2011–2015 TIP
5-Year Regional Transportation Improvement Program

Adopted May 27, 2010

Pima Association of Governments
La Cañada road improvements. Twin Peaks Road Bridge over Santa Cruz River. Fourth Ave. underpass. Installation of footbridge.
REGIONAL TRANSPORTATION IMPROVEMENT PROGRAM

FY 2011 THROUGH FY 2015

Adopted May 27, 2010

Pima Association of Governments (PAG)

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(* for transportation matters only) (** ex-officio members)

This report has been prepared in cooperation with, and financed in part by, the U.S. Department of Transportation - Federal Highway Administration, the Federal Transit Administration, and the Arizona Department of Transportation. The contents of this report do not necessarily reflect the official views of the Arizona Department of Transportation or the Federal Highway Administration. This report does not constitute a standard, specification, or regulation. Disclaimer: This is not a legal document. Although much care was taken to ensure the accuracy of the information presented in this document, PAG does not guarantee the accuracy of this information.
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CHAPTER 1 – INTRODUCTION

The Transportation Improvement Program (TIP), prepared by Pima Association of Governments (PAG), is a five-year schedule of proposed transportation capital improvements within the Pima County, Tucson urbanized area.

The TIP is typically updated annually through a multi-step process in association with PAG’s member jurisdictions or other implementing agencies. The TIP addresses improvements to diverse elements of the regional transportation system including national, state and local highways, transit, aviation, ride sharing, bikeways and pedestrian facilities. The TIP also responds to various state and federal regulatory requirements for development of a transportation improvement program and TIP conformance with air quality implementation plans, including the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) enacted in August 2005.

SAFETEA-LU expired on September 20, 2009 with no new bill in place. Congress and the country are operating on a continuing resolution until a new bill is authorized. For the purposes of fiscal constraint it was assumed that these extensions will, at a minimum, be at the same funding level of the last year of SAFETEA-LU.

The projects listed in Appendix 1 have an identified source of funding and are presently in some stage of project development. Every project that is federally funded whether, highway or transit, must be included in the TIP. The TIP also includes all regionally significant projects funded from non-federal sources.

The current five-year Transportation Improvement Program encompasses fiscal years 2011 to 2015. The complete project listing by jurisdiction is contained in Appendix 1.
CHAPTER 2 – SAFE, ACCOUNTABLE, FLEXIBLE, EFFICIENT TRANSPORTATION EQUITY ACT: A LEGACY FOR USERS (SAFETEA-LU)

On August 10, 2005, Public Law 109-59, the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU), was signed into law authorizing highway, safety, transit and other surface transportation programs for a six-year period. With guaranteed funding for highways, highway safety, and public transportation totaling $244.1 billion, SAFETEA-LU represents the largest surface transportation investment in U.S. history.

The two landmark bills that brought surface transportation into the 21st century – the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) and the Transportation Equity Act for the 21st Century (TEA-21) – shaped the highway program to meet the nation's changing transportation needs. SAFETEA-LU builds on this firm foundation, supplying the funds and refining the programmatic framework for investments needed to maintain and grow our vital transportation infrastructure.

SAFETEA-LU addresses the many challenges facing our transportation system today – challenges such as improving safety, reducing traffic congestion, improving efficiency in freight movement, increasing intermodal connectivity, and protecting the environment – as well as laying the groundwork for addressing future challenges. SAFETEA-LU promotes more efficient and effective Federal surface transportation programs by focusing on transportation issues of national significance, while giving State and local transportation decision makers more flexibility for solving transportation problems in their communities.

As the designated metropolitan planning organization, Pima Association of Governments has the responsibility to develop a transportation improvement program in cooperation with the State and any affected public transit operator. In developing the program, citizens, affected public agencies, representatives of transportation agency employees, freight shippers, providers of freight transportation services, private providers of transportation, representatives of users of public transit, and other interested parties are provided an opportunity to comment on the proposed program.

The transportation planning process provides for consideration of projects and strategies that will:

- Support the economic vitality of the United States, the State of Arizona, and the Tucson metropolitan area, especially by enabling global competitiveness, productivity and efficiency;
• Increase the safety and security of the transportation system for motorized and non-motorized users;
• Increase the accessibility and mobility options for people and freight;
• Protect and enhance the environment, promote energy conservation, and improve quality of life;
• Enhance the integration and connectivity of the transportation system, across and between modes throughout the State, for people and freight;
• Promote efficient system management and operation; and
• Emphasize the preservation of the existing transportation system.

SAFETEA-LU expired on September 20, 2009 with no new bill in place. Congress and the country are operating on a continuing resolution until a new bill is authorized.
CHAPTER 3 – TRANSPORTATION IMPROVEMENT PROGRAMMING OVERVIEW

The goal of the transportation improvement programming process is to develop a TIP that makes optimum use of available funds and resources to serve transportation needs and implement the long range transportation plan known as the Regional Transportation Plan or RTP in the PAG region.

Federal legislation [23 U.S.C. 134(h)(1)(B)] sets forth the parameters for TIP development. This law specifies that:

*In developing the program, the metropolitan planning organization, in cooperation with the State and any affected public transit operator, shall provide*

- Citizens;
- Affected public agencies;
- Representatives of transportation agency employees;
- Freight shippers;
- Providers of freight transportation services;
- Private providers of transportation;
- Representatives of users of public transit; and
- Other interested parties

*with a reasonable opportunity to comment on the proposed program.*

The legislation specifically defines certain aspects of the programming process. The TIP includes project priorities and a financial plan which documents the financial resources available to implement the program.

Federal laws regarding air quality [23 U.S.C. 109(j) and 40 CFR 52.138(d)] require that the regional TIP be analyzed and conform to the air quality implementation plan(s). The documentation of this effort is provided under the Air Quality section of this document.

The primary resource used for formulating the TIP is the RTP, however, with the passage of the Regional Transportation Authority (RTA) Plan in May of 2006 the projects and programs outlined in that plan will be included in the TIP. The RTP documents transportation facilities and services required to meet future travel needs. Additional roadway facilities and expanded public transportation services, combined with greater opportunities for ride sharing, bicycling, intermodalism, and alternate modes, are incorporated into the RTP to improve air quality and support the efficiency of the regional transportation network.
PAG’S TIP PROCESS

PURPOSE

PAG’s TIP covers a 5-year period and describes planned regional transportation projects and improvements, which lead toward implementation of the RTP. The TIP is the mechanism through which the RTP is implemented in a manner consistent with local needs and priorities. It is also the mechanism through which the air quality impacts of regionally significant transportation projects can be evaluated and addressed. The TIP is financially constrained and includes only those projects for which funding has been determined to be available. In addition to available federal funding sources, information is also included on projects using State, regional and RTA funding. The TIP includes regionally significant projects whether or not they are Federal Aid Projects. Information on other projects, which are locally funded, is included as available, including the projects identified in the voter approved RTA plan.

Contributing Agencies: Information on programmed projects is provided by the following agencies:

- PAG’s eight member governments - the cities of Tucson and South Tucson; Pima County; the towns of Oro Valley, Marana and Sahuarita; the Pascua Yaqui Tribe and the Tohono O’odham Nation;
- Regional Transportation Authority (RTA);
- Tucson Airport Authority (TAA);
- Sun Tran;
- Pima County Department of Environmental Quality (PDEQ);
- Arizona Department of Environmental Quality (ADEQ);
- Arizona Department of Transportation (ADOT); and
- Other agencies or transportation interests.

TIP SUBCOMMITTEE

PAG’s TIP Subcommittee is the standing technical committee responsible for development of the TIP. The TIP Subcommittee meets once a month throughout the year with additional meetings on an as-needed basis to deal with technical issues and other matters related to TIP development. Regular meeting notices are provided to committee members and when requested to a list of interested parties, which includes citizens, neighborhood groups, non-profit organizations and various special interest groups. Key aspects of the cooperative TIP process include maintenance of funding flexibility, recognition of diverse needs and an ability to respond to changes in the community. Thus, the ability to request and take timely action upon TIP amendments is an important component of the process. Amendments to the TIP document may be processed, where necessary, to reflect changing needs, priorities, or funding scenarios.
TYPES OF PROJECTS

The types of projects that appear in the TIP may include roadway improvements, bridge improvements, transit improvements, transportation enhancements, transportation planning studies, bicycle and pedestrian programs, RideShare, Travel Reduction, Clean Cities, alternate mode programs and airport improvements.

TITLE VI AND ENVIRONMENTAL JUSTICE

PAG is committed to planning, developing and implementing programs that are in compliance with Environmental Justice regulations and Title VI of the Civil Rights Act of 1964. Title VI states that “no person in the United States shall, on the grounds of race, color, national origin, gender, age, or disability be excluded from participation in, be denied the benefits of, or be otherwise subjected to discrimination under any program or activity.” PAG addresses Title VI requirements both quantitatively and qualitatively with extensive public involvement and data analysis techniques. Federal regulations define specific groups as “protected populations”

Outreach

PAG’s Public Involvement Program is designed to inform and solicit input from the region’s “protected populations” and engage them in meaningful participation in the transportation planning process.

PAG conducted three open houses for public comment on the TIP. They were conducted at central locations throughout the community. One open house was conducted at Reid Park which is located on a bus line and handicapped accessible. At all the open houses, Spanish translators were available upon request and Spanish translations of the TIP materials were available.

Analysis Overview

This TIP analysis is part of a tiered approach that the region employs for Title VI and Environmental Justice compliance. On the broadest level, projects are drawn from the Regional Transportation Plan (RTP) for which an overall analysis is conducted. The RTP analysis assesses the impact of all of the projects proposed in the region over the next 20 - 25 years. On the next level, another regional analysis is performed on the 5 years of projects included in the TIP. In addition, a more focused assessment is done during project development. Each project sponsor is responsible for Environmental Justice and Title VI compliance as part of the planning and construction of its individual projects.
Specific projects are expected to have appropriate public involvement and mitigation techniques applied during their design & development process. For example, a variety of State and Federal rules and regulations govern “just” compensation and relocation assistance for properties that qualify due to the impacts of individual projects. These requirements are administered by the sponsoring agency at an appropriate time during project development and right-of-way acquisition.

All of the projects contained in the TIP must be consistent with PAG’s long-range transportation plan, known as the Regional Transportation Plan (RTP). The RTP has been analyzed and developed to provide an appropriately balanced program of transportation improvements with significant investment in transit, bicycle and pedestrian projects that benefit low income individuals and others who may not own or operate a motor vehicle. Projects within the roadway component of the RTP are distributed throughout the region so as to not place disproportionate impacts on any one area or population group.

