Performance Audit of

The Arizona Department of Transportation

A Review of the Oversight and Management of the Maricopa County Regional Freeway System

June 2005

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OFFICE OF THE
AUDITOR GENERAL

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AUDITOR GENERAL

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DEPUTY AUDITOR GENERAL

June 30, 2005

The Honorable Ken Bennett, President
Arizona State Senate

The Honorable Jim Weiers, Speaker
Arizona House of Representatives

Members of the Arizona Legislature

The Honorable Janet Napolitano, Governor

Mr. Victor Mendez, Director
Arizona Department of Transportation

Transmitted herewith is a report of the Auditor General, A Performance Audit of the Oversight and Management of the Maricopa County Regional Freeway System. This audit was conducted by the consulting firm Sjoberg Evashenk Consulting under contract with the Auditor General and was in response to the requirements of A.R.S. §41-1279.03.

Responses to the audit from the Department of Transportation, Maricopa County Association of Governments, and the State Transportation Board can be found at the end of the audit report. As outlined in their responses, the parties agree with all of the findings and plan to implement all of the recommendations addressed to them.

My staff and I will be pleased to discuss or clarify items in the report.

This report will be released to the public on July 1, 2005.

Sincerely,

Debbie Davenport
Auditor General

Enclosure

cc: Maricopa Association of Governments
State Transportation Board

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June 24, 2005

Ms. Debra Davenport
Auditor General
Arizona Office of Auditor General
2910 N. 44th Street, Suite 410
Phoenix, Arizona 85018-7243

Dear Ms. Davenport:

Sjoberg Evashenk Consulting is pleased to submit our final report for the *Performance Audit of the Arizona Department of Transportation: A Review of the Oversight and Management of the Maricopa County Regional Freeway System*. This report assesses the Arizona Department of Transportation's (ADOT) management over the planning and construction of the Regional Freeway System and addresses issues raised by interested parties and answers questions mandated by Arizona statutes.

Our review concludes that past performance indicates that ADOT will likely complete the remaining Regional Freeway System projects by the end of 2007, the statutorily mandated deadline. Specifically, since 2000, ADOT has demonstrated the ability to meet targeted completion dates for various phases of highway construction, and has delivered these projects within a reasonable deviation from their budgets. However, we did find that the collaborative oversight of the Regional Freeway System by ADOT, the State Transportation Board, and the Maricopa Association of Governments should be broadened to include tracking more historically-based performance and budget measures, and in fact, project data are now being captured that can be employed for such reviews. Moreover, we recommend that these advances be transitioned to Proposition 400 projects as ADOT, the State Transportation Board and the Maricopa Association of Governments begin to implement this measure.

We appreciate the opportunity to have served the Office of the Auditor General and it has been our pleasure to work with you. We also appreciate the cooperation we received from all those who assisted us throughout our review including ADOT, the State Transportation Board, the Maricopa Association of Governments, and your staff.

Respectfully Submitted,

Kurt R. Sjoberg
Chairman

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Executive Summary

In 1985, Maricopa County voters approved a sales tax initiative that authorized the Arizona Department of Transportation (ADOT) to embark on a 20-year program to build a comprehensive network of regional freeways in the Phoenix metropolitan area. After several earlier plans to manage and deliver the proposed network produced less than hoped for results, in 1999 the Governor, State Legislature, ADOT, the Maricopa Association of Governments, and the State Transportation Board worked together to develop the "2007 Accelerated Program" which revised the scope, funding streams and timeline of the proposed network. In 2000, the Accelerated Program was implemented, with plans to complete the network by the end of 2007.

In 1992, additional legislation also set into place a requirement for regular performance audits of the Maricopa County Regional Freeway System (RFS). This report addresses the findings of the fourth and final audit of the RFS program conceived and funded in 1985[1]. The Office of the Auditor General contracted with Sjoberg Evashenk Consulting, Inc., to fulfill this requirement in 2005. The objective of the 2005 audit is to assess ADOT's management performance of the RFS, review specific areas of concern identified by interested parties, address statutorily mandated questions, and recommend ways to improve ADOT's efficiency and effectiveness in fulfilling its overall program responsibilities through the life of the existing transportation excise tax.

ADOT's historical performance indicates that ADOT is likely to complete the remaining Accelerated Program projects by 2007.

As of January 2005, the Accelerated Program was approximately 78 percent complete. ADOT's performance at managing the funding, design, engineering, right-of-way acquisition and construction of the network, or the Maricopa Regional Freeway System (RFS) since 2000 through January 2005, indicates that the department will most likely complete the remaining 22 percent by the close of calendar year 2007. Specifically, we found:

- ADOT's performance since 2000 supports the likelihood of completing the Accelerated Program on schedule
  Since implementation of the Accelerated Program in 2000, ADOT has generally demonstrated the ability to meet targeted completion dates for various phases of highway construction, and within a reasonable deviation from budget.

[1] Subsequent sales tax initiatives and the RFS programming that they enable are subject to separate audit requirements.

- Available funding appears sufficient to meet the remaining construction needs
  As of January 2005, the total projected costs remaining for the program comprise only 93 percent of the total remaining funding.

- ADOT's project management procedures and processes, while they could be better documented, are sound and functioning well
  RFS design and construction is accomplished through a project management structure which ensures a "cradle-to-grave" approach, enabling each phase of highway design and development to inform every other appropriately, and in accordance with best practices within the transportation industry. Further, the department's controls for budget and timeline changes are appropriate, though documentation of key project developments could be improved.

- A more absolute conclusion on the likelihood of completion is impossible
  Since unpredictable delays and cost overruns are not atypical of large-scale construction projects, we cannot conclude unequivocally that the RFS will be completed on time. Further, the Accelerated Program may face some tight timelines as it nears completion with significant staffing vacancy issues.

ADOT's, MAG's, and STB's efforts at analyzing the RFS program should be broadened.

Oversight of the RFS is provided collaboratively by the State Transportation Board (STB), Maricopa Association of Governments (MAG), and ADOT[2]. Collectively, these organizations share (1) an explicit responsibility to deliver the Accelerated Program on time and within the available funding, and (2) an implicit responsibility to assure the RFS's cost-efficiency and effectiveness. This audit recognizes the success of ADOT, MAG and STB in serving the first responsibility of bringing the RFS near completion on-time and on-budget. Keeping this success in mind, we also identified several opportunities to help meet ADOT's goal of "excellence and continuous improvement" in achieving cost-efficiency and effectiveness. Specifically, we believe:

- Oversight processes should include historical review of projects' progress when evaluating budgetary or timeline revisions
  The types of information presented in support of proposed project and program changes to the Accelerated Program lack historical context—some of which is not available for projects initiated in the 1980s or early 1990s. However, even for projects initiated since the establishment of the Accelerated Program, decisions to approve proposed changes are made based upon the support for the current

[2] The Citizens Transportation Oversight Committee also has review and advisory responsibilities for oversight of the RFS, though it does not have any authority to approve or disapprove ADOT plans or proposals.

proposal without reference to original budgets and estimated completion dates, or any other incremental changes previously approved to the original budgets and estimated completion dates. Only the most recently approved budget and completion estimates are compared to the newly proposed changes. As a result, the RFS oversight and management agencies may be missing useful evaluative information regarding opportunities to improve RFS estimating processes, initial considerations in design, and other processes with the potential to positively affect cost-efficiency and effectiveness. Taking the opportunity to hold the program to account for, expecting explanations of, and conducting analysis of historical incremental and cumulative budget and timeline deviations would create opportunities to learn how to improve delivery of the RFS projects.

- Program and project data, currently residing in decentralized systems, should be consolidated
  When the RFS was initiated in the 1980s and into the early 1990's, ADOT's information technology systems did not capture early project budgets and estimated timelines in a manner to make them available for analytical purposes now. Since the mid-1990s, however, ADOT has collected most of the types of data necessary for the historical review of changes in budget, scope and timeline that would make a historical review of the cost-efficiency and effectiveness of many of the more recently-initiated Accelerated Program projects possible. Unfortunately, at this point, various pieces of the overall picture for both individual projects and the program overall reside in decentralized databases and require manual manipulation and analysis to study. It will be necessary to consolidate Accelerated Program and project data to ease the staff analysis and preparation of such historical review for both oversight and managerial purposes.

New phase of RFS development and construction offers opportunities to apply lessons from the Accelerated Program

In November 2004, Maricopa County taxpayers passed Proposition 400, which extends Maricopa County's transportation excise tax for another 20 years beginning in 2006 and initiates a new phase of RFS development and construction, including new highway corridors, High-Occupancy Vehicle lanes, other lane expansions, and new traffic interchanges.[3] ADOT, MAG and the STB should bring forward the successful practices and policies developed during the Accelerated Program and take the opportunity to apply lessons learned about ways to further improve RFS management and oversight presented in this report.

[3] Proposition 400 also includes proposals for new non-RFS initiatives outside of ADOT management, including an ambitious arterial and streets development and improvement program, and new light rail development.

Conclusions and Recommendations

Overall, the conclusions drawn from this audit are largely positive. The recommendations primarily focus on opportunities for improvement in support of the strategic values of "excellence and continuous improvement." Further, they are made with the expectation that their implementation offers benefit not only to the Accelerated Program completion, but to implementation of Proposition 400 initiatives.

Recommendations for ADOT:

1. Continue to improve and implement successful project management practices.
2. Develop and implement a memorialization and retention policy for documentation of approved project changes and key project decisions, including project file checklists.
3. Develop a single database, or a system of coordinated databases, which is capable of generating reports that track, present, and explain individual projects' and the overall program's history.

Recommendations for ADOT, MAG and STB:

4. Require comparisons of historical budgets and estimated completion dates when evaluating newly proposed changes as well as other useful evaluative data.
5. Define key performance indicators for the RFS program that will help ADOT, MAG and STB recognize trends of performance.
6. Require separate tracking, monitoring, and reporting on the completion of the Accelerated Program from new initiatives resulting from the passage of Proposition 400.

CHAPTER 1

Introduction and Background

Maricopa County Regional Freeway System (RFS) and the Accelerated Program Life-Cycle

In October 1985, Maricopa County voters approved a 20-year, one-half cent sales tax increase to fund a plan for developing approximately 230 miles of freeways and expressways for metropolitan Phoenix — or, the Maricopa County Regional Freeway System (RFS). However, in 1991, the revenue generated from the sales tax increase appeared to be insufficient to complete the plan within the original 20-year time-period, only 16 miles of the system had been completed in six years, and costs were escalating. The Arizona Auditor General contracted a performance audit of the RFS and the resulting report made numerous recommendations to improve the Arizona Department of Transportation's (ADOT) effectiveness in fulfilling its regional freeway program responsibilities. Nonetheless, RFS progress continued to falter. In 1995, the governor altered the original plan to reduce the scope of the overall program. In 1996, after the Governor's Plan was adopted, MAG and ADOT jointly developed a plan that incorporated additional funding and moved the RFS completion date to 2014. The new program, as approved by the MAG Regional Council, extended the HURF allocation to RFS and the allocation of additional MAG Federal funds to the RFS. Additionally, the new plan scaled back the RFS system by 37 percent from 230 miles to 144 miles of freeway. Other reductions included the elimination of certain highway lighting and landscaping projects.

The 2007 Accelerated Program Life-Cycle

By 1999, the RFS was turning around—58 miles of the RFS had been completed. A cooperative effort among ADOT, the Maricopa Association of Governments (MAG), the governor, the legislature, and the business community reenergized the plan. Specifically, they adopted the Accelerated Program—a new plan to speed RFS completion by seven years from the expected finish in 2014 up to 2007, made possible by innovative financing, earlier availability of funds, and increased highways monies. Figure 1, "Accelerated Program, January 2000 Life Cycle Certification" displays a map of the planned corridors and projects for the Accelerated Program as of January 2000. (Sections and projects due to begin construction or yet to complete construction are indicated by leading lines or brackets and a ratio such that the numerator indicates the estimated year of completion and the denominator indicates the anticipated costs in millions.)

