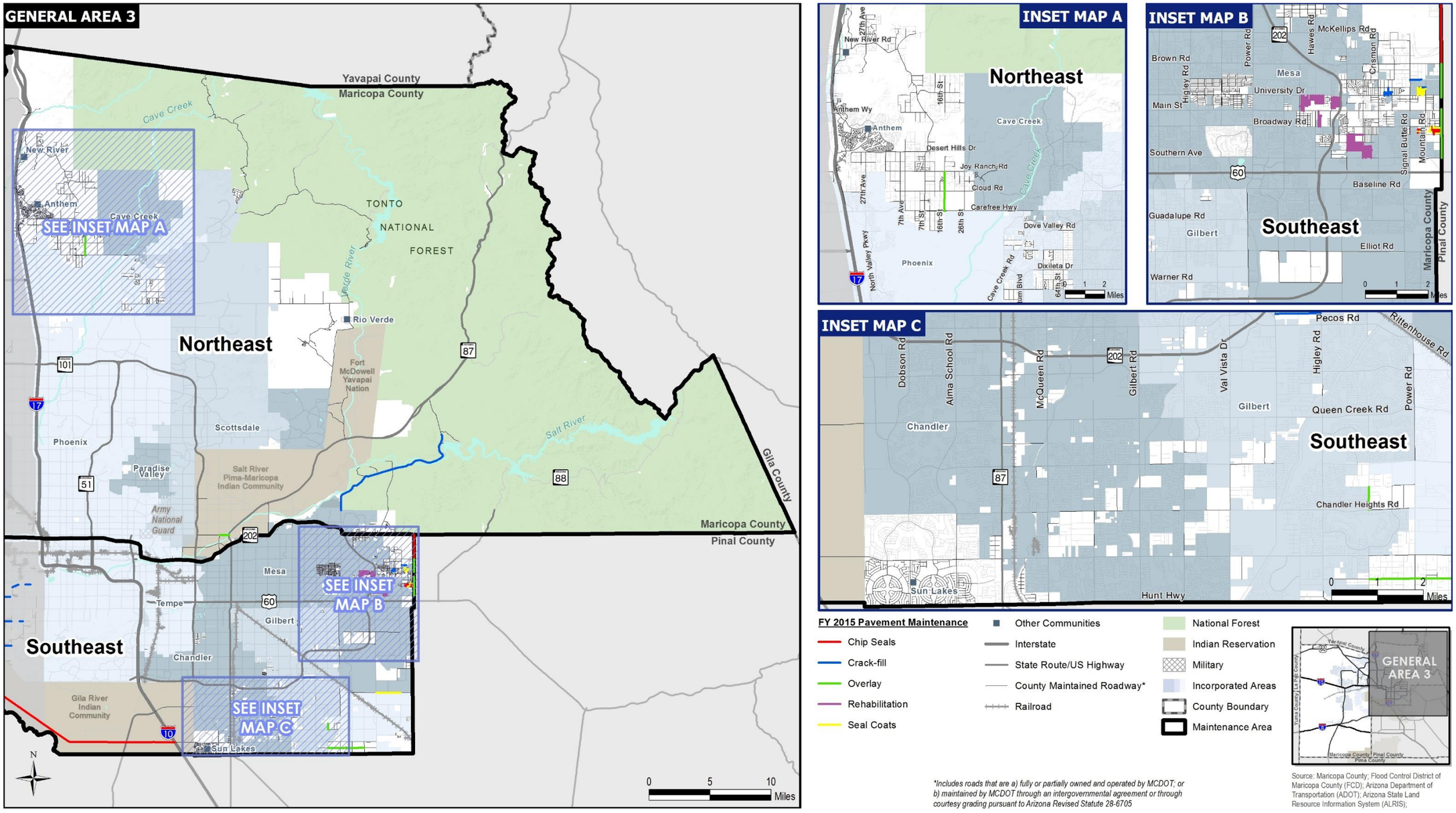


Figure 29: FY 2015 Pavement Maintenance Activities

Area 2



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Source: Maricopa County; Flood Control District of Maricopa County (FCD); Arizona Department of Transportation (ADOT); Arizona State Land Resource Information System (ALRIS);

Figure 29: FY 2015 Pavement Maintenance Activities

Area 3

5-Year Pavement Preservation Plan

Pavement preservation plans are generated by applying of the preservation strategy flow charts to the current pavement ratings in the database. Per **Figure 30**, in 2015 it was projected that the pavement preservation and preventative maintenance needs for the five-year period (FY 2015 - FY 2019) would be $91.7 million to keep the County road system at the then existing serviceability level. In FY 2015, MCDOT completed pavement preservation and preventative maintenance projects for a total amount of approximately $17.2 million, or about 19 percent of the projected five-year expenditures. The projected needs for pavement preservation and preventative maintenance were identified to be $85.5 million for the next cycle of five fiscal years, FY 2016 to FY 2020.

	FY 2016 – FY 2020 5 Yr. Projection - 2016		FY 2016 Only		
Preservation Type	**Lane Miles**	**Cost**	**Lane Miles**	**Cost**	%
Arterial AR Overlay	226.96	$30,071,553	42.55	$6,485,163	21.5%
Local M&R/Rehab	163.54	$24,429,810	59.75	$8,691,431	35.5%
HIPR	8.77	$936,273	8.77	$936,273	100%
Chip Seal HV	398.36	$9,290,309	141.90	$3,711,987	40%
Chip Seal LV	231.55	$4,627,097	59.34	$978,760	21%
Micro Seal	95.60	$2,322,655	18.41	$420,610	18%
Slurry Seal	231.00	$3,908,796	41.66	$598,796	15%
Preservative Seal	1,663.21	$5,929,877	336.36	$966,895	16%
Crack Seal	1,126.06	$4,036,923	248.72	$714,967	18%
Pavement Preservation Totals:	**4,145.04**	**$85,553,292**	**957.47**	**$23,504,880**	**27.5%**

Figure 30: FY 2016 Pavement Preservation 5-Year Summary Report

FY 2016 Pavement Preservation Plan

Table 22 shows the FY 2016 Pavement Preservation Plan that was developed in FY 2015. Implementation of the projected maintenance plan will cost $19.3 million to apply all the recommended surface treatments and existing pavement rehabilitation.