Methodology

PAG has developed maps showing the concentration distribution of “protected” classes (as defined by federal regulation) within the region. These maps, along with official population statistics, current estimates and projections, and other household data in the PAG region, assist in analyzing the potential impacts of the TIP on these groups.

For this analysis, a “concentration” of a protected group has been defined as those geographic areas where the percentage of a protected population within the area exceeds the average percentage of that same population living within the County as a whole. For example; if the county average for a protected population is 5 percent, an area with a population greater than 5 percent would be considered to have a concentration of that protected population. Also, for this analysis, Transportation Analysis Zones (TAZ) were used as the geographic area to identify concentrations of the protected groups.

The method used for this analysis was a computer model computation for the average travel time in the region with and without the projects identified for construction in the TIP. Additional computer runs were preformed for each protected class by both concentration (table 3.1) and region-wide (table 3.2) and a comparison between the difference between the protected classes and the region as a whole were analyzed.

The maps provided at the end of this chapter are provided as a graphic representation of the location of the projects in comparison to the location of various concentrations of protected populations.
Because the impacts of projects are very subjective, the analysis assumes projects are equal in their benefits and burdens. The goal of this analysis is to attempt to determine if comparable numbers of people are being impacted by the project in the protected population as are being impacted in the general population. The TIP strives to provide a balance so that all groups are affected at approximately the same ratio.

It should be noted that there are several programs in the TIP that do not lend themselves to being mapped such as RideShare, Job Access Reverse Commute (JARC), purchase of transit vehicles, etc. These therefore are not included in this analysis. For the most part, these activities are targeted toward one or more of the protected classes or they are distributed uniformly throughout the region. It is, therefore, assumed that these activities are either neutral or would improve the observed benefits of the program for each of the protected populations.

Analysis

The following tables provide the average travel time for the whole region (labeled “all”) and each protected population. Table 3.1 provides the travel times for the protected populations in concentrations (labeled “protected”) and the rest of the region (labeled “non-protected” and derived by subtracting the protected population from the regional total). Table 3.2 shows the results for the same analysis using raw population numbers and not concentrations.

Please note that some individuals may belong to more than one of the protected population. For example someone could belong to a protected ethnic population and be elderly, disabled and/or low income as well.

Conclusion

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 both analyses, the average travel time improvement with the TIP projects compared to without was 0.1 of a minute. No protected classes experienced an increase and most had an improvement in travel time in both analyses between 0.0 and 0.1 minutes.

Title VI Maps

The maps provided at the end of this chapter are provided as a graphic representation of the location of the projects in comparison to the location of various concentrations of protected populations.
### Table 3.1: Title VI Analysis – Modeling Results for Concentrations of Protected Populations

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<th>Group</th>
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<th>Avg Travel Time 2015 (min/veh)</th>
<th>Avg Travel Time 2015 with projects (min/veh)</th>
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Table 3.2: Title VI Analysis – Modeling Results for All Protected Populations

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REVENUE SOURCES

The use of major sources of transportation revenues such as federal transportation funds or regional Highway User Revenue Funds (HURF) monies is specified in the TIP. No project is eligible to receive federal funding unless it has been included in the TIP with a finding that the TIP is in compliance with the requirements of the Clean Air Act. While revenues available through the TIP are limited, competition for those funds is great. Thus, extensive cooperation between local jurisdictions and other competing agencies is required.

PRIORITIZATION

During formulation of this year’s TIP program, the TIP Subcommittee developed a series of specific evaluation factors designed to assist in measuring benefits and establishing priorities. Projects which were involved in funding competitions were measured against these factors and compared to one another to provide a sense of order and priority. The factors considered in this evaluation included Safety, System Preservation, the Number of Benefiting Users, Congestion Benefits, Environmental Benefits, Accessibility, System Continuity, and Regional Significance.

Following this evaluation, additional consideration was given to a variety of other factors such as previous public comments, jurisdictional priority, project readiness, geographic balance, and historical distributions. Final project selections are based on the melding of these considerations while project schedules are based on readiness and resource availability.

RTA projects are not subjected to this prioritization criteria during the TIP process as they are programmed based on the plan that was approved by the voters. The RTA funding source is fixed by the RTA plan approved by the voters and cannot be overridden by the TIP process.

INFLATION IN THE TIP

The Federal Highway Administration (FHWA) has provided guidance to planning organizations across the country to ensure that future years of the Transportation Improvement Program (TIP) document account for inflation. Sponsoring jurisdictions have been advised to account for the future costs of a project so that expenditures in the TIP reflect costs in the fiscal year of the expenditure. This accounting for inflation is called “Year of Expenditure” (YOE).

For the FY2011-2015 TIP cycle, the fiscal year 2015 STP and 12.6% funds were to be programmed in 2015 dollars. As such, jurisdictional funding requests needed to adjust current construction costs for inflation, using the Construction Price Index for Roads, Railroads and Bridges used by the Army Corps of
Engineers. The table below provides the adjustment factor that was recommended to inflate current estimates to the program year.

Table 3-3: Inflation Adjustment Factors

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<th>Fiscal Year</th>
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<td>2010</td>
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<td>2015</td>
<td>1.107485238</td>
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Example – if a jurisdiction had two projects – one in FY12 with a current construction cost of $1 million and the other in FY14 with a current construction cost of $1 million. It would be appropriate for the jurisdiction to inflate the FY11 project to $1,061,928 and the FY14 project to $1,094,083.

OPERATIONS AND MAINTENANCE COSTS

The region and its jurisdictional partners are aware of the value of maintaining and operating the existing transportation infrastructure in the region. With limited transportation dollars available now and into the foreseeable future, emphasis should be placed on infrastructure maintenance. It is more cost effective to do so than to replace facilities that have failed due to lack of maintenance.

Typical maintenance and operations types of activities include but are not limited to: adjustments due to inclement weather (closing flooded roads, de-icing bridges and snow plows at higher elevations), clearing sight-distances, traffic signal maintenance, striping, and warrant studies and pavement management, from filling pot holes to full pavement overlays.

The chart below outlines what jurisdictions pay in operations and maintenance in current and future fiscal years. Jurisdictions were asked to provide budget numbers as available for their transportation operations and maintenance activities system wide, so numbers would reflect both local roads as well as roads of regional significance.
Table 3-4: Operations and Maintenance Costs

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<th>FY12</th>
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<td>$27,324,320</td>
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<td>$25,585,109</td>
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<tr>
<td>Tucson Transit*</td>
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<td>$72,747,000</td>
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<td>Pima County</td>
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<td>City of South Tucson</td>
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<td>Town of Oro Valley</td>
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<td>Pascua Yaqui Tribe</td>
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</table>

* The City of Tucson runs the Sun Tran transit service, which includes the para-transit service known as Van Tran. Operating numbers shown cover the entire O&M budget for SunTran, VanTran, and Transit Services.

Note that the arterial roadways within the Tohono O’odham Nation (PAG member jurisdiction not listed in chart above) are either federal BIA roads, state routes (maintained by ADOT) or county roadways (maintained by Pima County).

Not all jurisdictions had numbers available for all fiscal years outlined in the chart. If no future estimates were available, no increase was assumed.

SCHEDULE

PAG’s TIP development process typically starts in the spring of each year. The first step in the process consists of revising the existing TIP to reflect the actual obligation of funds for specific projects, such as changes in schedules and budgets. Information about planned transportation improvements is then gathered from all involved jurisdictions or agencies. The information that is collected is then screened for compatibility with the Regional Transportation Plan. A fiscal constraint analysis is performed. This draft TIP was presented to the public for comment at four PAG Transportation open houses, held this past year on March 8, 9 and 10.

Following receipt of public comment and any subsequent revision, this draft TIP is reviewed for air quality conformity and is presented for review at meetings of the PAG Transportation Planning Committee, Management Committee, and Regional Council for approval.

JURISDICTIONAL PROGRAM DEVELOPMENT

The following section describes procedures used by each jurisdiction in developing their portion of the regional Transportation Improvement Program.
STATE OF ARIZONA

The Arizona State Transportation Board determines state priorities through recommendations from their Priority Planning Advisory Committee (PPAC) (mandated by A.R.S. 28-6951). The PPAC is comprised of key ADOT personnel plus a representative of the Citizen's Transportation Oversight Committee, as a non-voting member.

The state uses a priority rating system as one of the major criteria in selecting projects for the Five Year Construction Program. The intent is for projects with the highest priority ranking to be constructed first. However, such factors as continuity of improvement, environmental/utility clearances, right-of-way acquisition, and/or funding constraints may cause changes in the priorities.

When the Five Year Highway Construction Program is approved by the State Transportation Board, it is filed with the Director of the Department of Transportation and the Governor.

PASCUA YAQUI TRIBE

The Pascua Yaqui Reservation, known as Pascua Pueblo, is located approximately 13 miles southwest of downtown Tucson, south of Valencia Road. Transportation improvements and capital projects on the reservation are facilitated through the Development Services Department. The project review process is guided by Tribal Council and coordinated with various Tribal departments including the Attorney General’s Office, Finance, Land, Housing, and Facilities Management.

In the spring of 2009, the Pascua Yaqui Tribe updated its Long-Range Transportation Plan in accordance with the Indian Reservation Road (IRR) Program and Inventory. The study resulted in a 5-, 10-, and 20-year plan of prioritized multi-modal improvements that provides a clear road map for future transportation improvements on the Reservation and a basis for developing project funding. Community input was essential to the study. Public meetings were held at pivotal stages in the process to gain feedback from residents and direction from Tribal leaders.

The IRR Program addresses transportation needs of tribes by providing funds for planning, designing, construction, and maintenance activities. The program is jointly administered by the Federal Highway Administration’s Federal Lands Highway Office and the Bureau of Indian Affairs (BIA). The IRR Inventory is a database of all the transportation facilities eligible for IRR funding. Information collected for the Inventory includes the classification, route number, bridge number, current and future traffic volumes, maintenance responsibility, and
ownership. Data in the Inventory is used to determine 80% of the Tribe’s IRR Program Relative Need Distribution Formula (RNDF).

The Tribe’s transportation needs substantially exceed the IRR Program’s formula allocation funds. Regional and State funds, grants, and programs administered by the Regional Transportation Authority (RTA), Pima Association of Governments (PAG), and the Arizona Department of Transportation (ADOT) present alternatives and matching strategies to financing Tribal transportation projects. The Ignacio M. Baumea Road project, the Tribe’s first proposed complete multi-modal roadway, is a prime example of utilizing IRR Program and Regional funds to fully finance a project.

PIMA ASSOCIATION OF GOVERNMENTS

PAG is the federally designated metropolitan planning organization for Pima County with program areas that include regional transportation planning.