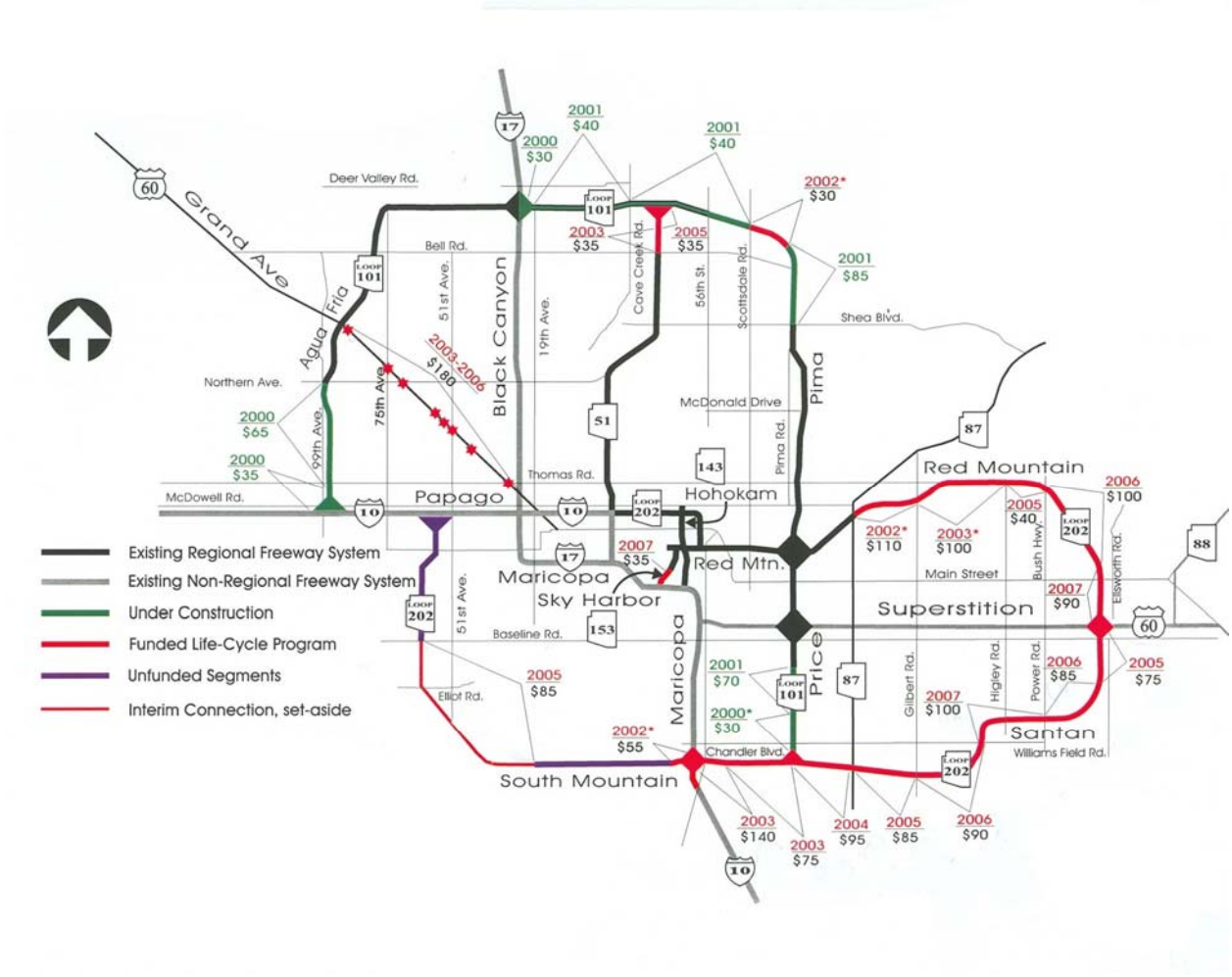

Figure 1. Accelerated Program, January 2000 Life Cycle Certification
Source: Arizona Department of Transportation, January 2000

Typically, Arizona's highway construction is planned, developed and implemented in accordance with a long-range transportation plan that is updated every five years. To help ADOT and MAG maintain a realistic plan for the Accelerated Program's construction schedule, predicated upon available funding, it was programmed on a "Life-Cycle" basis. In the case of the RFS, the "Life-Cycle Program" concept refers to a programming approach that includes the usual five-year programming period and also recognizes the need to forecast and allocate funds through the full life of major funding sources. As a result, the Accelerated Program Life Cycle was defined to cover the full period of the Proposition 300 one-half cent tax extending through fiscal year 2006, construction concluding by the end of 2007. Specifically, the projects of the Accelerated Program are tracked through 2007 in accordance with the plan specified in 2000, and the funds necessary to ensure completion are forecasted and allocated accordingly. In addition, the semi-annual recertification of the Accelerated Program and its progress, in accordance with its Life Cycle, enables periodic reports to the public on the Accelerated Program's progress.

Accelerated Program Funding

Since January 2000 through December 2004, the Accelerated Program averaged $639 million a year in new revenues, or approximately $3.2 billion for the entire period. Although Accelerated Program projects are funded by a variety of sources, approximately 74 percent of the funding comes from the Maricopa County transportation excise tax (RARF), the Highway Users Revenue Fund (HURF), and the proceeds from innovative bonds made possible by the dedicated RARF and HURF funding. Additional funding measures such as the State Infrastructure Bank loans (HELP) and Grant Anticipation Notes (GANs) comprise approximately 14 percent of available monies. This is displayed in Figure 2, "Accelerated Program Funding Sources." More detailed descriptions of each of the funding sources follow.

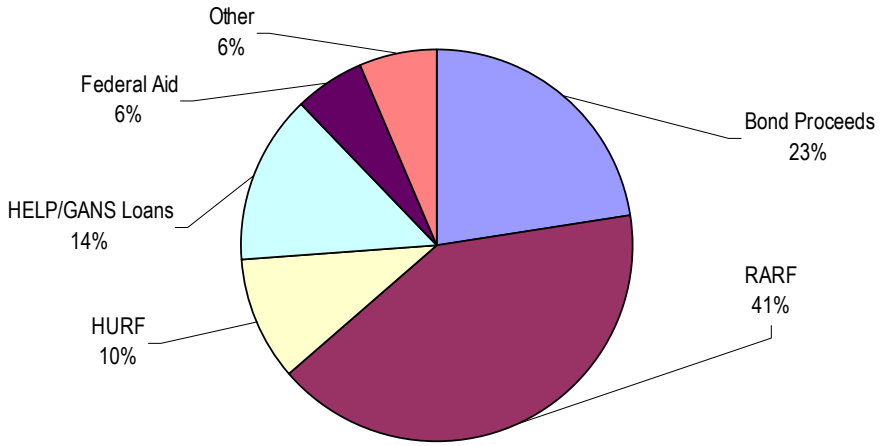

Figure 2. Accelerated Program Funding Sources 2000-2004
Source: Arizona Department of Transportation, January 2005

The Maricopa County Transportation Excise Tax/Regional Area Road Fund (RARF) – The one-half cent sales tax approved by the Maricopa County residents in 1985, specifically for building the Regional Freeway System, flows into the Regional Area Road Fund (RARF). This excise tax would have ended on December 31, 2005, except for a recently passed extension through December 31, 2025. Over the past five years, RARF revenues have averaged approximately $263 million a year.

The Highway Users Revenue Fund (HURF) – Under provisions of Arizona Revised Statutes Title 28, Sections 6538 and 6540 and State Transportation Policy, Maricopa County receives a portion of state revenues generated from motor fuel taxes and vehicle registration fees for the construction of controlled access freeways in the county. In addition, the State Transportation Board may allocate portions of the State HURF funds for the Regional Freeway System. Over the past five years, the Accelerated Program's

portion of HURF (and State HURF) revenues has averaged approximately $65 million a year.

Bond Proceeds – The State Transportation Board (STB) has the authority to issue bonds backed by a pledge of transportation excise tax revenues or highway user revenues. Because legislation stipulates how much can be outstanding at any one time, ADOT determines if outstanding bonds are within the legal limits and if new bonds can be issued. STB issues bonds as needed to complete the Regional Freeway System. Between January 2000 and December 2004, bond proceeds averaged approximately $144 million a year.

Highway Expansion and Extension Loan Program (HELP) — Authorized by Congress in 1995, State Infrastructure Banks (SIB) operate much like private banks by providing financial assistance in the form of loans or credit enhancement for transportation projects. Arizona's SIB, the HELP fund, was established in 1998. In 1999, Senate Bill 1201 set total HELP funding at approximately $370 million. STB is also authorized to provide loans from the HELP fund. Since 2000, the Accelerated Program has averaged approximately $44 million a year in HELP loan funding.

Grant Anticipation Notes (GANs) — STB also has the authority to issue GANs which are notes backed by a pledge of future federal funds. This allows the state to use federal funds earlier and in advance of when they are actually earned, and thus allowing the state to start projects sooner. This practice of spending money not yet earned through the use of the GANs is both permissible and encouraged by Federal Highway Administration. During the past five years, the Accelerated Program has averaged approximately $44 million a year in GANs funding.

Federal Funds — Both ADOT and MAG receive direct federal assistance monies. ADOT federal aid includes Surface Transportation Projects, or STP, funding which ADOT assigns directly to eligible projects. MAG receives federal aid including STP funds but Congestion Mitigation of Air Quality funds as well and can allot up to 70 percent of its federal funding to ADOT transportation projects. Since 2000, the federal funding of the program has averaged approximately $37 million a year.

Other Income — A portion of the Regional Freeway System is also funded by miscellaneous income such as interest income, third party billing, and proceeds from disposition of excess right of way. Third party billing refers to payments from other entities for various activities of a project like cities' funds to add enhancements to a specific project. Other income averaged approximately $41 million a year between January 2000 and December 2004.

The Future of the RFS — the Proposition 400 Excise Tax Extension

In November 2004, Maricopa County voters passed Proposition 400, a 20-year extension of the transportation excise tax to take effect in January 2006. The extension enables significant new transportation planning in Maricopa County, including 344 miles of new or improved RFS highway and freeway corridors. Specifically, of the $8.5 billion in excise tax revenues expected to be generated by the Proposition, $4.4 billion is earmarked for RFS highway construction and another $354 million for minor RFS maintenance projects. In combination with HURF and federal funds, the tax extension enables new plans for the RFS including additional lanes on most existing corridors, the creation of new freeways, new or improved traffic interchanges, new carpool (HOV) lanes, Grand Avenue improvements, application of rubberized asphalt throughout the system, and a comprehensive computerized freeway management system.

Proposition 400 also includes proposals for new non-RFS initiatives outside of ADOT management, including arterial and streets development and improvement program, a substantially expanded regional bus system and new light rail development.

RFS Program Management and Oversight

Building the Roads: RFS Program and Project Management

ADOT is statutorily required to manage the RFS construction. Within ADOT, the Intermodal Transportation Division (ITD) is responsible for the majority of project development statewide, including all engineering, construction, and administrative functions required to advance a project from conception through design and construction, and finally, into the operation and maintenance of the project. The entire development process generally comprises four distinct phases—project scoping, design and pre-construction activities, construction, and operation and maintenance. Collectively, these phases are known as the project life cycle.

Responsibility for RFS program and project management specifically is shared between several sub-divisions within ITD's Valley Transportation Division, and the Right of Way Group of the ADOT Development Division. The ADOT deputy state engineer, Phoenix District Construction, Valley Project Management and the head of the Right of Way sub-division coordinate their efforts in management and oversight of the RFS projects.

Generally, this coordination is accomplished through a single point project management approach where an assigned project manager from the Valley Project Management Group has responsibility for managing the budget and timeline and coordinating the collaboration of specialty expertise, including external consultants, in the project design and development process. The project manager hands off more authority for the project at the point of construction to an assigned resident engineer from the Phoenix District

Construction Group, though the project manager still remains involved. During the construction phase, external contractors perform the work of building highways and freeways, under construction contracts supervised by the resident engineer with some collaborative input from the project manager. Once a freeway project opens to the public, ADOT staff from the Phoenix Maintenance District monitor operation of the project, identify areas where adjustments are warranted and communicate these to the design and construction staff.

In 1995, ADOT also hired an external general consultant for all Regional Freeway System projects who is involved in the daily issues of project design or construction and provides post design services. The general consultant prepares general plans for regional freeway projects, participates in progress meetings with ADOT, updates project schedules and cost estimates, generates monthly reports, and reviews and revises costs using recent bid prices. ADOT also frequently contracts with other external consultants and contractors to provide professional services for more detailed designs, environmental studies, or other project tasks.

Deciding How and Which Roads to Build: RFS Oversight

Project and program management oversight is necessary to monitor the progress of the Accelerated Program and ensure that it is on time for completion by 2007 within the available funding. Oversight starts internally, at a project management level. The coordination of efforts between ADOT divisions as discussed above is crucial to the success of project delivery under this structure. ADOT holds numerous weekly and monthly project management meetings between the parties involved in the current project phase to provide this basic level of oversight. For example, the deputy state engineer holds weekly staff meetings to discuss project status, address issues at hand and discuss possible solutions. In addition, designated project managers hold semi-monthly project status meetings.

However, higher level oversight functions are also necessary, and are performed both within ADOT and externally, in a multi-stage process, specifically involving the Project Review Board (PRB), the Priority Planning Advisory Committee (PPAC), and two outside entities, the State Transportation Board (STB) and Maricopa Association of Governments (MAG).

Project Review Board (PRB) **—** ADOT provides additional internal oversight through the PRB, which guides and monitors project progress from the beginning to the end to ensure that the project managers are making appropriate decisions as to the overall project delivery. The PRB consists of the deputy state engineer, district operations group managers, and Statewide Project Management Section managers. The PRB serves as a mentoring body for project managers and provides assistance to the deputy state engineer in planning and staffing the highway division program.

***Priority Planning Advisory Committee (PPAC*)** — Providing a higher level of oversight, and still mostly internal, PPAC consists of the ADOT finance director, state engineer, three deputy state engineers, ADOT planning director, ADOT motor vehicle division director, ADOT aeronautics director, and chair of the Citizens Transportation Oversight Committee[4] (who is a non-voting member). PPAC reviews and approves all proposed changes to the Accelerated Program prior to any external review and approval.