Table 22: FY 2016 Pavement Preservation Plan

Project Name	WO #	Cost/SY	SY	Lane Miles	Needs Cost
Arterial - AR Overlay - Bush Hwy - Phase I	T348	$38.00	83,000	10.11	$3,154,000
AR M&R - Arterials - T474nw	T474	$12.50	88,317	10.75	$1,103,963
AR M&R - Arterials - T475se	T475	$12.50	136,215	16.59	$1,702,688
AR M&R - Arterials - T476sw	T476	$12.50	41,961	5.11	$524,513
Rehabilitation - Locals - Area 2	T473	$18.50	371,231	45.20	$6,867,774
AR M&R - Locals - Area 2	T473	$12.50	64,500	7.85	$806,250
HIP - AR Ovl - Patton Rd & Alma School Rd	T---	$13.00	72,021	8.77	$936,273
Chip Seal - HV - Hot Precoated	T473	$3.80	426,006	51.87	$1,618,823
Chip Seal - HV -		$2.85	699,025	85.11	$1,992,221
Chip Seal - LV -		$2.00	446,984	54.42	$893,968
Chip Seal - HV - Town of Gilbert IGA		$2.50	40,377	4.92	$100,943
Chip Seal - LV - Town of Gilbert IGA		$2.10	40,377	4.92	$84,792
Crack Seal - Town of Gilbert IGA		$0.35	42,762	5.21	$14,967
Micro Seal - Town of Gilbert IGA		$2.23	42,762	5.21	$95,359
Micro Seal - Anthem Arterials		$3.00	108,417	13.20	$325,251
Rehabilitation - SCW Unit 39		$18.50	54,995	6.70	$1,017,408
Slurry Seal - Sun Lakes Units 1-10		$1.75	342,169	41.66	$598,796
Preservative Seal - Arterials MC		$0.35	1,159,625	141.19	$405,869
Preservative Seal - Local - TRMSS Plan 1		$0.35	1,602,931	195.17	$561,026
Crack Seal		$0.35	2,000,000	243.52	$700,000
Pavement Preservation Totals:			7,863,675	957.47	$23,504,880
				TIP Funding:	$14,159,186
				Operations Funding:	$9,345,694
				Additional Funding Required:	$0

Figure 31 and **Figure 32** break down the planned FY 2016 projected maintenance projects and project costs by the type of surface treatment that will be performed. Similar to FY 2015, the 20 projects in the FY 2016 plan will have the highest number of lane miles being treated by crack seal.

For costs, in FY 2015, the treatment that was generating the highest cost was rehabilitation. In FY 2016, the treatment with the highest projected cost is also rehabilitation, which is estimated to cost approximately $8.7 million. AR M&R are the next highest costs, with projections at approximately $6.5 million.