Pima Association of Governments’ Transportation Planning Committee (TPC) provides guidance to PAG’s overall transportation work program and the products produced. The TPC is comprised of the department heads of the local planning and transportation implementing agencies, as well as representatives from the Arizona State Transportation Board, ADOT Transportation Planning and Highway Divisions, the Tucson Airport Authority (TAA), Davis-Monthan Air Force Base, the Federal Highway Administration, the University of Arizona, Citizens Transportation Advisory Committee (CTAC), and the local public transit system.

The TPC reviews the TIP within the framework of the regional transportation planning and air quality conformity process and federal and state regulations. The TIP Subcommittee is comprised of key staff from involved planning and implementing agencies, and other important stakeholders such as freight service providers and was established by the TPC to review the TIP. The TIP Subcommittee reviews the composite jurisdictional programs for consistency with both regional needs and the long-range Regional Transportation Plan. The TIP Subcommittee then assembles a recommended program based on the identified needs and the limitations imposed by available resources. A public open house is held to acquire input concerning the tentative program and any potential adjustments. The final draft program is then prepared by the TIP Subcommittee and forwarded through the TPC and Management Committee for approval. An official public comment period is scheduled prior to final review and adoption by the Regional Council.

REGIONAL TRANSPORTATION AUTHORITY

The Regional Transportation Authority (RTA), a regional governmental entity established in August 2004, developed a 20-year regional transportation plan
approved by Pima County voters on May 16, 2006. The $2.1 billion plan will be implemented over a 20-year period, ending in 2026.

The RTA will remain the fiscal agent and manager of the RTA plan. As part of the federal transportation requirements, the projects in the RTA plan must be incorporated into the long-range Regional Transportation Plan. Likewise, projects of the RTA must be incorporated into the TIP. The RTA funding source is, by the enabling legislation, restricted to those projects identified in the RTA plan approved by the voters. Therefore, RTA funds are not programmed through the same process as other regional funds. The RTA projects will be paid with funds generated from a ½-cent excise tax over the 20-year life of the plan. The tax is expected to generate $2.1 billion.

PIMA COUNTY

The mission of the Pima County Department of Transportation (PCDOT) is “To develop, deliver and operate transportation facilities and services for Pima County; valuing the cost-effective, safe, and efficient movement of people and goods in a manner that protects and enhances all natural environments and quality of life.” The projects put forth for consideration in the TIP are identified by PCDOT staff and are subject to administrative review. PCDOT has developed a 5-year plan that focuses on improving the major north-south and east-west corridors of the region. The plan also supports multi-modal transportation including bike lanes, bus pullouts, sidewalks, and safer street crossings. PCDOT staff evaluates all projects based on criteria developed by the PAG TIP subcommittee and submits these projects to PAG for consideration to be included in the TIP. These transportation improvement projects typically involve upgrading existing infrastructure where warranted by operational and/or safety needs; however, new facilities are also constructed where warranted. Improvement areas are identified by existing or imminent development trends, land use patterns, present and projected transportation demand, and safety considerations.

CITY OF TUCSON

The City of Tucson develops its transportation improvement projects using funds from various sources: allocated highway user taxes, approved streets and corresponding bond funds, federal-aid funds, FTA funds, the General Fund, and assessments under state statutes. Local general funds are used primarily to provide operating revenue for transit and are minimally programmed for capital improvements.

Projects selected for implementation are based on evaluation of many criteria, which define need, consistent with adopted Regional Plan Elements.
The criteria are:

1. Street and Highway Projects – Criteria for selection involve a highway sufficiency priority rating system involving physical conditions, traffic volume to capacity ratios (existing and future), and safety. The sufficiency index is updated annually. These items combined with professional experience, use data, and modal interfacing, assist in determining the needs for street and highway improvements. Bikeway and pedestrian projects are considered an integral part of street and highway projects.

2. Transit Projects – Criteria for selection include: balance of public and handicapped transportation; route and service expansion; express service with the inclusion of park-and-ride facilities; and air quality conformity requirements.

The Mayor and Council of the City of Tucson have formally appointed a Citizens Transportation Advisory Committee (CTAC) to review and make recommendations to the Mayor and Council on all transportation issues. Citizen committees work in conjunction with the City's Transportation Department and in coordination with the Regional Transportation Plan process to develop effective regional transportation programs.

TOHONO O'ODHAM NATION

The Tohono O’odham Legislative Council (TOLC) passes resolutions that prioritize BIA road improvement projects based upon priority listings submitted by each of the Nation’s eleven Districts. Several years ago the Nation’s Planning Department succeeded in acquiring BIA 2% Planning Funds to conduct a system inventory and develop a Transportation Study and TIP. With the associated education process the TOLC recently approved joining PAG. The Nation’s prioritization process for non-BIA projects is under development. Currently the Planning Department coordinates these efforts with the Nation’s Executive Office of the Chairwoman, the Districts, and the Tohono O’odham Legislative Council.

TOWN OF ORO VALLEY

Transportation projects for the Town of Oro Valley Department of Public Works fall under the supervision of the Town Engineer. Federal, State and local funding as well as development impact fees, fund these projects. Generally, Town projects involve upgrading and widening arterials in the existing road network while adding turn bays, bicycle and pedestrian facilities and occasionally, traffic signals.

In addition to Public Works staff input, the Town employs a Public Participation Process for development of Capital Improvement Projects that are programmed in the Pima Association of Government’s TIP. Their involvement is an important
element of the plan. In this process, citizens participate in Town meetings, community surveys, public hearings and focus group meetings. For some, participation may also include membership on the Technical Advisory Committee. Additionally, scheduled workshops are held in order to solicit feedback from the attendees.

Information gathered from the various modes of public input is used by the citizen’s Technical Advisory Committee to evaluate specific projects. Combining the Department of Public Works assessments with the recommendations of the Technical Advisory Committee, projects are then selected and sent to the Town’s Mayor and Council for review and action.

CITY OF SOUTH TUCSON

The City of South Tucson, through its Planning and Public Works Departments strives to deliver a safe, reliable and efficient transportation system to meet the mobility needs of its residents and users.

Transportation projects for consideration for the TIP are identified by Planning and Public Works staff with the goal to preserve the existing transportation infrastructure in the City, maximize technology wherever possible and implement transportation improvements that incorporate the unique culture of the City.

South Tucson encourages citizen participation via open Council meetings, public meetings and hearings. The City also conducts onsite, open community meetings at the beginning of the design process for each major transportation project.

TOWN OF MARANA

The Town of Marana prepared its initial Master Transportation Plan in 1989 to guide roadway development within the corporate limits of the Town. The Circulation Element of the Town’s General Plan, updated in February, 1997, reflected the roadway concepts contained within the 1989 Master Transportation Plan.

Subsequently, the Town had three significant transportation documents prepared and accepted. Continental Ranch and Dove Mountain Sub-Regional Transportation Studies were completed in February, 1997 and August 1999 respectfully. Marana adopted an updated General Plan on November 5, 2002 and revised on December 19, 2007. The Circulation Element of the General Plan update contains roadway concepts provided in the Updated Master Transportation Plan adopted June 19, 2001. The updated Master Transportation Plan contained such components as Existing and Future Conditions, Roadway, Bicycle and Pedestrian, Transit and Funding. The update spans the years of 2001-2025.
TOWN OF SAHUARITA

Annually, The Town of Sahuarita evaluates transportation goals and priorities through its Capital Improvement Program (CIP) and advances its transportation improvement program with consideration of the latest and best available data. The CIP is the Town’s five-year blueprint for creating and maintaining the crucial infrastructure that will support the continued growth and development of Sahuarita. Each year, in conjunction with the annual budgeting process, the Town Manager and Finance Department coordinate the process of revising and updating the long-range CIP document. The values, priorities, goals, and objectives established by Sahuarita’s elected officials, Town Staff and citizen input determine the broad parameters for incorporating new capital improvement projects into the CIP. Other documents, such as the Town’s General Plan also provide valuable information and guidance in the preparation of the CIP.

TUCSON AIRPORT AUTHORITY

The Tucson Airport Authority is responsible for implementing projects at Tucson International Airport and Ryan Airfield. Projects are identified by the Tucson International Airport Master Plan, Ryan Airfield Master Plan, and from the Airport Authority staff. Primary consideration is given to airport needs, available federal and state funds, bonding capacity and the availability of Airport Authority matching funds. Proposed projects are forwarded to the Airline Affairs Committee and the Operations Council for review and recommendation prior to final approval by the Authority's Board of Directors.
CHAPTER 4 – TIP DEVELOPMENT POLICIES

The TIP Committee has adopted several policies to guide the development of the annual TIP document. These include the following:

Policy #1 - The TIP Committee will work toward the goal of developing the new TIP with a zero or non-negative balance in each fund category at the end of each of the first 3 years of the program. - Approved 8/20/02

Policy #2 - Funding increases for existing projects or the addition of new projects in the first 4 years of the program must be offset with funding decreases in other projects so that the annual total for each funding category does not exceed the levels established in the previous TIP. - Approved 8/20/02

Policy #3 - Funding resources which are designed to accelerate project schedules, i.e. Advanced Construction, HELP loans, etc., shall not be recognized and programmed in the TIP until their repayment sources have been secured. - Approved 6/15/2004

Policy #4 - No individual jurisdiction may request more funding in any year from any individual funding source, including STPX funding, which exceeds the total amount available to the PAG region from that funding source. The RTP Financial Plan Advisory Committee shall provide an estimate of annual revenue by funding source, by year, to the TIP Subcommittee in advance of the programming process. - Approved 8/20/02

Policy #5 - Each project sponsor will submit its funding requests with its own prioritized ranking based on its own internal priority system. - Approved 9/17/02

Policy #6 - Project sponsors must complete funding for construction projects listed in the TIP before initiating new major projects. Design, right-of-way and studies are not included. Jurisdictions over 100,000 population may request three new projects and remaining jurisdictions may request one new project annually for consideration. - Approved 6/15/04

Policy #7 - During the development of the annual TIP Program, the TIP Committee shall consider Minor Projects separately from Major Projects with criteria and data analysis designed to accommodate the unique nature of smaller projects. Minor Projects shall be defined as those projects with a total project cost including design, right-of-way, and construction of less than $1 million. - Approved 9/21/04
CHAPTER 5 – PUBLIC INVOLVEMENT

The primary PAG-sponsored events for regional public involvement in the development of the FY 2011-2015 TIP were three open houses and the 30-day public comment period. The open houses provided the public with an opportunity to review the candidate list of projects for the updated TIP, speak with jurisdiction representatives about the projects, and submit written comments; and the 30-day public comment period extended the opportunity to the public to thoroughly review the plan on their own and to provide comments. Other opportunities for public involvement were provided through PAG’s Web site (www.PAGnet.org) and TIP Subcommittee meetings, which are open to the public.