State Transportation Board (STB) — STB has statutory authority over the state highway system. It is comprised of a seven-member board appointed by the governor and represents six geographical regions throughout the state, each member serving a six-year term (two members represent Maricopa County). The board sets priorities over the highway system, approves the Five-Year Highway Construction Program for statewide projects, reviews and provides final approval for all PPAC approved project or program budget and time changes, and is responsible for final approval of all RFS projects that have been prioritized and funded by MAG. Additionally, the board has authority to issue bonds that can be used to accelerate the completion of transportation projects.

Maricopa Association of Governments (MAG) — MAG is the regional planning agency for Maricopa County and serves as its metropolitan planning organization. MAG's decision-making body—known as the Regional Council—includes elected representatives from 25 incorporated cities and towns within Maricopa County and the contiguous urbanized area, the Gila River Indian Community, the Salt River Pima Maricopa Indian Community, Fort McDowell Yavapai Nation, and Maricopa County as well as ADOT (represented by the Maricopa County members of STB) and the Chair of the Citizens Transportation Oversight Committee (CTOC) in ex-officio capacities.

MAG's Transportation Policy Committee—consisting of MAG members, community business representatives, and representatives from transit and freight entities, CTOC and ADOT—collaborates to develop the Regional Transportation Plan (RTP) for the Regional Council's approval. The RTP is a long-range 20 year planning document. Under state statute, MAG prioritizes transportation projects based on qualitative criteria such as congestion relief, travel demand, and cost effectiveness. The Committee also prepares a Five-Year Transportation Improvement Plan (TIP) for the Regional Council's approval which identifies individual transportation projects and their sources of funding. The TIP and RTP define ADOT's responsibilities for RFS construction, to the extent they are approved by STB.

[4] State law provides for the establishment of a Citizens Transportation Oversight Committee (CTOC) in Maricopa County and charges the seven-member committee with advisory responsibilities in the oversight of the RFS including consulting with the Arizona Auditor General to define the scope of each performance audit. CTOC does not have, however, review or approval authorities.

Additionally, in 1991 MAG established a material change policy for any changes made by ADOT to the RFS Program. According to this policy, MAG approval is required for all changes to RFS project budgets or schedules that would cause:

- An increase in the cost of a project that is more than five percent of the adopted project budget, but not less than $500,000, or any increase greater than $2.5 million; or
- A time delay of more than three months; or that prevents construction of a freeway segment by one year beyond the dates on the Certified Regional Freeway map; or, that delays the start of the project into another fiscal year (compared to the most recent Life Cycle Report and the Long Range plan (RTP).

Such material changes are forwarded by ADOT to the MAG Transportation Policy Committee and the MAG Management Committee. Final approval must be granted by the MAG Regional Council.

Audit Scope and Methodology

Arizona Statutes, Title 41, Section 1279.03 requires the Arizona Auditor General to conduct periodic performance audits in counties that have a transportation excise tax in effect. This is the fourth audit related to the Maricopa County transportation excise tax authorized under Proposition 300 in 1985. The Office of the Auditor General contracted with Sjoberg Evashenk Consulting, Inc, to fulfill this requirement. The objectives of the audit were to: (1) assess ADOT's management performance of the Maricopa County Regional Freeway System and recommend ways to improve ADOT's efficiency and effectiveness in fulfilling its overall responsibilities; (2) review and address statutorily mandated issues; and (3) review and address other areas of interest, as identified by stakeholders.

We reviewed federal and state laws and regulations related to transportation, right-of-way acquisition, financing, and organizational responsibilities. Additionally, we researched studies conducted by ADOT, others in Arizona, and entities at the federal level on topics such as the industry's best practices, alternative transportation, traffic volume and modeling, and project management.

To understand how ADOT and other key players in Maricopa County's transportation network operated, we conducted individual interviews and attended meetings with a cross-section of relevant parties and interested persons including ADOT, MAG, Regional Public Transportation Authority/Valley Metro, Citizen's Transportation Oversight Committee, and ADOT's general consultant. We met with the key managers and decision-makers involved in the highway projects.

To establish whether ADOT's management over the Regional Freeway System was efficient and effective, we analyzed a variety of documents including monthly project status and update reports, Life Cycle Certification Reports, and project summary reports. Additionally, we interviewed key ADOT officials and their staff to identify the tools and techniques used to manage the progress of the Regional Freeway System and demonstrate accountability to stakeholders. We attempted to compare baseline time milestones and cost estimates against completed dates and actual cost data both for the Accelerated Program overall, and for specific projects. Through interviews and review of monthly performance reports, we assessed the appropriateness and usefulness of ADOT's performance measures used to manage the freeway system. Furthermore, we sub-contracted with Quincy Engineering, a Transportation Engineering expert, to review and assess ADOT's practices in areas such as project management, cost estimating, and right-of-way acquisition.

With the assistance of our Transportation Engineering Consultant, we also attempted to ascertain if ADOT would meet the Accelerated Plan's 2007 completion timeline. To predict ADOT's ability to meet this schedule, we evaluated ADOT's past performance in meeting internal timelines and critical milestones. Specifically, we selected a sample of 14 projects to evaluate development and construction budgeting and timeline performance, and a sample of 20 parcels for which ADOT acquired right-of-way to evaluate timeliness and cost controls (in addition to general compliance with state and federal statutes and regulations). With our Transportation Engineering Consultant, we also reviewed two projects in-depth, from the planning phases through the completion of construction, in order to observe the project development process as well as the adequacy of costs controls and documentation.

To assess ADOT's revenue and expenditure practices and its forecast models, we reviewed audited financial statements, Life Cycle Certification Reports, construction cost estimate reports, revenue forecasts, cash flow calculations, assumptions behind non-traditional funding mechanisms, and various management documents used by ADOT. Additionally, we performed analytical reviews on revenue and cost estimates to evaluate past performance and project future trends. To assess the reasonableness of cost estimates, we worked cooperatively with our Transportation Engineering Consultant to compare ADOT's cost criteria against other state transportation departments. We also captured historical data to assess actual expenditures against estimated expenditures at a summary level. Furthermore, we attempted to evaluate ADOT's ability to meet cost estimates—from an individual project perspective—by comparing actual expenditures against estimated expenditures using our sample of 14 projects.

Finally, we were also asked to review 13 specific areas, including traffic projection issues and alternative transportation issues. To examine these areas, we performed a variety of audit techniques and analyzed a variety of documents. Because many of these issues were

specific and not necessarily related to our primary reportable issues, we address each question in Appendix A.

We conducted this audit in accordance with generally accepted government auditing standards. We limited our review and analyses to those areas described in Audit Scope and Methodology section of the report. The audit issues resulting from these analyses were presented and discussed with representatives of ADOT, MAG, and STB prior to completion of the audit fieldwork.

CHAPTER 2

Historical performance indicates that ADOT is likely to complete the remaining Accelerated Program projects by 2007.

As of January 2005, the Accelerated Program was approximately 78 percent complete. ADOT's performance at managing the funding, design, engineering, right-of-way acquisition and construction of the network, or the Maricopa Regional Freeway System (RFS) since 2000 through January 2005, indicates that the department will most likely complete the remaining 22 percent by the close of calendar year 2007. Specifically, an analysis of the department's projected to actual scheduling performance since 2000 shows that ADOT has typically met its goals and/or adequately allowed for slippages and, further, that the remaining funding projected for the program should be sufficient. Additionally, we found that ADOT's project management practices have improved significantly in recent years and are currently sound and functioning well.

However, we cannot conclude more definitively about whether ADOT will meet all of the goals for the Accelerated Program by 2007 for several reasons, including the possibility of unpredictable delays or cost overruns which may be out of ADOT's control and the current scheduling which includes some projects that will need to be tightly-managed to complete on time. Additionally, over the last five years, the scope of the Accelerated Program has been subject to redefinition every six months.

ADOT's Performance Since 2000 Supports the Likelihood of Completing the RFS on Schedule

As of January 2000, the newly adopted Accelerated Program projected completion of 144.1 miles of regional freeway in Maricopa County by 2007, which included 58.2 miles constructed in the fifteen years since the RFS was originally proposed and adopted in 1985 (at an approximate rate of about four miles constructed per year). As of January 2005, the total projected miles for the RFS had been reduced to 137.9 miles, but 107.6 of those miles had been constructed. In other words, ADOT had completed 49.4 miles in the five years between January 2000 and January 2005, at an approximate rate of 9.88 miles a year. With only 30.3 miles remaining to complete before the end of calendar year 2007 (another three years), ADOT appears to be on track. Figure 3, "Accelerated Program, January 2005 Life Cycle Certification" displays the current map of planned and completed corridors. (Sections and projects due to begin construction or yet to complete

construction are indicated by leading lines or brackets and a ratio such that the numerator indicates the estimated year of completion and the denominator indicates the anticipated costs in millions.)

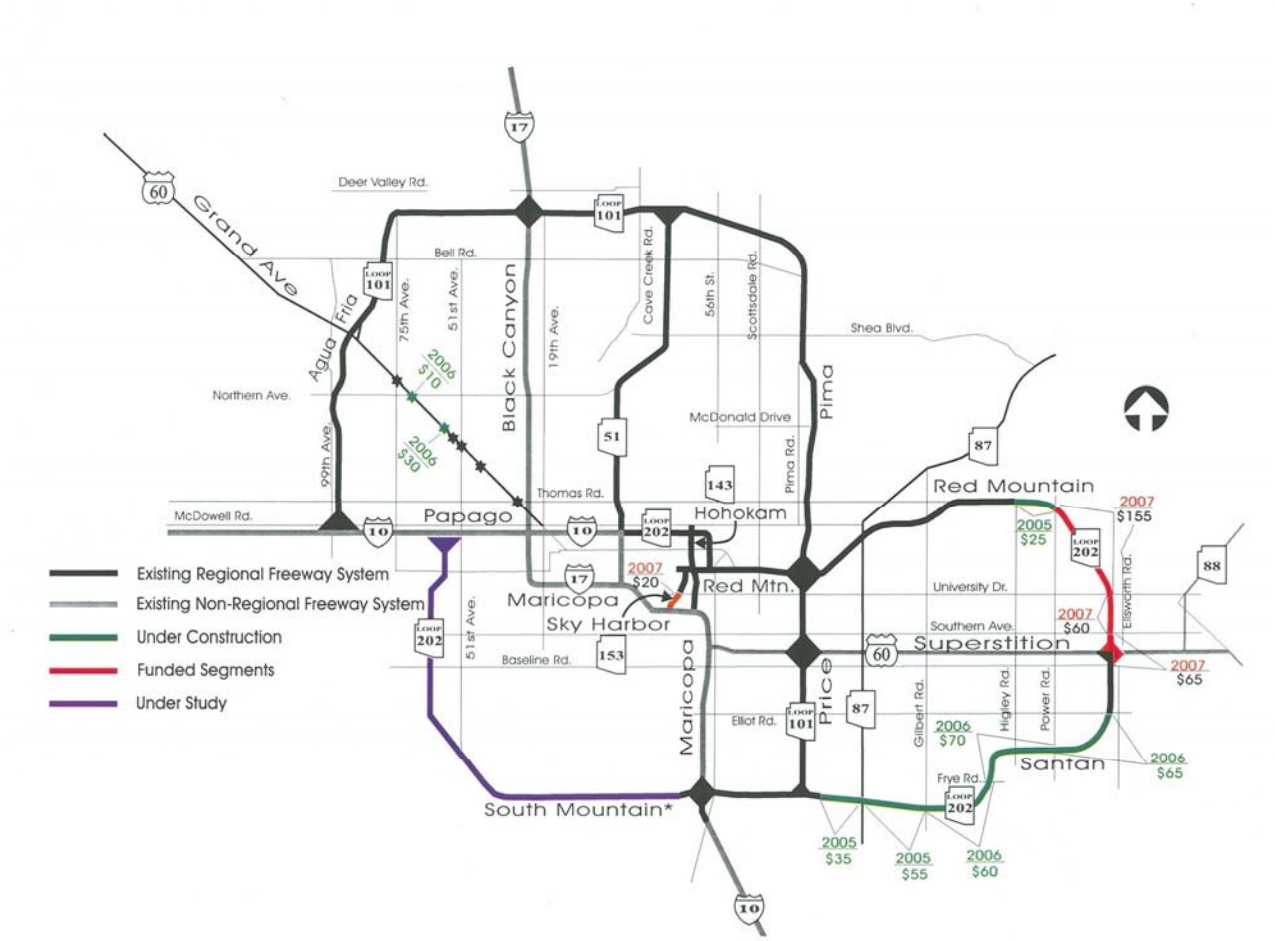

Figure 3. Accelerated Program, January 2005 Life Cycle Certification
Source: Arizona Department of Transportation, January 2005

The status of the miles completed and remaining miles to complete by major RFS corridor, and by percentage, are displayed in Table 1, "Status of RFS Program Miles by Corridor, as of January 2005" and Figure 4, "Status of Program Miles by Stage, as of January 2005".