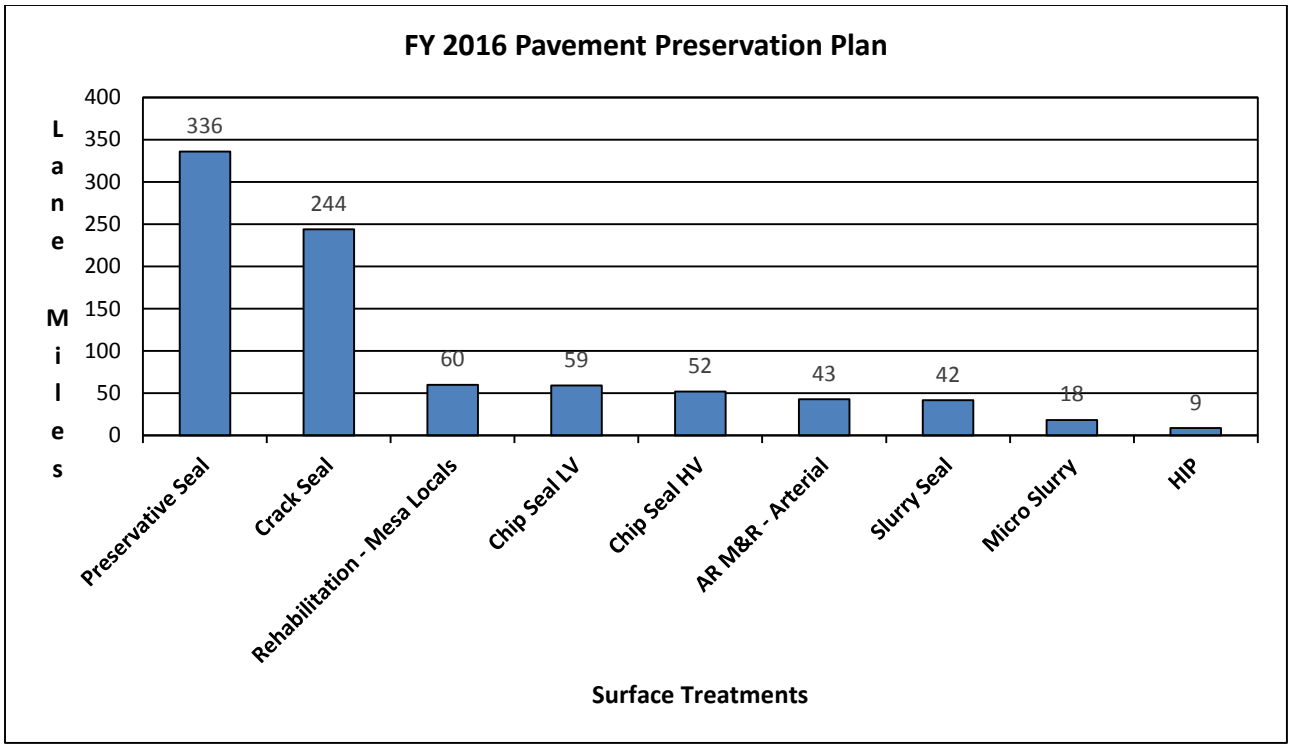

Figure 31: FY 2016 Pavement Preservation Plan Summary

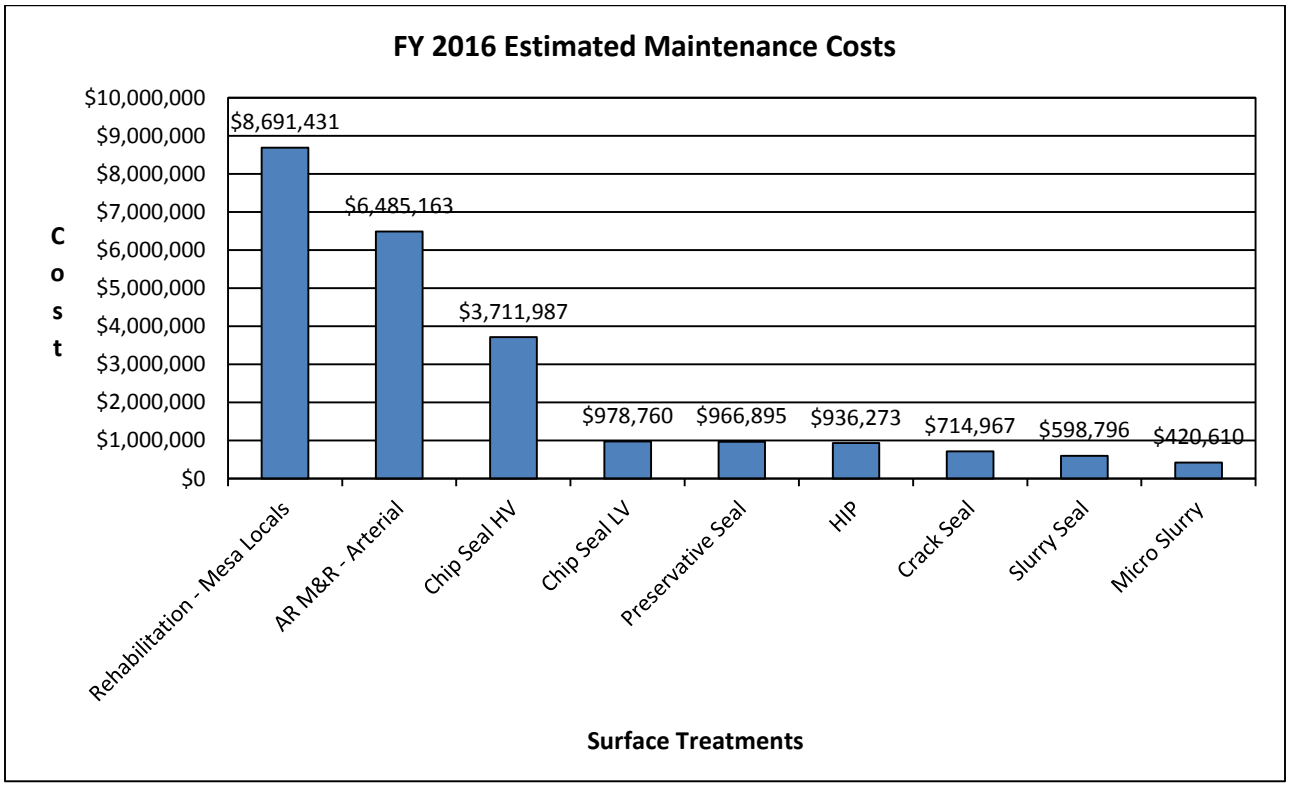

Figure 32: FY 2016 Estimated Maintenance Costs

Appendix A – Alphabetical Listing of All Structures in the MCDOT Bridge Inventory

Structure No.	Road	Location	Feature Intersected	Sufficiency Rating
10050	7th St	0.2 mi N/ 7th St/Carefree	Desert Lake Wash	98.33
10051	7th St	450' N/ Carefree Hwy	Desert Lk Wash S Branch	98.33
8583	59th Ave	0.5 mi S/ Buckeye Rd	RID Canal	98.14
9289	91st Ave	at McDowell Rd	RID Canal	94.83
10444	96th Street	1/8 mi N/ Broadway Road	Wash	98.70
9666	99th Ave	250' N Grand Ave	Drainage Ditch	95.74
9672	99th Ave	0.25 mi N/ McDowell Rd	RID Canal	96.23
990151	99th Ave	200' N/ Grand	Drainage Ditch	95.74
990153	99th Ave	at Concho Circle	Drainage Ditch	96.04
990154	103th Ave NB	325' N/ Olive	Drainage Ditch	92.75
9677	105th Ave	at Del Webb Blvd Median	Drainage Ditch	96.94
990234	105th Place	Quarterline Rd to Contess	Drain Ditch	96.94
9678	106th Ave	at Del Webb Blvd Median	Drainage Ditch	96.94
9679	107th Ave	at Del Webb Blvd Median	Drainage Ditch	96.50
990280	116th Street	600' S of Riggs Rd	Consolidated Canal	91.92
10783	117th Avenue	620' S/ Agua Fria Blvd	Wash	80.27
990265	119th Avenue	0.5 mi s/ Williams Drive	Drainage Ditch	79.68
10368	129th Avenue	N/ Camelback Rd	Drainage Channel	96.91
10553	12th Street	N of Circle Mtn Rd	Wash	99.98
7561	138th Ave	200' W/ Camino del Sol	Drainage Ditch	97.95
990202	141st Ave	200' W/ Yosemite Dr	Drainage Ditch	96.95
10552	144th St-Rio Verde	120' S of Dixileta Dr	Wash	79.81
10554	144th St-Rio Verde	350' S of Peakview Rd	Wash	79.81
10555	144th St-Rio Verde	1250' S of Dixileta Dr	Wash	79.81
10556	144th St-Rio Verde	at Windstone Trail	Wash	79.81
990203	145th Drive	200' W/ Yosemite Dr	Drainage Ditch	96.95
990204	147th Drive	200' N/ Antelope	Drainage Ditch	96.95
10849	150th Street	765' N of Rio Verde Drive	Wash	85.83
10850	150th Street	1610' N of Rio Verde Dr	Wash	85.83
990287***	151st Ave	0.33 mi S of Deer Valley	Wash RCB	95.12
8571	163rd Avenue	5 mi N/ US 60 Grand Ave	HaydenRhodes CAP Aqueduct	93.80
11109	203rd Place	just N of Riggs Rd (QC)	Sonoqui Wash	96.89
11327	231st Ave	0.25 mi. N/Patton Rd	Drainage Wash	99.99
7582	309th Avenue	S of Lower River Rd	Buckeye Canal	97.95
8576	355th Avenue	7 mi N/ Indian School Rd	CAP Canal	90.60
7548	571st Ave AguaCal	9.75 mi N/ I-8 via AC Rd	Gila River	99.14
990156	571st Ave AguaCalR	8.5 mi N/ I-8 via AguaCal	Wash	95.87
8001	Airport Rd	0.5 mi N/ Lower Buckeye	RID Canal	97.53
10126	Airport Rd	1 mi N/ MC85	Buckeye Canal	97.77
7549	Aleppo Drive	200' N/136th Dr W/SpnGrdn	Drainage Ditch	96.78
8553	Alma School Rd	300' S/ McKellips	Salt River(N.Channel)	74.92
8554	Alma School Rd	0.25 mi N/ McLellan	Salt River(S.Channel)	74.92
990117	Alma School Rd	0.25 mi S/ Riggs Rd	golf cart underpass	97.66
990187	Amigo Dr (SCW)	at Stardust Blvd Median	Drainage Ditch	94.42
10405	Anthem Way	East of I-17	Wash	92.57
10551	Anthem Way	0.89 mi SE/ Daisy Mtn Dr	Wash	98.94
990227	Anthem Way	530 ft SE/ Navigation Way	Wash	98.51
990228	Anthem Way	475 ft SE/ Venture Court	Wash	98.51
990229	Anthem Way	NW of Anthem Club Dr	Wash	99.12
990230	Anthem Way	350 ft SE/Anthem Club Dr	Ped X	99.12
990231	Anthem Way	E/ Freedom Way	Wash	98.79
990232	Anthem Way	.25 mi W/ Daisy Mtn Dr	Wash	99.48
990250	Anthem Way	370 ft NW of LibertyBell	Wash	99.47
990258	Anthem Way	0.53 mi SE/ Daisy Mtn Dr	Wash	99.47
990259	Anthem Way	0.4 mi SE/ Daisy Mtn Dr	Wash	99.47
990184	Aurora Dr	at Stardust Blvd Median	Drainage Ditch	97.87