Three open houses were held. The first open house was held on March 8 in Green Valley at the Conrad Joyner Green Valley Branch of the Pima County Library. The second open house was held on March 9 in central metropolitan Tucson at the Randolph Clubhouse. The third open house was March 10 at the Foothills Mall in northwest Tucson. Two of the facilities were accessible by public transportation (Foothills Mall and Randolph Clubhouse) and all had ample parking. Approximately 80 people attended the open houses with two of these indicating they work in the transportation field. A total of five TIP comment sheets were submitted. The comment sheets solicited input on the proposed TIP, project impacts and priorities for selecting projects. Verbatim comments on the proposed TIP and the tabulated results of the rating scale survey question are included in a separate public involvement report.

The TIP display at the open houses featured large boarded maps of TIP projects and Title VI analysis, along with boarded displays on regional transportation funding sources, how to read the TIP projects document, and common acronyms and funding sources in order to interpret the TIP projects document. PAG also provided the public with candidate project listings by jurisdiction or agency; background information about the TIP, and other related information, as well as the TIP public comment form. Transportation professionals from PAG member jurisdictions and the Regional Transportation Authority (RTA) were available to talk one-on-one with members of the public in attendance regarding TIP projects.

The TIP open houses were widely publicized in print and electronic media (see Appendix 7). The open houses were advertised in the Sunday, February 28, 2010, edition of the Arizona Daily Star. In addition, the open houses were promoted and posted on PAG’s Web site.
A 2011-2015 TIP Web page featured the candidate project list, an online public comment form and information about the TIP planning process.

Following the open houses, TIP survey results were compiled and analyzed. This documentation was transmitted to the TIP Subcommittee for consideration in the development of final recommendations for project selection. Jurisdictions also had the opportunity to develop written response to the comments received. These responses were displayed on PAG’s Web site.

A 30-day final notice for public comment was issued on April 27, 2010, with the comment period ending May 27, 2010 prior to the May 27, 2010, Regional Council meeting considering the final TIP for adoption.

In addition to the PAG regional public participation process, the individual PAG jurisdictions also conduct public involvement activities which feed into the development of the regional TIP. Most jurisdictions conduct public participation efforts in conjunction with the development of their Capital Improvement Programs (CIP) prior to beginning the regional TIP development process. Jurisdictional recommendations for projects to be included in the candidate TIP project list are typically based on these CIP processes.
The Public Comment Form used during the TIP development process is shown below:

Pima Association of Governments
177 N. Church Ave, Suite. 405, Tucson, AZ, 85701
Annual Regional Transportation Open House
March 2010

Comment Sheet
2011-2015 Transportation Improvement Program (TIP)

The region’s leaders want to know what you think about proposed transportation projects for the 2011-2015 Transportation Improvement Program (TIP). Please take a moment to review the maps and/or lists of proposed TIP projects, or talk to a transportation professional, and then please answer the questions below.

1. What specific comments do you have about the proposed 2011-2015 Transportation Improvement Program (e.g. are there projects that should be deleted or added to the proposed list)?
________________________________________________________________________________
________________________________________________________________________________
________________________________________________________________________________

2. In what way do you feel the proposed 2011-2015 TIP project(s) might affect you or your immediate neighborhood either positively or negatively (e.g. increase safety, increase access to jobs and services; relieve congestion; other impacts on the environment, neighborhoods and/or businesses, etc)?
________________________________________________________________________________
________________________________________________________________________________
________________________________________________________________________________

3. The Transportation Improvement Program is a financially constrained program, where the cost of the projects cannot exceed the available funding. Federal regulations require that you have an opportunity to comment on this 5-year financial plan explained in the Draft 2011-2015 Pima Association of Governments’ Transportation Improvement Program in Appendix 2. This section is labeled “Fiscal Constraint Analysis” and shows a year-by-year comparison of available funds, (revenues and expenses) allocated to PAG for the Transportation System.

Please provide any other comments or questions you may have regarding the financial plan.
________________________________________________________________________________
________________________________________________________________________________
________________________________________________________________________________
4. Given the region’s limited funding for transportation, please rate the relative importance of the following factors if you were making decisions about which transportation projects to fund in the next five years:

<table>
<thead>
<tr>
<th>Factors to be considered when selecting projects to be funded in the next five years</th>
<th>More important/Less important (Please circle your choice)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Improve safety</td>
<td>5  4  3  2  1</td>
</tr>
<tr>
<td>Provide air quality benefits</td>
<td>5  4  3  2  1</td>
</tr>
<tr>
<td>Relieve congestion</td>
<td>5  4  3  2  1</td>
</tr>
<tr>
<td>Maintain and preserve the existing transportation infrastructure</td>
<td>5  4  3  2  1</td>
</tr>
<tr>
<td>Support economic development efforts by improving movement of goods/services and access to jobs, businesses and/or commercial areas</td>
<td>5  4  3  2  1</td>
</tr>
<tr>
<td>Distribute funds equitably among the various political jurisdictions</td>
<td>5  4  3  2  1</td>
</tr>
<tr>
<td>Provide opportunities for alternative modes of transportation such as transit, bicycling, walking, or ridesharing</td>
<td>5  4  3  2  1</td>
</tr>
<tr>
<td>Widen roads to gain more capacity from the existing system</td>
<td>5  4  3  2  1</td>
</tr>
<tr>
<td>Use new technology to gain more capacity from the existing system</td>
<td>5  4  3  2  1</td>
</tr>
<tr>
<td>Solve specific problems in my neighborhood</td>
<td>5  4  3  2  1</td>
</tr>
<tr>
<td>Solve major problems on a regional level</td>
<td>5  4  3  2  1</td>
</tr>
<tr>
<td>Provide improvements that benefit the greatest number of people</td>
<td>5  4  3  2  1</td>
</tr>
</tbody>
</table>
5. Please provide any other comments or questions you may have regarding the 2011-2015 TIP or TIP planning process.

________________________________________________________________________________
________________________________________________________________________________
________________________________________________________________________________
________________________________________________________________________________

**ADDITIONAL INFORMATION**

<table>
<thead>
<tr>
<th>Question</th>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Please provide your five digit ZIP code (home):</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Do you work in transportation planning?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Did you find the information you had expected at this Open House?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Did you receive adequate answers to your questions?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Can you suggest ways we might improve the Open House next year?</td>
<td></td>
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</tr>
</tbody>
</table>

Optional: If you would like to be included in future mailings about the TIP please provide your contact information below.

Name:

Address (street):

City or Town and ZIP Code:

E-mail address:

Completed Comment Sheets can be mailed to:
Pima Association of Governments
Attn: Robert Done
177 N. Church Ave, #405
Tucson, AZ, 85701

Comment Sheets can also be faxed to **620-6981** or e-mailed to RDone@pagnet.org.
CHAPTER 6 - AIR QUALITY EVALUATION

AIR QUALITY OVERVIEW

Motor vehicle emissions are a major contributor to air pollution across the nation and in the Tucson urban area. Approximately 60 percent of the total air pollutants within eastern Pima County are produced by motor vehicles; the largest component of which is carbon monoxide (CO).

To assist local jurisdictions in measuring and improving air quality, the U.S. Environmental Protection Agency (EPA) establishes maximum acceptable levels of pollution for six common air contaminants known as the National Ambient Air Quality Standards (NAAQS). These federal standards for outdoor or ambient air are set to protect public health. When an area measures air pollutant levels above these standards, it is designated as a nonattainment area for that pollutant. If this occurs, an area plan must be developed and adopted to reduce emissions of that pollutant. The nonattainment area plan is incorporated in the State Implementation Plan (SIP) as a SIP amendment and must contain effective strategies for curtailing air pollution. For EPA approval, the plan must include financial and resource commitments for plan implementation.

EPA designated part of the Tucson urban area a CO nonattainment area in 1978. This designation meant that this area’s ambient CO concentration exceeded the NAAQS frequently enough to violate the federal health standard. Pima Association of Governments (PAG) adopted a SIP revision under the limited maintenance plan option. This plan met the EPA’s requirements for CO nonattainment areas. The Tucson Air Planning Area (TAPA) was designated CO attainment status, effective July 10, 2000, and the Tucson area has not violated the CO NAAQS since 1984. Continuation of this status relies on data obtained from monitoring and modeling procedures.

In June 2008, the PAG Regional Council adopted a 10-year CO Limited Maintenance Plan (LMP) for the TAPA. This SIP Revision, together with a statutory provision extending the life of the State’s Vehicle Emissions Inspection Program (VEIP) through the end of 2016, was sent to ADEQ for submittal to the EPA for review. These SIP revisions to renew the CO LMP in accordance with the Clean Air Act (CAA) §107(d.) and ensure maintenance of the NAAQS in the TAPA through 2020 was approved by the EPA in Dec. 2009, with an effective date of Jan. 20, 2010. This plan maintains existing controls and contingency provisions and replaces the previous plan approved by the EPA in 2000. CO levels are expected to remain well below the NAAQS for a second 10-year period ending 2020.

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1 NAAQS for CO is 9 parts per million for an 8-hour average.
Tucson Carbon Monoxide Maintenance Area

MAJOR DEVELOPMENTS

The conformity determination for the 2009-2013 TIP was approved by the FHWA and FTA in November 2008. The Amended 2030 Regional Transportation Plan (RTP) was approved by FHWA and FTA in November 2006. A 2040 RTP is underway and is expected to be adopted by PAG’s Regional Council in mid-2010. PAG continues to comply with all legal requirements for transportation conformity determinations in effect at the time of this TIP report.

EPA has not imposed any federal control measures for Pima County, but has included the State’s Vehicle Emissions Inspection and Oxygenated Fuels Program, the PAG Travel Reduction Program (TRP) and the Pima County Department of Environmental Quality (PDEQ) Voluntary No Drive Days Program as federally enforceable air quality control measures. Since these control measures are included in the Arizona SIP, they must continue to be implemented.
SIP CONTROL MEASURES

The following mobile source emissions control measures in the CO LMP for the TAPA are currently in effect:

- Federal Motor Vehicle Control Program
- State Vehicle Emissions Inspection Program (VEIP)
- State Oxyfuels Program
- PAG’s TRP including the RideShare Program
- PDEQ’s Voluntary No-Drive Days Program

These programs represent the permanent and enforceable commitments (as required under § 107(d) (3) (E) (iii) of the CAA) that assist the region in achieving attainment status and/or will help keep the area in attainment. All legally enforceable commitments to other control measures outlined in the 1987 SIP revision have been completed. A summary of these enforceable control measures follows.

