



Regional Mobility and Accessibility Plan Update



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2045 RMAP UPDATE

REGIONAL MOBILITY AND ACCESSIBILITY PLAN



The Regional Mobility and Accessibility Plan (RMAP) is a performance-based, long-range transportation plan for Pima Association of Governments' (PAG) designated planning area, which covers Pima County, Arizona. The 2045 RMAP serves as the federally mandated planning tool for the region's long-range transportation needs and was developed under the regulatory framework of the 2015 Fixing America's Surface Transportation (FAST) Act. The plan provides a framework for the investment of anticipated federal, state and local funds, based on needs, regional goals and objectives.

The plan serves as a blueprint for transportation solutions in the greater Tucson region through 2045 and is a living document that will be updated and revisited when:

- the region grows
- funding sources evolve
- new data and analytical methods become available
- needs and priorities are identified

The update builds upon the *2045 RMAP* adopted in 2016 by incorporating the latest relevant data. Extensive public involvement for the 2045 RMAP led to the development of a regional vision and goals, and needs and investment categories that remain relevant today. This update was designed to continue with the vision, goals, performance measures and strategies of plan adopted in 2016 by the PAG Regional Council. Factored into the update are new population and employment data, as well as updated revenue forecasts. Goals and investment priorities established as part of the *2045 RMAP* were used in this update. Furthermore, each jurisdiction was asked to review its projects, update project cost estimates where appropriate, identify completed projects and restate the priorities for projects.

Public Engagement

Public input was actively sought throughout the development of the plan adopted in 2016. Online and hardcopy surveys, workshops, open houses, presentations and comment forms were used to gather community feedback. Over 1,100 residents contributed to establishing the regional transportation goals and identifying investment priorities. PAG developed an online engagement tool which allowed users to explore the trade-offs between land use scenarios and regional transportation investment strategies. The online tool, called RMAP Engage 2045, helped to identify residents' transportation investment priorities which allowed for a balanced investment approach that continues under the *2045 RMAP Update*.

More than 1,900 people participated in developing the plan through the community engagement tool. In addition, open houses provided opportunities for the community to participate in the process, and the mandated public comment periods were conducted. The vision, goals and strategies for regional transportation were established as a result of this extensive public participation. A comprehensive list of the approved goals and strategies can be found in *Appendix 1* of the *2045 RMAP*.

This update includes the changes based on public participation activities conducted since the approval of the *2045 RMAP*. Specifically, transit projects were revised in the *2045 RMAP Update* based on PAG's Long-Range Regional Transit Plan (LRRTP), which was developed in 2018-2019. The LRRTP included a substantial public outreach effort that involved workshops, open houses and surveys.

The PAG Transportation Improvement Program (TIP) is a five-year schedule of proposed capital improvements within the region. The PAG TIP is typically updated biennially. For a project to be listed in the TIP, it needs to be included in the *2045 RMAP Update* in-plan project list. The current FY 2020-2024 TIP was approved by the PAG Regional Council in May 2019. The PAG TIP development process included three open houses and a 30-day public comment period. The open houses provided the public with an opportunity to review the proposed projects, discuss projects with jurisdiction representatives and submit written feedback. A similar process will be conducted during the development of a future TIP. This will provide further opportunity for public comment on proposed projects before dollars are allocated to them.

In February 2018, the Arizona Department of Transportation (ADOT) approved a long-range transportation plan for 2016-2040. The *What Moves You Arizona 2040* plan included an extensive engagement process that provided residents and stakeholders across the state with opportunities to offer input. Additionally, the ADOT 2020-2024 Five-Year Facilities Construction Program included a public participation process that resulted in publicly vetted updates to state-sponsored projects included in the *2045 RMAP Update*.

The *2045 RMAP Update* development process included presentations to stakeholder groups, jurisdictional partners and governing bodies. The required public comment period was conducted to ensure that the continuation of foundational vision, goals and strategies from the plan adopted in 2016 to the *2045 RMAP Update* are in line with current public expectations. Updated elements of the plan are consistent with that established foundation.

10 Regional Planning Factors

The most recent federal surface transportation bill, Fixing America's Surface Transportation (FAST) Act, was signed into law in 2015. This federal law mandates that the RMAP development process provides projects, strategies and services that address 10 regional planning factors. The revised projects, strategies and services of the *2045 RMAP Update* continue to address the broad range of planning factors outlined below through a variety of initiatives that are linked to performance goals and targets covering each factor. The 10 regional planning factors are to:

- Support the economic vitality of the metropolitan area, especially by enabling global competitiveness, productivity and efficiency.
- Increase the safety of the transportation system for motorized and non-motorized users.
- Increase the security of the transportation system for motorized and non-motorized users.
- Increase accessibility and mobility options of people and freight.
- Protect and enhance the environment, promote energy conservation, improve the quality of life, and promote consistency between transportation improvements and state and local planned growth and economic development patterns.
- Enhance the integration and connectivity of the transportation system, across and between

- modes, for people and freight.
- Promote efficient system management and operation.
- Emphasize the preservation of the existing transportation system.
- Improve the resiliency and reliability of the transportation system and reduce or mitigate stormwater impacts of surface transportation.
- Enhance travel and tourism.

Vision

The 2045 RMAP Update considers a long-range transportation vision as identified in the 2045 RMAP. It envisions a state-of-the-art, reliable, multimodal and environmentally responsible regional transportation system that is continuously maintained, interconnected and integrated with sustainable land use patterns to support a high quality of life and healthy, safe and economically vibrant region.

2045 RMAP Goals

- **Maintenance:** Roadways, bike and pedestrian infrastructure, and transit systems are rehabilitated, completed and maintained in a state of good repair.
- **Safety:** Safety and security for all transportation users across the region.
- **Multimodal Choices:** A variety of integrated, high-quality, accessible and interconnected transportation choices to meet all mobility needs and changing travel preference.
- **Performance:** Improved regional mobility, congestion management and travel time reliability through reducing travel demand, enhancing operations and adding system capacity for all modes where necessary.
- **Environmental Stewardship:** Environmental stewardship, natural resource protection and energy efficiency in transportation planning, design, construction and management.
- **Land Use and Transportation:** Land use decisions and transportation investments are complementary and result in improved access to important destinations, and vibrant and healthy communities.
- **Freight and Economic Growth:** Regional freight transportation infrastructure supports global competitiveness, economic activity and job growth by providing for the efficient movement of goods within our region, giving access to national and international markets, and improving intermodal connections.
- **Public Involvement:** Continued outreach and involvement of all users in transportation decision-making.
- **Advanced Technologies:** State-of-the-art, cost effective delivery of transportation services and facilities.
- **Funding and Implementation:** Revenue sources and strategies ensure ample funding and timely project development.
- **Accountability:** Continued transparency, responsiveness and coordination to meet transportation needs throughout the region.

Performance-Based Approach

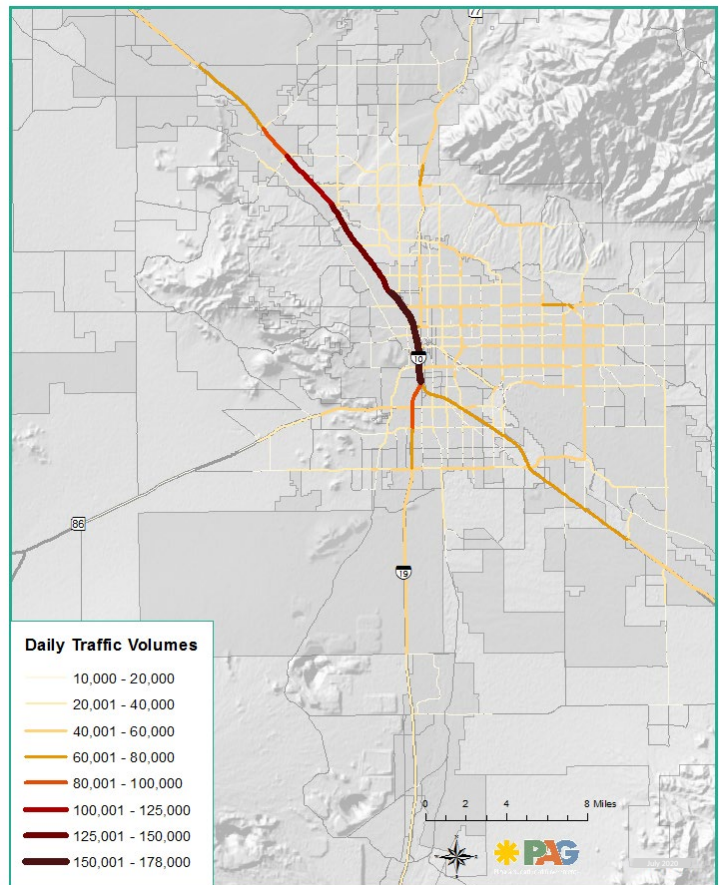
Under the FAST Act, the transportation planning process must “provide for the establishment and use of a performance-based approach to transportation decision making.” The 2045 RMAP adopted in 2016 was the region’s first performance-based, long-range transportation plan. The identified performance

measures and targets help the regional and operating agencies assess system-wide progress relative to regional goals, helping to ensure that resources are being invested to improve performance to achieve national and regional goals.

Transportation System

The current transportation system in the greater Tucson region includes an extensive roadway network, multiple transit services, bicycle and pedestrian facilities, airports, railroad corridors and critical freight corridors connecting the United States and Mexico. For the transportation network to be successful, people and goods need to be moved safely and efficiently to many key destinations. Due to the diverse nature of the system, the needs of many different users must be taken into consideration. The *2045 RMAP Update* provides funding for a wide variety of users including bicyclists and pedestrians. The regional system includes airport and rail facilities that provide a well-rounded system for the movement of people and goods.

Figure 1.1 Current Estimated Traffic Volumes



As the region grows, demands on the system will expand. The *2045 RMAP* considered current and future traffic volumes as factors influencing the transportation system. For the *2045 RMAP Update*, PAG analyzed current and future traffic volumes along with updated population and land use data. Future traffic volumes are shown for both a no-build scenario, meaning no new projects would be built through 2045, as well as a build scenario in which all the in-plan *2045 RMAP Update* projects are completed through 2045. **Figure 1.1**, **Figure 1.2** and **Figure 1.3** demonstrate current and future estimated traffic volumes in the greater Tucson region.

Figure 1.2 Future Estimated Traffic Volumes
(2045 No-build Scenario)

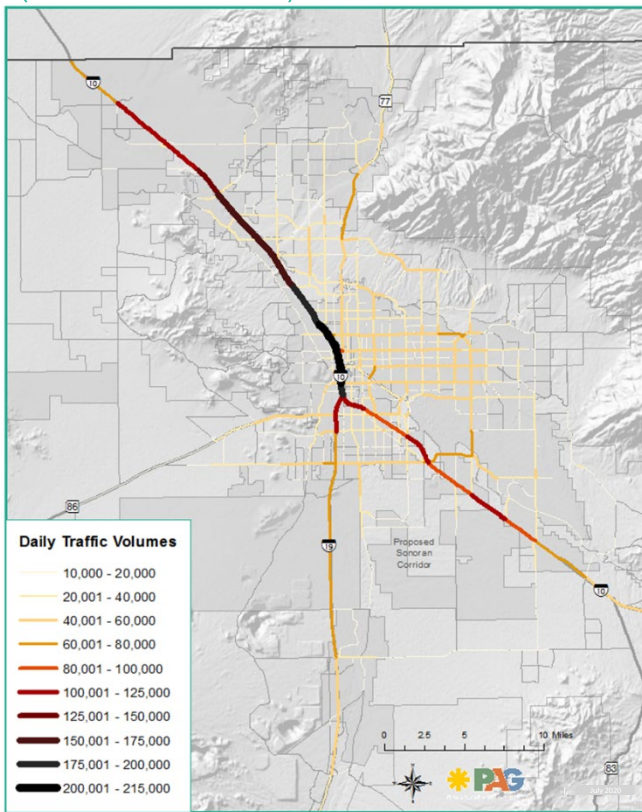
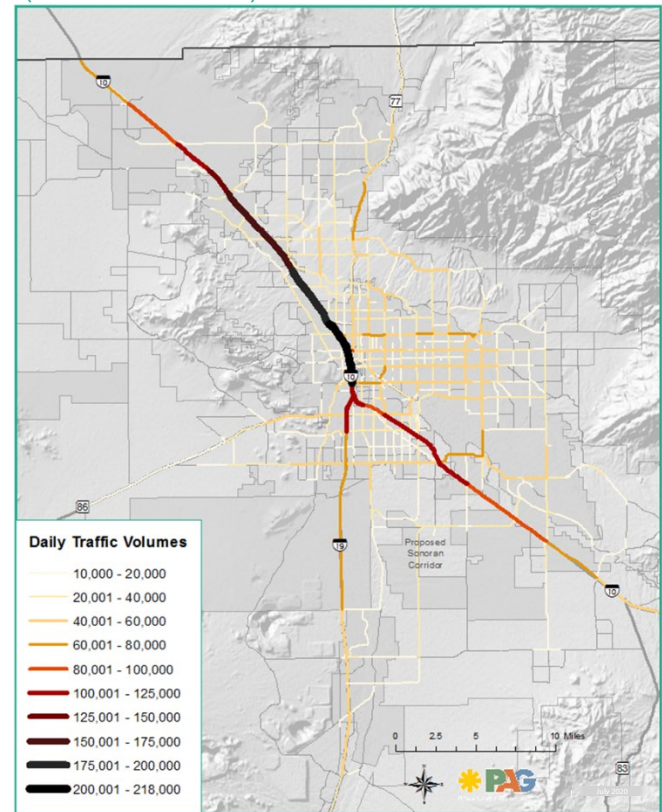


Figure 1.3 Future Estimated Traffic Volumes
(2045 Build Scenario)



Technology

Emerging technologies will undoubtedly change the transportation network with new solutions addressing traffic congestion, safety, personal mobility and environmental impacts. People and freight will move in different ways and in more technologically advanced vehicles. The delivery of real-time information is already impacting the efficiency of moving people and goods throughout the region. Current technologies that will have the greatest effects on transportation include:

- Activity-Based Modeling (ABM):** Travel models are created to support decision making. They provide information about the impacts of transportation and land use investments and the policies factoring in demographic and economic trends. ABM has the ability to incorporate very detailed person- and household-level attributes rather than just zone-level attributes. ABM considers many personal and household attributes such as age, income and gender. ABM attempts to predict whether, where, when and how travel occurs. ABM provides much more robust capabilities and sensitivities for evaluating different scenarios. PAG is currently developing an ABM which will be used for planning purposes in the future.
- Electrification of Vehicles:** Electric vehicles (EVs) are vehicles that use electric motors with battery storage technology. EVs can significantly improve air quality through reduced fossil fuel consumption and decreased emissions of greenhouse gases and other harmful air pollutants. EV technology can provide benefits to personal vehicles, transit vehicles and freight vehicles.
- Shared Mobility:** Shared mobility offers a diverse menu of transportation options such as ride sharing, public transportation, bike sharing, e-scooters, taxi services and car sharing. These

mobility options provide a range of safe and inexpensive alternatives to the use of the private car that may be as convenient as well as more sustainable. Shared mobility options can aid in reducing congestion. Many shared mobility options are in place and are continuing to develop in the greater Tucson region.

- **Big Data and Artificial Intelligence (AI):** Big Data provides the opportunity to analyze large data sets to reveal patterns, trends and associations as they relate to human behavior. These data sets can be refined to analyze travel behavior region wide. Improvements to connectivity, travel information and system operation information have already begun in part due to the ability to access big data. Enhancements to on-line communication affects travel demand, transportation system management and logistics. The use of AI technology, including vehicle and roadside sensors, enables remote monitoring and enhanced management of infrastructure and the transportation network.
- **Connected and Autonomous Vehicle Technologies:** Connected vehicles (CV) and autonomous vehicles (AV) are advancing rapidly and will continue to do so beyond the planning horizon of the *2045 RMAP Update*. These technologies offer a range of benefits including increased safety and efficiency of the transportation network. Cameras, sensors and global positioning systems (GPS) allow vehicles to operate independent of a human operator and allow vehicles to share data with other vehicles and roadside infrastructure. This technology can provide benefits to personal vehicles, transit vehicles and freight vehicles. Truck platooning and automation as well as on-demand delivery services could significantly impact the efficiency of the freight network.
- **Material Technology:** Changes in building materials could also have significant effects on the transportation network. The life cycle of pavement, drainage and communications infrastructure will be extended as advancements to building materials and maintenance practices continue to develop.
- **Unmanned Aerial Systems:** Unmanned aerial systems (UASs), sometimes referred to as drones, are aircraft which are outfitted with cameras and sensors including light detection and ranging (LiDAR) technology. They can be used to increase safety and efficiency of the transportation network. They already are being deployed to perform structural inspections, construction inspections, geologic analysis, environmental analysis and emergency response.

Fiscal Constraint

The U.S. Department of Transportation (US DOT) Code of Federal Regulations (CFR) requires the RMAP to be a fiscally constrained plan. That is, estimated costs cannot exceed forecasted revenues (CFR Part 450.324(f)). The plan must include a financial plan that shows how the region expects to pay for each project and program. The *2045 RMAP* included a financial plan detailing anticipated revenues. This update revisited the financial plan and updated the revenue projections. Project costs were also reexamined to accurately portray the required fiscal constraint. By doing so, the expectations of the region to have sufficient funds to pay for the in-plan projects can be demonstrated in the time periods the region expects these projects to be implemented. The *2045 RMAP Update* forecasts \$15.1 billion in anticipated revenue, and the in-plan project list is fiscally constrained.

Forecasting Population and Employment Growth

The region's transportation system influences the location of growth and development. Similarly,

growth can influence travel choices. The connection between transportation and land use drives the need for continuous coordination between all jurisdictions in the greater Tucson region. A vital part of this coordination is working to forecast population and employment growth. Representatives from state and local planning agencies worked together through the process of adopting regionally accepted population and employment projections. The projections became inputs for developing a land use model that provides the location and concentration of population, households and employment. These key inputs to the region's travel demand model are used to analyze work and non-work related travel patterns.

Outputs from the land-use model and the travel demand model help to identify regional transportation needs and can inform decisions on potential new projects. Forecasted population and employment growth in the greater Tucson region is shown in **Figure 1.4**, **Figure 1.5** and **Figure 1.6**.

Figure 1.4 Future Population and Employment Estimates

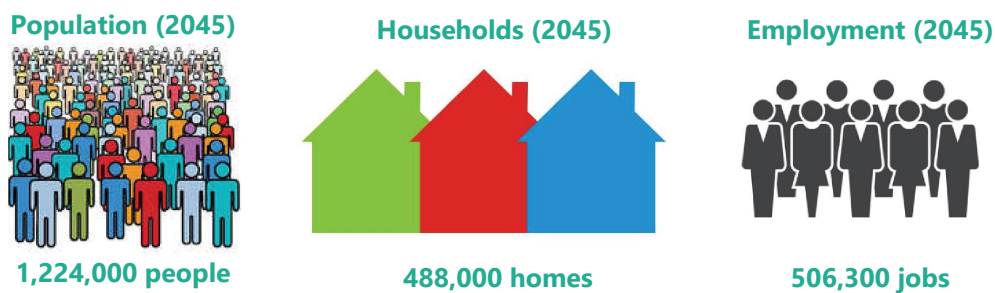


Figure 1.5 Current and Future Population Estimates

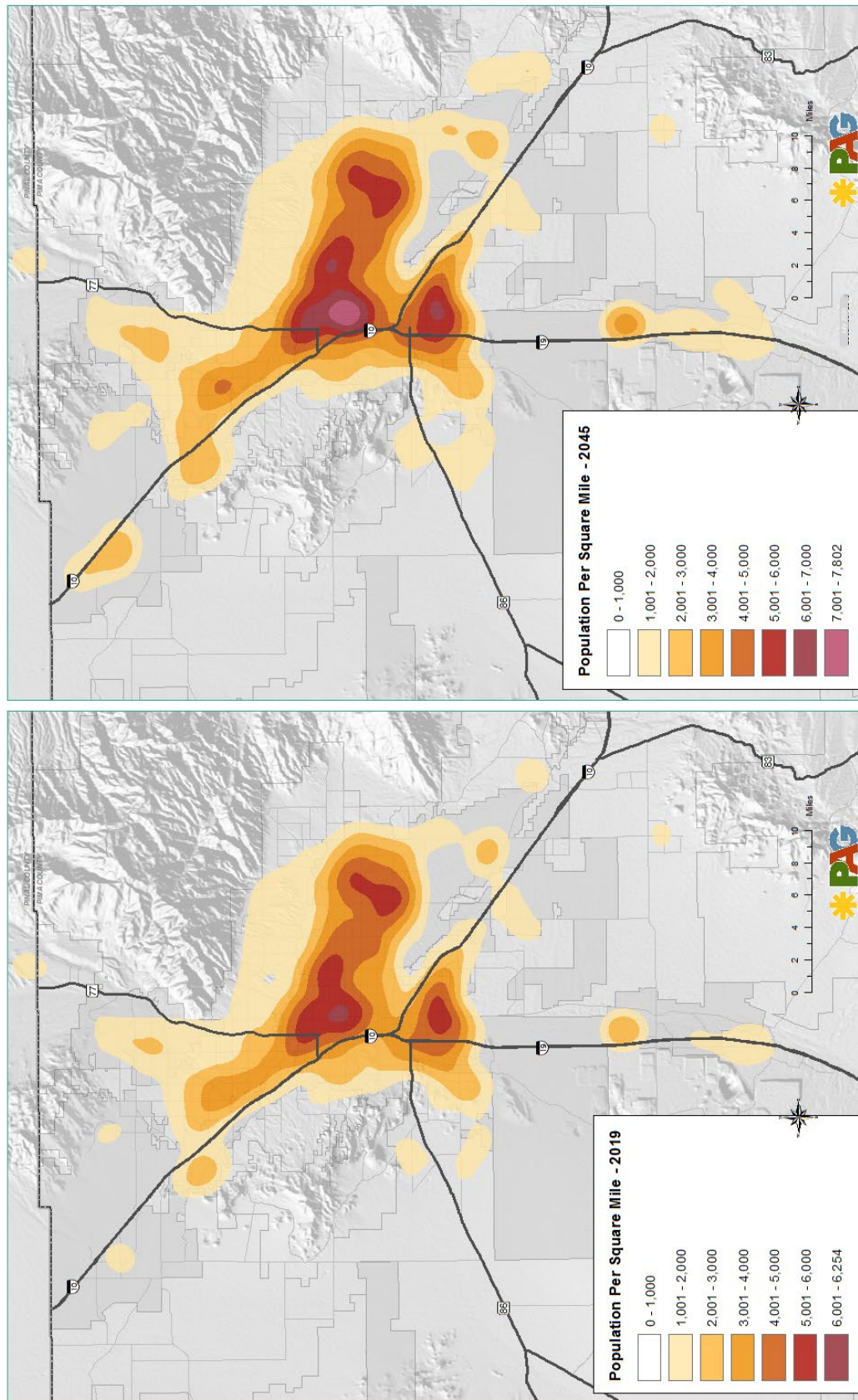
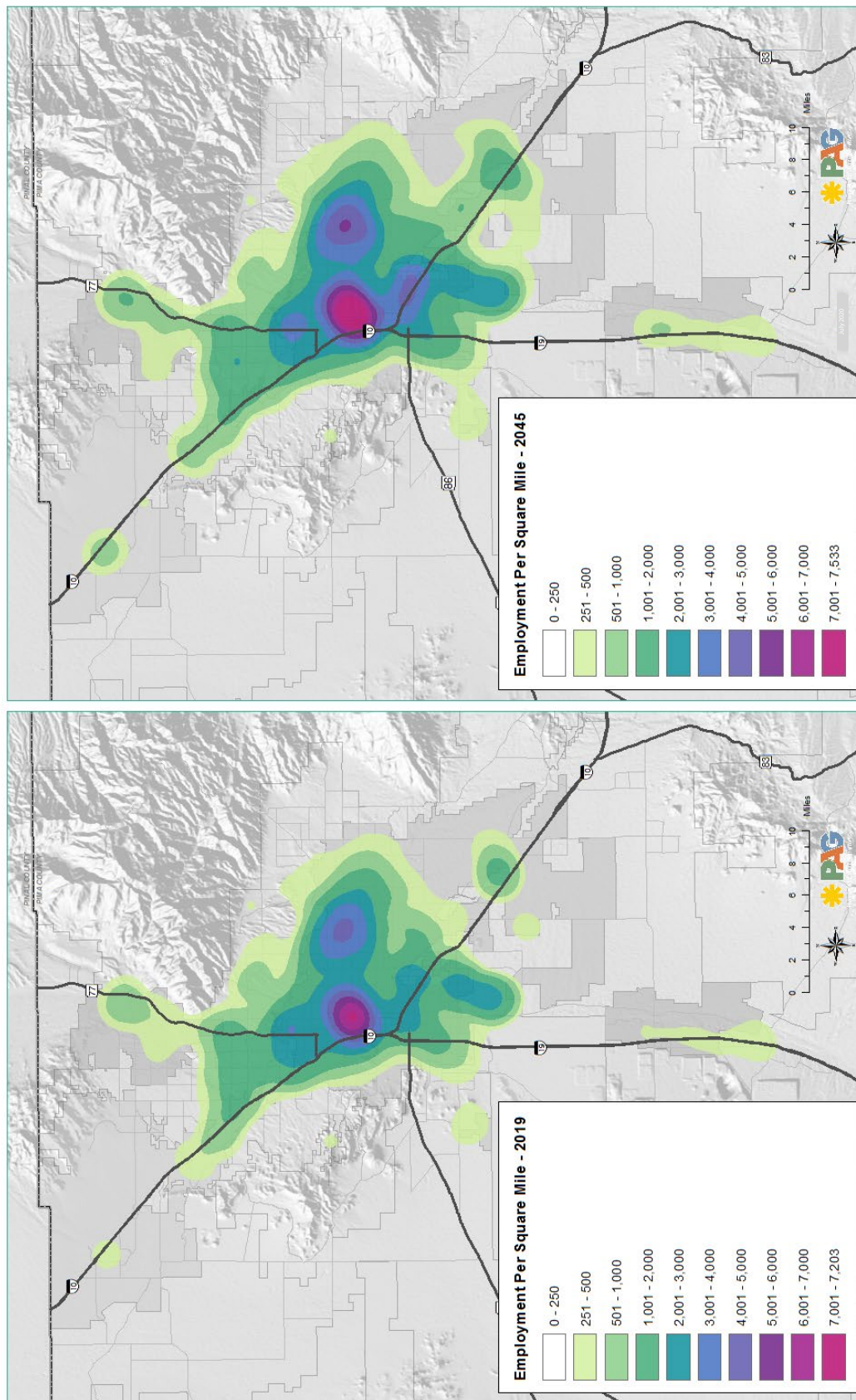