Table 1. Status of RFS Program Miles by Corridor as of January 2005

Corridor	Completed	Under construction	Planned	Total Miles
Agua Fria	22			22
Grand Avenue	2.7	1.8	0	4.5
Hohokam	3.1			3.1
Pima	28.2			28.2
State Road 51/Superstition	10.2			10.2
Red Mountain	21.5	2	7.4	30.9
Santan	6.6	18.2	0	24.8
Price	9.9			9.9
Sky Harbor*	2.4	0	0.9	3.3
South Mountain**	1			1
Totals	**107.6**	**22**	**8.3**	**137.9**

* The remaining 0.9 mile planned for Sky Harbor may be completely withdrawn, depending on a decision still pending by the City of Phoenix and MAG Regional Council.
** As of January 2005, further development of the South Mountain corridor, 21.1 miles for which are shown as under study in the current Accelerated Program, will not be funded until implementation of Proposition 400.

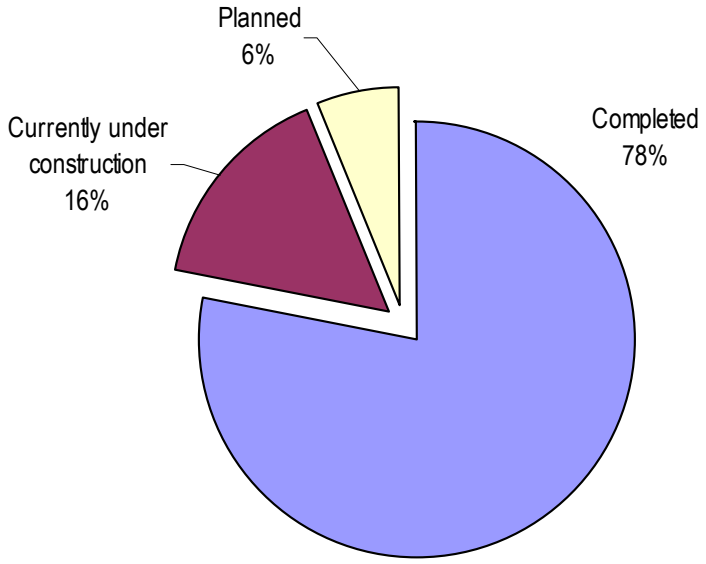

Figure 4. Status of Accelerated Program Miles as of January 2005
Source: Arizona Department of Transportation, January 2005

ADOT Generally Appears to Meet its Completion Goals and/or to Adequately Allow for Slippage

To complete the Accelerated Program, approximately 64 projects are scheduled for construction between 2005 and 2007, including some major construction scheduled to be completed by the end of the third quarter of 2007. Most of the 64 projects are already under construction and of those that are not, most are already in advanced design phases with any necessary environmental studies already completed or nearing completion. For a number of these projects, 78 parcels still require the acquisition of rights-of-way.

In a review of the completion estimates compared to actual completion dates for five construction projects, we found that four were completed on time. (One project was delayed due to a local agency's permit issue outside of ADOT's control.) Additionally, we discovered in a review of the timeliness of right-of-way acquisition for a sample of 20 projects that ADOT had not consistently met its official right-of-way acquisition goal of obtaining clearance for use of the property at least two months before the construction contract is sent to bid. However, in those cases that acquisition had taken longer, it appeared ADOT had been able to acquire clearance in time to enable construction completion goals to be met.

In effect, comparisons of the estimated project timeline assumptions for completed projects in the Accelerated Program against the current status of the remaining projects, suggest that it is reasonable to expect that the remaining projects will be completed by 2007.

Accelerated Program Costs are Reasonably on Budget

The total RFS project obligations as of January 31, 2005 (including those preceding the adoption of the Accelerated Program) have amounted to approximately $5.6 billion[5]. Of these expenditures:

- $5.2 billion have been spent or obligated for projects that have been completed or are in progress.
- $389 million has been dedicated to projects yet to commence.

As the focus of this audit was the Accelerated Program, we did not attempt to gauge the overall budget performance for the RFS since 1985. However, in a comparison of the total programmed expenditures for the Accelerated Program in ADOT's Life Cycle Certification Report of 2000[6] to the actual spending and remaining amount projected as of July 2004, we found overall Accelerated Program expenditures to be approximately

[5] Source: January 2005 Life Cycle Certification Report. ADOT's Chief Financial Officer noted that it is difficult to impossible to determine or confirm the exact costs of the RFS since 1985 because ADOT's automated systems are unable to provide reliable data going back to late 1980's and early 1990's.

[6] The projected expenditures in the January 2000 Life Cycle Certification Report would have included projections for projects that had been initiated since 1985 that had yet to be completed.

seven percent over the original budget. Specifically, in 2000 the Accelerated Program's expenditures were budgeted through 2007 at $2.035 billion. In July 2004, the revised budget set the program's (actual and projected) expenditures at $2.177 billion—$142 million more, a difference of approximately seven percent. Additionally, an ADOT staff analysis of budgeted to actual expenditures limited specifically to projects planned and completed between 2000 and 2004 showed a difference of not even quite one percent. Due to the highly variable nature of large-scale construction projects, overall, a deviation below 10 percent between the projections of 2000 compared to the 2004 projections appears reasonable by industry standards.

Funding Appears Sufficient to Complete Accelerated Program

Available funding for the Accelerated Program is projected on the rate of ADOT's RARF and HURF-secured bonds amortization, forecasts of the transportation excise tax and highway user revenue proceeds, a predictable amount of Federal grants, interest income, local and state federal funds for specifically programmed projects, and some miscellaneous income (e.g. from the sale of excess property, rent, etc.). ADOT's Chief Financial Officer certifies these projections every six months in ADOT's Life Cycle Certification Report.

For internal tracking purposes, ADOT maintains a current cash flow analysis to monitor and project its available funding through the estimated completion of the Accelerated Program by the end of 2007. While we were concerned to note that projected expenditures in this analysis are based on 30 percent design estimates—which as noted later in the report, we found to be a somewhat unreliable indicator of actual expenditures—this issue is mitigated by two factors:

- First, a cash flow forecast issued of available funding prepared for the January 2005 Life Cycle Certification Report shows a positive cash balance remaining at the end of 2007 of over $108 million. Considering that the remaining projected expenditures from January 2005 through the end of 2007 are approximately $1.4 billion, this leaves a cushion of nearly 7.7 percent. Please see Figure 5, "Total Available Funding through 2007 (in thousands)."

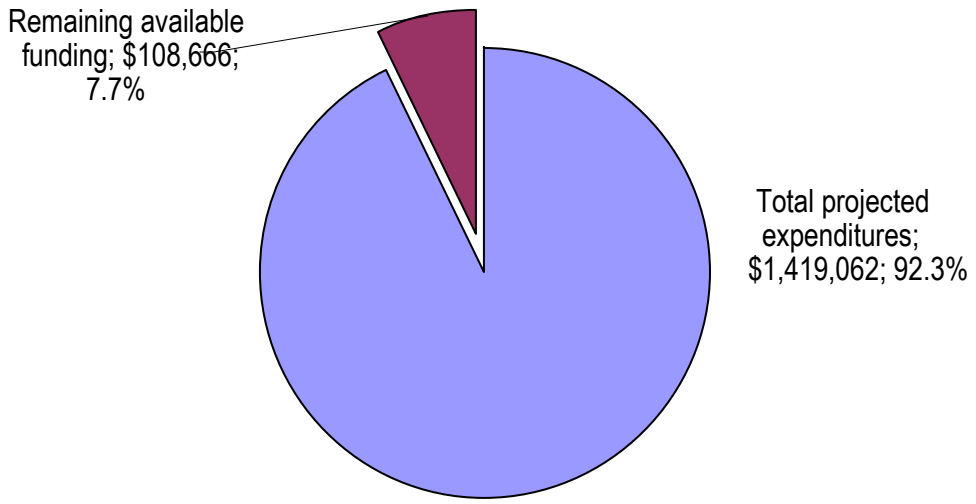

Figure 5. Total Available Funding through 2007 (in thousands)
Source: Arizona Department of Transportation, January 2005

- Second, ADOT, its oversight agencies, MAG, and the STB, require that any proposed scope and budget changes for Accelerated Program projects be predicated upon the cash flow analysis. Specifically, they would not allow a change that exceeded available funding. Further, in the last four years, ADOT has not had to reject a project change request for budgetary reasons.

Thus, the remaining Accelerated Program appears to have sufficient funding to complete the remaining projects by 2007.

Project Management Procedures and Processes, While They Could be Better Documented, are Sound and Functioning Well

We found that the project management model currently being used by ADOT is appropriate and working well, which supports the likelihood of timely completion of the Accelerated Program. The level of coordination between project phases and specific methods of project management align with best practices defined by the Federal High-Ways Administration (FHWA). Moreover, the process for controlling change orders appeared sound and rigorous. However, while this issue does not affect the likelihood of completion, we also noted opportunities for improvement in ADOT's project documentation practices and policies.

ADOT Has Improved its Project Management for the Accelerated Program

To better understand the project management process, we asked ADOT to walk us through the project management documentation and key decision points for two projects,

one initiated in the 1980's and one initiated prior to adoption of the Accelerated Program, but which was nonetheless managed primarily as an Accelerated Program project.

As a result, it became readily apparent to our transportation engineering consultant that ADOT transitioned from weak and ill-defined formal project management procedures in the mid 1980's to a well defined project management system for delivering the Accelerated Program. For example, during the era of 1986 to 1995, ADOT hired consultants to deliver entire corridors. However, inadequate controls were in place for ADOT's management of such corridors, and both timelines and budgets slipped significantly. In 1995 ADOT cancelled the corridor contracts and changed their management model to have a single "general consultant" to better define each project prior to awarding a design contract and increase the roles and responsibilities of staff in managing the project's development. In addition, ADOT developed a Project Management Process Manual that comprehensively defines the project development process, the roles of staff in delivering and monitoring projects within corridors, and the processes for review and approval of proposed changes.

Overall, our transportation engineering consultant found that ADOT has made an excellent transition from limited project management when the RFS was first initiated 20 years ago to now having significant policies and procedures in place that support a sound management system.

ADOT Has Nearly "Seamless" Transitioning Between Project Phases

Currently, ADOT applies a team work approach to project management, based upon a Project Work Plan (PWP) that defines project objectives, the scope of the project, responsibilities of each functional (technical) unit as well as resources needed to deliver on the schedule identified. While a design project manager is responsible for implementing the PWP through the development and design stages and a resident engineer assumes responsibility for the delivery of the construction project; however, to a large degree the project manager and resident engineer—as well as other pertinent parties —work together throughout most of the life of the project.

Specifically, during the development phase the project manager works closely with ADOT's general consultant to get a project to a 30 percent design stage prior to awarding the design contract. The general consultant continues to stay involved through later design phases, helping to analyze design costs and variations that could result in repackaging construction segments that might expedite delivery or save money. The project manager conducts regular meetings of all the key staff or consultants necessary to develop the evolving design, including those involved in the acquisition of right-of-way, utility relocation, or environmental studies for the project, local governmental stakeholders, and later, the consultants responsible for the 60, 95 and 100 percent design plans.

Once a project has reached the 60 percent design stage, the resident engineer becomes an active participant in the development of the project and begins to participate in all relevant meetings. Until the construction phase, the project manager retains responsibility to carry out the PWP including scheduling team meetings, staying within budget and keeping ADOT and MAG management apprised of the project status. However, during the construction phase, the resident engineers assumes authority and responsibility to carry out the construction contract, and the project manager's role becomes one more of reporting rather than authoritative[7].

The formal project "handoff" between design and construction is done as part of the "Partnering Meeting" at the initiation of construction. Our transportation engineering consultant found it notable that the project manager continues to attend safety meetings with the contractor and otherwise remains involved during construction in order both to fulfill the project manager's reporting responsibilities and to provide the continuum of knowledge of decisions and commitments made during the design phase. In addition, through this process, the project manager is informed and signs off on contract change orders even though it is the resident manager, not the project manager, who has the authority to approve these change orders[8].

Our transportation engineering consultant found this degree of coordination impressive and likely to enable very productive, nearly "seamless" overlap between the phases.

ADOT's Project Management Style Appears to Meet Industry "Best Practices" with Regard to "Cradle-to-Grave" Single-point Project Coordination and Multi-disciplinary Integration

Over the past decade, national trends in the transportation industry have moved more toward integrated approaches to transportation solutions[9], both as they relate to the inclusion of various stakeholders in project development, as well as with regard to the phases of project development. Specifically, we found that ADOT's project management style conforms to a significant degree to two of the industry's best practices: "cradle-to-grave" single-point project management, and the integration of various disciplines and stakeholders in project development and management.

[7] According to our transportation engineering consultant, it would not be possible or desirable for the project manger, who manages several projects at various stages, to take over the full-time responsibility of managing any one of those projects through the construction phase; to this extent a single-point project manager from "cradle to grave" is not truly feasible.

[8] As noted later in the report, the resident engineer's and project manger's ability to authorize contract change orders is limited to a certain dollar threshold amount above which progressively more layers of review and approval are required.

[9] As noted in the FHWA's "Integration and Streamlining Transportation Development and Decision-Making – State of the Practice Synthesis Report" July 2003.