Structure No.	Road	Location	Feature Intersected	Sufficiency Rating
990185	Ballad Dr	at Stardust Blvd Median	Drainage Ditch	97.87
8000	Baseline Rd	300 ft NW MC-85	Buckeye Canal	95.14
8555	Beardsley Rd	100' E/ 125th Ave	Drainage Ditch	97.61
990272	Belfair Way	N of Meridian Drive	Wash	99.96
9126	Bell Rd	at 99th Ave	Drainage Ditch	91.74
9686	Bell Rec Center Dr	at 99th Ave Median	Drainage Ditch	96.55
990157	Beloat Rd	E/ Rainbow Rd	Buckeye Canal S. Branch	99.67
10512	Bethany Home Rd	200' E of 125th Ave	Wash	95.83
990243	Bethany Home Rd	350' E of 137th Ave	wash	83.55
990244	Bethany Home Rd	418' W of 135th Ave	Wash	83.55
9676	Boswell Blvd	at Del Webb Blvd Median	Drainage Ditch	96.69
9687	Boswell Blvd	at 99th Avenue Median	Drainage Ditch	99.83
8975	Broadway Rd	400' W/ FanninMcFar CAP	Drainage Ditch	93.21
990101	Broadway Rd	at Meridian Rd.	Drainage Ditch	95.10
990102	Broadway Rd	1000' E/ Crismon Rd	Drainage Ditch	92.07
9375	Broadway Rd EB	0.2 mi E/ Price Rd	Tempe Canal	75.26
9384	Broadway Rd WB	0.2 mi E/ Price Rd	Tempe Canal	75.26
8855	Bruner Rd	0.75 mi N/ Old US-80	Buckeye Canal	97.99
9688	Burns Drive	at 99th Avenue Median	Drainage Ditch	99.78
9763	Bush Hwy	3.2 mi N/ McDowell Rd	Spook Hill Fldwy	86.32
9824	Bush Hwy	1.7 mi N/ Thomas	FanninMcFar CAP Agueduct	97.08
9849	Bush Hwy	at Blue Point-Salt River	Salt River	92.59
990113	Bush Hwy	3.25 mi N/ McDowell Rd	Wash	94.92
7779	Bush Hwy-FAS 388	3.5 mi N/ McDowell Rd	Wash	95.97
9859	Camelback Rd	1.0 mi E/ El Mirage Rd	Agua Fria River	77.12
990158	Camelback Rd	0.5 mi E/ El Mirage Rd	Drainage Ditch	95.30
990282	Camelback Road	E of Jackrabbit Trail	White Tanks FRS#3	85.41
9689	Cameo Dr	at 99th Avenue Median	Drainage Ditch	95.83
10158	Carefree Highway	W/ 16th Street	Wash	98.93
10159	Carefree Highway	0.5 mi W/ 24th Street	Wash	96.93
10160	Carefree Highway	0.25 mi E/ 24th Street	Wash	96.93
10161	Carefree Highway	0.5 mi E/ 24th Street	Apache Wash	96.93
9891	Carefree Hwy	at 10th St	Wash	98.93
9892	Carefree Hwy	200' W/ 12th St	Wash	98.93
9893	Carefree Hwy	200' W/ 24th St	Wash	98.93
10162	Carefree Hwy EB	2 mi W/ Cave Creek Rd	Cave Creek Wash	82.92
9825	Carefree Hwy WB	2 miles W/ Cave Creek Rd	Cave Creek Wash	77.92
990269	Carlota Lane	313' W of 119th Avenue	Drainage Ditch	97.89
990256	Castano Drive	just N. of Bethany Home R	Wash	94.82
7550	Cavalcade Drive	200' E/ 141th Ave	Drainage Ditch	95.77
7898	Cave Creek PKWY	1.5 mi N/32nd St/Cloud Rd	Wash	93.76
11111	Centennial Rd	5.7 mi W/ Hargua. Val. Rd	CAP Aux Canal	95.15
10240	Chambers Street	0.6 mi S/ Broadway Rd	Buckeye Feeder Ditch	93.08
990116	Chandler Hts Rd	0.5 mi E/ SR-87 (AZ Ave)	Consolidated Canal	96.81
990218	Cicero Street	E/ 105 St & N/ Univ Dr	Drain Ditch	96.95
10084	Circle Mtn Road	3437' E/ New River Rd	Wash	88.70
10229	Citrus Road	just N/ Northern Ave	Wash	76.75
10520	Clarendon Avenue	just W/ 195th Ave	Drain Ditch	91.33
990261	Clearview Trail	N/ Meridian Dr	Wash	99.92
990235	Cloud Rd	just E/ Via Puzzola	Wash	82.81
990236	Cloud Rd	1000' W/ 32nd Dr	Wash	80.80
10443	Cloud Road	500' W of 32nd Drive	Wash	91.47
990283	Colter Road	just E of Jackrabbit Trl	White Tanks FRS#3	96.99
990162	Conquistador Dr	200 ft E/ Regal	Drainage Ditch	96.83
990163	Conquistador Dr	200 ft S/ Beechwood	Drainage Ditch	86.91
990107	Coralbell Ave	E/ Ellsworth & S/Broadway	Drainage Ditch (Wash)	96.85
990164	Cotton Lane	N/ Camelback Rd	Drainage Ditch	68.08