FEDERAL MOTOR VEHICLE CONTROL PROGRAM

Emissions Regulations

Federal regulations for reducing motor vehicle tailpipe emissions have been in place since 1968. Initial standards required major reductions in vehicle tailpipe hydrocarbon and CO emissions and elimination of crankcase hydrocarbons, relative to 1963 vehicle model emissions. Subsequent federal regulations continued to lower vehicle emission standards throughout the 1970s and 1980s. Several recent regulations requiring more stringent pollutant reductions are detailed below.

Tier 1 and Tier 2 Emission Standards

Two sets of tailpipe emissions standards were defined for light-duty vehicles in the Clean Air Act Amendments (CAAAs) of 1990: Tier 1 and Tier 2. The Tier 1 standards were published in 1991, and were phased in progressively between 1994 and 1997. These standards apply to tailpipe emissions for all new light-duty vehicles up to 8,500 lbs. Gross Vehicle Weight Rating (GVWR) (passenger cars, light-duty trucks, sport utility vehicles, minivans and pick-up trucks).

Tier 2 tailpipe emission standards were adopted by EPA in 1999, and have been implemented progressively from 2004 to 2009. They apply stricter standards to all vehicles covered in the Tier 1 standards in addition to more rigorous restrictions for larger vehicles (over 8,500 lbs GVWR). Unlike the Tier 1 standards, the Tier 2 regulations apply the same emission standards to all vehicle weight categories and for all fuel types.
National Low Emission Vehicle Program (NLEV)

In 1997, EPA finalized the regulations for the NLEV program, a voluntary agreement between EPA and auto manufacturers. This program applied to cars and light-duty trucks nationwide starting with the model year 2001. It provided more stringent tailpipe emission standards for the transition period before the introduction of Tier 2 regulations. The program was phased in from 2001 through 2003, and required light-duty car manufacturers to certify that a certain percentage of their vehicle fleets would comply with cleaner emission standards.

Vehicle Equipment

In addition to complying with federal tailpipe emission standards, automobile manufacturers were required to install certain devices to limit emissions. Starting in the early 1970s, new cars were equipped with charcoal canisters and exhaust gas recirculation valves to meet emission standards. One of the more significant innovations was the introduction of the catalytic converter in the mid 1970s. Catalytic converters significantly reduce CO, nitrogen oxides (NOx) and hydrocarbon emissions by converting harmful fuel combustion products into less harmful emissions before leaving the vehicle’s exhaust system.

Beginning with the 1996 models, the EPA required manufacturers of light-duty vehicles and light-duty trucks to install on-board diagnostic (OBD) systems. These systems monitor vehicle control components for malfunctions that cause exceedance of emission levels. When a failure occurs, the diagnostic information is stored in the vehicle’s computer to assist technicians with diagnosis and repair. Since that time, the EPA has extended OBD requirements to all medium and heavy-duty highway vehicles.

ARIZONA VEHICLE EMISSIONS INSPECTION PROGRAM (VEIP)

The Arizona VEIP began in 1977, and includes both the Tucson and Phoenix metropolitan areas. Vehicle models from 1967 through 2005 are subject to emissions testing, unless they are exempt. New cars are not required to be tested until they have been registered for five years. Older vehicles (1967 through 1995) undergo tailpipe emission inspections while newer vehicles (after 1995) undergo OBD testing. The OBD system detects malfunctions at an early stage, often identifying failing components before tailpipe emissions testing would detect them. This earlier detection system helps protect the environment and allows for repair at a much lower cost. Since Jan. 2, 2009, vehicle OBD testing in Pima County is valid for two years.

Vehicles may receive a one-time only repair waiver that is valid for the current year’s registration. Once a waiver is granted, the vehicle is ineligible for additional waivers. Failing vehicles that received a waiver must be repaired and pass inspection for subsequent registration in the Tucson metro area.
**ARIZONA OXYFUELS PROGRAM**

The Oxyfuel Program has completed 18 full seasons in eastern Pima County. This program decreases CO tailpipe emissions in the winter months by adding ethanol to all grades of motor fuel. The current oxygen content of winter motor fuels is 1.8 percent by weight. Legislation passed in 1996 (SB1002), granted PAG the ability to increase oxyfuels under specified conditions. Up to 60 days before Sept. 30 of each year, PAG, with concurrence of the Director of the ADEQ, may notify the Director of the Arizona Department of Weights and Measures to increase the oxyfuel content not less than 0.3 percent by weight of oxygen and not more than the maximum EPA allowance. Before making that determination, a cost-benefit analysis of all reasonable alternative emission reduction measures must be completed.

**PAG’S TRAVEL REDUCTION PROGRAM (TRP)**

The Travel Reduction Ordinances (TROs), which created the regional Travel Reduction Program (TRP), are in place for Pima County, the cities of Tucson and South Tucson and the towns of Oro Valley, Marana and Sahuarita. The goals of the ordinances are to reduce traffic congestion and improve air quality. Currently, the TROs specify that employers with 100 or more full-time equivalent employees at a single or contiguous work site must participate in the TRP. Employers with fewer than 100 employees can be voluntary participants.

From 1989 to 2005, PAG staff conducted annual TRP surveys. Participating employers were not required to conduct a survey in 2006, but did submit annual plans. In 2007, employers conducted surveys, submitted annual plans and committed to continuing their 2007 plans through 2008. The employee survey resumes in 2010, with 25 percent of the employers completing the survey each year.

In 2009, all TRP employers participated in an online survey of their Travel Demand Management activities in lieu of the annual, written plan completed in previous years. The survey results are used by the TRP staff to assist employers in planning activities, determining deficiencies and in designing new employee programs promoting alternative transportation use at the work place. Figure 6.1 shows the key results from the 2009 survey as compared with those of 2006. Over this three year period, the participation rate has declined in every category except adjusted work schedule. These declines can be contributed to the downturn in the economy and a reduction in the local workforce. The largest declines were seen in the Guaranteed Ride Home (GRH) program and the carpool matching system.

Figure 6.1: Results of the 2006 and 2009 Surveys of Regional Employers’ Travel Demand Management Activities
The Rideshare program was established in 1974, and is administered by PAG. In 2009, the program was renamed Sun Rideshare, reflecting its assimilation into the regional transit system. Sun Rideshare continues to promote alternative transportation to area employers and residents of Pima County through marketing campaigns, public relations, advertising, incentive offerings and outreach to local employers, organizations and commuters. The Sun Rideshare Web site and marketing materials were updated in 2009, to incorporate the new logo and to modernize the look and feel, as well as the content of these materials.

Since its initiation in late 2008, almost all of the interactive carpool matching system and the GRH programs are done electronically. By entering their profile in the rideshare database, commuters can access information regarding all their commute options, update their profiles and log in their daily travel mode. Currently, 87 percent of registered commuters can be contacted via e-mail to access and relay information more efficiently. In addition, commuters can register on-line for GRH and print a GRH voucher when needed. GRH registrants doubled in 2009, to 1,493.

The Pima County Vanpool program has shown steady growth since the change to a new provider in 2008. The net increase in 2009 was four new vanpools, an increase of 20 percent. The goal is to have a net increase of five new vanpools in 2010. Sun Rideshare staff is also advising area employers without access to transit to consider using Job Access and Reverse Commute (JARC) funds to support an employee vanpool program.
In 2009, there was a net increase of 254 new commuters in the Rideshare database for a total of 3,090. It is important to maintain current and reliable data so commuters will maintain confidence in the carpool, vanpool and bike buddy matches provided by this interactive matching system. In response to this need, a routine purging process was established in 2009, to delete any records that were inactive for more than 24 months.

**PDEQ’S VOLUNTARY NO-DRIVE DAYS PROGRAM**

PDEQ’s national award-winning program seeks to increase awareness of air quality issues and encourage actions to reduce air pollution. PDEQ’s Clean Air Program (referred to as the Voluntary No-Drive Day Program in the SIP) is a state-mandated program started in 1988 to address CO violations in Pima County. This program uses several methods to achieve its goals:

*Community Outreach* - PDEQ provides air quality information and resources to the public through Air Pollution Advisories; articles and information on the PDEQ Web site (www.deq.pima.gov); near real-time air quality information Web site (www.airinfonow.org), a telephone hotline (882-4AIR) in English and Spanish, speakers’ bureau, displays at community events and major employment centers, regular media releases pertaining to air quality issues, public service announcements and paid advertising. Due to state funding cuts in FY08/09, the Smoking Vehicle Hotline service was discontinued in January 2009.

*School and Youth Programs* - PDEQ’s activities include K-college level classroom presentations, teacher training, development and distribution of air quality materials and work with the University of Arizona on the Earthkeepers’ Program and the Cooper Environmental Learning Center. Due to state funding cuts in FY08/09, the Kids for Clean Air Club (over 4,000 cumulative members) has been discontinued.

*Annual Public Events* - PDEQ’s sponsors or co-sponsors events such as the Green Living Fair, International Walk to School Day, Bike Fest and Earth Day. Due to state funding cuts in FY08/09, the annual Car Care Checkup and Clean Air Days events have been discontinued.

Figure 6-2 summarizes PDEQ’s Air Quality program’s outreach accomplishments from FY00/01 to FY08/09. Over this time period, Web site information requests have shown the greatest increase and widest outreach performance.
In the past, FMR Associates conducted annual telephone surveys to evaluate the success of PDEQ’s Clean Air Program. Results of the most recent survey in FY07/08, indicated that individuals who were aware of the Clean Air Program and who participated in at least one event were 80 percent more likely to have changed, or considered changing, their behaviors to improve air quality.

VOLUNTARY CONTROL MEASURES

In addition to the federally mandated commitments mentioned, several voluntary air pollution reduction programs are/were in operation in Pima County:

- PAG’s Clean Cities Program
- PDEQ’s Voluntary Repair and Retrofit Program (no funding - discontinued in 2008)
- PDEQ’s Gas Cap Replacement Program (no funding-discontinued in 2009)

Below is a summary of these control measures and the air quality benefits realized from their implementation.
PAG CLEAN CITIES PROGRAM

The Clean Cities program is a national effort, sponsored by the U.S. Department of Energy (DOE). The program’s major goals are to increase clean fuel vehicle usage, thereby reducing the country's dependence on foreign petroleum and improving air quality. The Tucson Regional Clean Cities Coalition received its DOE designation in August 1999 as the 73rd such coalition in the nation. The local 72-member Coalition consists of representatives from major utilities and other fuel providers, vehicle dealers and fleet owners along with a variety of government agencies. The Coalition developed a five-year plan, which was renewed in 2005, and approved by DOE. It continues to be executed under the direction of a local steering committee with the assistance of PAG staff members.