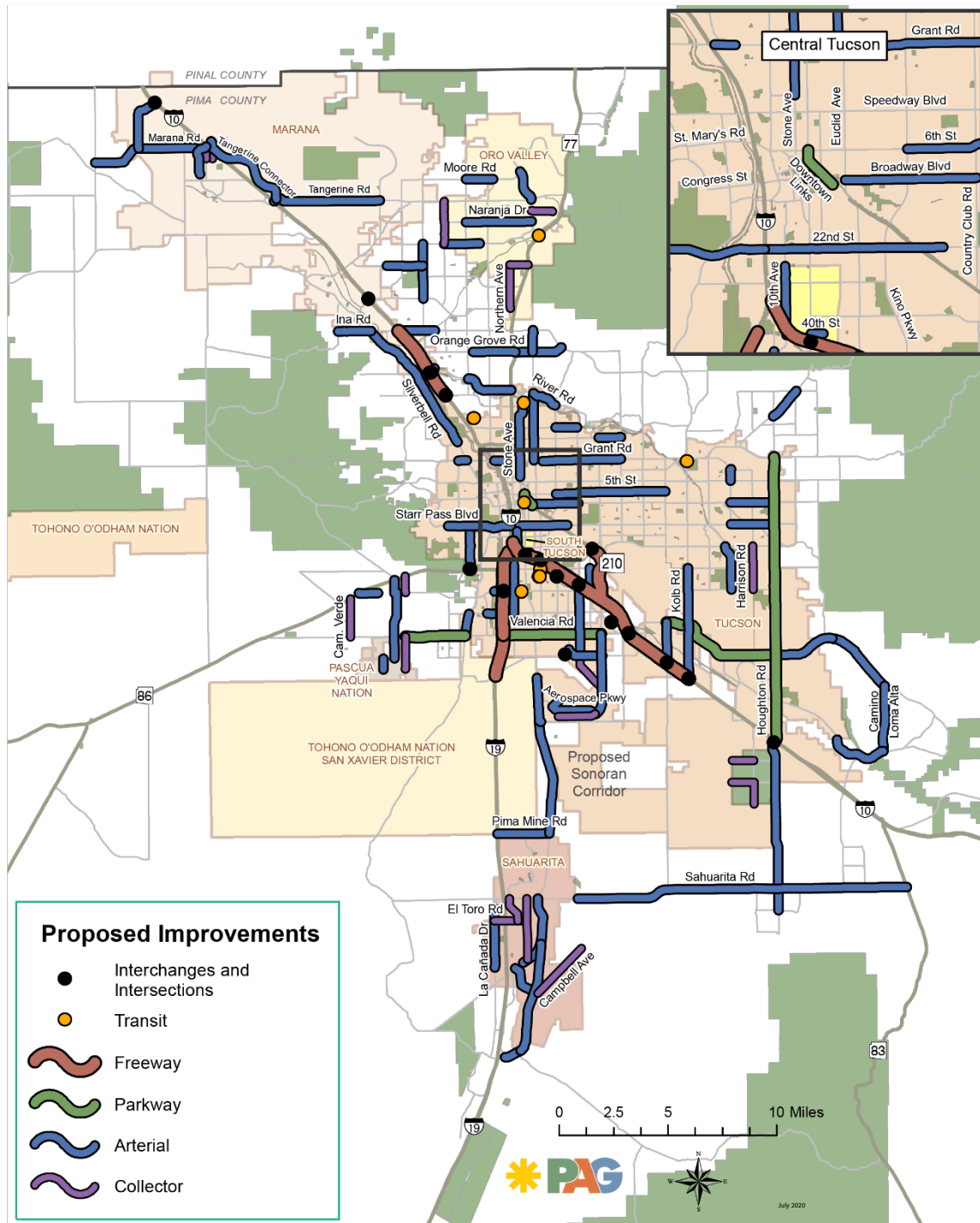
Figure 1.6 Current and Future Employment Estimates



Multimodal Roadway Improvement Projects

This update includes projects that are assigned to specific roadways and other projects that can be assigned to specific locations based on need over the course of the planning horizon. This allows regional partners to have funds available for projects as needs arise. For instance, intersection improvements can be funded over the course of the next 25 years, yet specific intersections do not need to be identified in the plan. Roadway projects with an identified location are shown in **Figure 1.7**.

Figure 1.7 2045 RMAP Update Multimodal Roadway Improvements



Transit Projects

On January 30, 2020, the PAG Regional Council approved the Long-Range Regional Transit Plan (LRRTP). This plan included extensive public participation and set the direction for future transit investments. In response to the LRRTP, transit investment in the *2045 RMAP Update* will focus on expanding night and weekend bus service and adding new bus routes. This will provide service to more people and access to more jobs. As a result, capital investments to accomplish this expansion are identified in the in-plan project list.

Bicycle and Pedestrian Projects

In addition to bicycle and pedestrian improvements included in multimodal roadway improvement projects, additional bicycle and pedestrian improvements are included a wide variety of projects with flexibility to be adjusted to accommodate the needs of the region over the duration of this plan. Like some roadway projects, bicycle and pedestrian projects can be assigned to specific locations over the course of the planning horizon based on needs. This allows regional partners to have funds available as needs arise.

Congestion

The maps on this page show current and projected congestion levels during peak hours in the morning and evening. Congestion levels without the 2045 RMAP Update in-plan projects, and congestion levels with the 2045 RMAP Update in-plan projects are shown for comparison. The performance report includes performance measures used to analyze congestion regionwide. These measures include hours of delay, congestion duration, average transit speed, travel time, volume and capacity information, multimodal availability, land use, freight, incident duration and several other data sources. More information on congestion can be found in the 2045 RMAP, as well as in the performance report in this update.

Figure 1.8, Figure 1.9 and Figure 1.10 demonstrate the extent of congestion resulting from options shown in the 2045 RMAP Update.

Figure 1.8 Current Estimated Congestion

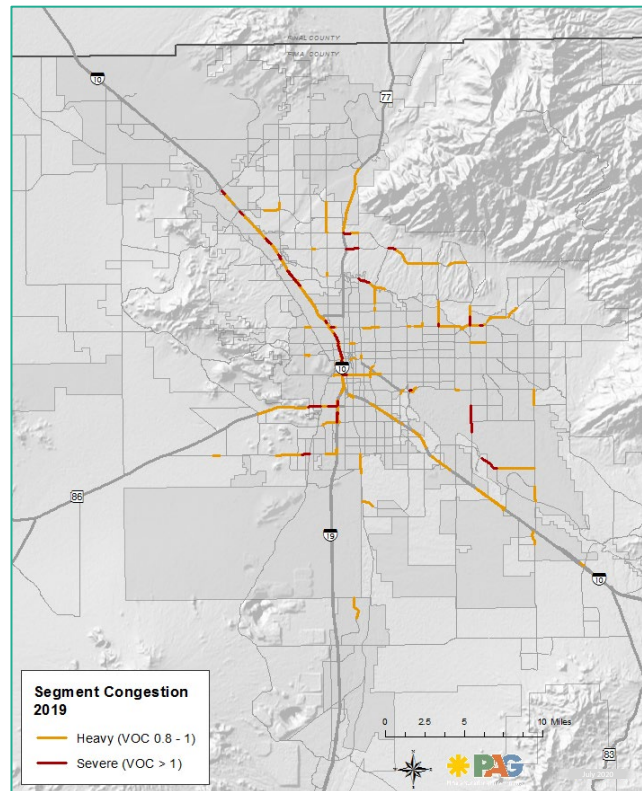


Figure 1.9 Estimated 2045 Congestion, No-Build

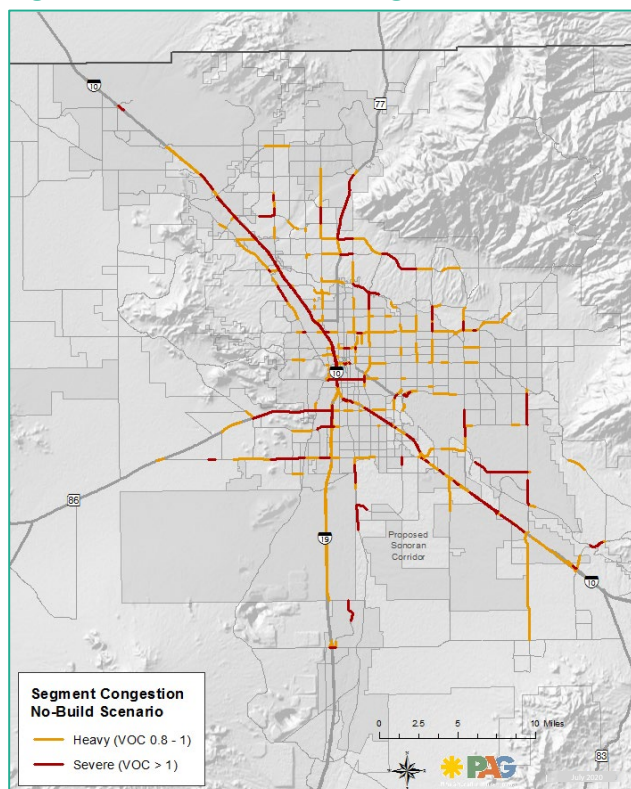
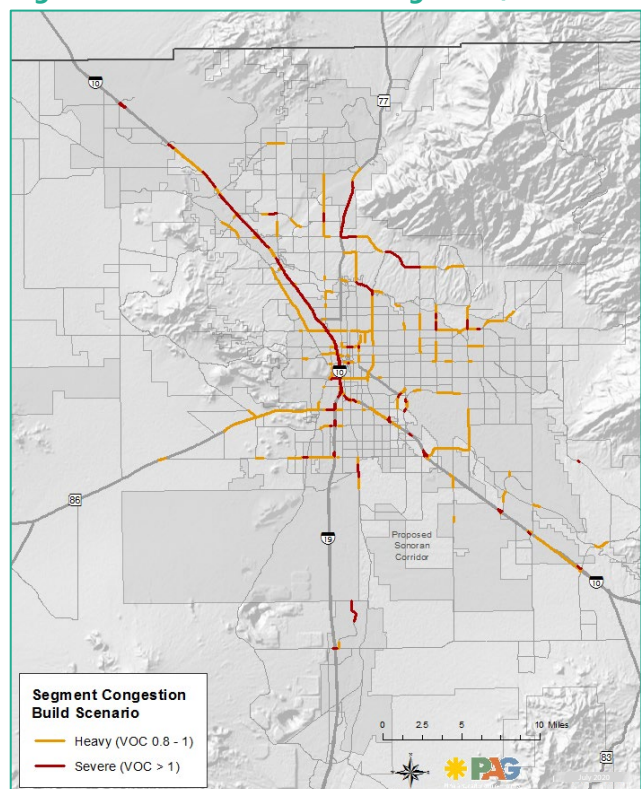


Figure 1.10 Estimated 2045 Congestion, Build



FINANCIAL PLAN

FUNDING SOURCES



The 2045 RMAP Update financial plan shows total estimated reasonably expected revenue for projects over the course of the 25-year fiscally constrained plan. All revenues are in 2019 dollars. Reasonably expected revenues include federal, state, regional and local funding sources, each with its own restrictions. It should be noted that all revenue projections were completed prior to the COVID-19 pandemic and revenue projections do not reflect any potential impacts to the economy based on the outcome of the pandemic. Federal stimulus money that may result from the COVID-19 pandemic has not been included as a potential revenue source.

Federal	State	Regional	Local
<p>Surface Transportation Block Grant Program (STBGP) is a flexible funding source available for use on most types of transportation projects, including roadway, pavement preservation, bike/pedestrian, and transit capital. PAG currently receives \$20 million annually for the greater Tucson region.</p> <p>Regional Transportation Alternatives Grant (RTAG) is restricted to bike and pedestrian improvements and programs. PAG receives about \$1 million annually.</p> <p>Federal Transit Association (FTA) Grants are available for a variety of transit projects.</p>	<p>AZ Surface Transportation Program (ASTP) provides state discretionary funds which can only be used on state facilities. By agreement, 13% of state discretionary funds must be used for projects within the greater Tucson region.</p> <p>AZ Dept of Environmental Quality (ADEQ) is state environmental funding used for air and stormwater quality planning and travel demand management programs.</p> <p>Regional Highway User Revenue Fund (HURF) is set-aside for PAG and Maricopa Association of Governments by state statute. The HURF is generated from the gas tax and other state taxes and fees. HURF 2.6% can only be used on state facilities, while HURF 12.6% can be used on locally owned arterials and collectors. Through 2026 these funds can only be used on named RTA projects. Regional HURF is restricted to roadway projects. PAG currently receives about \$30 million annually in Regional HURF funds for the greater Tucson region.</p>	<p>Regional Transportation Authority (RTA) is funded by a countywide half-cent excise (sales) tax that was approved by Pima County voters in 2006. RTA funding provides more transportation funding than any other single funding source available to the region, about \$85 million annually. The current RTA plan will continue until the conclusion of Period 4 in June 2026. Voters may be asked to approve a new RTA plan yet-to-be-drafted.</p> <p>Current projections show expected revenues falling short of the originally planned \$2.1 billion for the current RTA plan. The funding will be made up by dedicated federal, state and local funding to complete RTA planned project commitments in the 4th period of the RTA (FY 2022-2026). This commitment is reflected in the RMAP Financial Plan.</p>	<p>Local transportation funding is generated through local taxes and fees, direct local and County HURF allocations, County VLT* and local transit revenues. Locally funded projects do not need to be included in the RMAP except where such projects are regionally significant. Therefore, a large portion of the projected local revenues are reserved for these types of projects, as well as other non-capital projects and overhead costs.</p> <p>*County VLT refers to the portion of the Vehicle License Tax that is distributed directly to counties for transportation purposes.</p>

TOTAL REVENUE PROJECTIONS

The *2045 RMAP Update* financial plan starts with an estimate of revenues over the next 25 years. These revenues are categorized into seven broad categories. Each of these categories contains two or more subcategories.

Different growth rates are applied to each funding source, each one based on a conservative evaluation of actual growth rates over the last 10 years. These rates range from 0.5 percent to 1.5 percent and determine the 25-year total revenues from each source. In addition, the financial plan assumes a voter-approved extension of the Regional Transportation Authority tax and that the region will be the recipient of three supplemental federal grants over the course of the plan horizon. An extension of the RTA tax for a future RTA plan is projected to generate \$2.3 billion in new funding for transportation projects, while supplemental federal grants would bring in \$160 million for transportation projects. While not included in the current revenue projections, it could be reasonable for the region to expect the Arizona State Legislature to allocate “special funds” to address statewide transportation issues in the region as was done with the Interstate 17 project. The *2045 RMAP Update* project list will be fiscally constrained to the \$15.1 billion in projected revenue.

The revenue categories and their respective sub-categories are as follows:

Figure 2.1 Revenue Projections by Funding Source

Funding Category	25-Year Revenue Projection
Federal (STBGP, RTAG, Supplemental Federal Grants)	\$ 732 million
State (ASTP, ADEQ)	\$ 2,089 million
Regional HURF (HURF 2.6%, HURF 12.6%)	\$ 924 million
RTA (2020-2045)	\$ 2,330 million
Local (Local Taxes and Fees, Local and County HURF, Pima County VLT)	\$ 6,321 million
Federal Transit (5307, 5339, 5310, 5311, BUILD)	\$ 490 million
Non-Federal Transit (Local Collections, LTAF 2)	\$ 1,984 million

Note: Numbers may not add up due to rounding. Table does not include aviation funding.

COMMITTED AND UNCOMMITTED FUNDS

Over \$990.3 million of the total revenues are already committed to projects in the FY 2020-2024 Transportation Improvement Program (TIP). In addition, some projects in the current TIP will require \$106.8 million in additional regional funds beyond 2024 to be completed.

Of the \$6.3 billion in local revenues, a large portion is assumed to be committed to local priorities and non-capital projects such as local studies or routine maintenance. And finally, the region is committed to transit maintenance and operations for the entire span of the RMAP. Uncommitted funds are available for all projects, since they have not been committed to a specific project or program.

Figure 2.2 Committed Funds

Committed To	Time Period	Amount
Projects in the FY 2020-2024 TIP	Through 2024	\$990 million
Finish Projects in the Current TIP	Through 2028	\$107 million
Completing the RTA Plan	Through 2026	\$542 million
Local Funds used for Local Priorities	Through 2045	\$4,235 million
Transit Maintenance and Operations	Through 2045	\$1,954 million

RESTRICTED FUNDS

Because some of the uncommitted funds are restricted to certain types of activities, the financial plan divides these funds into restricted and unrestricted funds. Restricted funds are limited to paying for certain improvements such as bicycle, pedestrian and transit projects. Unrestricted funds can be used across all types of projects. The *2045 RMAP Update* financial plan contains the following five restriction categories:

Figure 2.3 Restricted Funds

Restriction	Funding Source	Amount
Roadway: Pavement Preservation	Local Funds	\$1,347 million
Roadway: Flexible	ASTP (State assets) HURF 2.6% (State assets) HURF 12.6%	\$2,330 million
Transit	Federal Transit Non-Federal Transit	\$401 million
Bike/Ped	Federal RTAG Local Match	\$26 million
Programs	ADEQ Local Funds	\$10 million
TOTAL RESTRICTED FUNDS		\$4,114 million
TOTAL UNRESTRICTED FUNDS		\$3,005 million

At this time, the financial plan assumes 50 percent of available local funds will be used for pavement preservation of roadways on the federal-aid system (functionally classified as minor collectors and above).

This section makes several necessary assumptions, which are the same assumptions used in the 2045 RMAP adopted in 2016. These assumptions are:

- First, of the local funds not committed to local priorities (see the previous section), the financial plan assumes that 50 percent will be used for pavement preservation activities on federal-aid roadways.
- Second, the *2045 RMAP Update* financial plan assumes that local funds will be used as a match to federal RTAG funds for the bike/ped activities. Therefore, local funds restricted to these activities are calculated to equal the required match on the federal RTAG funds in these categories.
- Third, the financial plan assumes that 100 percent of federal RTAG funds will be used for bike/ped projects.

PLANNED EXPENDITURES BY ELEMENT

The *2045 RMAP Update* continues to apply the similar funding split for approved funding distribution as in the *2045 RMAP*. This split was developed through an extensive public involvement process which gathered input from nearly 3,000 people. Some shifts in categories may result from recategorizing specific projects, though the overall intent of the split remains the same. Some projects identified as programs in the *2045 RMAP* adopted in 2016 have been recategorized to more accurately reflect the nature of the project. This resulted in a 1 percent increase in the multimodal roadway improvements and system maintenance and modernization categories.

Incorporating the updated revenue projections and assumptions into the planned expenditures by elements of the original 2045 RMAP yields the following distribution:

Figure 2.4 Funding Splits

Funding Category	2045 RMAP	2045 RMAP Update
Multimodal Roadway Improvements	\$4,991 million	\$4,519 million
System Maintenance and Modernization	\$3,180 million	\$2,862 million
Transit	\$4,333 million	\$3,765 million
Bike/Ped	\$602 million	\$602 million
Programs	\$685 million	\$301 million
Local Funding Priorities	\$3,498 million	\$3,012 million
Total	\$17,289 million	\$15,062 million

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PERFORMANCE REPORT



2045 RMAP UPDATE PERFORMANCE IMPACTS

PAG uses the best-available data to monitor and track performance conditions on the regional transportation network. Based on current performance data, the roadway projects in the 2045 RMAP Update in-plan project list will have the overall estimated impacts shown in **Figures 3.1** and **3.2**.

Figure 3.1 Measuring Performance of Roadway Projects in the 2045 RMAP Update

The 2045 RMAP Update has 127 named corridor projects. Shown below are the estimated combined benefits of investing in those projects. The figures were calculated using RMAP performance measures and their respective ratings criteria established by the Federal Highways Administration.