Structure No.	Road	Location	Feature Intersected	Sufficiency Rating
10062	Cottonwood Rd	N Entrance Lk Plsnt Pk	Cottonwood Creek RCB	84.18
9736	Courthouse Rd	3 mi W/ Salome Rd	Saddleback Diversn Chn	98.54
8761	Crismon Rd	0.25 mi N/ Brown Rd	Signal Butte Fldwy	90.29
8856	Crismon Rd	500' N/ Apache Rd	CAP Canal	94.70
990247	Daisy Mtn Dr RCB	0.52 mi S of Anthem Way	Wash	99.10
10519	Daisy Mtn Drive	0.6 mi S of Anthem Way	Wash	99.55
10557	Daisy Mtn Drive	E of Dedication Trail	Wash	97.45
10558	Daisy Mtn Drive	750 ft E/Dedication Trail	Wash	97.45
10559	Daisy Mtn Drive	0.36 mi NE/ Dedication Tr	Wash	97.45
10627	Daisy Mtn Drive	0.4mi W/GavilanPkPkwy	Wash	95.75
10628	Daisy Mtn Drive	0.1 mi W/GavilanPk Pkwy	Wash	95.75
990266	Daley Lane	just e/ 123rd Avenue	Drainage Channel	95.89
7551	Dean Rd	600 ft N of Lower Buckeye	RID Canal	97.56
8638	Dean Rd	0.75 mi N/ MC-85	Buckeye Canal	97.86
10044	Deer Valley Dr	W/ 135th Ave	Golf Cart Path (SCW)	99.39
990165	Deer Valley Dr	W/ Dustytrail Blvd (SCW)	Golf Cart Path	96.36
990166	Deer Valley Dr	E/ Veterans	Golf Cart Path	99.67
990167	Deer Valley Dr	W/ Acapulco Drive	Golf Cart Path	96.67
11071	Deer Valley Drive	Just N/ exist DeerValleyD	Deer Valley Channel	79.60
990168	Desert Glen Dr	160 ft W/ 132nd Ave	Drainage Ditch	97.88
11365***	Dusty Trail Blv	N of Parada	Wash	99.97
990224	Dysart Rd	N/ Camelback Rd	Drain Chnl	94.38
7883	Dysart Rd-FAS 547	0.25 mi N/ Camelback Rd	Colter Channel	94.65
10787	Dysart Road	0.25 mi. S/ Jomax Rd	Beardsley Canal	99.99
8560	Eagle Eye Rd	2 mi S/ Salome Hwy	CAP Canal	96.88
10784	El Granada Blvd	0.18 mi. S/ Jomax Rd	Drainage Channel	96.92
10785	El Granada Blvd	0.42 mi. N/Happy Valley Rd	Drainage Channel	99.96
10786	El Granada Blvd	0.4 mi. N/ Happy Valley Rd	Beardsley Canal	99.99
8561	El Mirage Rd	N/ Bell Rd	Drainage Ditch	98.99
9949	El Mirage Rd	0.5 mi N/ Glendale Ave	Dysart Drain	96.82
11105	El Mirage Rd	1.7 mi N. of Bell Road	McMicken Dam Outlet Wash	93.98
11106	El Mirage Rd	3.4 mi. N. of Bell Road	McMicken Dam Outlet Wash	93.98
990169	El Mirage Rd	0.25 mi S/ Beardsley	Drainage Ditch	85.58
990279	El Mirage Rd	600' S. of Loop 303	Pinnacle Pk Drain Chnl	96.61
9586	Elliot Rd	at Sossaman	Sossaman Ditch	94.06
9842	Ellsworth	200' S/ Apache Trail	Drainage Ditch	98.14
9895	Ellsworth Rd	0.25 mi N/ University Rd	CAP Canal	98.24
7899	Ellsworth-FAU 7077	400' N/ Broadway	Wash	97.70
990284	Encanto Blvd	W. of Jackrabbit Trail	White Tanks FRS#3	96.99
10366	Forest Rd	1.3 mi N/ McDowell Mtn Rd	Large Wash	94.95
10367	Forest Rd	1.4 mi N/ McDowell Mtn Rd	Small Wash	92.44
990223	Forest Road	1.3 mi N/McDowell Mtn Rd	golf cart crossing	82.64
10104	Fort McDowell Road	just N/ Yavapai Rd	Wash	99.62
8019	Ft McDowell Rd	2.25 mi N/ SR 87	Wash	87.24
10384	Gavilan Peak Pkwy	300 ft N/ King Drive	Wash	99.18
10397	Gavilan Peak Pkwy	0.2 mi W/ Navigation Way	Wash	99.73
10582	Gavilan Peak Pkwy	S of DaisyMtnDr	Deadman Wash	96.68
10855	Gavilan Peak Pkwy	840 ft N of Daisy Mtn Dr	Wash	99.18
11005	Gavilan Peak Pkwy	0.5 mi N of Pioneer Rd	Wash	98.36
11070	Gavilan Peak Pkwy	NE of Jordan Lane	Wash	98.26
990233	Gavilan Peak Pkwy	0.3 mi SE/ Navigation Way	Wash	99.75
7554	Gemstone Drive	200' W/ 136th Dr SCW	Drainage Ditch	87.29
10276	Germann Road	.25 mi E/ Sossaman Rd	Drainage channel	87.40
7780	Gilbert Rd-FAS 229	0.5 mi N/ Thomas Rd	Salt River	79.70
990170	Granite Valley Dr	200' N/ Antelope Dr (SCW)	Drainage Ditch	94.58
8562	Greenway Rd	at 99th Ave	Drainage Ditch	88.56
10396	Happy Valley Pkwy	1.5 mi W/LkPleasant Pkwy	Agua Fria River	87.13

Structure No.	Road	Location	Feature Intersected	Sufficiency Rating
10457	Happy Valley Pkwy	2.06 mi w/ LakePleasantRd	Wash	86.67
10458	Happy Valley Pkwy	1.65 mi W/LakePleasantRd	Wash	86.67
11006	Happy Valley Road	0.7 mi E of Dysart Rd	Trilby Wash	96.55
990249	Hastings Way	250 ft SE/ Hickcock Trail	Wash	99.36
990254	Hastings Way	250 ft SE of Blaze Court	Wash	99.36
990255	Hastings Way	280 ft NW of Blaze Court	Wash	99.36
10518	Hemingway Lane	E of DedicationTrail	Wash	88.25
10581	High Noon Way	NW of Kuralt Drive	Wash	99.96
9503	Higley Rd	0.5 mi S/ Germann	RWCD Canal	89.84
9668	Hutton Drive	at 99th Ave Median SCW	Drainage Ditch	99.73
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	99.58
990213	I-17 Frontage Rd	S/ Meander Rd	Wash	99.59
9145	Indian School Rd	0.5 mi E/ El Mirage	Aqua Fria River	95.52
990281	Indian School Rd	W of Jackrabbit Trail	White Tanks FRS#3	85.96
990285	Indian School Road	at 191st Avenue	Beardsley Canal	96.89
990260	Iron Horse Way	N/ Meridian Dr	Wash	99.96
9831	Jackrabbit Trail	0.25 mi N/ Southern Ave	Buckeye Canal	97.52
10088	Jackrabbit Trail	0.25 mi N/ Yuma	RID Canal	96.62
11204	Jackrabbit Trail	just N of Minnezona Ave	White Tanks FRS#3	93.46
990175	Jackrabbit Trail	0.25 mi S/ MC-85	Buckeye Canal S. Branch	78.00
8680	Johnson Rd	0.25 mi N/ Broadway	RID Canal	99.86
10274	Jomax Road	.25 mi W/ Grand Ave	Wash	98.93
990268	Jomax Road	0.25 mi. W of Dysart Rd	Drainage Channel	95.47
10511	King Drive	0.1 mi E/ Gavilan PkPkwy	Wash	99.89
990248	Laurel Valley Way	N of Keller Drive	Wash	99.96
990177	Lk Pleasant Ent Rd	0.2 mi E/ Castle HSpr Rd	Wash	93.83
10052	Lone Mountain Rd	0.75 mi E/ 227th Ave	Wash	98.94
10053	Lone Mountain Rd	0.65 mi E/ 227th Ave	Wash	98.94
7556	Lower Buckeye Rd	1 mi W/ El Mirage Rd	AFR Diversion Channel	98.47
11110	Marsh Rd	just N of Riggs Rd (QC)	Drainage Ditch	97.92
7901	MC 85 Hwy	0.5 mi N/Southern	Buckeye Canal	97.25
11425	MC-85	0.75 mi W/ Cotton Lane	303L drainage sys	97.20
990127	MC-85	0.5 mi W/ Sarival	Drainage Ditch	93.77
990128	MC-85	0.25 mi E/ Cotton Lane	Drainage Ditch	80.46
990214	MC-85	0.25 mi E/ Perryville Rd	Buckeye Canal S Branch	99.43
990215	MC-85	E/ Perryville Rd	Buckeye Canal S Branch	99.43
990219	MC-85	335' W/ Estrella Pkwy	Dirt Irr Ditch	90.19
990220	MC-85	0.3 mi W/Estrella Pkwy	Dirt Irr Ditch	90.19
7819	MC-85 Hwy	0.5 mi W/ El Mirage	Aqua Fria River	94.12
10230	MC-85 Hwy	0.3 mi E/ Estrella Pkwy	Bullard Wash	91.24
7583	McDowell Rd	W/ Jackrabbit Tr 195th Av	Wash	91.88
990262	McDowell Road	0.5 mi E of Hawes Rd Mesa	Drainage Ditch	96.70
10105	McKellips Road	0.5 mi W/ SR 101	Granite Reef Wash	98.54
10242	Meadowbrook Ave	W/ Jackrabbit Tr (195Ave)	Wash	90.91
8797	Meeker Blvd	0.5 mi S/ RH Johnson Rd	Drainage Ditch	96.21
990179	Meeker Blvd	0.75 mi S/ RH Johnson	Golf Cart Underpass	96.21
10385	Memorial Drive	0.1 mi E/Gavilan Pk Pkwy	Wash	99.68
10386	Memorial Drive	0.3 mi E/Gavilan Pk Pkwy	Wash	99.68
10388	Memorial Drive	350 ft E of Republic Way	Split Flow Wash	99.57
990226	Memorial Drive	160 ft E of Republic Way	Split Flow Wash	99.57
990275	Memorial Drive	250 ft NW/ Daisy Mtn Dr	Wash	99.36
10560	Meridian Drive	480 ft SE/ Daisy Mtn Dr	Wash	99.49
10561	Meridian Drive	0.3 mi SE/ Daisy Mtn Dr	Wash	98.99
7557	Meridian Rd	0.5 mi N/ Brown Rd	Bulldog Floodway	97.37
10108	Meridian Rd	0.25 mi N/ McKellips Rd	Wash	79.21
11338***	Meridian Rd	425' N of Southern	Wash	97.26