"Cradle-to-grave" Single-Point Project Management

Our transportation engineering consultant was careful to note that considering the size, complexity, and duration involved in delivering transportation projects, it is probably not desirable or possible to have a single person assigned to each project throughout all its phases—from planning through design, construction, operation and maintenance.[10] Consequently, he believes that ADOT's degree of coordination first by the project manager, and then by the resident engineer, results in a "single point project management" style, specifically in which projects are overseen from "cradle-to-grave" by an individual or team of managers. A July 2003 FHWA report cites this type of "cradle to grave management approach"—one in which "a single person, or team of persons, is responsible for managing the project from inception to completion"—as having the following benefits:

- Improved understanding of total costs and impacts of proposed projects
- Providing a central contact for members of the community as well as internal agency staff on the project
- Enabling timely tracking of concurrent activities and monitoring of the project schedule

As mentioned earlier, we recognized some of these benefits in play in ADOT's current project management structure.

Integration of Disciplines and Stakeholders in Project Development and Management

The FHWA report also states that "in an integrated approach, all disciplines are more involved in the initial planning and scoping phases when alternatives are developed and the preferred solution is identified. The increased participation earlier and throughout the process helps to ensure consensus and minimize potential conflicts." In keeping with FHWA best practices, ADOT makes an effort to keep members on the project informed of the progress throughout the length of the project.

Example 1: Integration of Right-of-Way Division

For instance, since the adoption of the Accelerated Program, it seems as though ADOT has involved Right-of-Way (ROW) from the inception of the project planning process. Many states surveyed in 2003 by the FHWA responded that "ROW was not solicited early enough to be effective under old processes" and since "acquisition is often identified as the critical path for capital projects, therefore it has been given a heightened level of attention within the department." Earlier integration allows ROW "to address issues and concerns that would otherwise result in increased design and ROW costs as well as project delays." Thus, ADOT's efforts seem to be in-line with the best efforts identified by the FHWA in other states.

[10] ADOT also includes maintenance staff, who begin participating in preconstruction meetings, in its coordination of projects.

Example 2: Integration of local governmental stakeholders
Recently, ADOT's Communications and Community Partnership Office (CCP) has become a more significant member of the RFS project management team. Specifically, CCP staff participate and arrange for the local governmental representatives (or other affected constituents) participation in project development and construction meetings. For the last several years, ADOT has included MAG representatives in bi-weekly and monthly briefings on the RFS. Overall, this project-level involvement helps to ensure that local stakeholders' concerns are understood and considered throughout project implementation. According to the FHWA, "early and continuous communication with the public is integral to ensuring that a project satisfies the needs of the users."

ADOT Has a Sound Process for Controlling Change Orders

ADOT's Project Development Process Manual requires the preparation of project cost estimates at each stage of the process. We found ADOT's methods of estimating similar to ones used in other states with the detail of each estimate improving as the project is refined. Further, we found that appropriate, industry standard contingencies are added to in the estimates at each stage to account for the level of detail at that stage.

If a scope, schedule, or cost change is needed before the next stage, ADOT prepares a change request that includes justification. Depending on the significance of the proposed change, the review and approval of the request is conducted by various committees, either internal to ADOT and/or including MAG and the STB. Material changes, for example, are defined as changes to RFS project budgets or schedules that cause an increase in the cost of a project that is more than five percent of the adopted project budget, but not less than $500,000 or any increase greater than $2.5 million. Material schedule changes are delayed when construction completion is delayed by more than three months; the construction phase of a segment is delayed by one year beyond the date on the Certified Regional Freeway map; or the start of the project will occur in a fiscal year different than shown in the most recent Life Cycle Report and the Long Range Plan. Material changes require review and approval by several internal ADOT committees prior to submittal for approval by two outside entities, the STB and MAG.

Smaller changes also have review and approval processes depending on the threshold of cost increase or time delay and the phase of development in which they are sought. For example, during the design phase budget changes less than $200,000 may be approved by the project manager. Changes of over $200,000 are approved by the Design Group managers and also require the approval of the Project Review Board, an internal committee of ADOT's RFS design and construction groups. Changes that exceed the project budget by $200,000 or 15 percent (whichever is lesser) and projects that change fiscal years require Project Review Board approval, then the approval of the Priority Planning Advisory Committee, which is comprised of ADOT executives, including fiscal

staff, as well as a non-voting advisory member from the Citizens Transportation Oversight Committee. Most projects presented to the PPAC for adjustment will also be forwarded to the State Transportation Board so that it can take formal action to reprogram the project's funds.

Changes during the construction phase resulting in new costs of less than $10,000 require a letter of agreement between the contractor and the resident engineer; while changes of over $10,000 but less than $50,000 require a formal change order request, they are approved by the resident engineer who, in addition seeks project manager's consent on design changes that are greater than $25,000. The district engineer approves changes greater than $50,000 but less than $250,000 while a formal change order must be approved by the project review board following the design phase change request requirements of over $200,000 or 15 percent of total project budget.[11] In other words, ADOT's processes generally and appropriately involve progressively more layers of review as changes become more significant and costly.

Generally, our transportation engineering consultant found ADOT's process for controlling change orders to be sound and rigorous enough to support the likelihood that the Accelerated Program will be completed on time and within available funding.

ADOT Could Improve Documentation Policies and Practices

Despite ADOT's sound project management and change order controls, we found that ADOT did not have a uniform system or policies to document project-related detail from the inception to delivery. For instance, ADOT relied on its general consultant to provide various reports, rather than maintain in-house data, in order to reconstruct 30 percent design estimates for the projects we selected for review, and also for the minutes on design coordination meetings allowing the re-creation of the project development trail. When we requested the 30 percent design estimates for fourteen projects, ADOT (and its general consultant) initially could provide estimates for only four of the projects. This was particularly notable since ADOT asserts that it projects expenditures for the purposes of evaluating the Accelerated Program's available funding based on these estimates. After several weeks, we did receive estimates for the other 10 projects as well; ADOT staff just had difficulty locating them.

Further, we noted that one project we reviewed had a high variance between the budget and actual amounts spent ($4,865,000 budgeted compared to $11,183,636 expended). When we asked about the reasons for this discrepancy, the key information for the budget changes and justification for these changes was not readily available. While we were

[11] For Contract Change Orders (CCOs), ADOT has controls on who provides the authorizing signature for the change to the contract. For CCOs less than $50,000, the resident engineer may approve; between $50,000 and $250,000 the construction district engineer must provide the authorizing signature. The deputy state engineer must authorize CCOs with costs ranging between $250,000 and $500,000; and the State Engineer authorizes CCOs greater than $500,000.

later provided a re-printed unsigned letter which ADOT staff asserted had been sent as documentation, we were surprised to find that the documentation of the Deputy State Engineer's authorization of a budget change of over $500,000 was not more formally maintained.

Additionally, issues related to documentation and records accessibility were also addressed in a prior audit[12]. Specifically, the following recommendation was made:

- Identify additional information to be documented during project development and construction and who is or should be maintaining the documentation. At a minimum, documentation should include deliverables and documentation of significant decisions and actions taken during the course of individual projects.

While these memorialization and documentation retention issues do not impact the likelihood of the Accelerated Program's timely completion within remaining funding, we encourage ADOT to recognize them as opportunities to improve its transparency and accountability, as well as to facilitate information-sharing in-house on a forward-going basis. Generally, our transportation engineering consultant agreed that it is good practice in providing the governmental oversight and management of large-scale construction programs to ensure that project files be centrally located and include hard copy evidence that documents all key project milestones and decisions, including adherence to the protocols for review and approval of change requests (at any level).

A More Absolute Conclusion on Likely Accelerated Program Completion is Impossible

Despite all indications that the Accelerated Program will be completed on time, we are unable to conclude definitively that it will be. To begin with, large-scale construction is frequently subject to unpredictable delays and cost overruns for a variety of reasons. Workers can strike. Steel prices can suddenly sky-rocket. Concrete can be subject to sudden shortages. Affected local jurisdictions can suddenly decide to withdraw their funding portions and approval of design, or catastrophic weather can erase progress or just delay it beyond expectations. This myriad of potential interruptions to construction work can disrupt the best-laid plans and exhaust the most conservative contingency funds. ADOT is not able to completely control for these possibilities—though, as noted, for the most part we found its systems to be designed to accommodate an appropriate level of unpredictability.

[12] "Performance Audit of the Arizona Department of Transportation: a Review of the Maricopa County Regional Freeway System," Sjoberg Evashenk Consulting, July 2000.

These uncertainties, coupled with some additional issues regarding the likelihood of completion described below, affect our ability to conclude unequivocally on the Accelerated Program's timely conclusion. Specifically we identified a few issues where completion may face particularly tighter timelines or budget consideration while ADOT faces critical staff vacancies. Also, the Accelerated Program has a history of being subject to redefinition, which could make the definition of "completion" a moving target.

Successful Completion Faces a Few Particularly Tight Timeline and/or Budget Considerations

Again, while mitigated by a recent history of generally solid performance, ADOT faces some possible tight spots in its completion of the Accelerated Program. For example, as of January 2005, ADOT was still working to acquire right-of-way on 78 parcels. As noted earlier, in the past ADOT has consistently been able to gain clearance to begin work on needed parcels prior to the scheduled start date of construction, thus preventing right-of-way acquisition from holding up the construction phase. However, based on our review of 20 right-of-way acquisitions, on average, obtaining clearance took 21 months, where 10 months represented the shortest time period and 54 months the longest. Considering that most construction is due to complete by the end of 2006, if remaining parcels take as long as the average of our sample from January 2005 to obtain clearance—which means construction will not be able to commence before mid to late 2006—ADOT will face some particularly tight scheduling in order to stay on track for completion.

Additionally, as discussed earlier, while ADOT has been able to control program budgets through a series of semi-annual budget adjustments and revisions, our analysis shows the Accelerated Program was approximately seven percent over budget overall as of July 2004 when compared to the program budget set in 2000. A more careful analysis of this number actually reveals widely disparate budget performance between corridors, as much as 46 percent under budget to 35 percent over budget. The corridors that had the highest budget overruns are also those still under construction (Red Mountain—nearly 35 percent over budget, and Santan—approximately 18 percent over budget); much of these budget increases stemmed from unanticipated escalation in right-of-way acquisition costs. The bulk of the remaining right-of-way acquisition is for the Red Mountain and Sky Harbor corridors. (Red Mountain and Sky Harbor are the corridors with major construction scheduled to complete by the end of 2007.) Sky Harbor is currently more than eight percent over budget, although it is also on hold at the request of the City of Phoenix.

The current cash flow analysis reveals an ability to accommodate the projected seven percent increase in the January 2005 budget and still remain within the available funding. The January 2005 budget for Red Mountain reflects only a 1.2 percent increase in projected right-of-way costs; no change is reflected in Sky Harbor projected right-of-way costs. While this does not necessarily indicate that budget overruns for either corridor

would prevent successful completion of the Accelerated Program within the available funding, again, it may indicate the possibility that ADOT will face a challenge of particularly tight timelines and challenges for any new budget increases within the remaining funding available.

ADOT Faces Significant Staffing Vacancy Issues

Our transportation engineering consultant stated that ADOT's current documentation policies and practices result in a sort of dependence on staff remaining consistent for the life of project development and construction. ADOT's current staffing issues, however, suggests that reliance on staff retention for project continuity may not be a safe approach.

At the time of our review, the Intermodal Transportation Division (ITD), the ADOT Division with responsibility for the management of highway construction generally and the RFS specifically, had 249 vacancies in 2,216 authorized full-time positions—a vacancy rate of approximately 11.2 percent. For the ITD groups most responsible for delivery of the RFS, the average vacancy rate was approximately 16.5 percent. Please refer to Table 2, "Significant Vacancies in Critical Department Groups" for a breakdown of the vacancy rates among these ITD groups or sections.

Table 2. Significant Vacancies in Critical Department Groups

ITD Group or Section	Number of positions	Number vacant	Vacancy rate
Valley Project Management	11	3	27.3%
Phoenix Construction	214	51	23.8%
Phoenix Maintenance	198	22	11%
Right of Way	92	9	9.8%
Totals/average:	**515**	**85**	**16.5%**

Moreover, the turnover rates for critical journey-level engineering classes—from which project managers and resident engineers are assigned—were particularly high in these groups. Of 134 vacancies throughout ITD in these classes, 68.7 percent were in sections or groups responsible for delivery of the RFS.

This not only presents a possible challenge to ADOT's ability to ensure that when it is most needed, adequate staffing will be available to provide tighter project management, but additionally, without comprehensive and detailed project management documentation, ADOT risks losing the institutional knowledge gained in the development and construction of the RFS to date as more journeyman level staff move to private industry and as executive and senior management continue to retire. In order to continue to ensure successful RFS project development and management ADOT will need to build from the experiences of the Accelerated Program projects, which may be difficult, if not impossible, if key staff or management retire before ADOT memorializes

and ensures adequate documentation of what is currently held exclusively as institutional knowledge by these critical employees.

Accelerated Program has Been Subject to Changing Definitions

Every six months, the Accelerated Program budget, funding, and timeline is re-examined and certified in ADOT's Life Cycle Certification Report, which memorializes the most current plan for the program, based on the review and approval of any change requests in the six months since the prior report, and explains the changes from the last report to the most current. In effect, the Accelerated Program's scope, budget, and specific timelines for completion are publicly redefined every six months. While each new iteration is consistent with the goal of completion by 2007 within the available funding, to some degree the Accelerated Program that is due for "completion" becomes a moving target, as defined by ADOT, MAG, and the STB.