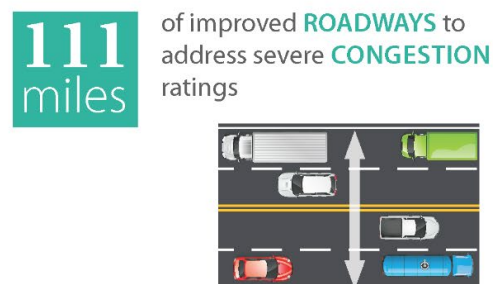


Figure 3.2 Impacts of 2045 RMAP Update Corridor Projects

Number of Roadway Projects	127	projects
Centerline Miles of Roadway Projects	276	miles
Lane Miles of Roadway Projects	1,116	miles
Miles of Added Roadway Lanes, total	475	miles
Miles of Added Roadway Lanes on Roadways with Severe Congestion Ratings	126	miles
Miles of Added Bicycle and Pedestrian Facilities	360	miles
Miles of Added Bicycle Lanes	168	miles
Miles of Added Sidewalks	165	miles
Miles of Added Multi-use Paths	28	miles
Rehabilitated Bridges Currently Rated Poor Condition	30	bridges
Rehabilitated Miles of Pavement Currently Rated Poor or Fair Condition	209	miles
Miles of Improved Roadways for Freight Movement	109	miles
Number of Improved Intersections with Poor or Fair Safety Ratings	85	intersections
Miles of Improved Roadways with Poor or Fair Safety Ratings	243	miles
Number of Improved Intersections with Severe Congestion Ratings	15	intersections
Miles of Improved Roadways with Severe Congestion Ratings	111	miles

There are 70 in-plan projects that are not named corridor projects. Total cost estimates for these projects are categorized by RMAP performance goal area as shown in **Figure 3.3**. The figures do not include roadway projects that are represented in **Figures 3.1 and 3.2**.

Figure 3.3 Cost Estimates for 2045 RMAP Update Categorical Projects

Performance Goal Area	Estimated Cost	Example Projects
System Maintenance	\$2,344 million	Regionwide Pavement Preservation, Regionwide Bridge Improvements
Safety	\$480 million	Tucson Roadway Safety Improvements, Regionwide Intersection Improvements
Multimodal Choices	\$4,345 million	Tucson Transit System Expansion, Regionwide Shared-Use Paths
Transit	\$3,743 million	Sun Tran, Sun Van, and Sun Link Operations and Maintenance
Pedestrian	\$423 million	Regionwide Sidewalk Improvements and Signalized Bike-Ped Crossings
Bicycle	\$179 million	Regionwide Bicycle and Safe Routes to School Facilities
System Performance	\$154 million	Regionwide Intelligent Transportation and Arterial Traffic Management Systems
Environmental Stewardship	\$166 million	Regionwide Wildlife Linkages, Regionwide Air Quality Monitoring
Freight and Economic Growth	\$174 million	Small Business Assistance, Regional Freight Improvements
Land Use and Transportation	\$45 million	Regional Aerial Mapping and Data Acquisition, Regional Transportation Studies

APPENDIX 1

2045 RMAP UPDATE IN-PLAN PROJECT LIST



Appendix 1 of the *2045 RMAP Update* includes “in-plan” projects expected to be funded by or before 2045. A performance assessment was completed for these projects, including analysis on traffic congestion, air quality, environmental impact and travel time data and of the impact of these projects on individuals protected by Title VI of the Civil Rights Act. Projects are sorted alphabetically by jurisdiction. The table presents information in columns that cover the following:

RMAP ID#: Each project has an ID number that is used to identify and track the project. Numbers after the decimal point indicate the year the project was originally added to PAG’s regional project database.

Project Name, Location, Description: The general scope and location of each project is provided.

Jurisdiction/Sponsor: Each project identifies the agency that is expected to be responsible for its implementation. “Multiple” indicates more than one sponsor is responsible for implementing the project.

Estimated Project Costs: Totals include the anticipated costs, as appropriate, for planning, design, right-of-way, and construction for each project. All costs and revenues are in 2020 dollars and may be subject to change as project scopes are further defined.

Estimated Time Frame: Estimated project time periods are shown where available. The early period includes projects anticipated for fiscal years 2020-2026, the middle period includes project anticipated for fiscal years 2027-2035, and the late period includes projects expected to be developed between fiscal years 2036-2045. Projects with a timeframe of “All” are programs or activities that are ongoing throughout this planning timeframe. Actual implementation time periods may vary based on changing priorities and do not require a plan amendment to the RMAP.

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2045 RMAP Update In-Plan Project List

Projects are listed alphabetically by name

RMAP ID	Name	Location	Description	Sponsor Jurisdiction	Estimated Project Cost (000s)	Estimated Time Frame
3.18	10th Ave Enhancements	25th St to 40th St	Improve pavement conditions	South Tucson	\$2,000	Unavailable
40.02	1st Ave	Orange Grove Rd to Ina Rd	Widen to 4-lane roadway, bike lanes & sidewalks	Pima County	\$11,162	Middle
684.03	1st Ave #1	Grant Rd to River Rd	Widen to 6-lane roadway, bike lanes, sidewalks & bus pullouts	Tucson	\$138,156	Middle
180.98	22nd St #1	I-10 to Tucson Bl / Barraza-Aviation Pkwy	Widen to 6-lane divided roadway, bridge over railroad & bike lanes	Tucson	\$130,248	Early
327.98	22nd St #2	Camino Seco to Houghton Rd	Widen to 4-lane roadway, bike lanes, sidewalks & bus pullouts	Tucson	\$25,710	Middle
300.98	40th St Extension	Between 4th Ave and 6th Ave	New roadway, curbs, walk, landscape & street lights	South Tucson	\$2,000	Early
332.98	5th St / 6th St	Campbell Ave to Wilmot Rd	Bike lanes, sidewalk and pedestrian amenities	Tucson	\$15,000	Middle
53.18	6th Ave Traffic Interchange	I-10 / 6th Ave	Widen crossroad and bridge over I-10	ADOT	\$20,000	Middle
571.08	Adonis Rd #2	Tangerine Rd to San Lucas	Construct 4-lane roadway	Marana	\$55,000	Middle
34.18	Aeronautical Way & Country Club Rd Connection	Tucson International Airport	2-lane roadway connecting Aeronautical Way & Country Club Road	Multiple	\$3,570	Early
429.03	Aerospace Pkwy Expansion	Raytheon Parkway to Alvernon Way	Widen to 4-lane roadway	Pima County	\$22,700	Early
230.98	Air Monitoring & Data Collection	Regionwide	Expand Air Quality Monitoring	Multiple	\$10,000	All
299.03	Air Quality Model and Inventory Upgrades	Regionwide	Develop new air quality model with emissions inventory	PAG	\$6,500	All
137.98	Air Quality Planning	Regionwide	Regional Air Quality Planning, inventory and monitor pollutants	PAG	\$10,000	All
47.18	Ajo Way Phase II	Ajo Way to Irvington Rd	I-19 Improvements between Ajo and Irvington	ADOT	\$38,000	Early
541.08	Alternative Energy and Fuel Vehicle Infrastructure	Regionwide	Improve alternative energy and fuel infrastructure	PAG	\$7,000	Late
65.00	Alternative Modes Program	Regionwide	Education and outreach to promote alternative modes	PAG	\$3,000	All

2045 RMAP Update In-Plan Project List

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85.08	Alvernon Way #1A	Hughes Access Road to Valencia Rd	Widen to 4-lane roadway	Multiple	Unavailable	Unavailable
365.98	Arterial Street Lighting	Arterial streets regionwide	Construct roadway lighting	Multiple	\$17,000	All
234.08	Arterial Traffic Management System	Regionwide	Improve the operation of traffic signal systems and traffic flow	Multiple	\$65,000	All
198.08	Bicycle and Pedestrian Encouragement and Safety Outreach	Regionwide	Develop and distribute materials on bicycle safety	Multiple	\$21,800	All
193.08	Bicycle Boulevards	Regionwide	Install bicycle boulevards	Multiple	\$30,000	All
556.08	Bicycle Facilities Connectivity	Regionwide	Fill gaps in the bike lane system, including protected bike lanes	Multiple	\$100,000	All
196.08	Bicycle Parking and other amenities	Regionwide (in appropriate locations)	Install racks, corrals, lockers, etc.	Multiple	\$4,000	All
668.03	Bicycle Signage and Stenciling	Regionwide	Way-finding, wrong-way & stenciling along bikeways	Multiple	\$2,000	All
237.08	Bond Debt Service	Regionwide	Repayment of regional bond debts	Multiple	\$520,000	All
202.98	Bridge Improvements	Regionwide	Construction of New or Replacement Bridges	Multiple	\$75,000	All
195.98	Broadway BI #1	Euclid Ave to Country Club Rd	Widen to 6-lane roadway, bike lanes, bus pullouts & sidewalks	Tucson	\$29,700	Early
337.98	Broadway BI #2	Camino Seco to Houghton Rd	Widen to 4-lane roadway, bike lanes & sidewalks	Tucson	\$17,200	Middle
110.03	Bus Pullouts	Fixed-route system	Construct transit pullouts at select bus stops	Multiple	\$25,000	All
585.08	Bus Shelters	Regionwide	Add new bus shelters and refurbish existing bus shelters	Tucson	\$2,850	All
160.00	Camino de Oeste	Irvington Rd to Ajo Way	Reconstruct to 3-lane roadway, bike/ped, drainage, art	Pima County	\$4,500	Late
317.03	Camino de Oeste (South)	Calle Torim to Valencia Rd	Widen to 4-lane roadway	Pascua Yaqui	\$8,500	Middle
95.00	Camino Loma Alta	Colossal Cave Rd to Old Spanish Tr	Widen to 4-lane roadway, bike/ped, drainage, art	Pima County	\$27,144	Late

2045 RMAP Update In-Plan Project List

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340.98	Camino Seco	Speedway Bl to Wrightstown Rd	Upgrade to multimodal and add safety improvements	Tucson	\$5,700	Middle
505.08	Camino Seco	Irvington Rd to Golf Links Rd	Safety enhancements and access control	Tucson	\$26,000	Late
101.08	Camino Verde	Valencia Rd to Ajo Way	Reconstruct to 3-lane roadway	Pima County	\$12,500	Middle
27.00	Campbell Ave (South)	Quail Crossing Bl to Sahuarita Rd	Extend 2-lane roadway, bike lanes, sidewalks & drainage	Sahuarita	\$29,900	Middle
102.08	Catalina Hwy	Houghton Rd to Snyder Rd	Widen to 3-lane roadway	Pima County	\$10,000	Middle
7.14	CNG Fueling System NW	Sun Tran Maintenance Facility Northwest	Install new CNG fueling system to fuel CNG vehicles	Tucson	\$10,500	Early
6.14	CNG Fueling System TOPSC Expansion	Sun Tran's South Park / Thomas O Price Service Center	Expand existing CNG Fueling system	Tucson	\$1,500	Early
355.03	Commuter Programs for alternative transportation	Regionwide	Commuter programs	PAG	\$5,000	All
704.03	Continental Rd	Abrego Dr to Old Nogales Hwy	Widen to 4-lane roadway, bike/ped, drainage, art	Pima County	\$16,600	Middle
75.18	Country Club Rd: I-10 to Irvington Rd	I-10 to Irvington Rd	Widen to 6 lanes	Tucson	\$5,100	Late
76.18	Country Club Rd: I-10 to Irvington Rd to Corona Rd	Irvington Rd to Corona Rd	Widen to 4 lanes	Tucson	\$47,800	Late
174.03	Dirt Roads & Shoulder Improvements	Regionwide	Pavement of dirt roads to control particulate matter	Multiple	\$15,000	All
261.98	Downtown Links	Broadway Bl to 6th Street Underpass	Extend Barraza-Aviation Pkwy, railroad bridge at 9th Ave / 6th St	Tucson	\$62,100	Early
6.03	Drexel Rd Extension	Midvale Park Rd to Calle Santa Cruz	Extend 2-lane roadway, includes bridge over Santa Cruz	Tucson	\$16,700	Early
23.00	El Toro Rd - Part 1	La Cañada Dr to La Villita Rd	Construct new 2-lane roadway, sidewalks & multi-use lanes	Sahuarita	\$6,700	Middle
498.08	Emergency & Incident Management System	Regionwide	Programs to address emergency situations and routine incidents	Multiple	\$20,000	All
27.18	Enhance Ft Lowell Rd / Camp Lowell Rd	Alvernon Way to Swan Rd	Capacity and Safety Improvements	Tucson	\$5,000	Middle

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633.08	Environmental Mitigation Strategies	Regionwide	Environmental mitigation strategies for transportation projects	Multiple	\$15,000	All
566.08	Expand Fixed-Route Bus System	Regionwide	Increase service area and frequency	Tucson	\$447,300	All
558.08	Federal Transit Grants	Regionwide	5310 and 5311 Programs	Multiple	\$47,040	All
259.98	Grant Rd Corridor Project	Santa Rita Rd to Swan Rd	Widen to 6-lane roadway, bike lanes, sidewalks & streetscaping	Tucson	\$157,484	Early
631.03	Harrison Rd	Irvington Rd to Golf Links Rd	Widen to 4-lane divided roadway, new bridge over Pantano Wash	Tucson	\$39,591	Early
532.08	High Capacity Transit Enhancements	Regionwide	Enhance transit infrastructure with high-capacity elements	Multiple	\$10,000	All
11.02	Houghton Pkwy #3	I-10 to Tanque Verde Rd	Widen to 4- and 6- lane parkway, new bridges & greenway	Tucson	\$107,076	Early
12.02	Houghton Rd	Camino del Toro to I-10	Reconstruct to 4-lane roadway	Pima County	\$61,656	Middle
587.03	I-10 East #B: Country Club Rd TI	I-10 / Country Club Rd	Add Traffic Interchange & remove Palo Verde Traffic Interchange	ADOT	\$53,900	Middle
612.03	I-10 East #C: Valencia Rd TI	I-10 / Valencia Rd	Construct Traffic Interchange	ADOT	\$44,500	Late
613.03	I-10 East #E: Wilmot Rd TI	I-10 / Wilmot Rd	Reconstruct Traffic Interchange	ADOT	\$44,568	Late
544.03	I-10 East #H: Houghton Rd TI - Phase 1	I-10 / Houghton Rd	Reconstruct Traffic Interchange	ADOT	\$45,609	Early
55.14	I-10 East Phase 3: Alvernon Way to Kolb Rd	Alvernon Way to Kolb Rd	Widen to 10 lanes	ADOT	\$310,000	Late
428.03	I-10 East: 6th Ave to Kino Pkwy	6th Ave to Kino Pkwy	Widen to 8-lanes	ADOT	\$54,400	Middle
490.08	I-10 East: Kino Pkwy TI	I-10 / Kino Pkwy	Reconstruct Traffic Interchange	ADOT	\$60,000	Middle
605.03	I-10 East: Kolb Rd TI	I-10 / Kolb Rd	Reconstruct Traffic Interchange	ADOT	\$44,500	Late
82.14	I-10 East: Park Ave Traffic Interchange	I-10 / Park Ave	New TI at Park Ave and I-10	ADOT	\$44,000	Middle

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574.03	I-10 West: #B - Ruthrauff Rd TI	I-10 / Ruthrauff Rd	Reconstruct traffic interchange	ADOT	\$127,234	Early
74.18	I-10 West: Cortaro Rd Traffic Interchange	I-10 / Cortaro Rd	Reconstruct Traffic Interchange with grade separation at railroad tracks	ADOT	\$90,000	Late
54.18	I-10 Widening	Kino Pkwy to Alvernon Way	Widening I-10 to 6 lanes (coincides with RMAP projects 490.08 and 587.03)	ADOT	\$1	Middle
44.18	I-10 Widening and Reconstruct Sunset Rd TI	Ina Rd to Ruthrauff Rd	Widen I-10 to 8 lanes (four in each direction) and reconstruct Sunset Rd TI	ADOT	\$114,373	Early
27.02	I-10, I-19 to Kolb Rd and SR 210, I-10 to Golf Links Rd	I-10, I-19 to Kolb Rd and SR 210, I-10 to Golf Links Rd	DCR/EA	ADOT	\$6,015	Early
4.98	I-19: Mainline Phase 3	Valencia Rd to Ajo Way	Widen to 6-lanes (three in each direction)	ADOT	\$5,000	Middle
49.18	I-19: Phase 4	San Xavier Rd to Valencia Rd	Widen I-19 to six lanes (three in each direction)	ADOT	\$66,400	Middle
51.18	I-19: Phase 6	I-10 to Valencia Rd	Widen I-19 to eight lanes (four in each direction)	ADOT	\$92,000	Late
32.02	I-19: TI #5 @ Irvington Rd	I-19 / Irvington Rd	Reconstruct Traffic Interchange	ADOT	\$49,800	Early
161.00	Ignacio M Baumea Rd	Los Reales Rd to Calle Torim	Improve 2-lane roadway, add sidewalks, lighting, etc.	Pascua Yaqui	\$3,000	Early
169.00	Ina Rd	Wade Rd to Silverbell Rd	Widen to 3-lane roadway	Pima County	\$19,500	Middle
68.98	Ina Rd #3	I-10 to Camino de la Tierra	Widen to 6-lane roadway	Marana	\$30,000	Middle
30.08	Intersection improvements	Regionwide	Improve intersections throughout the region	Multiple	\$50,000	All
12.18	Ironwood Hill Dr	Silverbell Rd to Greasewood Rd	Widen to 4-lanes with median	Tucson	\$7,500	Middle
497.03	Irvington Rd	Ajo Way to Sunset Bl	New 2-lane roadway	Pima County	\$11,000	Middle
163.08	Irvington Rd #3	Santa Cruz River to east of I-19	Improve intersections, provide access mgmt, bike lanes & sidewalks	Tucson	\$9,800	Middle
230.08	ITS - Intelligent Transportation Systems	Regionwide	ITS improvements regionwide, including fiber installations and communications upgrades	Multiple	\$80,000	All

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RMAP ID	Name	Location	Description	Sponsor Jurisdiction	Estimated Project Cost (000s)	Estimated Time Frame
565.03	Kolb Rd #1	I-10 to Escalante Rd	Widen to 6-lane roadway, bike lanes, sidewalks & drainage	Tucson	\$74,000	Middle
321.03	La Cañada Dr (South)	Camino Sueno de Sahuarita to North of El Toro Rd	Widen to 4-lane roadway	Sahuarita	\$22,000	Middle
83.08	La Cholla Bl (South)	Ajo Way to Starr Pass Bl	Safety enhancements and access control	Tucson	\$13,800	Middle
17.00	La Villita Rd Extension (South)	Sahuarita Rd to Nogales Hwy	Construct 2-lane roadway, bike lanes, sidewalk & drainage	Sahuarita	\$11,900	Middle
101.98	Lambert Ln	Shannon Rd to Rancho Sonora Dr	Widen to 4-lane roadway, bike lanes, multi-use paths & drainage	Oro Valley	\$17,000	Early
86.14	Linda Vista Bl	Marana town limits to Thornydale Rd	Widen to 4-lane roadway	Pima County	\$20,000	Early
103.98	Linda Vista Bl Safety Improvements	Calle Buena Vista to Oracle Rd	Reconstruct, drainage, pedestrian, bike lanes	Oro Valley	\$3,131	Middle
201.00	Luckett Rd / Moore Rd	Marana Rd to Tortolita TI with I-10	Widen to 4-lane roadway	Marana	\$34,491	Late
417.03	Main St Extension (Marana)	Grier Rd to Tangerine Farms Rd	Construct 2-lane roadway	Marana	\$1,722	Early
199.00	Marana Rd	Trico Rd to Tangerine Farms Rd	Widen to 4-lane roadway	Marana	\$65,000	Middle
90.08	Mark Rd / Joseph Rd / Kinney Rd	Los Reales Rd to Ajo Way	Reconstruct 2-lane roadway	Pima County	\$12,398	Late
102.00	Mary Ann Cleveland Way	Red Iron Tr to Camino Loma Alta	Widen to 4-lane roadway	Pima County	\$22,500	Middle
692.03	Mission Rd	Valencia Rd to Drexel Rd	Widen to 4-lane roadway	Pima County	\$12,200	Middle
4.14	Moore Rd	La Cholla Bl to La Cañada Dr	Redesign and reconstruct roadway	Oro Valley	\$5,500	Middle
20.18	Multi-Modal Mobility and Safety Enhancements	Regionwide	Enhance system to include mobility and safety improvements including complete streets elements	Multiple	\$30,000	Early
107.98	Naranja Dr	La Cholla Bl to 1st Ave	Grade, pave, widen to 3 lanes, drain, add curb, gutter, bike lanes and multi use lanes	Oro Valley	\$16,000	Middle
223.08	Neighborhood Circulator Bus System	Regionwide	Neighborhood circulator bus system	Multiple	\$116,950	All

2045 RMAP Update In-Plan Project List

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RMAP ID	Name	Location	Description	Sponsor Jurisdiction	Estimated Project Cost (000s)	Estimated Time Frame
324.03	No Drive Days Program	Regionwide	PDEQ Program to promote alternative modes of transportation	Pima County	\$6,500	All
514.08	Nogales Hwy #1	Old Vail Connection Rd to Hermans Rd	Widen to 6-lane roadway	Pima County	\$11,052	Late
325.03	Nogales Hwy #2 (South)	Calle Valle Verde to Sahuarita Rd	Widen to 4-lane roadway	Sahuarita	\$27,400	Middle
427.03	Nogales Hwy #3	Pima Mine Rd to Old Vail Connection Rd	Widen to 4-lane roadway, bike/ped, drainage, art	Pima County	\$57,546	Late
557.08	Non-Regional Roadways	Throughout Region	Jurisdictional Discretion for local roads	Multiple	\$2,292,000	All
44.08	Northern Ave / Calle Buena Vista	Magee Rd to Linda Vista Bl	Add bike lanes, multi-use paths & transit elements	Oro Valley	\$7,368	Early
26.00	Old Nogales Hwy Corridor	Continental Rd to Nogales Hwy	Widen to 4-lane roadway, includes bridge over Santa Cruz	Sahuarita	\$39,700	Middle
100.00	Old Spanish Trail	Valencia Rd to Camino Loma Alta	Widen to 4-lane roadway	Pima County	\$34,600	Late
17.02	Orange Grove Rd #3	Corona Rd to Oracle Rd	Widen to 4-lane roadway	Pima County	\$27,000	Middle
1.03	Orange Grove Rd #4	Oracle Rd to Skyline Dr	Widen to 4-lane roadway	Pima County	\$26,000	Early
202.08	PAG Bicycle & Pedestrian Program	Regionwide	Coordinate Ped / Bike activities	PAG	\$1,500	All
108.98	Palisades Rd	1st Ave to 1 mile East	Widen to 3-lanes, shoulders, turn lanes & bike lanes	Oro Valley	\$5,886	Late
64.18	Palo Verde Rd	Irvington Rd to Ajo Way	Modernization including bike/ped, transit and public art	Pima County	\$10,500	Early
222.08	Park & Ride Lots	Regionwide	New Park-n-Ride Lots throughout region	Multiple	\$21,673	All
232.08	Pavement Preservation and Reconstruction	Regionwide	Maintain and Repair Roadway Pavement	Multiple	\$2,268,725	All
433.98	Pedestrian Facilities and Sidewalk Gaps	Regionwide	Improvements include sidewalks, maintenance, ADA ramps, lighting, landscaping, etc.	Multiple	\$334,000	All
30.18	Pima County Bus Shelters	Countywide	Construct new bus shelter pads and install new bus shelters	Pima County	\$1,250	All