Structure No.	Road	Location	Feature Intersected	Sufficiency Rating
990217	Meridian Rd	1/8 mi N/ University	Drainage Ditch	96.65
10846	Meridian Rd (Mesa)	0.5 mi S of Warner Rd	Drainage Channel	95.10
10847	Meridian Rd (Mesa)	0.25 mi S/Riggs Rd	Power Line Fldwy Chnl	93.10
10442	Meridian Road	0.45 mi N/ Warner Rd	Wash	99.86
9593	Miller Rd	0.25 mi N/ MC-85	Buckeye Canal	98.62
10778	Mingus Road	just E/ 25th Avenue	White Spar Wash	99.99
10241	Minnezona Ave	W/ Jackrabbit Trl	Wash	96.96
10510	Missouri Ave	N/ Marshall Ave 135thAve	Wash	80.36
990245	Missouri Ave	S/ Marshall Ave near 135	Wash	80.35
990246	Missouri Ave	just W of Dysart	Wash	80.26
7642	New River Rd	at 29th Ave	Wash	99.79
7643	New River Rd	0.25 mi E/ 27th Ave	Wash	99.79
8011	New River Rd	0.25 mi E/ I 17	Wash	97.96
10021	New River Rd	0.75 mi N/Venado Dr	Skunk Creek	98.66
10086	New River Rd	100' E/ I 17 Frontage	Wash	97.96
10083	New River Road	350' N/ Circle Mtn Rd	Cline Creek Wash	99.66
10106	New River Road	0.25 mi E/ I 17	New River	96.59
10780	Northern Avenue	1 mi. W/ Perryville Rd	Beardsley Wash	80.35
10781	Northern Avenue	1 mi W/ Perryville Rd	FRS#3 Dvrsn Chnl	79.78
8565	Old Lk Plsnt AccRd	0.6 mi N/ SR-74	Wash	99.91
10507	Old SR 87	0.8 mi NW of New SR87Junc	Wash	94.25
10521	Old SR 87	1.0 mi NW of New SR87Junc	Wash	94.25
990114	Old Stage Road	0.6 mi N/ New River Rd	Wash	86.54
8021	Old US 80	S/ Gillespie Dam	Gila River	61.50
8023	Old US 80	0.8 mi SW Arlgton Sch Rd	Arlington Valley Wash	96.12
8025	Old US 80	600 ft NE 331st Ave	Luke Wash E Tributary	95.99
9834	Old US 80	1 mi W/ Jct SR-85	Buckeye Drain	97.99
9999	Old US 80	E/ Salome Hwy	Hassayampa River	99.13
10061	Old US 80	450 ft SW of 331th Ave	Luke Wash	90.05
11007	Old US 80	3.5 mi S of Patterson Rd	Layton Wash	98.50
990155	Old US 80	0.5 mi W/ Palo Verde Rd	Buckeye Lateral	98.87
990180	Old US 80	50' S/ Cactus Rose	Arlington Valley Wash	96.87
990181	Old US 80	0.4 mi S/ Cactus Rose	Arlington Valley Wash	84.96
990205	Old US 80	0.75 mi S/ Cactus Rose	Arlington Valley Wash	96.87
990206	Old US 80	0.8 mi S/ Cactus Rose	Arlington Valley Wash	99.96
990207	Old US 80	1 mi S/ Cactus Rose	Arlington Valley Wash	85.85
990208	Old US 80	1.25 mi S/ Cactus Rose	Arlington Valley Wash	99.87
990209	Old US 80	1.5 mi S/ Cactus Rose	Arlington Valley Wash	94.87
8981	Olive Ave	0.5 mi E/ El Mirage Rd	Agua Fria River	94.27
11009	Olive Ave & BNSFRR	just W of Reems Road	Reems Road Channel	78.36
9588	Olive Avenue	E/ of 99th Ave	New River	76.92
10516	Olive Avenue	.5 mi W/ Perryville Rd	Wash W/ Beardsley Canal	78.00
10779	Olive Avenue	0.49 mi. W/ Perryville Rd	Waterfall Wash	78.64
990276	Olive Avenue	800' E of Perryville Rd	Wash	77.71
990251	Owens Drive	E of Capra Way	Wash	99.77
7782	Palo Verde Rd	0.9 mi N/ Old US80 Hwy	Buckeye Canal	97.84
9426	Palo Verde Rd	0.25 mi N/ Broadway	RID Canal	97.37
11362***	Parada Dr	0.25 mi W/Tom Ryan	Wash	96.95
10580	Patagonia Way	N of Honor Court (Anthem)	Wash	99.96
8569	Patton Rd	1 mi W/ Grand Ave	CAP Canal	94.07
8043	Perryville Rd	0.25 mi S/ Van Buren	RID Canal	97.82
8044	Perryville Rd	0.4 mi N/ Southern	Buckeye Canal	97.90
990264	Pinnacle Peak Rd	70' w/ 121st Avenue	Drainage Ditch	77.70
11439	Plymouth Drive	E of GavilanPkPkwy	Drainage Channel	99.96
9927	Power Rd	S/ Guadalupe Rd	RWCD Canal	92.38
9928	Power Rd	S/ Guadalupe Rd	East Maricopa Fldwy	92.38
10390	Power Road	0.2 mi S/ Queen Creek Rd	Queen Creek	96.68