As an example of how the definition of completion has changed, when we examined the January 2000 Life Cycle Certification Report, we noticed that the Accelerated Program was projected to include 144.1 miles. As of January 2005, it was projected to include 137.9 miles—a reduction of 6.2 miles. ADOT has provided explanations for the reductions in the Life Cycle Certification Reports as they occurred, the most significant of which was the reclassification of 8.8 miles of the South Mountain corridor from "planned" to "unfunded"—for good reasons, including an on-going environmental impact study and since further development of this corridor will not be funded until implementation of Proposition 400. However, when we say that the "Accelerated Program" is likely to be completed by the end of 2007, we are addressing the 137.9 miles version of the Program, and not the original program which included the 8.8 miles of the South Mountain corridor.

Technically, this supports the likelihood of "completion" of the Accelerated Program by 2007 and within available funding; however, the shifting definition of "completion" presents a dilemma in concluding which "Accelerated Program" will be completed. ADOT, MAG and STB policy does not assure that what will be completed by the end of 2007 will be the program as currently defined.

CHAPTER 3

ADOT's, MAG's, and STB's Efforts at Analyzing the RFS Program Should be Broadened

Oversight of the RFS is provided collaboratively by the State Transportation Board (STB), Maricopa Association of Governments (MAG), and ADOT. The Citizens Transportation Oversight Committee is also charged with review and advisory responsibilities related to the RFS, but it does not have any authority to approve or disapprove ADOT plans or proposals. Under Arizona statutes, it is ADOT, MAG and STB which share the explicit responsibility to deliver the Accelerated Program on time and within the available funding. Chapter 2 recognizes their success in serving this responsibility.

However, these agencies also share an implicit responsibility conferred by the public's trust to assure the RFS's cost-efficiency and effectiveness, as also recognized in ADOT's strategic planning goals. This chapter addresses opportunities for broadening oversight practices and systems that would assist in assuring the program's cost-efficiency and effectiveness. These include providing a historical review assessing proposed program or project changes, and consolidating ADOT's Accelerated Program and project data for easier tracking and analysis of historical performance.

Since 1985, ADOT has made several improvements to the management of the RFS, specifically including improved project management processes, controls and documentation. While nothing in this chapter is meant to convey that the management of the RFS has not been cost-efficient or effective—or, specifically, that there is necessarily money or time that could have been saved—it is nonetheless the case that better systems for holding the program to account for incremental and cumulative budget and timeline deviations should create new opportunities to learn how to improve RFS management in the future. The issues raised in this chapter are intended to support ADOT's value of "excellence and continuous improvement," which is also a best practice identified by the FHWA, and an important goal of all governmental agencies.

Oversight Processes Should Include Historical Review of Projects' Progress When Evaluating Budgetary or Timeline Revisions

Currently, ADOT, MAG, and the STB serve their responsibility to ensure that the Accelerated Program is completed on schedule and within available funding through a

process of regular review of the status of the program, and any proposed change orders to specific projects which may affect program delivery overall. This process, however, does not include historical review of budgetary and timeline changes, or other ways of assessing ADOT's long-term cost-efficiency and effectiveness. This evaluative information may prove useful in establishing best practices or "lessons learned" on various processes or activities in delivering the RFS, yet would entail little administrative effort to capture.

Evaluative Information Doesn't Include Historical Context

MAG and the STB primarily evaluate changes to the Accelerated Program through the process of reviewing and approving material change requests. In addition, the STB annually approve one of ADOT's semi-annual Life Cycle Certification Reports, which is prepared for the general public and memorializes the most current estimates and budgets for the program.

The Life Cycle Certification Report provides only a snapshot-in-time look at the Accelerated Program. While it may address recent changes to the program, its purpose is not to contextualize them with comparisons to prior, much less original, versions of RFS budgets, schedules, or scopes. At the time MAG and the STB are asked to approve such changes, they receive slightly more background and context justifying the need for the change. However, they also only receive information comparing the most current budget, scope and schedule to the newly proposed one. They do not receive historical comparisons of the original budget, scope, and estimate for completion and all of the changes prior to the most currently proposed. Also missing from the information MAG and STB receive as support for a requested change or the newly revised Life Cycle Certification, are analyses of the project's relative cost-efficiency (such as comparison to the average cost per mile for ADOT projects of similar types).

Historical Data has Been Limited Until Recently

To a certain degree, ADOT could not have provided this type of historical context or analysis in support of proposed changes to much of the program until only recently. In 1985, when the original plans and budgets for the RFS were established, ADOT did not have adequately sophisticated information technology to set up a database or coordinated databases that could track program and project development, specifically including deviations from early design estimates, scopes and completion schedules. In 2000, when the Accelerated Program was adopted, most of the projects and the entire general plan had been established years earlier. Implementation of the Accelerated Program has involved initial scoping and development of some specific projects within the context of the larger plan, but for the most part, early documentation of the original plans for the majority of the projects completed during the Accelerated Program is simply not available in formats that would enable easy reconstruction of their complete historical context.

Presently ADOT does have adequate information to provide this type of context for Accelerated Program projects initiated within the last few years. However, it is simply that the process of program change evaluation has not been adjusted to provide it.

Expanded Use of Historic Performance Could Provide Useful, Evaluative Information

MAG reported occasional efforts to evaluate the trends in types of cost increases and identify opportunities for improving RFS design considerations. Some example results that were cited included adding the consideration of drainage and utility relocation needs, as well as the need for wider ramp structures to allow for future ramp expansion. However, for the most part we did not see dedicated efforts to this type of analysis as part of the regular oversight processes.

For the purposes of our review, we tried to piece together some historical context for the Accelerated Program from past Life Cycle Certification Reports. While these data could provide best practices and lessons learned it may also assist in analyzing budgets or project costs. For instance, it could help in determining:

- The potential that actual project costs are being understated through the use of a "system-wide" expenses category and thus may not reflect true degree of deviation from budget.
- Whether right-of-way budgets are currently not designed to allow a retrospective analysis of cost increases.
- Whether initial project budgets may not reflect the actual project funding needed.

Use of "System-wide Expenses" Category Understate Actual Project Costs

Every six months, as part of the revision of the Life Cycle Report, ADOT reviews and adjusts the amounts budgeted for the "obligations" (projected and actual expenditures), in the "system-wide" category. The total in this category as of January 2005 was approximately $111.8 million. Expenditures in this category include Freeway Management System costs (an automated system necessary to control freeway traffic), system-wide change orders, ADOT staff charges, risk management indemnification costs, right of way advanced acquisition costs, etc.—all of which ADOT management may find useful to track separately of design and construction costs. However, a closer look at the actual expenditures reported in this category, revealed that many were traceable to specific projects, suggesting that they could have been reported as corridor or project-specific costs. In fact, every "system-wide" expense we tested traced to a specific project.

Good business practices and generally accepted accounting practices typically require costs that can be identified to a project or specific activity be directly attributed to those

cost drivers to properly reflect the cost of particular activity or a cost center. While ADOT may find the system-wide category of obligations useful to capture for its own internal management purposes, by not identifying and reporting all project-related costs as charges to specific projects for individual corridors in its Life Cycle Certification Reports, it may be obscuring true project costs in its representation of the Accelerated Program's performance to the public and its oversight agencies. Additionally, unless ADOT, MAG, and the STB receive reports accurately reflecting the true accounting for project costs, decision-makers may be foregoing the opportunity to recognize the true variances from project estimates, may lack information to identify trends, or identify ways to improve RFS processes.

Right-of-way Budgets Are Not Designed to Allow Retrospective Analysis of Cost Increases

We also found that there is not a baseline, or otherwise static budget assigned to the right-of-way costs in project development. Rather, the Right of Way Group manages acquisition costs against the "current" budgets that are updated semi-annually with the most recent cost estimates. As a result, budgets for right-of-way increase as estimated costs and budgets increase. While it is reasonable, even predictable, that real estate costs appreciate over time and necessitate budget revisions to appropriately account for them, the lack of comparison to a baseline allows costs to increase period after period without careful consideration of the whole picture; the floating budget does not provide an accurate retrospective for assessing if certain cost increases over an extended period were appropriate.

Project Budgets Appear to be Unreliable Basis for Assessing Remaining Available Funding

As noted earlier, for the purposes of ensuring that the remaining available funding is sufficient to cover proposed program changes, ADOT maintains a current cash flow analysis to monitor and project its available funding through the estimated completion of the Accelerated Program by the end of 2007. According to ADOT, the projected expenditures in this analysis are based on 30 percent design estimates. Initially we found it difficult to obtain the 30 percent design estimates for several projects[13], though eventually documentation of some form was provided for all the projects, in our sample, we found the deviations between the 30 percent design budget and actual expenditures to vary from as low as 6 percent to over 205 percent. Moreover, we also found wide variances in the budget to actual expenditures considering "original budgets" (the project budget as it is recorded in ADOT's accounting system). We found under-budget variances of "original" budgets tp actual expenditures from 100 percent under budget to 130 percent over budget. Some of the projects we selected were still open and accruing costs, and some were closed. The closed projects were 6.5 percent over budget on

[13] ADOT was eventually able to provide all of them.

average. ADOT, MAG, and STB may want to take a closer look at how to better correlate projected expenditures with actual expenditures.

Additional Evaluative Data May Also be Helpful to RFS Oversight

In addition to evaluating the historical context for proposed project changes, and specifically looking for trends in types of changes, ADOT, MAG, and STB should develop and identify key performance indicators both for individual projects and the program overall which are reported as part of any discussion about changes to a project or the Accelerated Program. Beyond, for example, simply reporting the variance between a project's original budget and a proposed budget, ADOT should set a goal for how much actual expenditures will ultimately deviate from the original budget, and in presenting the justification for the newly proposed change, indicate whether it may prevent ADOT from meeting this goal.

Similarly, we reviewed ADOT's current Performance Measures Reports that captures several statistics related to project change request characteristics. However, these measures are not set in any context to ascertain the relative significance or acceptability of the results; ADOT has not established benchmarks, targets, or objectives for comparative purposes. For example, one report showed the number and type of "After Stage Two" change requests considered by the PRB between July 2004 and December 2004, but the report did not indicate expected conditions or acceptability, thus making these statistics and the overall report less informative and less valuable as a tool for assessing outcomes. Moreover, while ADOT reported in response to the 2000 RFS audit that it would develop new measures that focus on cost control, citizen outreach and plan quality, it still has not adequately developed measures to assess performance and the cost efficiency and effectiveness of its operations. While it might be difficult to set a fair and reasonable goal for the number of change requests made for the program overall, setting, articulating, and tracking the program's success at meeting performance goals—for example, delivering projects within 95 percent of the original schedule, or having actual project costs come within 10 percent of the first design estimate (plus inflation)—provide evaluative tools for program oversight.

Benchmarks, goals and targets may be difficult to develop, reluctance to set such goals is understandable, as initially, they may appear arbitrary and or suggest to an external audience more conclusive than appropriate. Nonetheless, the purpose of setting such goals is not to encourage internal or external audiences to view failure to meet such goals as indicators of poor performance, but rather as markers to monitor activities and triggers for investigating unexpected results. Changes that result in managing using performance indicators may bring about improvements in estimating or budgeting or design considerations that provide a greater likelihood that future projects will meet and/or exceed the goals.

Program and Project Data, Currently Residing in Decentralized Systems, Should be Consolidated

As discussed earlier, for the early years of the RFS, and thus for many of the early Accelerated Program projects which were underway from as early as 1986, historical data about original (and/or 30 percent design) budgets, scope, and timelines — as well as actual costs — is simply not available in easily manipulated electronic formats. However, we found that the data for projects and aspects of the Accelerated Program which have come on-line since the mid-1990s is more consistently collected in electronic form and thus available for a level of analysis not possible for earlier projects. The complication is that while most of the data that would be needed for ADOT to provide historical context for newer projects (or projects in the future) is stored in databases or other electronic files, at this point, they are scattered in several data bases. Specifically, different pieces of data are often housed in different databases—many without the ability to "talk" to one another for the purposes of data extraction and analysis—and require intensive manual manipulation to use for such purposes. Currently, ADOT is in the process of developing a data warehouse to consolidate various information sources and software applications.

Data is Currently in a Number of Decentralized Systems

Specifically, we found that each of the several specialty divisions which have some level of input or responsibility for RFS projects (for example, Right of Way, Phoenix Construction Group, Valley Project Management, Finance etc.), uses at least one separate system for tracking certain aspects of a project's development. While some of these systems are "compatible" in the sense that they can recognize each other's data and update accordingly, most of these systems are "incompatible" and cannot communicate. In other words, project data in one system cannot be combined with data for the same project in another system. As a result, ADOT's various systems and specialty divisions produce several different reports which may at times be redundant but which, together, ultimately fill in most of the project development documentation. However, reviewing any single project's development—not to mention the entire RFS program's development—requires significant manual data manipulation and analysis as well as a unique level of familiarity with where certain data resides.