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18.02	Pima Mine Rd #1	I-19 to Nogales Hwy	Widen to 4-lane roadway	Sahuarita	\$19,900	Middle
127.00	Prince Rd #2	Campbell Ave to Country Club Rd	Safety enhancements and access control	Tucson	\$17,000	Middle
620.03	Quail Creek BI Extension Phase 1	Old Nogales Hwy to Nogales Hwy	Construct 2-lane divided roadway, includes bridge over Santa Cruz	Sahuarita	\$16,000	Early
34.00	Railroad Grade Crossing Warning System	Regionwide	Install warning systems at railroad crossing locations	Multiple	\$5,458	All
154.03	Railroad Underpass @ Grant Rd	Union Pacific Mainline and Grant Rd	Expand railroad underpass east of I-10 to accommodate 6 lanes	Tucson	\$20,000	Early
583.08	Rancho Sahuarita BI	Sahuarita Rd to El Toro Rd	Construct 4-lane roadway, bike lanes, sidewalk & drainage	Sahuarita	\$9,400	Early
111.98	Rancho Vistoso BI	Moore Rd to Tangerine Rd	Reconstruct, mill & overlay	Oro Valley	\$2,500	Early
384.98	Regional Aerial Mapping and Data Acquisition	Regionwide	Orthophotos, mapping, and data collection	PAG	\$15,000	All
24.18	Regional Freight Improvements	Regional	Spot freight improvements consistent with the 2018 Regional Freight Plan	Multiple	\$10,000	Early
392.98	Regional Transit Maintenance Facility and Equipment Upgrades	Regionwide	Miscellaneous facility improvements over 30 years	Multiple	\$36,000	All
370.98	Regional Traveler Information System	Regionwide	Programs to obtain and disseminate traveler information	PAG	\$5,000	All
616.03	Right-of-Way (RW) Preservation	Regionwide	Purchase RW to preserve from development	Multiple	\$50,000	All
65.18	River Rd	La Cholla BI to Oracle Rd	Modernization of arterial roadway	Pima County	\$23,300	Early
66.18	River Rd	1st Ave to Campbell Ave	Modernization of arterial roadway	Pima County	\$12,500	Late
83.14	Safe Routes to School	Regionwide	Regionwide Bike, Pedestrian, and Safety Infrastructure Improvements	Multiple	\$20,000	All
349.03	Safety Programming and Funding Process	Regionwide	Safety program	PAG	\$6,000	All
350.03	Safety Remediation	Regionwide	Expansion of safety & operations related projects	Multiple	\$56,000	All

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591.03	Sahuarita Rd	Country Club Rd to SR 83	Reconstruct 2-lane roadway with drainage	Pima County	\$72,651	Late
20.14	Sandario Rd #3	Grier Rd to Tangerine Farms Rd	Widen to 3-lane Roadway	Marana	\$4,000	Early
65.03	Shannon Rd	Lambert Ln to Tangerine Rd	Construct new 4-lane roadway	Oro Valley	\$7,800	Late
194.08	Shared Use Paths	Regionwide	Create more shared-use paths	Multiple	\$60,000	All
165.03	Signalized Pedestrian & Bike Crossings	Regionwide	Construct signalized pedestrian/bike crossings (HAWKS, etc.)	Multiple	\$29,000	All
257.98	Silverbell Rd	Goret Rd to Ina Rd	Widen to 4-lane divided roadway, bike lanes & drainage	Multiple	\$106,935	Early
4.06	Small Business Assistance	Regionwide	Provides help to businesses along major construction corridors	RTA	\$18,000	All
11.18	South 12th Ave	44th St to Drexel Rd	Safety enhancements, access control, and multi-modal	Tucson	\$15,000	Middle
29.18	Southeast Logistics Center Access Roads	Vicinity of Pima County Fairgrounds	Roadway Improvements to support economic development projects	Pima County	\$20,820	Early
233.00	Special Needs Transit Services	Regionwide	Provide transit services beyond mandated ADA service area	Multiple	\$165,000	All
189.08	SR 210: Barraza-Aviation Pkwy Extension	I-10 to Palo Verde Rd	Construct new corridor	ADOT	\$167,600	Late
23.03	SR 210: Golf Links Rd TI Stage 1	SR 210 / Golf Links Rd / Palo Verde Rd	Reconfigure Traffic Interchange	ADOT	\$50,000	Middle
149.08	SR 210: Right-of-Way Acquisition	I-10 to Palo Verde Rd	Advanced right-of-way funding for future connection with I-10	Tucson	\$19,600	Middle
5.14	SR 410: Sonoran Corridor	I-19 to I-10 in the vicinity of Rita Rd	New 4-lane freeway	ADOT	\$600,000	Middle
36.18	SR 86: Project #1	SR 86 / La Cholla Bl Intersection	Intersection Improvement	ADOT	\$3,700	Middle
37.18	SR 86: Project #2	SR86, La Cholla Bl to Holiday Isle Boulevard	Widen SR86 with intersection modifications	ADOT	\$10,100	Middle
40.18	SR 86: Project #3	700 feet east of Kinney Rd to Camino de Oeste Rd	Widen SR86 to six lanes (3 in each direction)	ADOT	\$2,700	Middle

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42.18	SR 86: Project #4	Camino de Oeste to La Cholla Bl	Widen SR86 to six lanes (3 in each direction)	ADOT	\$8,300	Middle
601.03	Starr Pass Bl	I-10 to Shannon Rd	Enhance roadway with safety improvements	Tucson	\$18,500	Middle
379.98	Stone Ave Corridor Gateway Project	Drachman St to Wetmore Rd	Enhance the gateway, alternative mode improvements	Tucson	\$15,000	Middle
33.14	Sun Link Modern Streetcar Operations and Maintenance	Downtown Tucson to University Medical Center	Operations and Maintenance for the Sun Link Modern Streetcar	Tucson	\$180,000	All
393.98	Sun Tran Bus & Support Vehicle Replacements	Regionwide	Replace Sun Tran buses and support vehicles over 25 years	Tucson	\$460,199	All
430.98	Sun Tran Existing Operations and Maintenance	Regionwide	Maintain existing Sun Tran levels of service regionwide	Tucson	\$1,591,216	All
416.98	Sun Tran Maintenance Facility Pavement Replacement-TOPSC	TOPSC, 4220 S. Park Ave	Repave and maintain bus fleet parking area (5 upgrades over 30 years)	Tucson	\$6,200	All
11.14	Sun Tran Maintenance Facility Roof Replacement- NW	Sun Tran NW Facility, 3920 N. Sun Tran Bl	Replace/repair roof for all 7 buildings at facility	Tucson	\$1,440	Middle
10.14	Sun Tran Maintenance Facility Roof Replacement-TOPSC	TOPSC, 4220 S Park Ave	Replace/repair roof for facility	Tucson	\$720	Early
426.98	Sun Van Existing Operations and Maintenance	Regionwide	Operations and Maintenance of existing Sun Van service regionwide	Tucson	\$426,901	All
9.14	Sun Van Maintenance Facility Rehabilitation	3401 E Ajo Way	Building improvements and upgrades. Includes new fueling management system	Tucson	\$5,000	Early
275.98	Sun Van Vehicle Replacements and Support Vehicles	Regionwide	Replace existing vans Sun Van and support vehicles for Sun Van and Sun Tran	Tucson	\$92,358	All
715.03	Sunset Rd	Silverbell Rd to I-10 to River Rd	New 3-lane roadway, bridge over Santa Cruz & bike lanes	Multiple	\$40,375	Early
35.18	TAA Business & Industrial Park Roadway	Tucson International Airport	New 2-lane connector roadway between Aerospace Pkwy and Old Vail Rd	Multiple	\$6,825	Early
55.18	Tangerine Farms Rd	I-10 TI to Clark Farms Rd	Construct 4-lane roadway, multi-purpose lanes & sidewalks	Marana	\$15,268	Middle
204.00	Tangerine Rd	I-10 to Dove Mountain Bl	Widen to 4-lane divided roadway, bike lanes & drainage	Marana	\$63,849	Early
367.98	Technology Transfer Program (LTAP)	Regionwide	Ongoing training for regional jurisdictions	PAG	\$1,250	All

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RMAP ID	Name	Location	Description	Sponsor Jurisdiction	Estimated Project Cost (000s)	Estimated Time Frame
162.98	Thornydale Rd	Cortaro Farms Rd to Lambert Ln	Widen to 4-lane roadway	Pima County	\$33,000	Middle
1.06	Tortolita BI TI	1.3 mi SE of Pinal Airpark TI	Construct Traffic Interchange south of County Line	ADOT	\$75,000	Late
142.03	Traffic Data Collection Stations	Regionwide	Install traffic data collection stations	Multiple	\$3,646	All
90.00	Transit - Minor Enhancements	Regionwide	1% FTA requirement for Transit Enhancement program	Multiple	\$2,650	All
105.03	Transit - Transit Station - Oro Valley	1st Ave / Oracle Rd	Construct a Regional Transit Station	Oro Valley	\$3,250	Late
109.03	Transit Amenities at bus stop locations	Fixed-route transit system	Electronic signs, route maps, shelters, etc.	Multiple	\$84,000	All
292.03	Transit Center Upgrades	Ronstadt, Laos, Tohono Tadaí, Udall centers	Rehabilitate regional transit centers	Tucson	\$11,000	All
407.98	Transit Planning and Project Development	Regionwide	Conduct a comprehensive operations analysis (COA) study and other studies	Tucson	\$5,000	All
13.18	Transit Technology Upgrades and Implementation	Regionwide	Provide smart technology for transit vehicles, communications and signalization	Tucson	\$33,900	All
72.00	Transportation Art by Youth	Regionwide	A program that employs youth to create new public art for transportation facilities	PAG	\$6,000	All
139.98	Transportation Planning Program	Regionwide	Regional transportation planning, includes RMAP and TIP planning	PAG	\$60,000	All
659.03	Transportation Studies	Regionwide	Studies to improve transportation network	Multiple	\$30,000	All
136.98	Travel Demand Management	Regionwide	Includes rideshare, TRP, vanpool & congestion management	PAG	\$20,000	All
21.18	Tucson Roadway Safety Improvements	Citywide	Safety Improvements across the city	Tucson	\$125,000	Early
130.00	Tucson Traffic Signal Operations	Regional	General maintenance	Tucson	\$10,000	All
10.19	TUS Airport Loop Project	Tucson International Airport	Construct TUS Airport Loop Project	Multiple	\$15,000	Middle
690.03	University of Arizona Transit System	In and around UA	Maintain and upgrade CatTran Shuttle Services	U of A	\$1,528	All

2045 RMAP Update In-Plan Project List

Projects are listed alphabetically by name

RMAP ID	Name	Location	Description	Sponsor Jurisdiction	Estimated Project Cost (000s)	Estimated Time Frame
84.00	Valencia Rd	Houghton Rd to Old Spanish Tr	Construct 2-lane roadway, includes bridge over Pantano	Pima County	\$16,000	Early
156.98	Valencia Rd	Camino de Oeste to Mission Rd	Widen to 6-lane roadway	Pima County	\$53,700	Early
685.03	Valencia Rd #4	I-19 to Alvernon Way	Access management & safety improvements	Tucson	\$9,800	Middle
152.08	Valencia Rd #5	Wilmot Rd to Kolb Rd	Widen to 6-lane roadway, bike lanes & sidewalks	Tucson	\$19,050	Early
153.08	Valencia Rd #6	Kolb Rd to Houghton Rd	Widen to 6-lane roadway, bike lanes & sidewalks	Tucson	\$29,698	Early
3.06	Wildlife Linkages	Regionwide	Construct wildlife linkages to help protect wildlife	RTA	\$34,000	All
77.18	Wilmot Rd #4 South	I-10 to Valencia Rd	Widen to 4 lanes. Add bike lanes, medians, and sidewalks	Tucson	\$21,058	Middle

APPENDIX 2

2045 RMAP UPDATE

RESERVE PROJECT LIST



Appendix 2 of the *2045 RMAP Update* includes “reserve” projects identified as future transportation needs. Projects on the Reserve List are not funded in the RMAP’s 25-year plan horizon. These projects are not technically part of the 2045 RMAP and, therefore, were not included in the analysis of transportation performance. If additional funding is identified, a reserve project may be added to the plan through an amendment process. Projects are sorted alphabetically by jurisdiction. The table presents information in columns that cover the following:

RMAP ID#: Each project has an ID number that is used to identify and track the project. Numbers after the decimal point indicate the year the project was originally added to PAG’s regional project database.

Project Name, Location, Description: The general scope and location of each project is provided.

Jurisdiction/Sponsor: Each project identifies the agency that is expected to be responsible for its implementation. “Multiple” indicates more than one sponsor is responsible for implementing the project.

Estimated Project Costs: Totals include the anticipated costs, as appropriate, for planning, design, right-of-way, and construction for each project. All costs and revenues are in 2019 dollars and may be subject to change as project scopes are further defined.

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2045 RMAP Update Reserve Project List

Projects are listed alphabetically by name

RMAP ID	Name	Location	Description	Sponsor Jurisdiction	Estimated Project Cost (000s)
8.18	6th Ave Streetcar - Capital	6th Ave: Downtown Tucson to Irvington Rd	4-mile streetcar connecting downtown Tucson to Irvington Rd via 6th Ave	Tucson	\$167,400
71.18	6th Ave Streetcar - Operations	6th Ave: Downtown Tucson to Irvington Rd	4-mile streetcar connecting downtown Tucson to Irvington Rd via 6th Ave	Tucson	\$222,000
25.18	ADA Right-of-way Improvements	Citywide	Implement ADA Transition Plan	Tucson	\$250,000
572.08	Adonis Rd #1	Lambert Ln to Tangerine Rd	Construct 4-lane roadway	Marana	\$38,864
421.03	Adonis Rd #3	San Lucas to Pinal County Line	Construct 4-lane roadway	Marana	\$27,988
63.18	All-weather Access Improvements	Countywide	Provide all-weather access throughout the county	Pima County	\$25,025
188.08	Alvernon Way Corridor Project	Hughes Access Rd to Ft Lowell Rd	Improve Corridor - widen to 4 and 6 lanes	Tucson	\$373,328
196.00	Avra Valley Rd #2	I-10 to Clayton Rd	Widen to 4-lane roadway, multi-purpose lanes & sidewalks	Marana	\$44,084
56.18	Avra Valley Rd Extension	I-10 to Tangerine Rd	4-lane road	Marana	\$23,076
425.03	Benson Hwy	Kino Pkwy to Irvington Rd	Widen to 6-lane roadway	Tucson	\$9,192
23.18	Bicycle and Pedestrian Safety and Encouragement Initiatives	Regional	Bicycle and Pedestrian Safety and Encouragement Program	Tucson	\$8,750
60.18	Bicycle Facilities	Countywide	Add new bicycle facilities countywide for capacity/safety/and mobility	Pima County	\$66,608
95.08	Bopp Rd	San Joaquin Rd to Kinney Rd	Widen to 4-lane roadway, bike/ped, drainage, art	Pima County	\$34,300
62.18	Bridge Repair and Replacement	Countywide	Repair and replace bridges countywide	Pima County	\$75,505
10.18	Bridge Replacements	Regional	Bridge Replacement	Tucson	\$200,000
6.18	Broadway BI Bus Rapid Transit - Capital	Broadway BI: Ronstadt Transit Center to Wilmot Rd	7-mile Bus Rapid Transit Line connecting Ronstadt Transit Center to Wilmot Rd	Tucson	\$34,300

2045 RMAP Update Reserve Project List

Projects are listed alphabetically by name

RMAP ID	Name	Location	Description	Sponsor Jurisdiction	Estimated Project Cost (000s)
69.18	Broadway BI Bus Rapid Transit - Operations	Broadway BI: Ronstadt Transit Center to Wilmot Rd	7-mile Bus Rapid Transit Line connecting Ronstadt Transit Center to Wilmot Rd	Tucson	\$309,720
7.18	Broadway BI Streetcar - Capital	Broadway BI: Downtown to Alvernon Way	3.75-mile streetcar connecting downtown Tucson to Alvernon Wy along Broadway Blvd	Tucson	\$152,200
70.18	Broadway BI Streetcar - Operations	Broadway BI: Downtown to Alvernon Way	3.75-mile streetcar connecting downtown Tucson to Alvernon Wy along Broadway BI	Tucson	\$188,700
569.08	Bus Rapid Transit - Vail	Downtown to Vail	BRT to serve Vail area	Tucson	\$39,332
104.08	Camino del Sol	Ocotillo Wash to Continental Rd	Widen to 4-lane roadway, bike/ped, drainage, art	Pima County	\$10,826
75.14	Campbell Ave Regional Arterial	SR-210 to Valencia Rd	Upgrade Campbell Ave to a regional arterial	Tucson	\$10,240
14.14	Cayton Rd	Dove Mountain BI to Thornydale Rd	New 2-lane roadway	Marana	\$10,708
279.98	City of Tucson Bicycle Infrastructure	Citywide	Construct Bicycle Infrastructure in the City	Tucson	\$157,000
231.08	Clark Farms BI Corridor	Sanders Rd to Tangerine Rd	Make Clark Farms BI a 3-lane roadway from Sanders Rd to Tangerine Rd	Marana	\$15,070
211.00	Clark Farms BI Phase #1	Despain Dr to Moore Rd	Construct new 4-lane roadway, multi-purpose lanes & sidewalks	Marana	\$8,538
207.00	Clark Farms BI Phase #1A	Sanders Rd to the East 2,700 feet	Construct new 3-lane roadway, multi-purpose lanes & sidewalks	Marana	\$3,843
213.00	Clark Farms BI Phase #2	Moore Rd to Despain Rd	Construct 3 lane-roadway, multi-purpose lanes & sidewalks	Marana	\$4,680
216.00	Collector A - North of Cochie Canyon / Project #22	Pinal County Line to Postvale Rd	Construct 4-lane divided roadway, multi-purpose lanes & sidewalks	Marana	\$60,697
159.03	Communications Expansion - ITS	Regionwide	Expand communications to improve data collection & distribution	Multiple	\$7,000
530.08	Commuter Rail - Marana to Downtown	Downtown to Marana Town Center	Commuter Rail to Marana	Multiple	\$381,175
568.08	Commuter Rail Study - Green Valley	Downtown Tucson to Green Valley	Study feasibility and implementation of commuter rail	PAG	\$5,000

2045 RMAP Update Reserve Project List

Projects are listed alphabetically by name

RMAP ID	Name	Location	Description	Sponsor Jurisdiction	Estimated Project Cost (000s)
567.08	Commuter Rail Study - Vail	Downtown to Vail	Study feasibility and implementation of commuter rail	PAG	\$5,000
531.08	Commuter Rail to Green Valley	Green Valley to Downtown	Commuter Rail to Green Valley	Multiple	\$460,000
55.08	Country Club Rd	Tucson International Airport	Extend 2-lane roadway south of Los Reales Rd	TAA	\$1,750
59.18	Countywide Sidewalk Improvements	Countywide	Add new bus sidewalks, ADA improvements and HAWK crossings	Pima County	\$29,942
74.03	Craycroft Rd #2	Golf Links Rd to 22nd St	Safety enhancements and Access Control	Tucson	\$17,100
4.12	Downtown Wye: West Leg	Additional rail near downtown Tucson	Additional rail near downtown Tucson	Pima County	\$12,000
18.00	East Frontage Rd along I-19 Phase 1	S 1/4 corner of Sec 26, T17S, R13E to Nogales Hwy	Realign and reconstruct roadway	Sahuarita	\$5,723
3.14	Egleston Rd	Calle Concordia to Linda Vista Bl	New Roadway	Oro Valley	\$2,583
31.14	El Toro Rd - Part 2	La Villita Rd to Wilmot Rd	Construct 4-lane divided roadway, includes bridge over Santa Cruz	Sahuarita	\$79,082
28.18	Fiber and Communications Systems	Citywide	City of Tucson Fiber and Communications Systems Design, Construction and Maintenance	Tucson	\$40,000
82.08	Flowing Wells Rd	Grant Rd to River Rd	Create a divided cross-section with turning lanes	Tucson	\$75,315
84.08	Greasewood Rd	Ironwood Hill Dr to Starr Pass Bl	Safety enhancements and access control	Tucson	\$31,264
208.00	Grier Rd	Luckett Rd / Moore Rd to Tangerine Farms Rd	Widen to 3-lane roadway	Marana	\$24,500
432.03	Hardin Rd	I-10 to Trico Rd	Widen to 3-lane roadway	Marana	\$31,882
519.08	HCT Plan - BRT - Speedway Blvd	UA to Houghton Rd	BRT along Speedway	Tucson	\$102,240
80.08	Houghton Area Master Plan	HAMP Planning Boundaries	Construct arterial street roadways within HAMP area	Tucson	\$156,960

2045 RMAP Update Reserve Project List

Projects are listed alphabetically by name

RMAP ID	Name	Location	Description	Sponsor Jurisdiction	Estimated Project Cost (000s)
490.03	Houghton Pkwy #2	I-10 to Dawn Rd	Widen to 4-lane divided roadway	Tucson	\$18,000
22.03	Houghton Rd	Tanque Verde Rd to Catalina Hwy	Widen to 3-lane roadway	Pima County	\$11,867
604.03	I-10 East #G: Rita Rd TI	I-10 / Rita Rd	Reconstruct Traffic Interchange	ADOT	\$50,000
606.03	I-10 East: Craycroft Rd TI	I-10 / Craycroft Rd	Reconstruct Traffic Interchange	ADOT	\$44,568
5.98	I-10 West Phase 2: Prince Rd to Marana Rd	Prince Rd to Marana Rd	Widen to 10-lanes	ADOT	\$108,000
661.03	I-10 West Phase 3: Marana Rd TI to N. County Line	Marana Rd TI to N County Line	Widen to 10-lanes	ADOT	\$24,000
37.00	I-10 West: #H - Moore Rd TI	I-10 / Moore Rd	Construct Traffic Interchange	ADOT	\$35,045
409.03	I-10 West: #I - Marana Rd TI	I-10 / Trico-Marana Rd	Construct Traffic Interchange	ADOT	\$40,000
602.03	I-10 West: #J - Pinal Air Park Rd TI	I-10 / Pinal Air Park Rd	Reconstruct Traffic Interchange	ADOT	\$15,000
39.02	I-19 Mainline Widening #1	Continental Rd to El Toro Rd	Widen to 6-lanes	ADOT	\$24,000
406.03	I-19 Mainline Widening #2	El Toro Rd to Valencia Rd	Widen to 6-lanes	ADOT	\$56,000
52.18	I-19: Phase 7	San Xavier Rd to Valencia Rd	Widen I-19 to eight lanes (four in each direction)	ADOT	\$113,800
22.00	I-19: TI #2 @ Pima Mine Rd	I-19 / Pima Mine Rd	Reconstruct Traffic Interchange	ADOT	\$50,000
34.02	I-19: TI #3 @ San Xavier Rd	I-19 / San Xavier Rd	Reconstruct Traffic Interchange	ADOT	\$30,000
13.02	I-19: TI #4 @ Drexel Rd	I-19 / Drexel Rd	Construct Traffic Interchange and bridge over Santa Cruz	ADOT	\$19,050
84.14	I-19: TI #7 @ El Toro Rd	I-19 / El Toro Rd	Construct interstate traffic interchange at El Toro Road exit	Sahuarita	\$45,000