The Clean Cities Program maintains a fuel-neutral position with respect to the support and use of all clean fuels. Currently, regional emphasis is placed on the use of biodiesel (B20), E85, compressed natural gas (CNG), propane, all electric, hybrid electric and truck and school bus idle reduction. The Coalition is working closely with school districts to implement clean fuel driver training using clean fuel vehicles and supports a program directed at educating young drivers on alternatives to petroleum fuels. The Coalition continues to work with the University of Arizona to maintain an extensive E85 program with the FlexFuel Vehicles (FFVs) in their fleet. The City of Tucson has continued their intergovernmental agreement with the University of Arizona to use its E85 facilities for its FFVs until other City fueling arrangements could be made. Additionally, the City of Tucson has switched all diesel vehicles to run on B20.

Although clean fueling infrastructure has not kept pace with demand, alternative fuel stations can be found throughout the metropolitan area. Currently, there are four electric recharging stations in the Tucson area; two new stations were built in 2009 at the Bookman’s sites on Grant Rd. and Thornydale Rd. Bookmans will continue to pursue EV charging at their additional sites around Tucson in 2010.

PAG and its Clean Cities program have entered into an MOU with Nissan North America and Ecotality/eTec to prepare Tucson and Arizona as one of the official launch markets for the all electric Nissan Leaf which will launch in late 2010. Tucson Clean Cities will work with eTec to add charging infrastructure to our region and connect the Phoenix Metro Area with Tucson and EV infrastructure as part of the MOU. Ecotality/eTec has received federal stimulus monies to help offset costs for this EV project. Propane refueling stations are widely available in the region, but public-access CNG refueling stations are still limited. The region has 11 restricted-access (business/government) CNG stations and two public access CNG station, one at the Tucson International Airport and a new facility at Broadway and Campbell which opened in February 2009.

Four public-access biodiesel outlets and eight ethanol outlets are located in the Pima County area. In addition, ethanol stations have opened in Sierra Vista, Coolidge,
Nogales and five in the Phoenix area directly related to our Clean Cities efforts. A map of alternate fuel stations in the metro area is available at: www.pagnet.org/documents/CleanCities/FuelStations-2008-08.pdf

Nationally, the number of clean fuel vehicles has grown, assisted by the Energy Policy Act of 1992 that mandates federal and state governments annually procure clean fuel vehicles as part of their fleets. Locally, the number of Pima County private and public clean fuel vehicles continued to grow from 2002 through 2008 (Figure 6-3). Based on the number of alternate vehicles in 2008, a total estimated 12 million gasoline gallon-equivalents were displaced. Clean fuel vehicles are gaining acceptance and popularity as fleet managers and the public become aware of their benefits.

Figure 6-3: Number of Pima County Clean Fuel Vehicles (2002-2008)

PDEQ’S VOLUNTARY VEHICLE REPAIR AND RETROFIT PROGRAM (V2R2)

The purpose of PDEQ’s V2R2 program is to reduce vehicle-related emissions by providing financial incentives to repair faulty vehicles. To qualify for the V2R2 program, certain criteria must be met. The vehicle must

- fail the state emissions test
- be at least 12 years old and in good working condition
- have an Arizona registration and title.

If accepted into the program, the vehicle owner pays the first $150 of repairs and PDEQ will pay up to an additional $550 for emissions-related repairs (or up to an additional $650 for emissions-related repairs and retrofit kit installation). Funding for the V2R2
Program is provided through an ADEQ grant.

The Pima County program began in 1999, and to date, over 4,906 vehicles have been repaired, resulting in a reduction of 1,635 metric tons of emissions per year for the life of the repairs. This equates to an 81 percent per vehicle decrease in emissions. Figure 6-4 shows a summary of the program’s benefits from FY00/01 to FY08/09. Due to the elimination of funding, the program was discontinued in July 2009.

Figure 6-4: V2R2 Program Participation and Air Emissions Benefits FY00/01 to FY08/09

![Graph showing pollution reduction and repair count](image)

**PDEQ’S GAS CAP REPLACEMENT PROGRAM**

PDEQ started the Gas Cap Replacement (GCR) Program in FY04/05 with funding sources including ADEQ, the Gila River Indian Community and PAG’s Clean Cities Program. The program’s goal was to reduce volatile organic compounds (VOCs) from mobile sources in southern Arizona by providing replacement gas cap vouchers for leaky vehicle gas caps. Due to the elimination of funding, the program was discontinued in 2008.

**SIP Control Measures Outlook**

The long-range control strategy will be to continue programs that control mobile emissions and reduce per capita vehicle miles traveled (VMT). Federal vehicle emission control measures and the Arizona VEIP are primarily responsible for the County’s consistently low CO levels. The continued implementation of PAG’s RideShare and Travel Reduction Programs are the most significant local CO reduction strategies,
targeting direct VMT reduction, with the added benefit of congestion management.

EMISSIONS ANALYSES

By reducing air pollutant emissions, the Tucson region will continue to be a healthy environment for the region’s citizens. Additionally, by conforming to a federally approved air quality plan, the Tucson urban area will remain eligible for federally funded transportation projects.

To assure compliance with federal clean air standards, an annual program of monitoring and analysis was established in Pima County. The principal measure of compliance is the CO monitoring program, operated by PDEQ. Each year stationary CO monitors are activated at various locations throughout the TAPA for the CO season (October through March). In addition, PDEQ can employ mobile monitors at hotspot intersections during the CO season if levels approach the health standard. Current CO levels in the TAPA remain low, at about 15 percent of the federal health standard, largely due to stricter federal tailpipe standards.

In Pima County, PAG staff estimates CO mobile source emissions using EPA’s MOBILE6.2 model for planning purposes. Local data are used for modeling and include seasonal averages for temperature, humidity, gasoline Reid Vapor Pressure, current oxyfuel and vehicle inspection and maintenance programs and 2008 County vehicle registration data. PAG uses current socioeconomic information, transportation and traffic data to generate VMT, vehicle hours traveled (VHT) and congestion levels. To account for local (non-network) travel, 13 percent of network system VMT (at 12.9 mph) is added to the network total and used for all calculations of VMT, speed and CO emissions. PAG’s air quality analysis of the TIP estimates CO emissions of 332 tons per day for 2015 if all projects are completed on schedule.

CONFORMITY OF THE PLAN

PAG is the designated air quality planning agency and the metropolitan planning organization (MPO) for the region. As such, PAG maintains cooperative relationships with the U.S. EPA, ADEQ, ADOT and PDEQ. Coordination of regional transportation planning with air quality planning has been carried out for many years. In April 1993, the procedures, methods and responsibilities for air quality planning were incorporated in a Memorandum of Agreement (MOA) between PAG, ADEQ, ADOT and PDEQ. The MOA was last updated in 2000.

The CAAA of 1990 require that the TIP conform to the SIP’s purpose of eliminating or reducing the severity and number of NAAQS violations and that it serves to achieve attainment of these standards. Additionally, the CAAA stipulate that TIP activities will not cause or contribute to any new NAAQS violations, increase the frequency or severity of any existing NAAQS violation, or delay timely attainment of any standard in an area.
In the TAPA, the federal standard for CO was attained in 1990. The TIP projects are not expected to contribute to any new violation of the CO NAAQS or delay any required emission reductions.

The PAG Regional Council and the U.S. Department of Transportation made a conformity determination for the Amended 2030 PAG RTP in 2006. It was found to be in conformity with the SIP following procedures outlined in the federal transportation conformity rule (40 CFR Part 93) and the State of Arizona conformity rule (R18-2-1401 et seq.). Under the CO LMP, regional emissions analysis for CO is not required in determining conformity of transportation plans and programs in the TAPA, but serves as a guide to the region for future air quality planning. Monitored CO levels continue to remain well below the EPA health standards and, as outlined in the CO LMP, transportation control measures continue to be implemented.

In summary, approval of this document by PAG’s Regional Council finds that the TIP and all projects contained within are in conformity with the applicable implementation plan, the Arizona SIP.
CHAPTER 7 - TRANSIT

SUN TRAN

Overview:
Sun Tran and its more than 622 employees are building on its reputation as the Tucson region’s award-winning public transportation provider.

With a fleet of 244 buses, Sun Tran provides fixed route transit service within the City of Tucson, and through intergovernmental agreements, delivers service into Pima County, the City of South Tucson, the Town of Marana, the Town of Oro Valley, the Tohono O’Odham Nation and the Pascua Yaqui Tribe. The system's 40 fixed routes cover a 296-square-mile area.

Through fiscal year 2008-09, ridership on Sun Tran continued to grow to a record-breaking 21.6 million passenger trips. Fiscal year 2009-10 has started an unfamiliar trend in transit, with a decrease of 6.5 percent for fiscal year-to-date through December 2009 versus the same period of the previous fiscal year. This decrease in ridership can be attributed to a fare increase in July 2009 implemented due to City of Tucson budget challenges, and a poor economy.

Figure 7-1: Sun Tran Passenger Trips FY03/04 to FY08/09 and estimated trips for FY09/10
For more than a decade, Sun Tran’s greatest challenge had been to fund service to meet the increasing demand for transit. Hopes of transit expansion became reality on May 16, 2006, when Pima County voters elected to enact a half-cent sales tax to fund transportation improvements. Through 2026, the Regional Transportation Authority Plan earmarks nearly $533 million for transit enhancements, including expanded hours of service, new service areas, greater weekday frequencies, more express service, and a fleet expansion to 280 buses.

Sun Tran implemented the first fixed-route improvements funded by the RTA in fall 2006, when buses were deployed on key routes to relieve a portion of the overcrowding. Between February 2007 and August 2008, Sun Tran launched later weeknight service on 21 routes, extending service to as late as midnight, and implemented expanded weekend service hours along 23 routes.

To provide a commuting alternative during the I-10 Widening Project, the Arizona Department of Transportation provided funding for Sun Tran to begin a new express route from Marana to downtown Tucson in May 2007. Originally identified as a project in the RTA Transit Element, ADOT’s resources enabled Sun Tran to accelerate implementation of the new service. Additionally, Sun Tran worked with the Town of Marana to secure a Park and Ride lot at Arizona Pavilions.

In 2009, RTA-funded fleet expansion enabled Sun Tran to launch three express routes serving Oro Valley and Rita Ranch into downtown, and from Oro Valley to the Aero Park area. Also in 2009, Route 27 extended to serve Casino del Sol, additional park and ride lots were established, Route 312X was extended and additional trips were provided on Routes 103X and 105X to better meet passenger needs. All of these route improvements were funded by the RTA.

In November 2009, construction was completed on the new Bus Storage and Maintenance facility designed to accommodate an additional 150 buses. The previous facility, also designed for 150 buses, maintained more than 200 buses and was inadequate for present and future operations as a stand alone facility. In early 2010, Sun Tran will begin construction on phase III of the new location, expanding the facility to include an administration building, bus storage for up to 250 buses and expansion of the maintenance building to accommodate the entire fleet.