As an example of this effect at the project level, we found data from the Right-of-Way Group difficult to connect with the data from other specialty groups within ADOT for the purposes of assessing the effects of right-of-way acquisition on projects' timing and budgets. In fact, we were warned in collecting data for a sample of projects to expect inaccuracies, as the data would be compiled from multiple computer systems and programs. For example, initially we were unable to correctly match parcels of land to ADOT's current project identifiers for eight of our sample of 20 projects; subsequently

we were provided correct project numbers but it was still necessary to enlist the help of specific staff members who were familiar with the ways the data correlated.

At a program level, to a large degree this is the method by which ADOT's semi-annual Life Cycle Certification Report is compiled. ADOT has no single system capable of gathering information from various specialty divisions within RFS that is needed to produce the Life Cycle Certification's overview of the Accelerated Program's development and progress. Rather, ADOT has a full-time dedicated staff member who is charged with the task of the compilation of data from the following sources: ADOT's Finance Group, ADOT's general consultant, ADOT's Phoenix Construction Group, ADOT's Valley Project Management Group, ADOT's Right-of-Way Group, the deputy state engineer who oversees the RFS, and several monthly, bi-weekly, and weekly meetings regarding specific Accelerated Program projects and overall program development.

To a certain degree, the need for greater data consolidation was also identified in a prior audit[14] when the following recommendations were made:

- Use a project management system as a tool to monitor costs as part of the project and track overall program status.
- Fully utilize the project management system by inputting the necessary data so that reliable reports can be produced in a timely manner. Evaluate its reports to determine which reports can be eliminated or consolidated with the intent to reduce duplication of efforts and the number of reports.

To ensure more efficient information gathering, analysis and dissemination throughout the organization, ADOT should consider how to make its information systems talk to each other. Specifically, a single system that combined all financial records, technical and administrative data and information for all projects funded in the RFS program could serve an important administrative function for the RFS Life Cycle Program and greatly alleviate the burden of manual staff analysis and manipulation. Until such a system can be instituted, however, ADOT can still take better advantage of the data currently available for newer and future projects through multiple systems and sources to provide historical reviews of project performance as part of the RFS oversight practices.

[14] "Performance Audit of the Arizona Department of Transportation: a Review of the Maricopa County Regional Freeway System," Sjoberg Evashenk Consulting, July 2000

CHAPTER 4

New Phase of RFS Development and Construction Offers Opportunities to Apply Lessons From the Accelerated Program

In November 2004, Maricopa County voters passed Proposition 400, a twenty-year extension of the excise tax which originally created and has helped to fund the RFS — and which was due to expire at the end of 2005. As a result, in 2006, a new influx of funding will take effect to meet Maricopa County's changing transportation needs. The new MAG Regional Transportation Plan components, made possible by the new funding, include 344 miles of new and improved freeway and highways along with an ambitious arterial and streets development and improvement program and new light rail and bus transit development.

While the streets development and alternative transit components of the new plan are outside of ADOT's purview, the further development of the RFS will be subject to the same program and project management and oversight model as the one currently applied to the Accelerated Program. Specifically, ADOT will manage a new 20 year RFS program, overseen by MAG and STB, involving the creation of new highway corridors, the addition of new lanes to most of the existing corridors, new or improved traffic interchanges on several existing corridors, installation of a comprehensive computerized freeway management system, application of rubberized asphalt throughout the system, and minor maintenance projects. This provides an exceptional opportunity for ADOT, MAG, and STB to apply lessons learned over the last 20 years, including as demonstrated by the apparent success of the Accelerated Program, and avoid many of the problems that plagued the original RFS plan such as funding shortfalls, reduced scope and extended timelines.

With only two years remaining to bring the Accelerated Program to completion, ADOT, MAG, and STB may be limited by time to implement many recommendations resulting from this audit in time to realize their full potential on the Accelerated Program. However, they will be no less applicable to the new RFS programming, and ADOT, MAG and the STB should bring forward the successful practices and policies developed during the Accelerated Program and take the opportunity of new programming to implement the recommendations for improvement identified in this report.

One of the heralded aspects of Proposition 400 is that it establishes "revenue firewalls" which require the funding for the different components of the new regional plan to be

kept separate. Funding currently earmarked specifically for the RFS, streets, or transit components cannot be transferred for the purposes of covering shortfalls in one area and thus inhibit the completion of programming in another area. As the new funding authorized by Proposition 400 will come on-line prior to the completion of the Accelerated Program, we also encourage ADOT, MAG, and the STB to take the additional step of establishing, in effect, a similar "firewall" between the Accelerated Program and the new RFS programming. Specifically, the successful completion of the Accelerated Program should entail completion within the remaining available funding under the original transportation excise tax. Especially with successful completion by the end of 2007 so seemingly likely at this point, ADOT, MAG, and STB deserve the recognition of having applied so many lessons from the early years of the RFS to develop and deliver the Accelerated Program, which will only be possible if it can be clearly distinguished from the implementation of new funding streams and new RFS plans.

CHAPTER 5

Conclusions and Recommendations

Overall, the conclusions drawn from this audit are largely positive. ADOT's performance since 2000, and the adoption of the Accelerated Program, suggests the likelihood that Maricopa County residents will see completion of the Accelerated Program on time and within the remaining available funding. Further, this appears to be a function of improved project and program management processes that align with best practices in the industry and solid controls on change orders instituted by ADOT and its oversight partners, MAG and STB.

We have identified opportunities for improved management and oversight practices and processes, specifically with regard to:

- ADOT's project documentation polices and practices;
- Historical review and additional evaluative information that could be used in ADOT's, MAG's and STB's RFS oversight processes; and,
- Consolidation of currently decentralized program and project data.

However, improvements in each of these areas would only support ADOT, MAG and STB's greater success; none currently pose barriers to the likely completion of the Accelerated Program. They are identified specifically in support of the strategic values of "excellence and continuous improvement"—important to all governmental enterprise, and specifically identified in ADOT's strategic plan. Because there are only two years in which they can be addressed for the Accelerated Program, they are also presented as opportunities for applying "lessons learned" to the implementation of new initiatives under Proposition 400.

To that end, our recommendations focus on these opportunities for improvement and additionally recognize the importance of ensuring a "firewall" in the accounting for the Accelerated Program and new programming made possible by the passage of Proposition 400 (the transportation excise tax extension).

We have addressed our recommendations to particular entities accordingly.

Recommendations for ADOT

1. Continue to improve and implement successful project management practices, both through the completion of the Accelerated Program and in the implementation of new RFS programming, including the current change order review and approval process.

2. Develop and implement a memorialization and retention policy for documentation of approved project changes and key project decisions which enables easy documentation location and review.

    a. ADOT should consider developing a checklist to keep in the centralized project files that indicates all the types of documentation to be included in the file, so that at any point, a project file could reasonably be expected to provide a comprehensive overview of changes to the project and/or other key project decisions throughout the project's development.

3. Develop a single database, or a system of coordinated databases, which is capable of generating reports that track, present, and explain the history of a project's incremental and cumulative development including budgeted to actual costs, timeline and scope changes. Ideally, this system should allow queries and reports for individual projects, whole corridors, and the Accelerated Program (and/or Proposition 400 program) overall.

    a. Additionally, in the process of establishing a method of retrieving consolidated data, we recommend that ADOT examine opportunities to allocate indirect and/or apply direct project costs currently captured as "system-wide" expenditures for the purposes of Life Cycle Certification Reporting on corridor-specific obligations.

    b. We also recommend that ADOT define and track right-of-way acquisition budgets and budget changes to watch for opportunities to increase its ability to anticipate the impact of the right-of-way acquisition process on overall project budget.

Recommendations for ADOT, MAG and STB

4. Require comparisons of historical budgets and estimated completion dates—and the memorialized explanations for all prior changes to them—when evaluating newly proposed changes. Proposed changes should also require the presentation of impact on key performance indicators established for the RFS program and other metrics of comparison to enable analysis of cost-efficiency and effectiveness (e.g. budgeted, estimated and actual costs per mile for similar projects).

5. Define key performance indicators for the RFS program that will help ADOT, MAG and STB recognize trends of performance that might trigger greater analysis for opportunities to improve cost-efficiency and effectiveness. For example, consider setting and tracking program success at delivering projects within 95 percent the original schedule, or having actual project costs come within 10 percent of the first design estimate (plus inflation)—and/or other indicators, as proposed by ADOT, MAG, and/or STB.

6. Require separate tracking, monitoring, and reporting on the completion, including funding and actual costs, of the Accelerated Program separately of the funding, costs, and timelines for initiatives resulting from the passage of Proposition 400.

Appendix A

Response to Stakeholder Issues

As part of our audit, we reviewed 13 areas of inquiry identified by Arizona stakeholders and the Arizona Auditor General. Several of these areas were related to our primary reportable issues, discussed in the body of this report. However, we address each of these separate topics below.

Statutorily Mandated Issues

1. **As required by A.R.S. Section 41-1279.03 (A)(6)(a), review "past expenditures and future planned expenditures of the transportation excise tax and determine the impact of the expenditures in solving transportation problems within the county." This includes assessing the appropriateness of the expenditures, and assessing how traffic has been impacted on various highway routes since the transportation excise tax passed; i.e. miles per hour in 1985 and currently, percent of person miles traveled by level of service, etc.**

   Since 1991, ADOT has developed and distributed a Life Cycle Certification report every six months that reports major accomplishment in building the freeway system and past and future planned expenditures, including the revenues and expenditures for projects funded through the Maricopa County transportation excise tax also referred to as the Regional Area Road Fund (RARF), ADOT's share of the Highway User Revenue Fund (HURF) and other local revenues.

   To determine the appropriateness of expenditures, we selected fourteen expenditure items, including right of way, design, construction, utility, and system-wide expenditures. All expenditures we reviewed appeared appropriate under ARS 41-1279.03. In our review of the underlying expense support, we were able to conclude that all of the expenditure items we reviewed were related to the design, construction, right of way, utility or system-wide charges for the Regional Freeway System projects.

   To determine the impact of the freeways built since the transportation excise tax passed, we compared traffic projections made in 1993, 1996, 1999 and 2000 to the actual vehicle counts measured in 2003. Overall, we found that the actual traffic volume has surpassed the projected vehicle counts. Generally, between 1993 and 1999, the projections were between 17 to 21 percent lower than the actual counts taken in 2003. However, the projections made in 2000, as compared to the actual counts in 2003, on the average were seven percent higher than the actual counts.

   The increased number of vehicle counts in excess of the projections developed in 1993 validate a concern prevailing among many Maricopa county citizens as well as

MAG and ADOT staff that that despite the fact that RFS freeways are being built in accordance with the Accelerated Program, the increasing population contributes to more vehicles per household and higher than expected congestion on the freeways. Over the last ten years, the Phoenix region has shown exponential growth beyond the 1993 estimates. United States Census data shows that exceptional growth is occurring throughout the southwestern United States. In particular, the Greater Phoenix population has increased by 59 percent since 1990, compared to the national rate of only 17 percent.

Further, our review of several MAG studies, including, "2001 Traffic Quality on the MAG Regional Freeway System," revealed that due to the rapid population growth in the area, the RFS freeways are operating at over than the expected capacity levels and traffic congestion is noted despite the fact that ADOT continues to open more and more segments of the RFS freeways.

2. **As required by A.R.S. Section 41-1279.03(A)(6)(b), review "projects completed to date and projects to be completed during the remaining years in which the transportation excise tax is in effect." Provide a comprehensive listing of all projects constructed with transportation excise tax monies, projects remaining, the cost of each project, and the number of miles associated with each project.**

   As noted previously, ADOT's Life Cycle Certification report covers RFS performance during the period from the beginning of the 1986 to 2005. The report shows revenues and expenditures associated with the program, and describes major accomplishments on the RFS projects. The information in the Life Cycle report is supported by project-specific data that reside in various systems such as construction databases and design consultant's electronic files to list a few. As required by A.R.S. Section 41-1279.03 (A)(6)(b), we reviewed projects completed to date and projects to be completed by the end of 2007. A comprehensive listing of theses projects derived from ADOT internal data is presented in the Appendix D of this report.

   While ADOT does not have a single information system capable of generating a comprehensive listing of all projects constructed with transportation excise monies, projects remaining, with costs of each project, and the number of miles associated with each project, such information is available in parts, in aggregate, or on a project-by-project basis. We did not test all of the underlying systems used to compile the Life Cycle Certification Report within the scope of this audit.

3. **As required by A.R.S. Section 41-1279.03(a)(6)(c), review, determine, and report whether the distribution of highway user revenues complies with A.R.S. Title 28, Chapter 18, Article 2 (Section 28-6531 et seq.), which specifically details the formula for distributing highway user revenues.**

Total HURF revenues, as required by Statute, should be distributed in the following way:

- 50.5 percent to the State Highway Fund; and of this portion, at least 12.6 percent should be allocated as follows:
    - 75 percent to counties with a population over 1,200,000
    - 25 percent to counties with populations over 400,000 but less than 1,200,000
- 3 percent to cities with populations over 300,000
- 27.5 percent to incorporated cities and towns
- 19 percent to all counties

Based on the review of the revenue collections documentation provided by the Motor Vehicle Division and the ADOT revenue distribution records, we determined that ADOT distributes HURF in accordance with the Arizona Revised Statute Title 28-6538. ADOT complies with the revenue distribution provisions of this Statute.