2045 RMAP Update Reserve Project List

Projects are listed alphabetically by name

RMAP ID	Name	Location	Description	Sponsor Jurisdiction	Estimated Project Cost (000s)
352.98	Irvington Rd #4	Kolb Rd to Houghton Rd	Widen to 4-lane roadway, bike lanes, sidewalks & drainage	Tucson	\$56,000
210.00	Kirby Hughes Rd	Luckett Rd to I-10 Frontage Rd	Widen to 4-lane roadway	Marana	\$23,462
528.08	Kolb / Orange Grove Parkway	La Cholla Bl to Houghton Rd	Upgrade to parkway level of service	Multiple	\$406,341
98.00	Lambert Ln #1	I-10 to Twin Peaks Rd	Construct 6-lane roadway, includes wildlife crossing	Marana	\$30,996
7.03	Lambert Ln #2	Twin Peaks Rd to Thornydale Rd	Widen to 6-lane roadway, includes wildlife crossing	Marana	\$43,516
26.03	Light Rail Transit - Starr Pass Bl	Starr Pass Bl to PCC & Downtown via St Mary's Rd	Construct new light rail system	Tucson	\$247,500
515.08	Light Rail Transit (LRT) - Broadway Bl	Broadway Bl from Downtown to Houghton	LRT on Broadway Bl, see High Capacity Transit plan for details	Tucson	\$617,460
526.08	Light Rail Transit (LRT) - Campbell Ave South / Kino Pkwy	TIA to Speedway Bl	LRT along Campbell, see High Capacity Transit plan for details	Tucson	\$537,720
524.08	Light Rail Transit (LRT) - Grant Rd	Oracle Rd to Tanque Verde Rd	LRT along Grant Rd, see High Capacity Transit plan for details	Tucson	\$483,690
522.08	Light Rail Transit (LRT) - Oracle Rd	Downtown to Tangerine Rd	LRT along Oracle Rd, see High Capacity Transit plan for details	Tucson	\$1,041,360
520.08	Light Rail Transit (LRT) - Speedway Bl	UA to Houghton Rd	LRT along Speedway Bl, see High Capacity Transit plan for details	Tucson	\$634,100
16.00	Linda Vista Bl #1	400' East of Marana Center Bl to eastern town limits	Widen to 4-lane divided roadway, curbs & sidewalk	Marana	\$15,789
33.02	Los Reales Rd	I-19 to Old Nogales Hwy	Extend and widen to 4-lane roadway	Tucson	\$56,000
434.03	Luckett Rd / Moore Rd	Luckett Rd to Sanders Rd	Construct 4-lane roadway	Marana	\$37,600
163.98	Mainsail Bl	Oracle Rd to Twin Lakes Dr	Construct 2-lane roadway and box culvert	Pima County	\$3,900
46.03	Modern Streetcar - Pima College West	Pima College West to Rio Nuevo via Congress St	Construct new streetcar line	Tucson	\$89,238

2045 RMAP Update Reserve Project List

Projects are listed alphabetically by name

RMAP ID	Name	Location	Description	Sponsor Jurisdiction	Estimated Project Cost (000s)
23.14	MOE and Complete Streets	Marana Rd	Measures of effectiveness and complete streets initiatives	Marana	\$3,500
198.00	Moore Rd	I-10 to Sanders Rd	Widen to 4-lane divided roadway with multi-purpose lanes & sidewalks	Marana	\$29,000
32.14	Nogales Hwy #4	Sahuarita Rd to Pima Mine Rd	Widen to 4-lane divided roadway	Sahuarita	\$24,984
76.14	Old Vail Connection Rd	Old Nogales Hwy to Rita Rd	Construct new 2-lane roadway	Pima County	\$37,476
4.18	Oracle Rd Bus Rapid Transit - Capital	Tohono Tadaí Transit Center to Ronstadt Transit Center	6-mile Bus Rapid Transit line connecting Tohono Tadaí to Ronstadt Center along Oracle Rd	Tucson	\$30,400
67.18	Oracle Rd Bus Rapid Transit - Operations	Tohono Tadaí Transit Center to Ronstadt Transit Center	6-mile Bus Rapid Transit line connecting Tohono Tadaí to Ronstadt Center along Oracle Rd	Tucson	\$225,000
415.03	Orange Grove Rd #1	I-10 to Thornydale Rd	Widen to 8-lane roadway	Marana	\$25,000
15.18	Park-and-Ride Facilities Upgrades	Speedway Bl, Houghton Rd, Old Vail, Kolb, Irvington, etc	Repairs and upgrades to the existing park-and-ride facilities	Tucson	\$7,500
22.18	Pavement Preservation	Regional	Pavement Preservation on roadways	Tucson	\$500,000
15.14	Pinal Air Park Connector	Luckett Rd / Moore Rd to Pinal Air Park Rd	New 2-lane roadway	Marana	\$7,238
511.08	Prince Rd #1	Country Club Rd to River Rd	Build new 4-lane connecting roadway	Tucson	\$10,000
47.00	Regional Component of Tucson/Nogales Passenger Rail	Southern border of Pima County to Downtown Tucson	Construct rail transit system toward Nogales	ADOT	\$604,188
46.00	Regional Component of Tucson/Phoenix Passenger Rail	TIA to northern Marana boundary	Construct passenger rail transit system toward Phoenix	ADOT	\$693,988
26.18	Regional Cross-town Corridors	Regional	Cross-town Mobility Corridors	Tucson	\$5,000
529.08	River / Alvernon / Swan Parkway	Thornydale Rd to Sahuarita Rd	Upgrade to parkway level of service and extend to south	Multiple	\$730,940
28.08	Roadway Development - Arroyo Grande	Arroyo Grande Planning Area	Plan, design and construct new roadways to support Arroyo Grande	Oro Valley	\$76,860

2045 RMAP Update Reserve Project List

Projects are listed alphabetically by name

RMAP ID	Name	Location	Description	Sponsor Jurisdiction	Estimated Project Cost (000s)
25.00	Sahuarita Rd #1	La Cañada Dr to La Villita Rd	Widen to 6-lane roadway	Sahuarita	\$17,658
497.08	Sandario Loop Bypass Project	I-10 to I-19	Limited access bypass	ADOT	\$2,369,650
98.08	Sandario Rd	Ajo Way to Emigh Rd	Reconstruct 2-lane roadway	Pima County	\$78,100
206.00	Sandario Rd #1	Twin Peaks Rd to Avra Valley Rd	Widen to 3-lane roadway	Marana	\$10,000
214.00	Sandario Rd #2	Moore Rd to Grier Rd	Widen to 3-lane roadway	Marana	\$8,059
200.00	Sanders Rd Corridor Project	Twin Peaks Rd to Marana Rd	Widen to 4-lane roadway	Marana	\$86,028
165.00	Shannon Rd	Cortaro Farms Rd to Lambert Ln	Widen to 4-lane roadway	Pima County	\$30,200
219.00	Silverbell Rd	Sanders Rd to west town limits	Widen to 4-lane roadway	Marana	\$12,650
4.03	Snyder Rd	Kolb Rd to Catalina Hwy	Construct new 2-lane roadway, includes bridge	Pima County	\$24,817
132.00	Speedway Bl	I-10 to Euclid Ave	Widen to 6-lane roadway	Tucson	\$68,873
5.18	Speedway Bl Bus Rapid Transit - Capital	Speedway Bl: Main Ave to Kolb Rd	8-mile BRT line along Speedway Bl	Tucson	\$39,200
68.18	Speedway Bl Bus Rapid Transit - Operations	Speedway Bl: Main Ave to Kolb Rd	Operating costs for 8-mile BRT line along Speedway Blvd	Tucson	\$408,000
42.00	SR 77 #1: Miracle Mile	I-10 to Oracle Rd	Widen to 6-lane roadway	ADOT	\$24,035
186.00	SR 77 #2: Oracle Rd	Rudasill Rd to Ina Rd	Widen to 8-lane roadway	ADOT	\$22,104
185.00	SR 77 #3: Oracle Rd	Ina Rd to Magee Rd	Widen to 8-lane roadway	ADOT	\$15,696
562.08	SR 77: Oracle Rd Parkway Project	Miracle Mile to County Line	Construct grade-separated intersections along corridor	ADOT	\$115,000

2045 RMAP Update Reserve Project List

Projects are listed alphabetically by name

RMAP ID	Name	Location	Description	Sponsor Jurisdiction	Estimated Project Cost (000s)
9.18	Stone Ave Streetcar - Capital	Stone Ave: 4th Ave and University Bl to Tohono Tadaí	4.4-mile streetcar connecting 4th Ave / University Bl to the Tohono Tadaí	Tucson	\$188,400
72.18	Stone Ave Streetcar - Operations	Stone Ave: 4th Ave and University Bl to Tohono Tadaí	4.4-mile streetcar connecting 4th Ave / University Bl. to the Tohono Tadaí	Tucson	\$264,000
14.18	Sun Tran Maintenance Facility Rehabilitation-TOPSC	TOPSC, 4220 S. Park Ave	Repair and upgrade the Sun Tran maintenance facility	Tucson	\$6,000
19.18	SunLink Maintenance Facility Repair and Upgrades	SunLink Maintenance Facility, 290 E 8th Street	Repair and upgrade the existing SunLink maintenance facility	Tucson	\$4,000
18.18	SunLink Rail Vehicle and Fleet Replacements	SunLink Maintenance Facility, 290 E 8th Street	Replace Sun Link rail vehicles and fleet vehicles	Tucson	\$77,600
31.18	Tangerine Road Connector	Marana	Tangerine Rd to Sandario Rd / Magee Rd	Marana	\$104,773
17.18	TDOT Transit Admin Building Upgrades	149 N. Stone Ave	Building repairs and upgrades	Tucson	\$2,500
57.18	Traffic Operations Center Upgrades	Traffic Operations Center	Conduct maintenance and upgrades to the Traffic Operations Center	Pima County	\$1,800
635.08	Transit Operations and Maintenance Expansion	Regionwide	Expand transit operations and maintenance	Multiple	\$1,014,000
25.08	Transit Services - Oro Valley/Arroyo Grande	Arroyo Grande Planning Area	Transit Circulator/Paratransit Expansion into Arroyo Grande	Oro Valley	\$11,675
426.03	Tucson Bl	Valencia Rd to Irvington Rd	Widen to 6-lane roadway	Tucson	\$44,835
16.18	Tucson Historic Depot Upgrades	400 N Toole Ave	Building repairs and upgrades	Tucson	\$3,750
56.14	Tucson Regional Bike Share	Regionwide	Implement public bike share system	Tucson	\$10,000
195.00	Twin Peaks Rd #2	Sanders Rd to Sidewinder Ln	Widen to 4-lane roadway	Marana	\$43,161
611.03	Valencia Rd	Houghton Rd to Old Spanish Tr	Widen to 4-lane roadway	Pima County	\$37,104
184.03	Wade Rd	Los Reales Rd to Ajo Way	Construct new 2-lane roadway	Pima County	\$17,220

2045 RMAP Update Reserve Project List

Projects are listed alphabetically by name

RMAP ID	Name	Location	Description	Sponsor Jurisdiction	Estimated Project Cost (000s)
215.00	Wentz Rd	Grier Rd to Hardin Rd	Widen to 3-lane roadway	Marana	\$18,028
581.08	Wilmot Rd #3 South	I-10 to Pima Mine Rd	Widen to 4-lane divided roadway, turn lanes, bike lanes & drainage	Multiple	\$70,000

2045 RMAP Update Reserve Project List

Projects are listed alphabetically by name

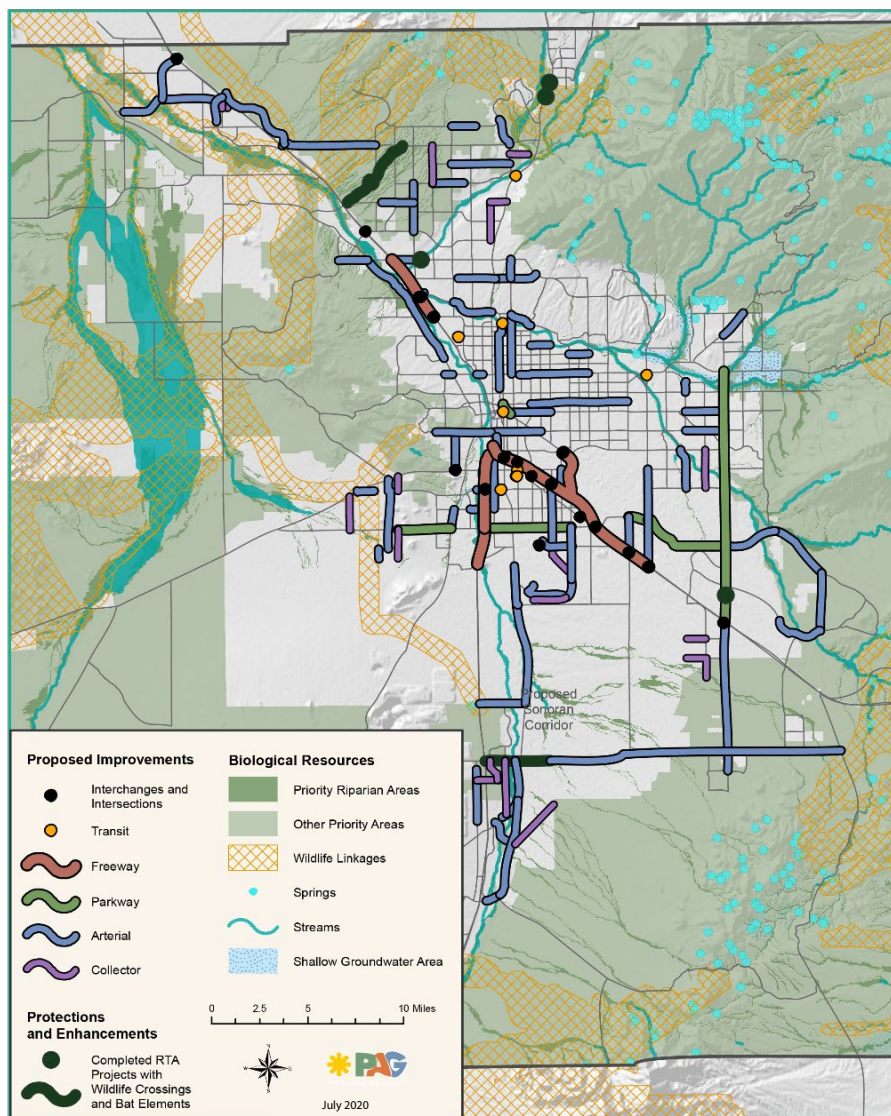
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APPENDIX 3

ENVIRONMENTAL & TITLE VI CONSIDERATIONS

Transportation infrastructure can impact the environment in many ways, both directly and indirectly. Air pollution comes from motor vehicles, paved roads can increase stormwater runoff and cause flooding, wildlife and habitat are impacted through land consumption, and vehicle-wildlife collisions are also among the impacts associated with roadway infrastructure. The 2045 RMAP recommended projects and programs to alleviate the potential negative effects on the environment.

Figure A3.1 Proximity of 2045 RMAP Update Projects to Biological



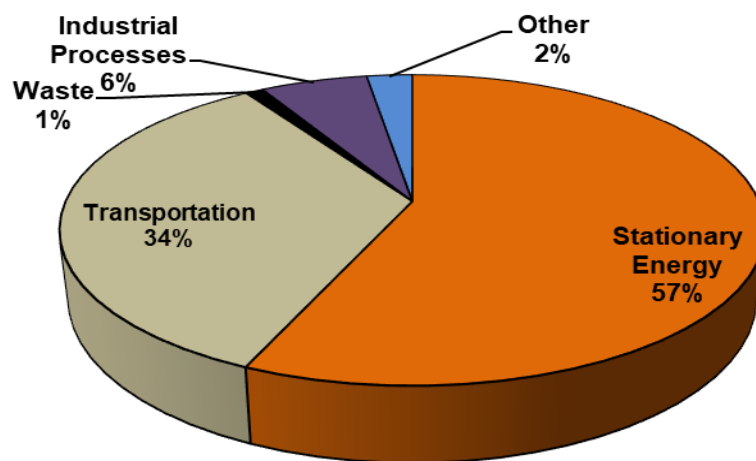
The 2045 RMAP Update continues the vision of environmental stewardship and perpetuates the implementation strategies included in the 2045 RMAP adopted in 2016. **Figure A3.1** shows the updated in-plan project list compared to the regional biological and water resources.

AIR QUALITY PLANNING

PAG conducts biennial regional greenhouse gas (GHG) emission inventories to provide baseline information and measure the region's overall progress in achieving jurisdictional GHG emission reduction goals. Inventories serve as a resource for jurisdictions to track and design their reduction programs and policies. The regional GHG inventory completed in 2019 for 2012-2017 indicates that 34 percent of regional GHG emissions were generated by the transportation sector, with GHG from on-road vehicles contributing 25 percent of total regional emissions (**Figure A3.2**). PAG plans to update the regional GHG inventory in 2021.

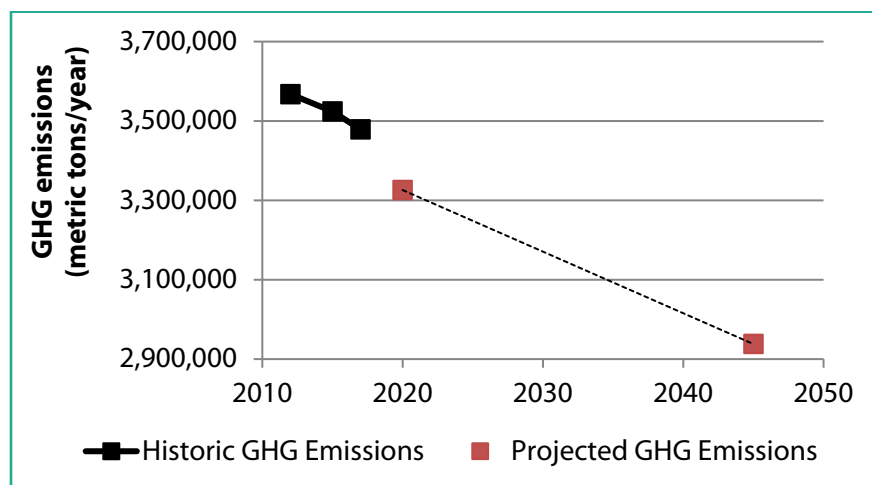
Although vehicle miles traveled and vehicle population is increasing, recent and future GHG emissions from vehicle travel are trending downward due to increased fuel economy standards and use of low carbon fuels. Regionally, battery electric vehicles currently emit 60 percent less GHG emissions than average new gasoline vehicles and emit zero tailpipe emissions (USDOE). **Figure A3.3** shows historic and projected GHG emissions from regional on-road vehicle travel estimated using EPA MOVES2014b emissions model. The emissions shown in 2045 represent those associated with the 2045 build scenario in the *2045 RMAP Update*.

Figure A3.2 2017 Eastern Pima County GHG Emissions by Source



Source: Regional Greenhouse Gas Inventory (PAG, 2019)

Figure A3.3 Regional Historic and Projected On-Road Transportation GHG Emissions



Air Quality Assessment

The federal Clean Air Act Amendments of 1990 require that the 2045 RMAP Update conforms with regional air quality plans and ensures that it will not cause or contribute to air quality violations of the National Ambient Air Quality Standards (NAAQS). Under the federal transportation conformity rule (40 Code of Federal Regulations Parts 51 and 93), conformity determinations for transportation plans and programs must include an emissions budget test, use of the latest planning assumptions and models, timely implementation of transportation control measures (TCMs) specified in the applicable air quality implementation plans, and consultation. The final determination of conformity for the 2045 RMAP Update is the responsibility of the Federal Highway Administration and the Federal Transit Administration.

Although the greater Tucson region currently meets the federal carbon monoxide (CO) standards, it violated the CO standards in the late 1970s and early 1980s. Prior to 2000, the greater Tucson region was designated in nonattainment with the carbon monoxide (CO) health standard. This nonattainment status required that federally supported transportation plans, programs and projects do not adversely affect air quality. A conformity determination on the short- and long-range plans included modeling results showing that future on-road mobile emissions from motor vehicles did not exceed those of the base year, assumed in the region to be 1990 levels.

Approval of the Carbon Monoxide Limited Maintenance Plan (CO LMP) for the Tucson Air Planning Area (TAPA) in July 2000, and the second 10-year CO LMP in January 2010, removed the conformity determination requirement for an emissions cap. However, modeling of the regional CO emissions is used for comparative purposes, and compliance is determined by monitoring of the existing system. The CO LMP will conclude at the end of 2020.

Air Quality Conformity of the 2045 RMAP

The current greater Tucson region CO levels are 11 percent of the health standard under the CO LMP. Improved emission and fuel economy standards and newer vehicle fleets have helped to significantly reduce the CO emissions in the region. These low concentrations serve to emphasize that CO is no longer considered a health concern in the Tucson metropolitan area. The following mobile source emissions control measures in the CO LMP for the Tucson Air Planning Area (TAPA) remain in effect:

- Federal Motor Vehicle Control Program
- State Vehicle Emissions Inspection Program
- State Oxyfuels Program
- PAG's Travel Reduction Program, including the Sun Rideshare program
- Pima County Department of Environmental Quality's (PDEQ) Voluntary No-Drive Days Program

These programs represent the permanent and enforceable commitments (as required under § 107(d) (3) (E) (iii) of the Clean Air Act) that will help keep the area in attainment.

Transportation conformity determination is required by the Clean Air Act section 176(c) (42 U.S. Code 7506(c)) to ensure that federal funding and approval are given to highway and transit projects that are consistent with the air quality goals in the state air quality implementation plan (SIP). Conformity ensures that transportation activities will not cause new air quality violations, worsen existing violations, or delay timely attainment of the national ambient air quality standards (NAAQS).

The regional CO emissions from motor vehicle travel were analyzed for the *2045 RMAP Update* projects. Outputs from PAG's travel demand forecasting model, and the EPA's air quality model, MOVES2014b were used by PAG to estimate the CO emissions from motor vehicles for the start year, and the 2045 build and 2045 no-build scenarios for the transportation network. The MOVES2014b model considers regulatory changes that affect emissions, including changes to tailpipe and fuel efficiency standards and fuel sulfur content.

The modeling results shown in **Figure A3.4** demonstrate that the CO emissions generated in the build scenario (2045B) are lower than the base year 2020 CO emissions. Thus, the new transportation projects planned in the 2045 build scenario will not worsen current CO levels. As previously mentioned, current CO concentrations are well below the EPA's standards.

Figure A3.4 Modeling Summary of the 2045 RMAP Update Scenarios for Carbon Monoxide

Scenario	Average Weekday Vehicle Miles Traveled (VMT)	Carbon Monoxide emissions (metric tons/weekday)
2020 Base year	23,214,165	123.9
2045 Build	30,113,825	42.8
2045 No Build	29,731,455	42.1

Despite VMT increases in 2045, total CO emissions and average emissions per vehicle continue to

decline. This primarily can be attributed to stricter federal vehicle tailpipe emission standards (Tier 2 and 3 Emissions Standards), fleet turnover and improved vehicle fuel-efficiency requirements.

Other Pollutants of Regional Concern

CO is one of six NAAQS pollutants (ozone, particulate matter, nitrogen dioxide, sulfur dioxide and lead are the others), of which five are monitored regionally for adherence to air quality standards. Ozone and particulate matter are of most concern.

Ozone: In October 2015, the EPA lowered the ozone standards from 75 parts per billion (ppb) to 70 ppb to further protect human health and the environment based on the most recent research. The Tucson region violated the ozone standard in 2018 but maintains attainment designation (PDEQ, 2018). The EPA is scheduled to review the ozone standard in 2020 and will make a subsequent designation of the region's status. Ozone is formed by a complex set of chemical reactions between two ozone precursors: volatile organic compounds (VOCs) and oxides of nitrogen (NOx) in the presence of sunlight. On-road vehicle emissions are the source of both precursors.

Particulate Matter (PM): Due to the local and regional climate and meteorology, dry periods combined with high wind events present the potential for episodes of high PM. Dust from paved and unpaved roads, along with tailpipe emissions, contribute to regional PM levels.

Summary

CO concentrations continue to decline regionally and nationally, despite increases in VMT. Ozone remains a pollutant of regional concern, with a violation of the federal standard occurring in 2018 due to the lowered ozone standards. In order to ensure compliance with the federal health standards, continuing current programs to reduce VMT, and promoting the use of alternate modes of transportation and cleaner transportation fuels, such as electricity, are important regional components for maintaining healthy air.