In February 2010, RTA funding provided additional trips for two express routes. Route 110X serving Rita Ranch to Downtown Tucson has two additional morning and two afternoon trips added each weekday. Route 109X serving Catalina Highway to Downtown Tucson has one additional morning and one afternoon trip each weekday.

Remaining RTA transit improvements are to be phased in over a period of approximately 8 years, and include improved frequencies on several highly traveled routes, the extension of Route 8, and the establishment of a new route serving Houghton to Rita Ranch.
At times, the system struggles to meet demand. Some regular and express routes experience intermittent overcrowding during peak and off-peak hours. Some overcrowding issues should be addressed by the additional service frequencies scheduled to begin in 2012.

Environmental Commitment:

In March 2010, Sun Tran will place a hybrid electric bus into service, procured to further demonstrate a strong commitment to the importance of our environment.

Also, a significant achievement was reached in 2007 when Sun Tran converted its remaining diesel vehicles to use biodiesel fuel, creating an entire fleet of buses that run on cleaner-burning fuel technologies. Currently, 116 buses use B20 biodiesel, and 38 run on B5 biodiesel. Biodiesel, like compressed natural gas, emits significantly fewer particulates than traditional diesel-fueled vehicles. Another 89 buses are fueled by CNG.

This fleet conversion was an effort to expand on Sun Tran’s Environmental Management System (EMS). In 2005, Sun Tran’s maintenance facility became the first in the U.S. certified as compliant with the ISO 14001 standard for its Environmental Management System (EMS). The EMS developed by Sun Tran contains operational procedures that assure compliance with federal, state, and local environmental regulations, as well as facilitate environmental stewardship. Sun Tran’s EMS identifies four significant aspects of environmental management: storm water, waste water, hazardous waste and coolant. As part of the EMS program, Sun Tran now utilizes lead-free weights for balancing the wheels on the buses.

Focus on the Customer:

In order to ensure that all of the new transit services work together as efficiently as possible, and to facilitate ease of use by the customer, the RTA formed a working group in 2006 to discuss the best way to retain and attract riders to the growing regional system.

One of the goals of the Regional Transportation Authority was realized in January 2009 with the introduction of a regional seamless transit system. Components of the regional system are being phased in beginning with a newly branded look and family of names for all regional transit vehicles. The new look was introduced in conjunction with the delivery of 47 new Sun Tran buses, 37 of which are funded through the RTA, and 42 Sun Van paratransit vehicles.

The branding includes a commonly linked name for all the transit services beginning with the word “Sun” to tie it to the name associated with the largest transit system currently in operation, Sun Tran.

Consolidated customer information for the seamless system has been developed. Elements include a new Web site featuring trip planning, schedules, maps and fare information; and a single customer service center with one phone number. A transit schedule booklet that includes information for all the transit providers is planned for the future. To further enhance the ease of riding the regional system, the RTA Transit Working Group elected to have Sun Shuttle neighborhood circulator fares mirror Sun Tran’s.
New signage for bus stops and transit centers will be installed in the future to provide improved information about the integrated system, connection information and maps.

Customer service representatives utilize the Trapeze COM Module to log customer feedback. This module interfaces with the current Trapeze Scheduling/Operations/Management system for enhanced complaint and commendation tracking. With streamlined management of feedback, customers benefit by receiving improved response time in complaint resolution.

Advanced Technology:

Sun Tran is committed to utilizing technologies that boost customer satisfaction, improve efficiency and increase safety.

This year Sun Tran’s award-winning website featuring easy navigation, online trip-planning and complete accessibility for user with visual disabilities, has continued to evolve. In February 2009, Sun Tran launched a live bus tracking system to enable passengers to receive up-to-the-minute information about their bus. In July 2009, Sun Tran launched its online pass sales system, giving passengers a convenient option to purchase passes with a credit card online.

A new fare payment technology funded by the RTA will become available in 2011 with the introduction of a “smart card” that people may use on Sun Tran, Sun Express and neighborhood circulators. This will simplify the process of transferring from one transit vehicle to another, including the modern streetcar. The smart card will be tapped on a fare collection box, allowing for faster boarding, and deducts the appropriate fare every time it is used.

Sun Tran also utilizes high-visibility LED signs which display scheduled individual route departure times are installed at every bus bay in Sun Tran’s three transit centers. Airport-style plasma signage is mounted in information booths indicating departure times for all routes. Future plans include the introduction of on-street signage at key bus stops, relaying real-time bus arrivals for passengers.

Sun Tran’s entire fleet is equipped with Computer Aided Dispatching/Automatic Vehicle Locator systems (CAD/AVL). This technology facilitates management of transit operations, providing up-to-date information on vehicle locations and schedule adherence. Each bus contains an automated fare collection system, allowing Sun Tran to maximize passenger revenue and ensure accurate rider counts. Other software systems implemented by Sun Tran maximize efficiency by assisting with scheduling, maintenance, customer information, and operations functions.

Operator and passenger security is a priority for Sun Tran. All coaches contain digital video recorders, and each transit center is equipped with multiple cameras to monitor activity. CAD/AVL technology enables operators to trigger a silent alarm system, alerting dispatch if an emergency arises on board.
Enhanced Amenities:

Several amenities have been added in the past few years to attract riders to the system. Sun Tran boasts expanded service with new park and ride lots in Rita Ranch, Oro Valley and Casino del Sol, all designed to encourage more transit ridership from the outlying communities.

Installation of solar-powered advertising shelters and new bus benches began in 2003. Through a contract awarded by the City of Tucson, AdVision installs lighted shelters throughout the greater Tucson area. Over 450 new ad shelters will be installed at key stops, and dozens of City-owned shelters will be refurbished over the next five years.

In partnership with the University of Arizona, the UA Mall Transit Hub and the Sixth Street Garage were completed in 2003. In addition to providing shelter from the elements, the Cherry Avenue Transit Hub offers passengers restrooms, water fountains and vending machines. The Sixth Street garage was designed to create a seamless transportation system for students and staff. The structure promotes multi-modal transportation, accommodating stops for Sun Tran and UA's Cat Tran service.

Additionally, commuters can bike and ride on Sun Tran at no additional charge. Each coach is equipped with bike racks, and folding bicycles are accommodated on board. Rental bike lockers are available at a nominal charge at five of the Park & Ride lots and other select bus stop locations.

Keeping Community Ties:

Sun Tran is an integral and necessary part of the Tucson community. The organization continues its long-standing associations with businesses, social service organizations, schools, churches, and other governmental bodies.

Promoting the system through a variety of events continues to strengthen Sun Tran's image in the region.

Most notably, the name “Sun Tran” has become synonymous with “Stuff-The-Bus.” A highly visible community relations effort, these campaigns generate tremendous media exposure, foster partnerships, and enhance Sun Tran’s public image in the community. The numerous charity drives solicit donations for the community food bank, goods for homebound seniors and natural disaster victims, as well as unwrapped toys and clothing for the holiday season.

Each Sun Tran bus is a “Safe Place” for young Tucsonans who are in crisis and need immediate help. This program is made possible through a partnership with Open Inn, Arizona’s oldest non-profit provider for runaway and homeless youth.

The UA offers subsidized bus passes to students, faculty and staff through the U-Pass program. Sun Tran and the UA have encouraged use of alternate modes through a successful partnership that has lasted nearly two decades.
Through Sun Tran's commuter pass program, Get on Board, most governmental employers in Tucson offer reduced-cost bus passes as an employee benefit. A partnership with Pima Association of Governments (PAG) enables Sun Tran to offer Guaranteed RideHome, a program which provides a free taxi ride home to passengers if an emergency arises. In addition to Travel Reduction Program companies, Get on Board members are qualified to join the program and are eligible for up to four free taxi vouchers a year.

Sun Tran strives to build strong partnerships with the disabled community. All of Sun Tran's fleet is wheelchair accessible. The fleet's 115 low-floor buses eliminate the need for wheelchair lifts, using instead a ramp to facilitate the movement of persons with disabilities onto or off the bus. To enhance service for persons with visual disabilities, buses acquired since 1996 provide automatic interior and exterior announcements.

With ongoing outreach and education efforts, Sun Tran's long-term relationship with its passengers with disabilities has continued to develop. Free mobility training is offered through the Sun Tran Accessible Rider Training program (START). Designed to help individuals with disabilities and seniors, these training sessions assist persons with special needs to utilize fixed route services with greater ease and confidence. In addition, Sun Tran works closely with the Commission on Disability Issues (CODI) to further strengthen relationships with the disabled community.

SUN VAN

Overview:

With more than 239 employees and a fleet of 125 vans, Sun Van provides award-winning paratransit service to the Tucson Metropolitan area and portions of Pima County.

Sun Van meets the standards set by the Americans with Disabilities Act of 1990 by providing demand responsive public paratransit service for those individuals who, because of their disability, are unable to ride Sun Tran.

Sun Van's service area includes points within three-quarters of a mile along each Sun Tran fixed route, excluding express routes, during the days and times that Sun Tran operates.

Ridership Trends:

Sun Van's ridership has grown steadily over the past several years, demonstrating a 31 percent increase from FY 03-04 through FY 08-09. In FY 08-09, Sun Van provided 468,895 rides, a 4.1 percent increase over the previous year. The fare increase effective July 2009 has had little impact on Sun Van's ridership. Ridership is down 0.1 percent for fiscal year to date through December 2009.
Environmental Commitment:

In 2007, Sun Van converted its entire fleet of revenue vehicles to cleaner-burning biodiesel fuel.

Based on the successful implementation of Sun Tran’s EMS program, Sun Van initiated its own EMS program. In the spring of 2007, Sun Van received ISO 14001 certification for its program and earned excellent audit results, demonstrating compliance with the EMS and regulatory requirements, and continuous improvement in pollution prevention activities. Sun Van’s program identifies three significant aspects of environmental management; increased awareness and regulatory compliance; energy and pollution reduction, and continued improvements.

Advanced Technology:

Sun Van is widely recognized as the industry leader in paratransit technology. Like Sun Tran, Sun Van’s entire fleet is equipped with global positioning systems. Other software systems that maximize system efficiency include Trapeze, Transit Master and Crystal Reports.
Sun Van recently received recognition for a partnership with Trapeze Software Inc. Sun Van helped develop software that provides trip alternatives that fit within the ADA guidelines, and ensures complete and accurate measurement against the comparable fixed route system without added personnel time or cost to perform the comparison. Sun Van is viewed as a leader in the project, with other paratransit systems now utilizing this module as well.

Electronic Fare System:

In 2007, Sun Van collaborated with the City’s Transit Services Department to begin converting customers to a voucherless fare system. This process was completed in early 2008 and has resulted in fare collection of 100 percent and a 2.4 percent increase in revenues for fiscal year 2008-09 as compared to the same period the previous year.