Structure No.	Road	Location	Feature Intersected	Sufficiency Rating
8681	Rainbow Rd	0.85 mi N/ Broadway	RID Canal	97.46
10776	Rainbow Road	0.5 mi S/ Southern Avenue	Buckeye Canal	97.59
990277	Ray Rd	1200' E of Mountain Rd	Wash	96.98
990278	Ray Rd	900' E of Mountain Rd	Wash	96.98
8570	RH Johnson Blvd	N/ Bell Rd	Drainage Ditch	67.64
990182	RH Johnson Blvd	175 ft E/ 132nd Ave	Drainage Ditch	77.40
11108	Riggs Rd	0.2 mi E of Hawes Rd (QC)	Sonoqui Wash	97.22
990286***	Riggs Rd	E/ of Sossaman	Wash	100.00
990270	Riggs Rd	160' W of Robson Blvd	Golfcart Underpass	94.84
8038	Rittenhouse Rd	0.25 mi N/ Cloud	Queen Creek Wash	85.52
10239	Roeser Rd	0.5 mi S/ Broadway Rd	Buckeye Feeder Ditch	93.08
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	94.46
8982	Signal Butte Rd	N/ Broadway Rd	Drainage Ditch	98.86
990112	Signal Butte Rd	0.5 mi N/ Brown Rd	Signal Butte Floodway	97.91
990186	Skylark Dr	at Stardust Blvd Median	Drainage Ditch	97.81
990252	Sossaman Rd	980' N of McDowell Rd	Wash	88.37
990253	Sossaman Rd	0.3 mi N of McDowell Rd	Drain Ditch	88.37
7716	Southern Ave	.6mi E of Signal Butte Rd	CAP Drainage Channel	97.41
8884	Southern Ave	.6mi E/ Signal Butte Rd	CAP Canal (Mesa)	97.41
990108	Southern Ave	E/ Ellsworth (Mesa)	Drainage Ditch	94.89
990211	Southern Ave	0.3 mi E/ MC-85	Buckeye Canal S Branch	97.99
8573	Spanish Garden Dr	200' E/ 132nd Ave	Drainage Ditch	97.77
990183	Stardust Blvd	165' S/ Yosemite Rd	Drainage Ditch	96.78
7644	Sun Valley Pkwy	300 ft W/ McMicken Dam	McMicken Dam Channel	99.11
7645	Sun Valley Pkwy-01	0.7 mi N/ McDowell Rd	Wash	85.62
7646	Sun Valley Pkwy-02	0.8 mi N/ McDowell Rd	Wash	85.62
7647	Sun Valley Pkwy-03	1.3 mi N/ McDowell Rd	Wash	85.62
7648	Sun Valley Pkwy-04	1.5 mi N/ McDowell Rd	Wash	85.62
7649	Sun Valley Pkwy-05	1.9 mi N/ McDowell Rd	Wash	85.62
7650	Sun Valley Pkwy-06	2.0 mi N/ McDowell Rd	Wash	85.62
7651	Sun Valley Pkwy-07	2.5 mi N/ McDowell Rd	Wash	85.62
7652	Sun Valley Pkwy-08	2.6 mi N/ McDowell Rd	Wash	85.62
7653	Sun Valley Pkwy-09	2.6 mi N/ McDowell Rd	Wash	85.62
990134	Sun Valley Pkwy-10	2.9 mi N/ McDowell Rd	Wash	85.62
7654	Sun Valley Pkwy-11	3.3 mi N/ McDowell Rd	Wash	85.62
7655	Sun Valley Pkwy-12	3.4 mi N/ McDowell Rd	Wash	85.62
7656	Sun Valley Pkwy-13	3.6 mi N/ McDowell Rd	Wash	95.98
990135	Sun Valley Pkwy-14	3.7 mi N/ McDowell Rd	Wash	85.62
990136	Sun Valley Pkwy-15	4.2 mi N/ McDowell Rd	Wash	85.62
7657	Sun Valley Pkwy-16	4.4 mi N/ McDowell Rd	Wash	95.98
7658	Sun Valley Pkwy-17	4.5 mi N/ McDowell Rd	Wash	95.98
7659	Sun Valley Pkwy-18	4.6 mi N/ McDowell Rd	Wash	95.98
990137	Sun Valley Pkwy-19	4.6 mi N/ McDowell Rd	Wash	85.62
990138	Sun Valley Pkwy-20	5.0 mi N/ McDowell Rd	Wash	85.62
7660	Sun Valley Pkwy-21	5.1 mi N/ McDowell Rd	Wash	95.98
7661	Sun Valley Pkwy-22	5.3 mi N/ McDowell Rd	Wash	95.98
990139	Sun Valley Pkwy-23	5.6 mi N/ McDowell Rd	Wash	82.62
7662	Sun Valley Pkwy-24	6.1 mi N/ McDowell Rd	Wash	96.50
7663	Sun Valley Pkwy-25	6.1 mi N/ McDowell Rd	Wash	96.50
990140	Sun Valley Pkwy-26	6.4 mi N/ McDowell Rd	Wash	95.46
990141	Sun Valley Pkwy-27	6.6 mi N/ McDowell Rd	Wash	96.50
990142	Sun Valley Pkwy-28	6.7 mi N/ McDowell Rd	Wash	96.50
990143	Sun Valley Pkwy-29	6.9 mi N/ McDowell Rd	Wash	96.50
990144	Sun Valley Pkwy-30	7.0 mi N/ McDowell Rd	Wash	96.50
990145	Sun Valley Pkwy-31	7.2 mi N/ McDowell Rd	Wash	96.50