TITLE VI AND ENVIRONMENTAL JUSTICE

A Title VI and Environmental Justice analysis was performed to determine the impact of 2045 RMAP Update improvements on protected populations. The Federal Highway Administration and the Federal Transit Administration are committed to ensuring that Title VI of the 1964 Civil Rights Act is carried out for federally funded programs. Within this context, PAG recognizes the importance of transportation to all residents in the region and works toward the fair distribution of benefits and burdens of transportation improvements.

PAG's Title VI and Environmental Justice analysis evaluates the relative distribution of costs and benefits of transportation projects upon various segments of the community. The analysis starts by identifying traffic analysis zones (TAZs) in which federally protected classes of population reside in greater concentrations than the total regional percentage of that population group. PAG then uses sophisticated travel modeling and geographic information system (GIS) mapping software packages

to determine the average travel times for all populations compared to those of protected classes residing in concentrated TAZs. Travel time refers to how long it takes the average person to travel by auto on a home-based vehicle trip (a trip that starts or ends at home). Additionally, maps are created to review whether transportation improvements are fairly distributed throughout the region.

PAG also performs a Title VI analysis on projects included in its five-year Transportation Improvement Program (TIP), while the jurisdictions conduct project-specific assessments during project development. Each jurisdiction or project sponsor is responsible for Environmental Justice and Title VI compliance as part of the planning and construction of its individual projects. This includes “just” compensation and relocation assistance for properties that qualify due to the impacts of the individual projects.

Title VI and Environmental Justice

Title VI of the 1964 Civil Rights Act (42 U.S.C. 2000d-1 and related regulations) states that, “no person in the United States shall, on the grounds of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving federal financial assistance.” A 1994 Presidential Executive Order directed every federal agency to make environmental justice part of its mission by identifying and addressing the effects of all programs, policies, and activities on “minority populations and low-income populations.”

The analysis shows that, when compared to a baseline travel time of all residents in the urban portion of the county (labeled as “all”), the protected populations are expected to experience comparable travel time benefits. In the land use scenario modeled for the *2045 RMAP Update*, the average travel time improvement “with the RMAP projects” compared to “without” was 0.6 minutes (36 seconds) for everyone in the region during peak period travel and 0.3 minutes (18 seconds) during off-peak travel. Protected classes would be expected to experience an improvement “with the RMAP projects” compared to “without” in travel time of 0.5 minutes (30 seconds) during peak period and 0.2 minutes (12 seconds) for off-peak travel. **Figure A3.5** contains the Peak and Off-Peak travel times for the entire population as well as for protected populations.

Figure A3.5 Title VI/Environmental Justice Analysis

Group	Travel Period	Average Travel Time 2019 (minutes/vehicle)	Average Travel Time 2045 No-Build (minutes/vehicle)	Average Travel Time 2045 with projects (minutes/vehicle)	Comparison with and without projects
Entire Population	Peak	14.4	16.3	15.7	-0.6
	Off-Peak	12.4	13.4	13.1	-0.3
Protected ¹ Population	Peak	13.2	14.7	14.2	-0.5
	Off-Peak	11.3	12.1	11.8	-0.3
African American	Peak	12.3	13.1	12.7	-0.4
	Off-Peak	10.5	10.8	10.6	-0.2
Asian	Peak	13.2	15.0	14.6	-0.4
	Off-Peak	11.1	12.2	12.0	-0.2
Disabled	Peak	14.2	15.8	15.4	-0.4
	Off-Peak	12.2	13.1	12.9	-0.2
Elderly (+65)	Peak	15.4	17.7	17.2	-0.5
	Off-Peak	13.2	14.6	14.3	-0.3
Hispanic	Peak	12.9	14.2	13.7	-0.5
	Off-Peak	11.1	11.7	11.4	-0.3
Low Income	Peak	11.4	12.4	12.1	-0.3
	Off-Peak	9.8	10.2	10.0	-0.2
Native American	Peak	13.3	14.5	14.0	-0.5
	Off-Peak	11.5	11.8	11.6	-0.2

¹ Protected Population group values are the combined averages of the seven identified protected groups.

Figure A3.5 shows modeling results and the travel time improvements based on building the 2045 *RMAP Update* projects, and it provides a breakdown by protected population group as compared to the general population.

Figures A3.6 - A3.12 are maps representing the location of the 2045 *RMAP Update* projects in comparison to the location of various concentrations of protected populations. This visualization validates the appropriate distribution of projects across the region in relation to protected populations and shows that no undue burden falls on any single group of residents.

Figure A3.6 Title VI Analysis – 2045 RMAP Update Roadway Projects and African American Population