SUN SHUTTLE

Overview:

Sun Shuttle launched neighborhood transit service in Marana, Oro Valley, Catalina, Sahuarita and Green Valley in May 2009 with funding provided by the Regional Transportation Authority. In November 2009, the RTA assumed operations of Pima County Rural Transit (PCRT) routes in San Xavier, Tucson Estates and Marana. Now part of the regional seamless transit system, Sun Shuttle can take passengers around their own community, or connect to Sun Tran services, providing an important link to the Tucson Metropolitan area from the rural and suburban communities.

To encourage regional use of the transit system, most Sun Tran pass products are accepted on Sun Shuttle routes. Effective November 2009, the RTA Transit Working Group agreed that Sun Shuttle fares would mirror City of Tucson’s transit fares for Sun Tran. This decision supports the vision of a seamless transit system by honoring a single fare structure throughout the region. When the conversion to smart card farebox technology occurs in 2011, Sun Shuttle will accept payment by smart card, further simplifying fare payments for customers.

The RTA is also operating the Ajo-Tucson connector and the Ajo/Why dial-a-ride services, formerly operated by PCRT. At this time these particular services are not operating under the Sun Shuttle brand.

Ridership:

From May to October 2009, ridership made a slight increase nearly every month. When the San Xavier and Tucson Estates service launched as part of the regional transit system, ridership jumped significantly by 126 percent from October to November, than another 13 percent from November to December.

The RTA is marketing the services to increase awareness and boost ridership. Schedules and routing are analyzed and adjusted to improve passenger convenience and productivity. Though some routes are performing to expectations, select routes in Marana, Oro Valley and Sahuarita may require major changes in 2010 due to low rider productivity.
Figure 7-3: Sun Shuttle Monthly Ridership May through December 2009

Sun Shuttle
May - December 2009
Total Monthly Passenger Trips

May: 1,959
June: 1,817
July: 1,968
August: 2,114
September: 2,413
October: 3,404
November: 7,681
December: 8,697
CHAPTER 8 - INTELLIGENT TRANSPORTATION SYSTEMS

Intelligent Transportation Systems (or ITS) use real-time, travel-related information to integrate all components of a traditional transportation system (roads, transit, traffic control devices, vehicles and drivers) into an interconnected network. Intelligent Transportation Systems use advanced technologies in electronics, information processing, and communications to gather, process and distribute information necessary to maintain and increase the efficiency and safety of the functioning system.

PAG, in coordination with the multi-jurisdictional Transportation Systems Subcommittee in 2004 adopted an ITS strategic plan for the greater Tucson metropolitan area. The new plan identified local ITS transportation options for ITS issues such as necessary communications infrastructure, transit, ITS data and traveler information, costs and fiscal considerations, intermodal applications, freeway management, and incident and emergency management related to transportation. The plan serves as a “roadmap” for implementation of ITS projects and programs in the PAG region for the next 30 years. The plan identifies a five-year capital ITS program along with identification of ITS related projects and programs recommended for medium (2011 -15) and long (2010-2040) range time periods.

Projects and programs identified within the ITS plan are reviewed regularly to assure that the appropriate steps are taken to secure funding and align resources for project implementation. This approach aims at mainstreaming ITS projects into traditional transportation planning and programming processes, including both the 5-year TIP and the long-range Regional Transportation Plan (RTP). Integration of ITS into the transportation planning and programming processes also provides better identification of more cost efficient programming and operation of ITS related projects by incorporating ITS features into major projects as opposed to having these elements installed as sole and separate projects. Additional ITS programs and applied research studies are also evolving from the ITS plan. The ITS plan relies heavily on the establishment of a Regional ITS System Architecture which identifies in-place, programmed and planned ITS projects and programs along with their integration and operation. This system architecture provides an accurate record of the region’s ITS program while allowing for expansion and maintaining consistency with the National ITS Program.

ITS TRAFFIC SIGNAL SYSTEMS

On behalf of the region, the City of Tucson currently monitors and controls over 500 traffic signals from the City of Tucson Transportation Control Center. The City of Tucson, Arizona Department of Transportation, Pima County, Marana, Oro Valley, Sahuarita, the City of South Tucson, the Pascua Yaqui Tribe and the Tohono O’odham Nation are in partnership to provide a "seamless" traffic signal operation across jurisdictional boundaries. This has resulted in the interconnection of traffic signals, in
and adjacent to the City of Tucson, into a centrally coordinated operation. This system has been expanded to encompass all the traffic signals in the Greater Tucson Metropolitan Area, making Tucson one of the few, if not only, metropolitan areas of its size with 100 percent of its signals controlled from a single center. Real-time monitoring of traffic as well as emergency response is being enhanced by the introduction of video detection cameras at pre-determined intersections on major arterials. In a multi-jurisdictional coordinated effort, the region’s signals use multiple signal timing patterns in order to maximize the efficiency of the network as a whole. This type of signal coordination being implemented in the Tucson area is providing for improved traffic flow. Such improvements tend to be most effective in locally congested areas, where progressive flows can reduce stops and signal delay.

The PAG member agencies have established a regional traffic signal program to enhance equipment purchase of necessary signal equipment and to provide evaluation and adjustments of the region’s traffic signal operations on a regular basis. Continuous improvement to equipment and performance of traffic signals will improve the ability of the transportation network to move traffic efficiently. In addition to this, the region is working cooperatively with the University of Arizona ATLAS Research Center to refine and test real-time traffic adaptive signal algorithms on the local road network. The algorithms respond to current traffic conditions and patterns by constantly readjusting signal timings according to traffic volumes, speeds and directions using detection equipment installed by the City of Tucson. Investment in traffic signal operations yields benefit cost ratios of 40:1 and higher and can effectively address motorists’ day-to-day traffic issues (Benefits of Retiming Traffic Signals: An ITE Informational Report. Washington, DC: Institute of Transportation Engineers (ITE), 2005). Better traffic signal operations

- reduces congestion and delays;
- reduces emissions; and
- reduces fuel consumption.

Improved signal operations can be completed for lower costs and in shorter time frames than most other capital-intensive transportation improvement options.

| Table 8-1: Summary of Traffic Signal System Benefits |
|---------------------------------|--------------------------|
| **Travel time** | Decrease 7% - 25% |
| **Travel speed** | Increase 14% - 22% |
| **Vehicle stops** | Decrease 11 - 41% |
| **Delay** | Decrease 17% - 37% |
| **Fuel consumption** | Decrease 6% - 12% |
| **Emissions** | Decrease CO emissions 5% - 13% |
|                | Decrease HC emissions 4% - 10% |

Source: Intelligent Transportation Systems Benefits, USDOT
ITS FREEWAY MANAGEMENT SYSTEMS

ITS Freeway Management System in the Tucson metro area uses 13 CCTV cameras with the ability to tilt, zoom and pan 359 degrees for use in monitoring traffic flow and detecting incidents. The cameras have been strategically placed along the mainline so that they can be used to observe traffic on the approaching arterials as well as Interstates 10 and 19. Eight Variable Message Signs (VMS) are also used to provide real-time information for drivers. The FMS components are serving as important tools to help manage the work zone for the Interstate 10 – Prince Rd. to 29th Street construction project. ADOT has recognized the importance of active corridor management and has installed a Traffic Operations Center (ITOC) to serve as the primary freeway operations headquarters during the Interstate 10 reconstruction. This TOC actively monitors and operates FMS cameras and message boards. The ADOT TOC coordinates closely with a number of other centers throughout the region including the City of Tucson Transportation Control Center (TTCC), the TOC in Phoenix, the City of Tucson 911 Center, the State Department of Public Safety and the ADOT Maintenance Facility. These centers are essential to maintaining efficient response and clearance times of incidents along the mainline. To enhance this service during I-10 construction, ADOT has established a tow truck service patrol to assist motorists and clearance activities during construction of the I-10 corridor.

Table 8-2: Summary of Freeway Management System Benefits

<p>| | |</p>
<table>
<thead>
<tr>
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<tbody>
<tr>
<td>Travel time</td>
<td>Decrease 20% - 48%</td>
</tr>
<tr>
<td>Travel speed</td>
<td>Increase 16% - 62%</td>
</tr>
<tr>
<td>Freeway capacity</td>
<td>Increase 17% - 25%</td>
</tr>
<tr>
<td>Accident rate</td>
<td>Decrease 15% - 50%</td>
</tr>
<tr>
<td>Fuel consumption</td>
<td>Decrease fuel used in congestion 41%</td>
</tr>
<tr>
<td>Emissions (Detroit study)</td>
<td>Decrease CO emissions 122,000 tons annually</td>
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<tr>
<td></td>
<td>Decrease HC emissions 1,400 tons annually</td>
</tr>
<tr>
<td></td>
<td>Decrease NOx emissions 1,200 tons annually</td>
</tr>
</tbody>
</table>

Source: Intelligent Transportation Systems Benefits, USDOT

ITS TRANSIT AND TRAVELER INFORMATION SYSTEMS

Similar positive effects on metropolitan area transportation network efficiency and safety have been experienced in the areas of ITS-related transit improvements and traveler information, which are both being implemented in the Tucson region. It is expected that the ITS projects relating to these two topics will result in benefits to the efficiency and operation of the transportation network by offering alternative travel routes and mode options more conveniently to the traveling public.
Delays at traffic signals can represent a significant proportion of transit travel time. However, with advanced ITS technology, buses can receive priority clearance at select intersections in order to decrease bus travel times and delay, ease passenger loading and unloading, and improve safety. The City of Tucson and Sun Tran are currently implementing a transit priority program in conjunction with regular traffic signal operations. European experience with transit priority control systems reveals average reductions in signal delay of 10 seconds per intersection, with a potential reduction in delays ranging from 40 percent to 80 percent. England and France have experienced reductions in transit travel times of 6 percent to 42 percent (FHWA-OP-99-012 ITS Benefits: 1999 Update, 28 May 1999).

The region provides the latest traveler information to residents and travelers through commercial radio, television and the Internet via the www.Transview.org Web site. In 1998 the City of Tucson established a partnership with METRO Networks-Tucson, a private traveler information provider, to implement a regional ITS Traveler Information System program. METRO Networks-Tucson provides funding for the operation and upgrading of the region’s transportation control center, flight time for staff to monitor roadway conditions, broadcasting of peak-hour transportation announcements, and a potential revenue stream for the city to use on related ITS projects.

Arizona’s newly established 511 phone-based travel information system is providing benefits to the traveling public by making accessible and current information on system conditions and transit information readily available to the public. This system has been launched throughout Arizona and is being expanded to include more information about local roadway conditions.