Structure No.	Road	Location	Feature Intersected	Sufficiency Rating
990146	Sun Valley Pkwy-32	7.3 mi N/ McDowell Rd	Wash	96.50
7664	Sun Valley Pkwy-33	7.3 mi N/ McDowell Rd	Wash	96.50
7665	Sun Valley Pkwy-34	7.4 mi N/ McDowell Rd.	Wash	96.50
7666	Sun Valley Pkwy-35	7.4 mi N/ McDowell Rd	Wash	96.50
990147	Sun Valley Pkwy-36	7.6 mi N/ McDowell Rd	Wash	96.50
7667	Sun Valley Pkwy-37	8.0 mi N/ McDowell Rd	Wash	96.50
7668	Sun Valley Pkwy-38	8.1 mi N/ McDowell Rd	Wash	96.50
990148	Sun Valley Pkwy-39	8.5 mi N/ McDowell Rd	Wash	96.16
990149	Sun Valley Pkwy-40	8.7 mi N/ McDowell Rd	Wash	96.16
990150	Sun Valley Pkwy-41	8.9 mi N/ McDowell Rd	Wash	96.16
7669	Sun Valley Pkwy-42	9.2 mi N/ McDowell Rd	Wash	96.16
7670	Sun Valley Pkwy-43	9.2 mi N/ McDowell Rd	Wash	96.16
7671	Sun Valley Pkwy-44	10.0 mi N/ McDowell Rd	Wash	96.16
7672	Sun Valley Pkwy-45	10.2 mi N/ McDowell Rd	Wash	92.98
7673	Sun Valley Pkwy-46	10.2 mi N/ McDowell Rd	Wash	92.98
990189	Sun Valley Pkwy-47	10.5 mi N/ McDowell Rd	Wash	82.62
990190	Sun Valley Pkwy-48	10.8 mi N/ McDowell Rd	Wash	82.62
7674	Sun Valley Pkwy-49	11.1 mi N/ McDowell Rd	Wash	96.16
7675	Sun Valley Pkwy-50	11.2 mi N/ McDowell Rd	Wash	92.98
7676	Sun Valley Pkwy-51	11.8 mi N/ McDowell Rd	Wash	92.98
7677	Sun Valley Pkwy-52	11.8 mi N/ McDowell Rd	Wash	92.98
7678	Sun Valley Pkwy-53	11.9 mi N/ McDowell Rd	Wash	92.98
7679	Sun Valley Pkwy-54	11.9 mi N/ McDowell Rd	Wash	92.98
7680	Sun Valley Pkwy-55	11.9 mi N/ McDowell Rd	Wash	92.98
7681	Sun Valley Pkwy-56	11.9 mi N/ McDowell Rd	Wash	92.98
7682	Sun Valley Pkwy-57	12.0 mi N/ McDowell Rd	Wash	96.16
990191	Sun Valley Pkwy-58	13.1 mi N/ McDowell Rd	Wash	82.62
7683	Sun Valley Pkwy-59	13.9 mi N/ McDowell Rd	Wash	92.98
7684	Sun Valley Pkwy-60	14.1 mi N/ McDowell Rd	Wash	92.98
7685	Sun Valley Pkwy-61	14.3 mi N/ McDowell Rd	Wash	96.16
990192	Sun Valley Pkwy-63	17.7 mi N/ McDowell Rd	Wash	87.24
990193	Sun Valley Pkwy-64	18.2 mi N/ McDowell Rd	Wash	87.24
7687	Sun Valley Pkwy-65	18.3 mi N/ McDowell Rd	Wash	87.24
7688	Sun Valley Pkwy-66	18.4 mi N/ McDowell Rd	Wash	87.24
990194	Sun Valley Pkwy-67	18.5 mi N/ McDowell Rd	Wash	87.24
7689	Sun Valley Pkwy-68	18.9 mi N/ McDowell Rd	Wash	87.24
7690	Sun Valley Pkwy-69	18.9 mi N/ McDowell Rd	Wash	87.24
7691	Sun Valley Pkwy-70	19.1 mi N/ McDowell Rd	Wash	87.24
990195	Sun Valley Pkwy-71	19.2 mi N/ McDowell Rd	Wash	87.24
7692	Sun Valley Pkwy-72	19.3 mi N/ McDowell Rd	Wash	87.24
990196	Sun Valley Pkwy-73	19.5 mi N/ McDowell Rd	Wash	87.24
7693	Sun Valley Pkwy-74	19.6 mi N/ McDowell Rd	Wash	87.24
7694	Sun Valley Pkwy-75	19.7 mi N/ McDowell Rd	Wash	87.24
7695	Sun Valley Pkwy-76	19.8 mi N McDowell Rd	Wash	87.24
990197	Sun Valley Pkwy-77	19.9 mi N/ McDowell Rd	Wash	87.24
7696	Sun Valley Pkwy-78	20.4 mi N/ McDowell Rd	Wash	86.40
7697	Sun Valley Pkwy-79	21.4 mi N/ McDowell Rd	Wash	86.40
7698	Sun Valley Pkwy-80	21.6 mi N/ McDowell Rd	Wash	86.40
7699	Sun Valley Pkwy-81	22.1 mi N/ McDowell Rd	Wash	86.40
7700	Sun Valley Pkwy-82	22.5 mi N/ McDowell Rd	Wash	86.40
7701	Sun Valley Pkwy-83	22.6 mi N/ McDowell Rd	Wash	86.40
7702	Sun Valley Pkwy-84	22.9 mi N/ McDowell Rd	Wash	86.40
7703	Sun Valley Pkwy-85	23.4 mi N/ McDowell Rd	Wash	86.40
990198	Sun Valley Pkwy-86	23.6 mi N/ McDowell Rd	Wash	86.40
7704	Sun Valley Pkwy-87	24.1 mi N/ McDowell Rd	Wash	86.40
7705	Sun Valley Pkwy-88	24.2 mi N/ McDowell Rd	Wash	86.40
990110	Sunland Ave	E/ Ellsworth	Drainage Ditch	96.88

Structure No.	Road	Location	Feature Intersected	Sufficiency Rating
9683	Thunderbird Rd	at 99th Ave Median	Drainage Ditch	98.22
11363***	Tom Ryan Dr	0.34 mi S of Deer Valley	Wash	99.93
990200	Trail Ridge Dr	200' W/ Yosemite Dr	Drainage Ditch	96.87
8629	Turner Rd	0.65 mi S/ Baseline Rd	Buckeye Canal	99.97
8584	Tuthill Rd	0.5 mi S/ Beloat Rd	Gila River	91.87
990152	Union Hills Dr	at 99th Ave	Drainage Ditch	95.83
9374	University Dr	900' W/ Dobson	Tempe Canal	95.39
8862	University Dr	0.5 mi E/ Ellsworth Rd	CAP Canal	98.57
7706	Van Buren St	E/ SVP-Palo Verde Rd	Drainage Ditch	99.78
8881	Van Buren St	0.5 mi W/ Citrus Rd	RID Canal	97.62
8882	Van Buren St	1 mi W/ 339th Ave	Dickey Wash	90.14
990273	Venture Drive	0.3 mi SW of Anthem Way	Wash	99.81
8983	Via Hermosa	W/ Forest Rd (Rio Verde)	Wash	99.70
11364***	Via Tercero	0.31 mi N of Williams Dr	Wash	99.95
990274	WhiteTanksMnt Blvd	460' W of 183rd Ave	Drainage Channel	96.56
10369	Whitman Drive	0.2 Mi E/GavilanPeakPkwy	Wash	99.89
10513	Wigwam Creek Blvd	200' SW of 124th Lane	Drain Channel	95.50
10514	Wigwam Creek Blvd	550' NW of Orange Drive	Drain Ditch	77.37
10515	Wigwam Creek Blvd	just N of Camelback Rd	Drain Ditch	77.37
8577	Wildwood Drive	200' W/ 125th Ave	Drainage Ditch	97.89
11361***	Williams Dr	0.35 mi E of Deer Valley	Wash	99.95
10782	Williams Dr	0.3 mi. E/ El Mirage Rd	McMicken Outfall Wash	89.57
990263	Williams Dr	at 123rd Avenue	Drainage Ditch	87.29
8578	Wilson (283rd) Ave	0.8 mi S/ Baseline	Buckeye Canal	97.99
9919	Woods Rd	E/ Old US-80	Gila Bend Canal	97.42
990267	Yearling Rd	0.2 mi. e/ Litchfield Rd	Drainage Channel	83.62

*** *indicates that MCDOT has bridge inspection responsibilities for the structure but does not have ownership*