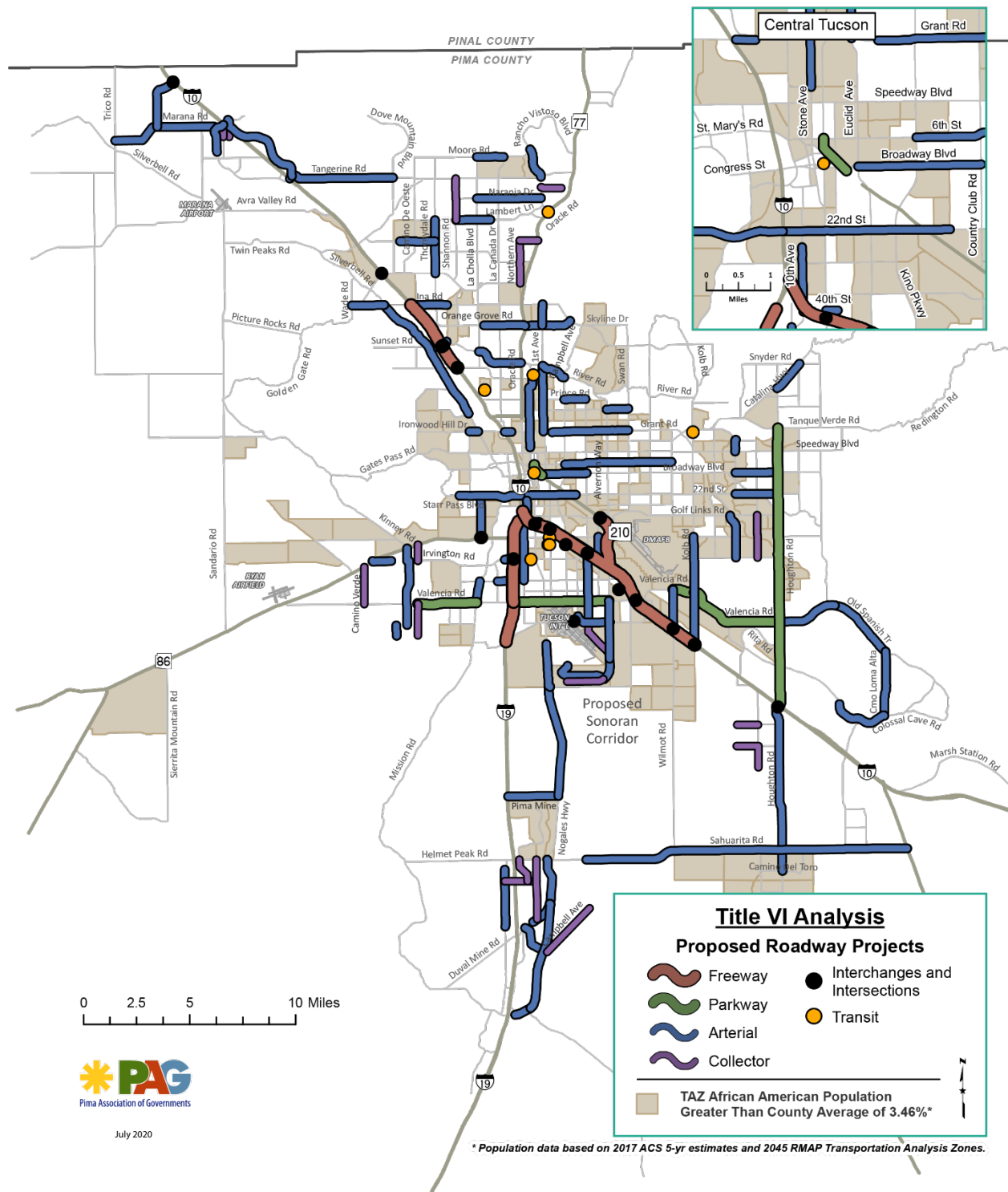


Figure A3.7 - 2045 RMAP Update Roadway Projects and Asian Population

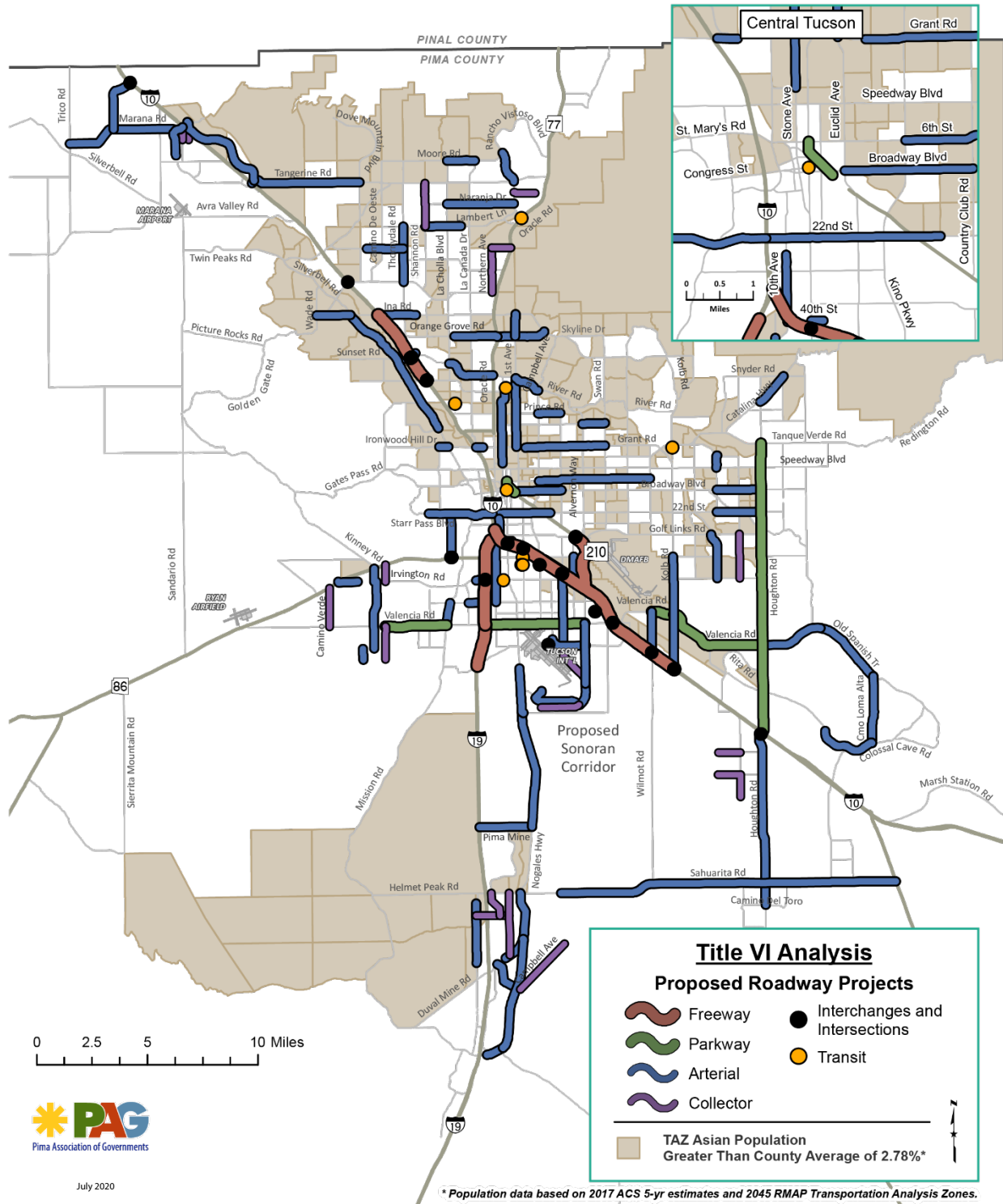


Figure A3.8 - 2045 RMAP Update Roadway Projects and Population with Disabilities

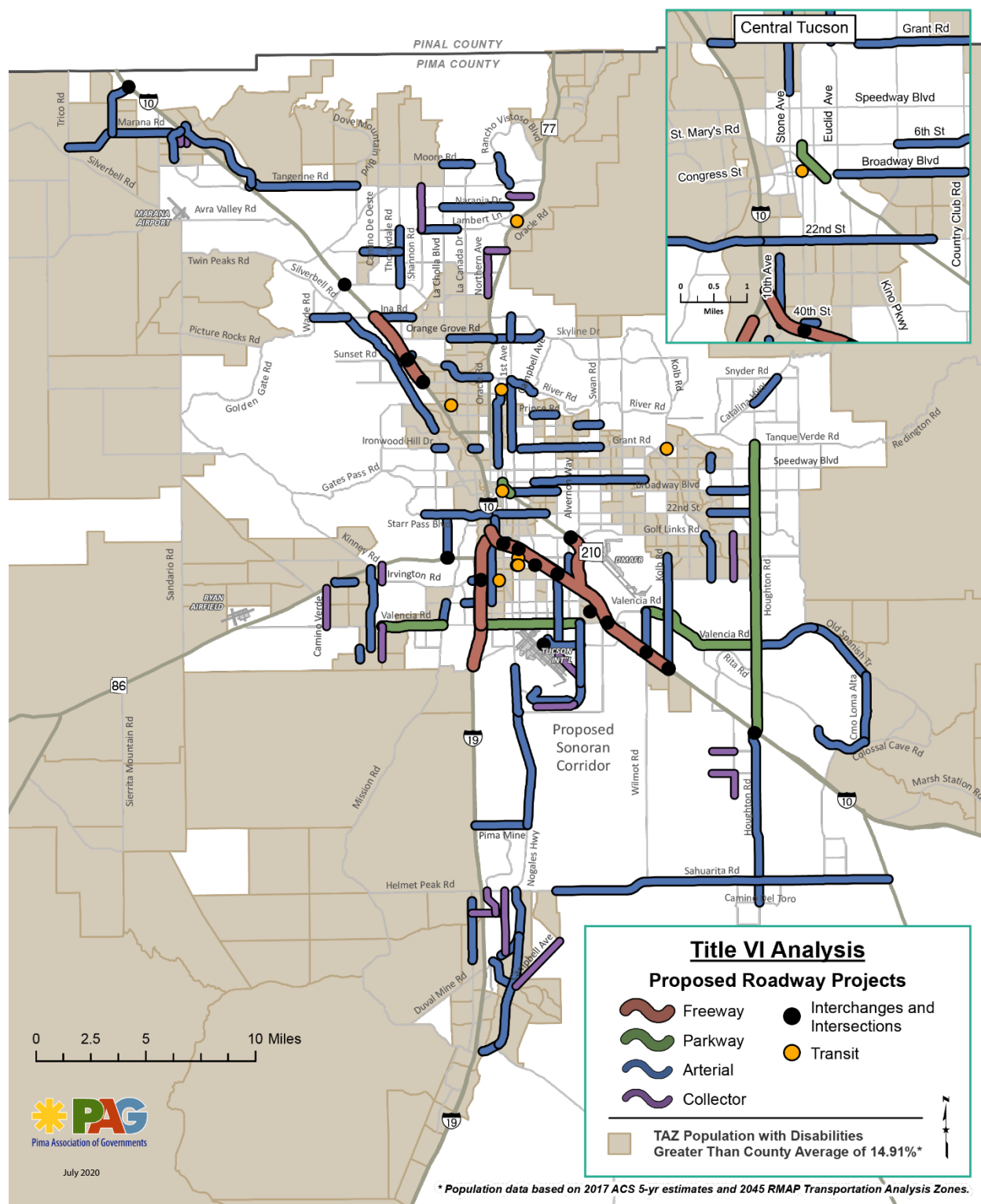


Figure A3.9 – 2045 RMAP Update Roadway Projects and Elderly (65+) Population

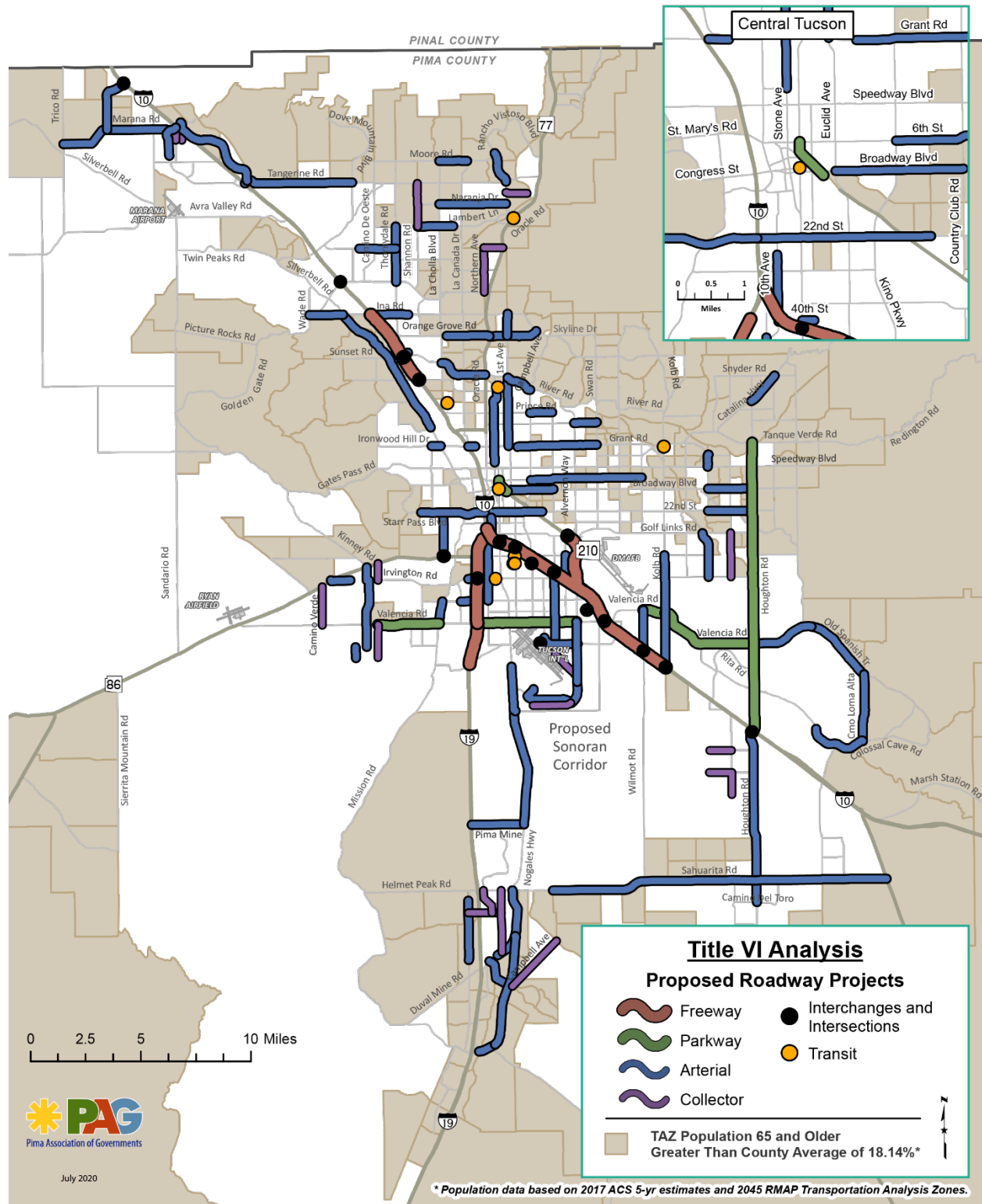


Figure A3.10 – 2045 RMAP Update Roadway Projects and Hispanic Population

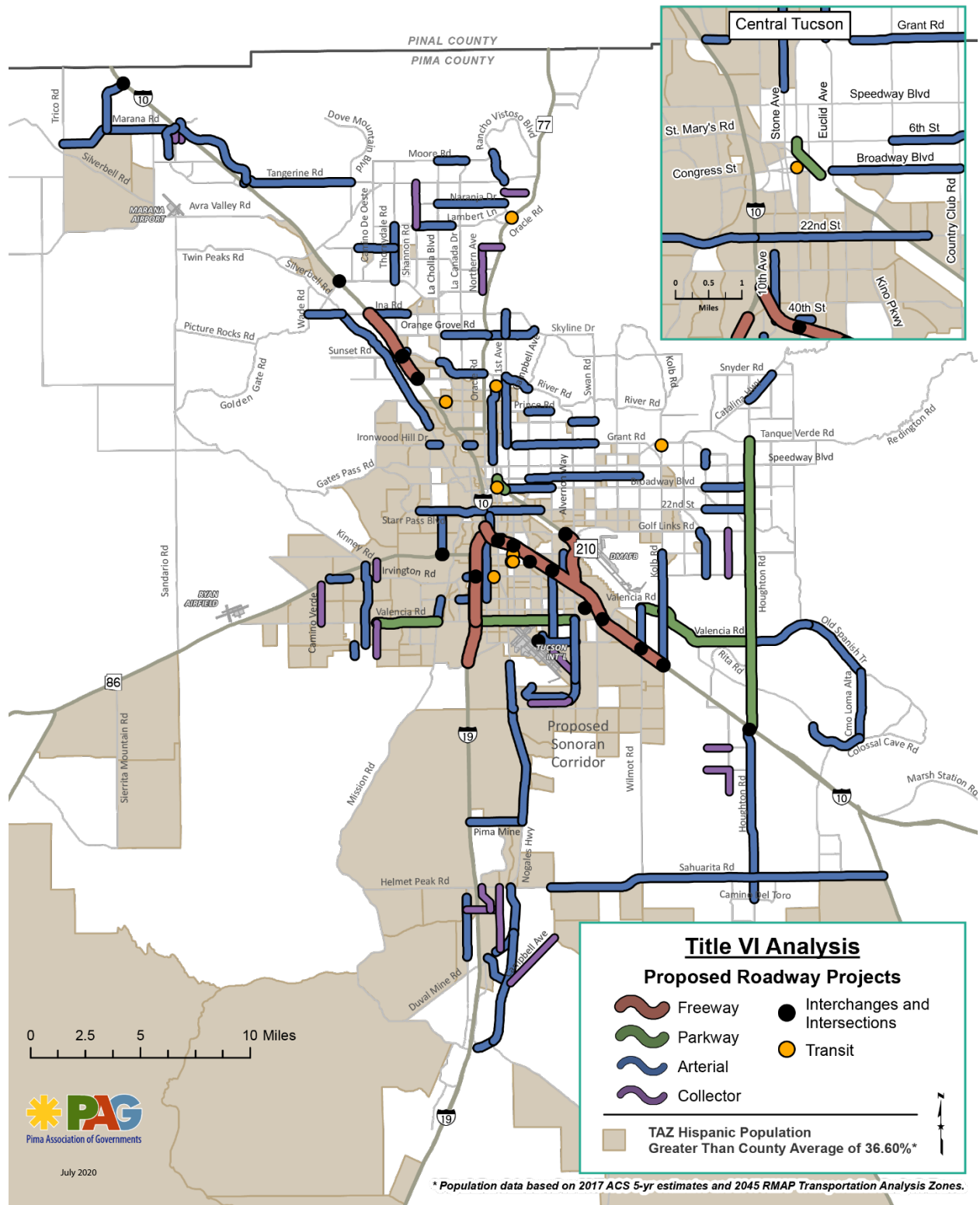


Figure A3.11– 2045 RMAP Update Roadway Projects and Low-Income Population

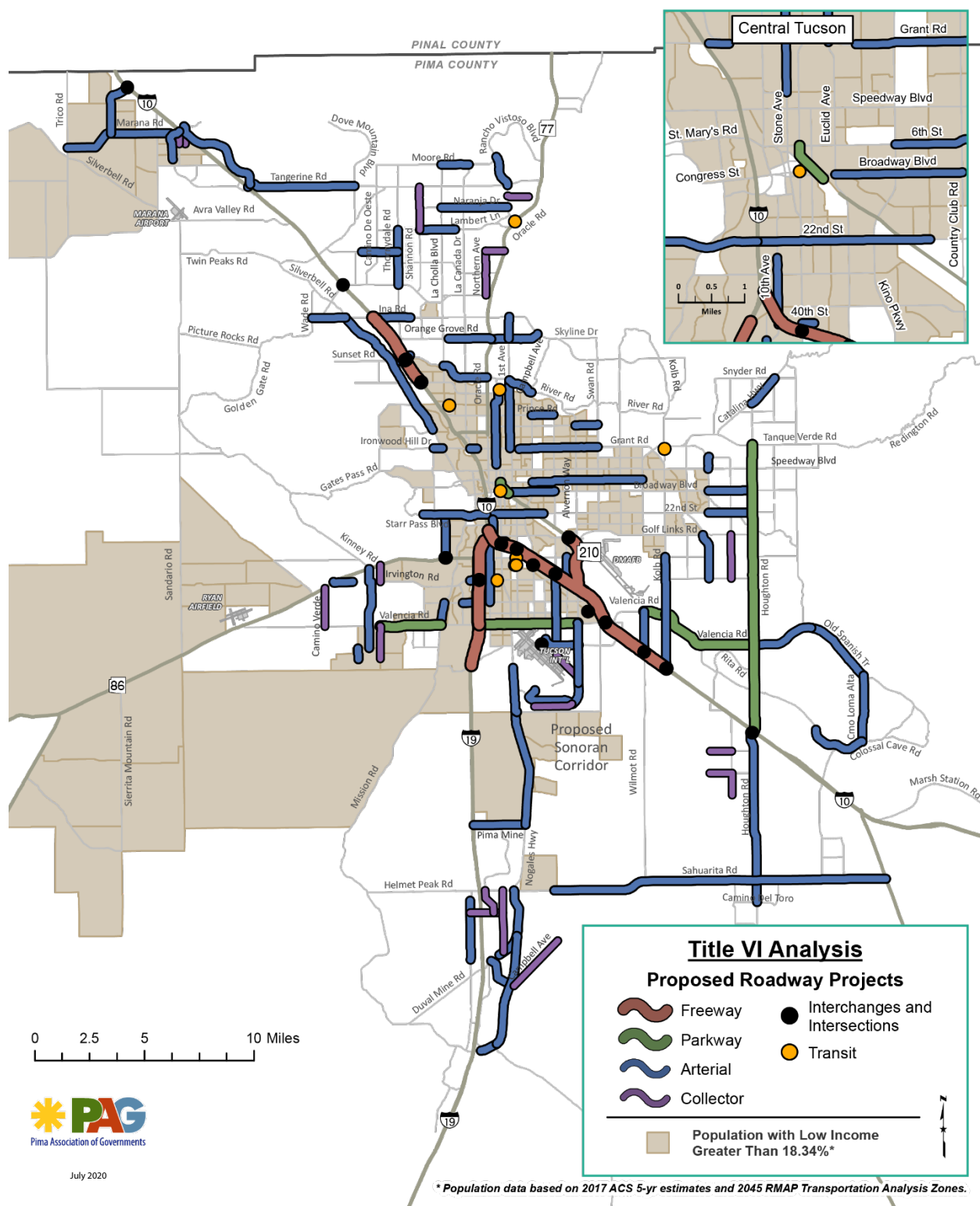
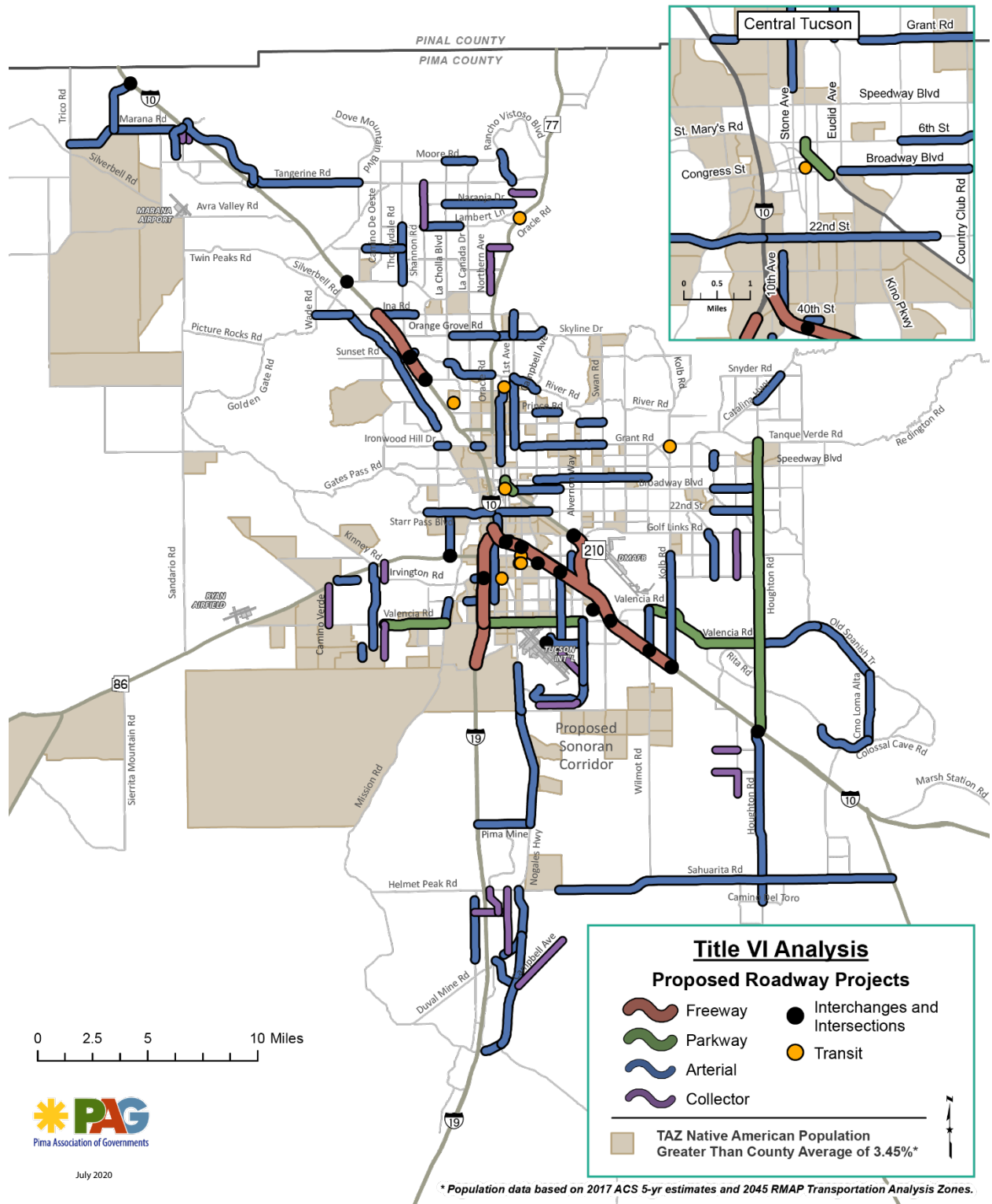


Figure A3.12 – 2045 RMAP Update Roadway Projects and Native American Population



APPENDIX 4

PERFORMANCE MEASURES



TRACKING TO RMAP PERFORMANCE TARGETS

When it was adopted in 2016, the 2045 RMAP identified performance goals, measures and targets to support the region's visions and goals. **Figure A4.1** provides a summary of the region's current progress toward target achievement. Performance measures that are on track to meet 2045 targets are listed along with performance measures that are not on track to meet 2045 targets.

Figure A4.1 Status of RMAP Performance Measures

Goal Area	On Track	Not on Track
System Maintenance	<ul style="list-style-type: none"> Federal Aid Pavement in Poor Condition Public Bridges in Poor Condition 	<ul style="list-style-type: none"> Average Age of Public Buses
Safety	<ul style="list-style-type: none"> Total Fatality Rate Total Serious Injuries Bicycle Serious Injuries Total Serious Injury Rate 	<ul style="list-style-type: none"> Total Fatalities Pedestrian Fatalities Pedestrian Fatality Rate Pedestrian Serious Injuries Pedestrian Serious Injury Rate Bicycle Fatalities Bicycle Fatality Rate Bicycle Serious Injury Rate Transit Crash Rate
Multimodal Choices	<ul style="list-style-type: none"> Total Miles of Pedestrian Facilities Total Miles of Bicycle Facilities Average Transit Speed 	<ul style="list-style-type: none"> Walk/Bike/Transit Mode Share (work trips) Walk/Bike/Transit Mode Share (all trips) Total Transit Trips Average Transit Travel Time
System Performance	<ul style="list-style-type: none"> Percent of Peak-Hour VMT under Severe Congestion Travel Time Index 	<ul style="list-style-type: none"> Daily Vehicle Miles Traveled per Capita Daily Vehicle Hours Traveled per Capita
Environmental Stewardship	<ul style="list-style-type: none"> Weekday Metric Tons of NOx Emissions Weekday Metric Tons of VOC Emissions Weekday Metric Tons of CO emissions Weekday Metric Tons of PM2.5 Emissions Weekday Metric Tons of PM10 Emissions 	<ul style="list-style-type: none"> Annual On-Road greenhouse gas emissions (GHG) per Capita
Land Use and Transportation	None	<ul style="list-style-type: none"> Jobs Reachable by Auto in 30 Minutes Jobs Reachable by Transit in 45 Minutes Job Accessibility Index Jobs within ¼-Mile of Transit Stop Homes within ¼-Mile of Transit Stop
Freight and Economic Growth	Targets have not been established. Performance is being tracked as data becomes available.	

On the next page, **Figure A4.2** displays the full progress report for all RMAP performance targets. A status of "on pace" implies the region is progressing at a pace to meet the 2045 target; "behind pace" means progress is being made but not at a pace to meet the 2045 target; and "trending away" is an indication the performance condition is getting worse. The 2025 benchmarks represent the necessary changes in performance over the next five years to be on 2045 target pace.

Figure A4.2 RMAP Performance Measure Progress Report

Performance Measure	Description	2015 Baseline	Current	2020 Benchmark	2025 Benchmark	2045 Target	Desired Trend	Status
System Maintenance								
Federal-Aid Pavement in Poor Condition	% of centerline miles	37.0%	32.1%	34.2%	29.0%	20.0%	decrease	on pace
Public Bridges in Poor Condition	% of all bridges	9.1%	5.4%	8.4%	6.6%	10.0%	maintain	on pace
Average Age of Public Buses	years in service	6.5	7.4	6.5	7.3	7.0	maintain	behind pace
Safety								
Total Fatalities	5-year average	95.8	105.8	95.8	97.8	75.0	decrease	trending away
Fatality Rate	per 100 million VMT	1.12	1.10	1.11	0.98	0.66	decrease	on pace
Total Serious Injuries	5-yr average	581.4	481.2	557.2	469.5	436.1	decrease	on pace
Serious Injury Rate	per 100 million VMT	6.8	5.4	6.3	5.0	3.7	decrease	behind pace
Total Pedestrian Fatalities	5-yr average	21.2	24.4	20.0	21.7	14.0	decrease	trending away
Pedestrian Fatality Rate	per 10,000 walk commutes	20.7	24.7	18.3	19.9	6.2	decrease	trending away
Total Pedestrian Serious Injuries	5-yr average	53.4	55.0	50.5	50.0	35.8	decrease	behind pace
Pedestrian Serious Injury Rate	per 10,000 walk commutes	52.1	55.8	46.0	45.4	15.6	decrease	trending away
Total Bicycle Fatalities	5-yr average	4.4	5.8	4.2	5.0	2.9	decrease	trending away
Bicycle Fatality Rate	per 10,000 bike commutes	5.9	8.2	5.2	6.5	1.8	decrease	trending away
Total Bicycle Serious Injuries	5-yr average	31.0	29.0	29.3	26.9	21.0	decrease	on pace
Bicycle Serious Injury Rate	per 10,000 bike commutes	41.3	41.0	36.5	33.6	12.4	decrease	behind pace
Transit Crash Rate	per 100,000-service miles	1.9	2.5	1.9	2.2	1.5	decrease	trending away
Multimodal Choices								
Walk, Bike, or Transit to Work Rate	% of population	6.8%	6.7%	7.3%	7.6%	10.0%	increase	trending away
Walk, Bike, and Transit Mode Share, All Trips	% of population	16.3%	16.4%	17.0%	17.3%	20.0%	increase	behind pace
Total Transit Trips	millions per year	21.3	16.7	22.1	21.26	34.4	increase	trending away
Average Transit Travel Time	minutes	50.8	55.1	50.7	53.93	50.0	decrease	trending away
Average Transit Speed	miles per hour	13.3	14.2	13.5	14.38	15.0	increase	on pace
Total Miles of Pedestrian Facilities		442	582	568	742	1200	increase	on pace
Total Miles of Bicycle Facilities		1010	1068	1128	1237	1720	increase	on pace
System Performance								
Daily Vehicle Hours Traveled per Capita	minutes	32.3	32.2	32.0	31.9	30.6	decrease	behind pace
Daily Vehicle Miles Traveled (VMT) per Capita		20.6	20.8	20.3	20.3	18.5	decrease	behind pace
Travel Time Index, PM Peak		1.44	1.43	1.46	1.46	1.58	maintain	on pace
Percent of Peak-Hour VMT under Severe Congestion	level of service E or F	0.012	0.0110	0.013	0.013	0.018	maintain	on pace
Environmental Stewardship								
On-Road Greenhouse Gas Emissions per Capita	metric tons per year	3.3	3.2	3.1	3.0	2.3	decrease	behind pace
Weekday Metric Tons of NOx Emissions		22.8	15.4	22.8	12.9	4.6	decrease	on pace
Weekday Metric Tons of VOC Emissions		18.4	10.1	18.4	8.8	4.6	decrease	on pace
Weekday Metric Tons of CO Emissions		164.4	123.9	164.4	106.7	49.3	decrease	on pace
Weekday Metric Tons of PM 2.5 Emissions		0.5	0.2	0.5	0.3	0.5	maintain	on pace
Weekday Metric Tons of PM 10 Emissions		1.3	0.9	1.3	1.0	1.3	maintain	on pace
Land Use and Transportation								
Regional Jobs Reachable by Auto within 30 Minutes		240,242	228,558	258,238	256,195	348,320	increase	behind pace
Regional Jobs Reachable by Transit within 45 Minutes		26,332	25,157	28,526	28,466	39,498	increase	behind pace
Job Accessibility Index for All Modes		57.1	52.4	58.6	55.5	65.7	increase	behind pace
Jobs within Quarter Mile of Transit Stop	% of all jobs	58.6%	57.7%	59.1%	58.2%	60.0%	increase	behind pace
Population within Quarter Mile of Transit Stop	% of population	42.5%	40.6%	43.0%	41.6%	45.0%	increase	behind pace

PERFORMANCE MEASURE TRENDS

Grouped by RMAP goal area, regional performance trends are shown in **Figures A4.3-A4.9**. The graphs illustrate performance measures data and the current status toward target achievement.

Figure A4.3 Performance Measures for System Maintenance

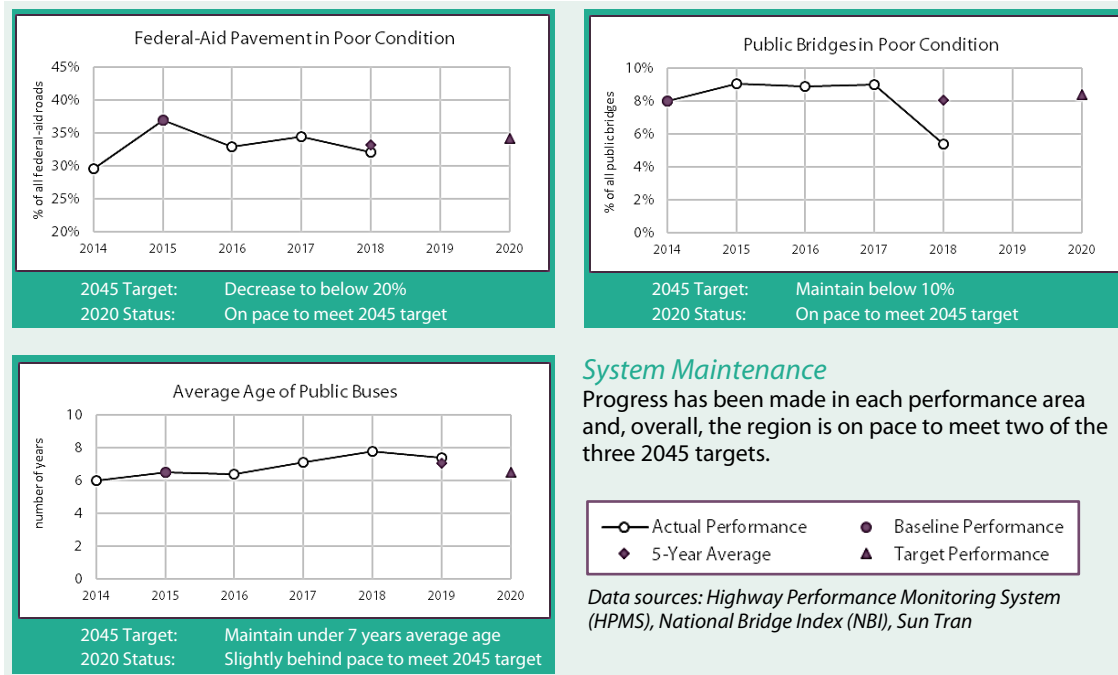
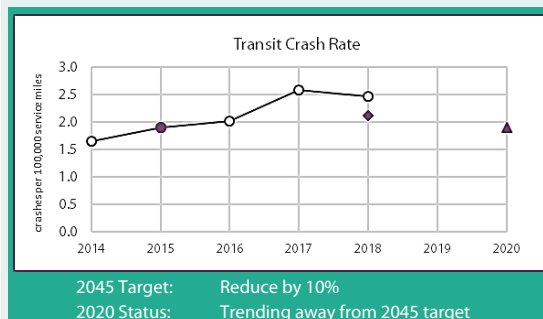
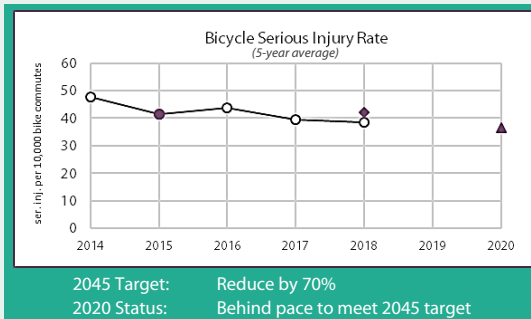
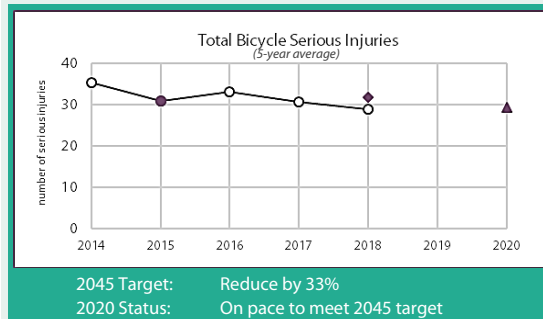
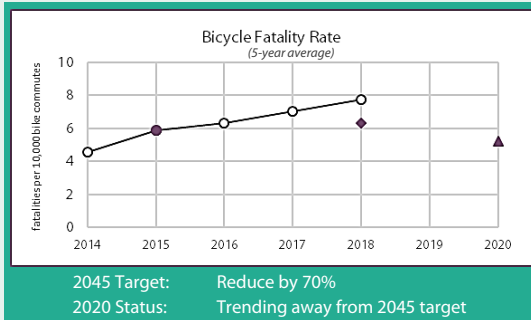
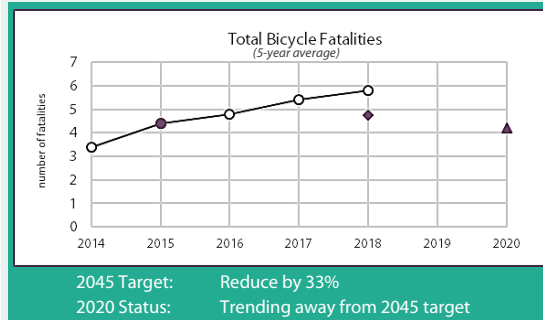
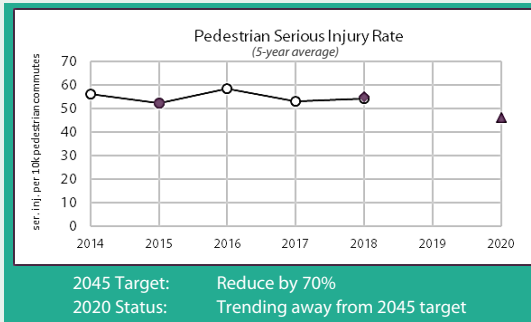
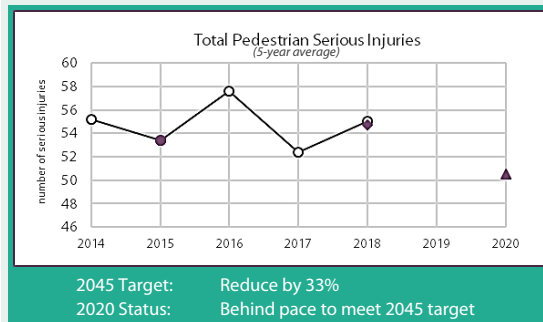
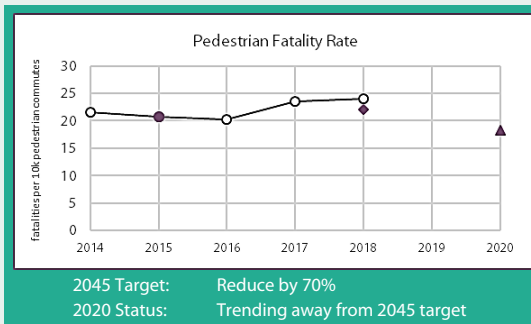
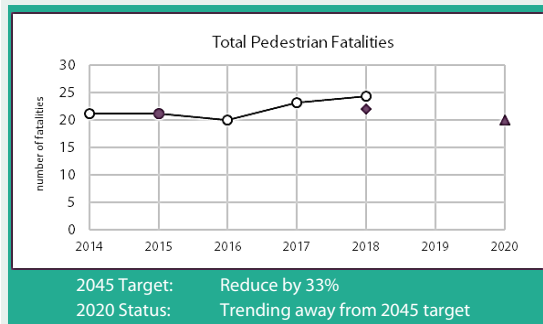


Figure A4.4 Performance Measures for Safety



Figure A4.4 Performance Measures for Safety (continued)



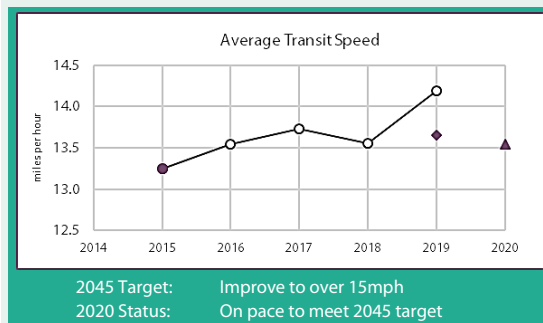
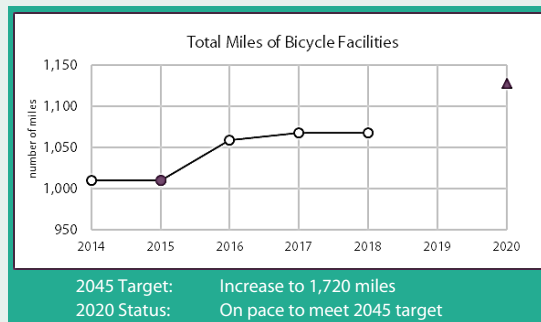
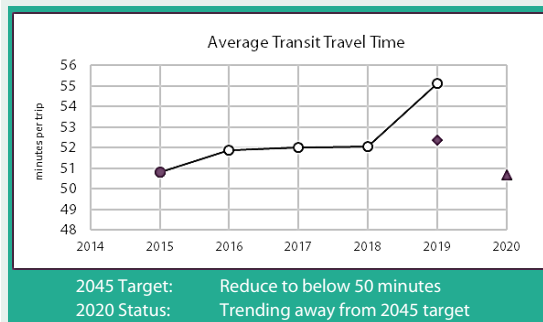
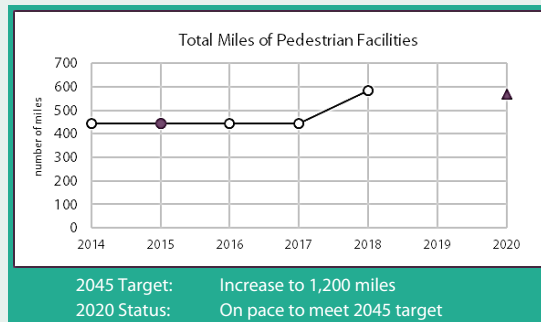
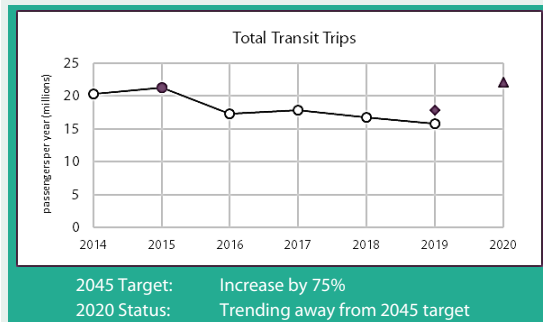
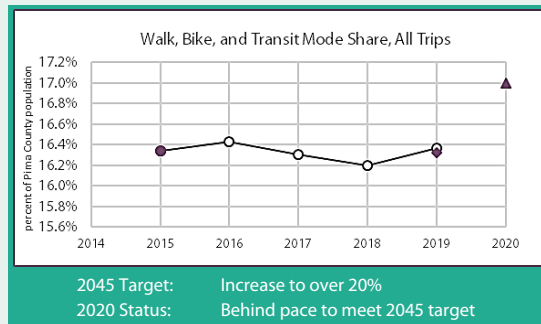
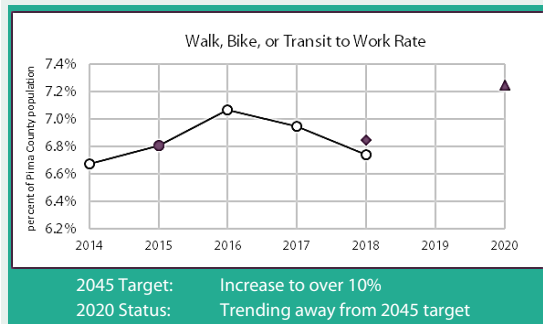
Safety

Nine of the 13 measures in this performance area are getting worse or showing no progress toward achieving 2045 targets.

—○— Actual Performance ● Baseline Performance
—◆— 5-Year Average ▲ Target Performance

Data sources: Arizona Crash Information System (ACIS), Highway Performance Monitoring System (HPMS), Sun Tran

Figure A4.5 Performance Measures for Multimodal Choices



Multimodal Choices

The region is on track to meet only three of the seven 2045 targets.



Data sources: American Community Survey (ACS), PAG data services, PAG land use model, Sun Tran

Figure A4.6 Performance Measures for System Performance



Figure A4.7 Performance Measures for Freight and Economic Growth

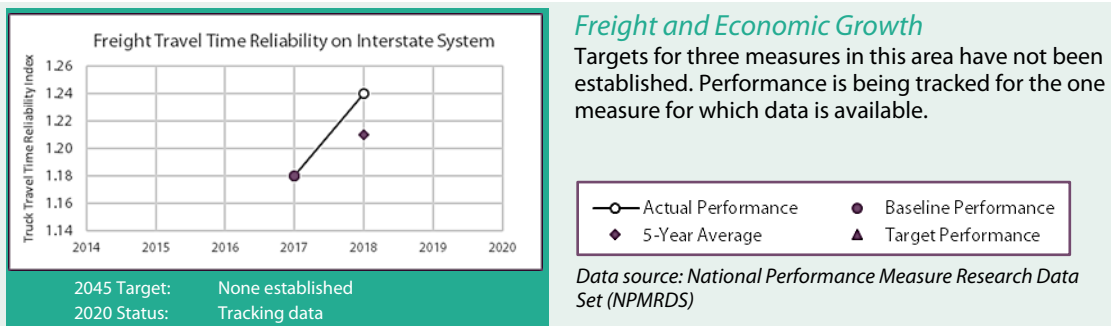
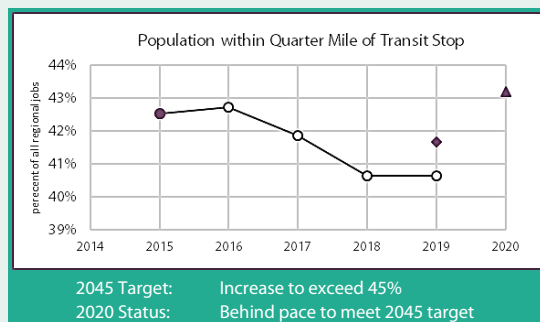
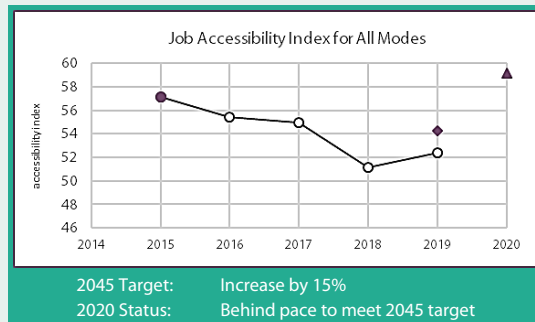
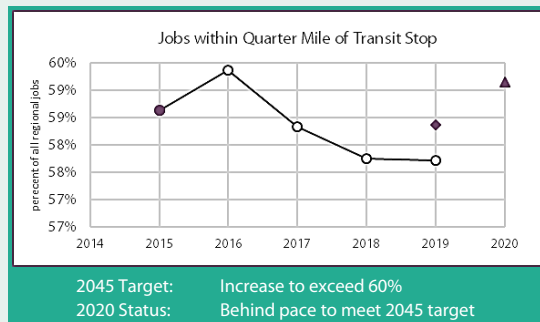
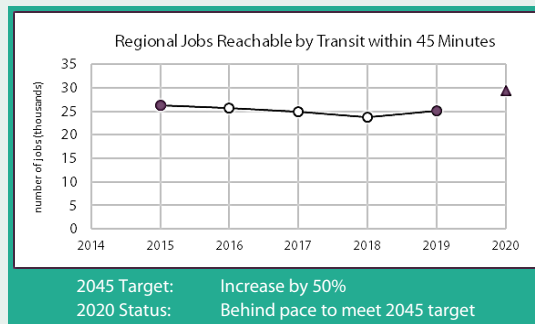
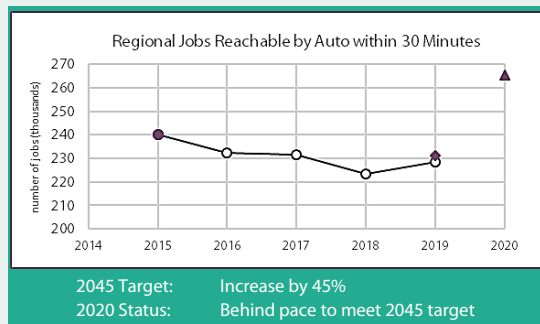
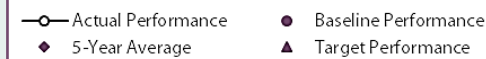


Figure A4.8 Performance Measures for Land Use and Transportation



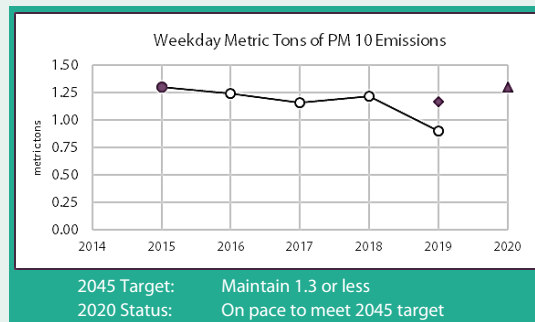
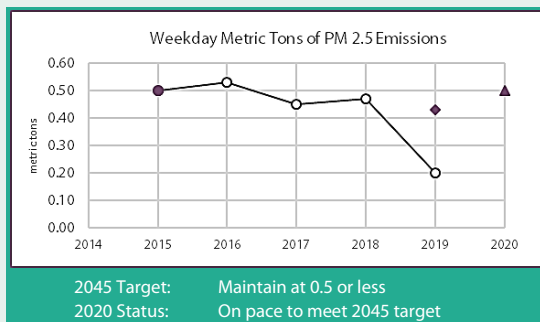
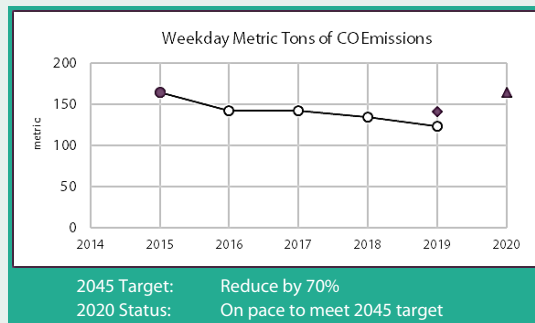
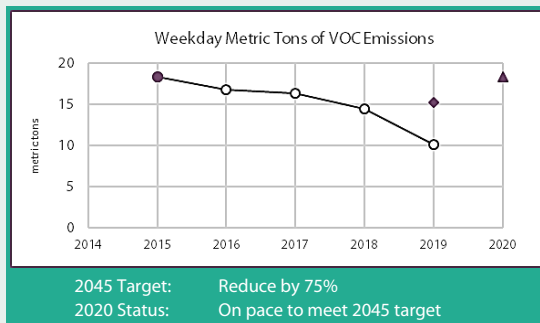
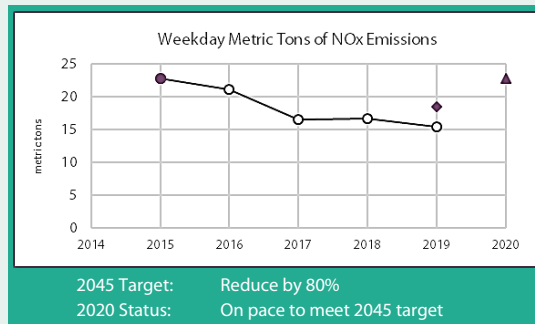
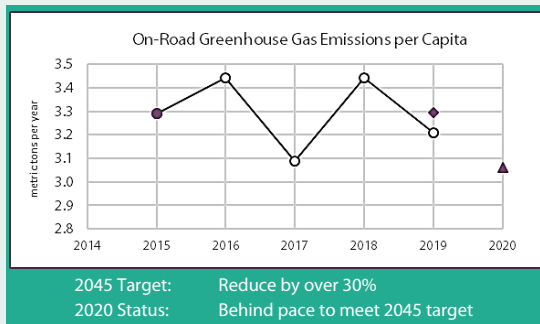
Land Use and Transportation

The region is not on track to meet any 2045 targets in this performance area.



Data sources: American Community Survey (ACS),
PAG land use model

Figure A4.9 Performance Measures for Environmental Stewardship



○ Actual Performance ● Baseline Performance
 ◆ 5-Year Average ▲ Target Performance

Data sources: American Community Survey, PAG land use model, MOVES air quality model

Environmental Stewardship

The region is on track to achieve the 2045 targets for four of the five measures in this performance area.

FAST ACT PERFORMANCE MEASURES

As part of the FAST Act, federal performance measures are used to track performance toward national goals originally established in MAP-21¹. Since 2018, ADOT routinely establishes performance projections to comply with FAST Act requirements. These projections (defined in the FAST Act as “targets”) differ from RMAP targets in that FAST Act requirements represent statewide projections of anticipated performance for a near-term time period, while RMAP targets are long-term and aspirational regional goals.

FAST Act targets are used by the state to track state performance against national targets. PAG supports ADOT’s performance target requirements of the FAST Act by tracking the federally required and regionally recommended measures for the PAG region.

Figure A4.10 shows a list of the FAST Act performance measures by the MAP-21 performance goal area and how each compare to RMAP performance measures.

Figure A4.10 Overview of FAST Act Performance Measures

FAST Act National Performance Measure	MAP-21 National Performance Goal Area	Comparison to RMAP 2045 Performance Measures
Number of Fatalities	Safety	Identical to Total Fatalities
Fatality Rate	Safety	Identical to Fatality Rate
Number of Serious Injuries	Safety	Identical to Total Serious Injuries
Rate of Serious Injuries	Safety	Identical to Serious Injury Rate
Number of Non-motorized Fatalities and Serious Injuries	Safety	Identical to Vulnerable User Fatalities and Serious Injuries
Percent of NHS Bridges in Good Condition	Infrastructure Conditions	Only NHS bridges vs all public bridges
Percent of NHS Bridges in Poor Condition	Infrastructure Conditions	Only NHS bridges vs all public bridges
Percent of Interstate Pavements in Good Condition	Infrastructure Conditions	Only Interstate pavement vs Federal-Aid pavement
Percent of Interstate Pavements in Poor Condition	Infrastructure Conditions	Only Interstate pavement vs Federal-Aid pavement
Percent of Non-Interstate NHS Pavements in Good Condition	Infrastructure Conditions	Only NHS pavement vs Federal-Aid pavement
Percent of Non-Interstate NHS Pavements in Poor Condition	Infrastructure Conditions	Only NHS pavement vs Federal-Aid pavement
Freight Reliability on the Interstate	Freight Movement and Economic Vitality	Identical to Total Freight Reliability on the Interstate
Interstate Travel Time Reliability	System Reliability	Similar to Travel Time and Planning Time indexes
Non-Interstate Travel Time Reliability	System Reliability	Similar to Travel Time and Planning Time indexes
CMAQ Emissions Reductions	Congestion Reduction and Environmental Sustainability	Similar to On-Road Vehicle Emissions but applicable to CMAQ project areas, of which the PAG region has none

¹ Moving Ahead for Progress in the 21st Century Act (MAP-21) of 2012 created a stream-lined, performance-based, and multimodal program to address the many challenges facing the U.S. transportation system. Fixing America’s Surface Transportation (FAST) Act of 2015 outlined the framework for performance management including establishing performance measures and target-setting requirements.

TRACKING FAST ACT PERFORMANCE

On the pages that follow, regional performance trends are shown for the FAST Act Performance Measures. Performance measures are grouped by MAP-21 goal area and shown in **Figures A4.11- A4.13**.

The charts display past and current performance for the PAG region, and data is compared against projected performance after applying ADOT's statewide trend.

Figure A4.11 FAST Act Performance Measures for Safety

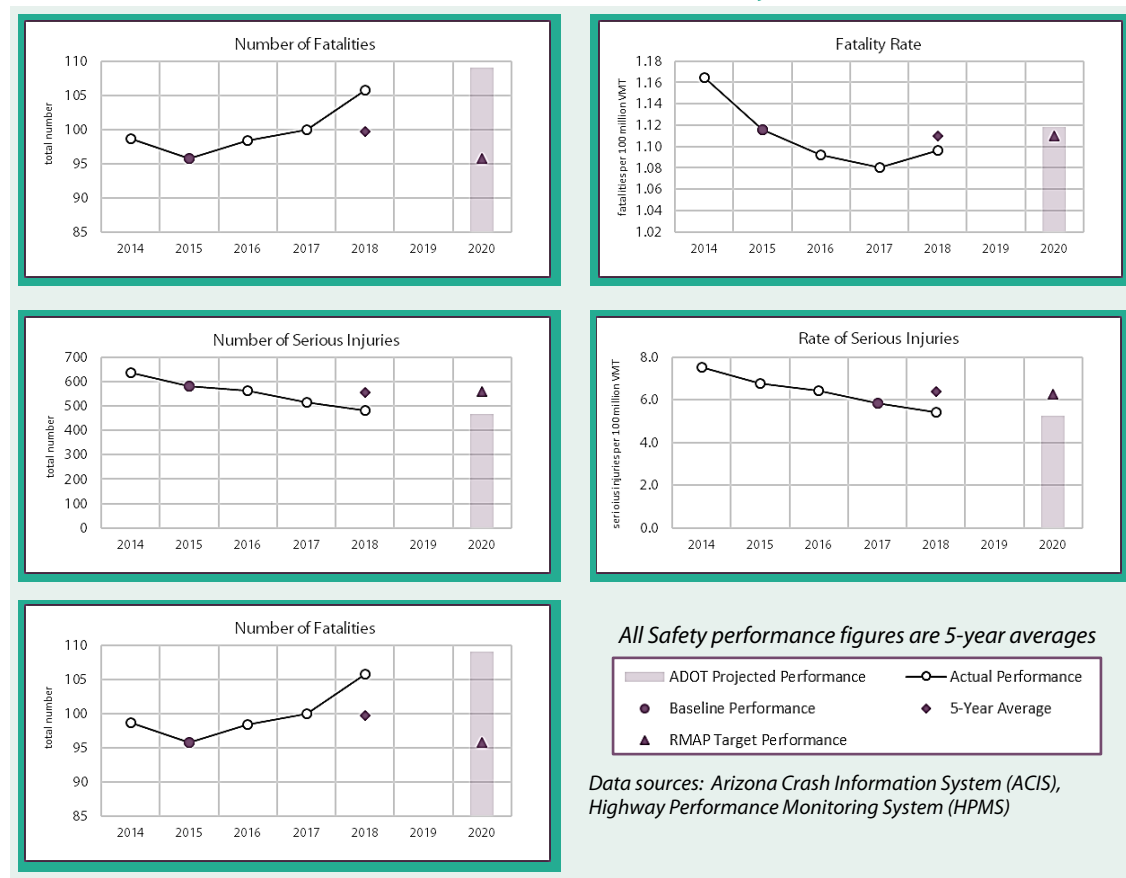


Figure A4.12 FAST Act Performance Measures for Infrastructure Condition



Figure A4.13 FAST Act Performance Measures for Freight and System Reliability



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APPENDIX 5

ACRONYM GLOSSARY



Transportation terms and acronyms can often be confusing. This glossary provides a listing of the most common transportation planning terms and acronyms that are referenced in the original RMAP document and the *2045 RMAP Update*.

AASHTO American Association of State Highway and Transportation Officials

ACIS Arizona Crash Information System

ACS American Community Survey

ABM Activity-Based Modeling

ADA Americans with Disabilities Act

ADEQ Arizona Department of Environmental Quality

ADOA Arizona Department of Administration

ADOT Arizona Department of Transportation

ADT Average Daily Traffic

ALISS Accident Location Identification Surveillance System

APRCS Arizona Passenger Rail Corridor Study

AI Artificial Intelligence

ASTP Arizona Surface Transportation Program

AV Autonomous Vehicles

BMP Border Master Plan

BRT Bus Rapid Transit

CAG Central Arizona Governments

CFR Code of Federal Regulations

CMP Congestion Management Process

CNG Compressed Natural Gas

CO Carbon Monoxide

CO LMP Carbon Monoxide Limited Maintenance Plan

COA Comprehensive Operational Analysis

CV Connected Vehicles

E-85 Ethanol

Eller EBR Eller College of Management Economic and Business Research Center

EIS Environmental Impact Statement

EPA Environmental Protection Agency

EVAC Economic Vitality Advisory Committee

FAA Federal Aviation Administration

FAST Act Fixing America's Surface Transportation Act

FHWA Federal Highway Administration

FMS Freeway Management System

FRA Federal Railroad Administration

FTA Federal Transit Administration

FY Fiscal Year

GA General Aviation

GHG Greenhouse Gas

GI Green Infrastructure

GIS Geographic Information System

GPS Global Positioning System

GSI Grade-Separated Intersection

HAWK High-Intensity Activated Cross Walk

HCT High-Capacity Transit

HPMS Highway Performance Monitoring System

HSIP Highway Safety Improvement Program

HURF Highway User Revenue Fund

IGA Intergovernmental Agreement

IRI International Roughness Index

ITS Intelligent Transportation Systems

JPAC Joint Planning Advisory Committee

LiDAR Light Detection and Ranging

LOS Level of Service

LOSS Level of Safety Service

LRRTP Long-Range Regional Transit Plan

LTAF Local Transportation Assistance Fund

MAG Maricopa Association of Governments

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

MOE Maintenance of Effort

MPO Metropolitan Planning Organization

MRA Marana Regional Airport

MUTCD Manual of Uniform Traffic Control Devices

NAAQS National Ambient Air Quality Standards
NBI National Bridge Index
NDOT Nevada Department of Transportation
NHS National Highway System
NHTS National Household Travel Survey
NOX Oxides of Nitrogen
NPMRDS National Performance Measure Research Data Set
O3 Ozone
PAG Pima Association of Governments
PDEQ Pima County Department of Environmental Quality
PM Particulate Matter
ppm parts per million
ppb parts per billion
PCS Primary Commercial Service
PTI Planning Time Index
RMAP Regional Mobility and Accessibility Plan
RSA Roadway Safety Assessment
RSC Regionally Significant Corridors
RTA Regional Transportation Authority
RTAG Regional Transportation Alternatives Grant
RTP Regional Transportation Plan
SDCP Sonoran Desert Conservation Plan
SHF State Highway Fund
SHSP Strategic Highway Safety Plan
SIP State Implementation Plan
SO2 Sulfur Dioxide
STBGP Surface Transportation Block Grant Program
STP Surface Transportation Program
STSP Strategic Transportation Safety Plan
TAA Tucson Airport Authority
TAPA Tucson Air Planning Area
TAZ Traffic Analysis Zone
TCM Transportation Control Measure
TDM Travel Demand Management
TI Traffic Interchange
TIA Tucson International Airport
TIGER Transportation Investment Generating Economic Recovery
TIP Transportation Improvement Program
TOD Transit-Oriented Development
TMA Transportation Management Area
TPC Transportation Planning Committee

TRP Travel Reduction Program
TTCA Transportation and Trade Corridor Alliance
TTI Texas Transportation Institute
TTI Travel Time Index
UA University of Arizona
U.S.C. United States Code
UAS Unmanned aerial system
US DOT U.S. Department of Transportation
UZA Urbanized Area
VOC Volatile Organic Compound
VHT Vehicle Hours Traveled
VLТ Vehicle License Tax
VMT Vehicle Miles Traveled