Program Management Issues

4. Review and evaluate the process used to recommend and select transportation projects for funding, as well as whether there is a system in place to reconsider or revisit project and their priority within the system to allow for changes in transportation needs in Maricopa County, and identify any recommendations for improvement.

The Maricopa Association of Governments (MAG) is a Council of Governments that serves as the Metropolitan Planning Organization (MPO) for Maricopa County and Apache Junction. MAG provides a regional forum for analysis, discussion and resolution of issues including areas of transportation, air quality, environment, regional development and social services.

MAG has the statutory power to review and prioritize projects for the Regional Freeway as defined in ARS 28-6354. MAG works closely with ADOT on setting the priorities for the RFS and making any changes (if needed) to the existing project schedules and budgets. The project priorities for the entire Regional Freeway System were initially established in 1985. Since the program's inception, the project priorities have been reviewed several times, but have not been re-prioritized since 1999.

Project priorities are based on a 20-year traffic projections model that generally fairly reflects the needs of the MAG growing region. However, due to the exponential population growth in the area, which increases the demand for the freeways use, the growing concern remains that the rate of freeway construction can hardly meet the quickly rising need for more freeways.

Nonetheless, we found MAG's process of prioritizing projects sound. MAG regularly conducts studies to measure traffic indicators, including transportation volume studies, such as household surveys, MAG Regional Travel time and travel speed studies, Phoenix External Travel Surveys, Traffic Quality on the MAG Regional Freeway System and MAG Regional Congestion studies. It uses these studies to evaluate the following prioritization criteria:

1. Travel demand
2. Congestion relief
3. Air quality improvements
4. Accident reduction
5. Cost effectiveness
6. Joint funding
7. Social and community impacts
8. System continuity and mobility
9. Establishment of a complete freeway system as rapidly as possible
10. Construction of segments that serve regional needs
11. Construction of segments that provide connectivity with other elements (Source: MAG Annual report)

We did not identify obvious improvements that could be made to this process.

5. Review and evaluate ADOT's plan for maintaining the roadways constructed with the ½ cent sales tax; i.e. pavement preservation, landscaping upkeep, road maintenance, etc.

According to the ADOT Maintenance Director, the maintenance spending for the Regional Freeway System has been generally appropriated through the State budget. Proposition 300, establishing the one-half cent transportation excise tax approved in October 1985, covers only the construction of controlled-access highways. It makes no allowances for maintenance.

Currently, ADOT estimates that the average annual costs to operate and maintain a standard new mile of a 6-lane urban freeway equal approximately $123,400 a year. Further, ADOT's long-range planning estimates include an expectation that maintenance costs per mile increase after the initial four years of highway operation at a rate of an additional $1,120 per mile per year. ADOT's maintenance plan includes several types of activities, including sweeping, landscaping, litter control, accidents and traffic control, freeway management system, lighting and electricity, signing and striping, drainage, gaffitti removal and pavement maintenance. With the passage of Proposition 400, $279 million of sales tax funds are allocated to ADOT for landscape maintenance and litter control to augment the funding that ADOT already has for maintenance in the MAG region.

6. **Determine the average cost per highway mile funded by the ½ cent sales tax in Maricopa County as compared to other state's highway programs and/or national construction cost indexes.**

   According to our transportation engineering consultant, the nation-wide standards related to the cost per mile indicators are generally expressed in capital cost per lane mile. While the capital costs such as direct labor, materials and equipment are affected by external factors such as cost of living, relative price of the construction supplies and many others, additional costs such as the right of way, design, utility and landscape typically fluctuate to a greater degree, when comparing highway construction costs across different territories and different states.

   Based on our review of the capital construction costs for a selected number of segments on the Regional Freeway System, we found that the cost varied between $2.38 million to $3.78 million per lane mile. Our transportation expert asserted that such cost indicators are comparable with the construction cost standards adopted by CalTrans, where the actual costs per lane mile should be within a $5 million range.

   It should also be noted that in April 2004, MAG reported that the total cost per RFS centerline mile was $39 million. This figure represented all costs associated with the design, property acquisition, utilities, landscape and construction of the freeway.

7. **Update the MAG program features identified in the 2000 performance audit report.**

   The MAG program features were updated to indicate progress made since 2000 and are included in this report in Appendix C.

Traffic Projection Issues

8. **Identify methods used by ADOT and MAG to determine areas in Maricopa County with the greatest transportation needs and review and evaluate these methods for validity and reliability. For example, if traffic projection models are used to evaluated transportation projects, are these models statistically valid and reliable?**

   To determine the areas in Maricopa County with the greatest transportation needs, MAG uses a trip based approach, built on a modified industry-standard four-step modeling process to predict travel demand. The process incorporates data such as travel characteristics and usage of transit services, as well as various socioeconomic data (including income, transportation mode preferences, land use, population, and recreational and work patterns). MAG uses the model's long range travel demand forecast output as part of various analyses, including feasibility analysis for transit capital improvements, evaluations of the impacts of transportation investments, air

quality analysis, analysis of travel reduction programs, travel demand management strategies, and congestion management—all of which are utilized in transportation plan development.

We found the MAG transportation planning process to be continuously updated and improved through the conduct and analysis of various travel volume studies, including MAG regional congestion studies, household surveys, transportation studies of travel times, travel surveys, traffic volume research and analysis. These studies, conducted by MAG staff, external consultants hired by MAG, and other local entities, ensure that MAG's travel demand forecast modeling process continues to provide a reasonable representation of current and future traffic conditions and thus more accurately determine the areas with the greatest need for transportation improvements.

9. Review and evaluate the latest 20-year traffic projections and the viability/appropriateness of the model(s) used.

To evaluate the current 20 year traffic projections and the viability and appropriateness of the model used, we reviewed industry and federal literature related to traffic modeling and traffic demand projection, developed a general set of criteria based on the literature, and compared the MAG model to that criteria. Based on this review and comparison, we determined that the MAG model was consistent with industry criteria, was viable and appropriate, and thus, that the current 20 year projections were reasonable.

Specifically, MAG's modeling process was based on the widely used trip-based approach, four-step travel demand forecasting method that included a majority of the input data identified by industry literature. Further, MAG's modeling process included interim and final output calibration/validation techniques developed to ensure the model generated reliable projections; the calibration/validation results generally met or exceeded those identified in industry literature. Additionally, MAG had a process of continually improving the model to ensure it remained sensitive to changes in input data and produced accurate projections.

Right of Way Issues

10. Compare and contrast Arizona's state laws regarding transportation right of way issues and standards of appraisal with Federal laws regarding transportation right of way and criteria for appraisals.

To compare and contrast Arizona's state laws regarding transportation right of way issues and standards of appraisal with federal laws and regulations, we reviewed, compared, and contrasted the relevant Arizona Revised Statutes, federal statutes, and Code of Federal Regulations as well as the ADOT Right of Way Group's Procedures

Manual. Based on this review and comparison, we did not note any discrepancies between Arizona's state laws and federal laws and regulations related to transportation right of way or standards for appraisals. Further, ADOT's right of way acquisition process appeared to be consistent with both state and federal laws requiring fair market value appraisals, negotiations with property owners, and condemnation proceedings if, or when, necessary.

11. Review and evaluate ADOT's efforts to preserve the transportation corridors needed for Maricopa County Regional Freeway System.

To review and evaluate ADOT's efforts to preserve the transportation corridors needed for the Regional Freeway System, we interviewed key executive and management level staff including the deputy state engineer over the Intermodal Transportation Division (responsible for the highway development process), the chief Right of Way agent, and the assistant chief Right of Way agent as well as reviewed relevant internal procedural documents related to right of way. Based on the interviews and review of documents, we determined ADOT efforts to preserve transportation corridors was reasonable.

Specifically, although a majority of the "corridors" for the RFS had already been acquired and constructed upon, we were informed most were designed and built using a flexible and expandable ultimate route concept. In other words, most of the RFS projects were designed and built with the ability to expand capacity by opening a closed median or paving a shoulder, which "preserved" future expansion corridors. Additionally, for the preservation of upcoming projects, ADOT continued to use the more successful historical practices to preserve right of way. Specifically, the Project Management Section continued to utilize a Red Letter coordinator who worked with local agencies in the "Red Letter" process. Further, ADOT continued to work with local developers planning projects in, next to, or near the RFS right of way to minimize the impact of the highway on the development and the development's impact on the Regional Freeway System.

12. Review a sample of ADOT's prior purchases of right of way for the Maricopa County Regional Freeway System and compare what was actually paid for the land versus what the land's fair market value was at the time of purchase. If possible, comment on what influence the planned highway project had on the price paid for the land purchased for right of way and whether the method used to determine the purchase price complied with Arizona law.

To review a sample of right of way acquisitions, we obtained and reviewed a universe of acquisitions between January 1, 2000 and December 31, 2004 classified by corridor, which included appraisal values, acquisition prices, and other relevant statistics such as size of acquisition. We selected a sample of acquisitions from the universe and reviewed ADOT's Right of Way Group's files for each acquisition.

Based on our review of files, we determined ADOT generally paid Fair Market Value—or slightly more—for its acquisitions and the determination of purchase price complied with Arizona law.

Specifically, ARS 28-7091 indicates fair market value is the most probable price for which a property would sell in the open market. Further, the Federal Highway Administration (FHWA) Right of Way Program Development Guide noted an appraisal could be used to determine an approximate fair market value. Using the FHWA concept to determine if fair market value had been paid, we reviewed right of way purchases in total and noted the average variance between acquisition price and appraisal value was $26,890, or approximately 24 percent more than the average appraised value and the overall average variance between judgment price (condemnation) and appraisal value was $550,071, or nearly 61 percent more than the appraised value. In our sample of 20 acquisitions, we found that ADOT acquired 4 properties for approximately the appraised value (within 5.6 percent of the appraisal value); 2 properties for less than the appraised value; and the remaining 14 properties above the appraisal value.

Alternative Transportation Issues

13. What percent or amount of the transportation excise tax monies has gone into funding alternative modes of transportation since year 2000, and what specifically has the money funded since 2000?

According to ARS 28-6305, ADOT is required to transfer $5 million of the excise sales tax monies each fiscal year to the Public Transportation Authority fund and adjust the distribution by the annual percent change for the previous calendar year in the "GDP price deflator" as defined in ARS 41-563. In 2001 ADOT's annual distribution to the Regional Public Transportation Authority (RPTA) was $7.19 million, which was approximately 2.7 percent of the excise tax monies. Although the total amount distributed to RPTA in 2005 increased to just over $7.71 million, it was still only 2.5 percent of the excise tax monies received by ADOT. Further, the RPTA used these excise tax monies to fund alternative modes of transportation, although some of the excise tax money funded administrative and overhead expenses. A majority of the excise tax money—65 percent or more of the allocated amount in each of the fiscal years—was budgeted and spent on projects such as fixed route transit services and community funded transportation.

Appendix B

Status of 2000 Performance Audit Recommendations

Recommendation	Fully Implemented	Partially Implemented	Not Implemented	No Longer Appropriate
1. Clearly define the roles, responsibilities, and accountabilities of all members of a project team. Specifically, it should designate project managers who have appropriate authority over team members and final accountability for scope, schedule and budget.	●			
2. Identify additional information to be documented during project development and construction and who is or should be maintaining the documentation. At a minimum, documentation should include deliverables and documentation of significant decisions and actions taken during the course of individual projects.		●		
3. Monitor project progress throughout the project's life cycle and identify variances from the plan with the intent to proactively alter the course of a project as necessary.	●			
4. Use a project management system as a tool to monitor costs as part of project and track overall program status.		●		
5. Require all employees to fully utilize the department's automated system, Primavera, since ADOT purchased it to function as its project management system.				●
6. Fully utilize the project management system by inputting the necessary data so that reliable reports can be produced in a timely manner. Evaluate its reports to determine which reports can be eliminated or consolidated with the intent to reduce duplication of efforts and the number of reports.		●		

Recommendation	Fully Implemented	Partially Implemented	Not Implemented	No Longer Appropriate
7. Refine its post review process for all projects and apply lessons learned to future projects. Best practices should be communicated to all team members and implemented on all projects.		●		
8. Reconsider existing performance measurement systems and develop more useful measures.		●		
9. Reconsider revising cost estimates to reflect the estimated effects of inflation, rather than adjusting revenues, in order to provide a more accurate estimate of actual costs. Additionally, a more accurate cost estimate could be used as a benchmark for cost containment.			●	
10. Monitor the impact of future air quality violations or possible federal sanctions on ADOT's ability to meet critical milestones and budget goals.	●			
11. Ensure that project managers, personnel, and stakeholders have the opportunity for participation in available air quality educational programs.	●			
12. Continue to integrate air quality issues into all transportation plans, programs, and projects to reduce the possibility of federal sanctions.	●			
13. Inform the public of the possible effects and impact of future air quality violations and possible sanctions on Regional Freeway System projects.	●			

Source: Performance Audit of the Arizona Department of Transportation: A Review of the Maricopa County Regional Freeway System, Sjoberg Evashenk Consulting, July 2000.

Regional Freeway System Program Features

Features	1985	1991	2000	2005
Right-of-Way Acres	8,500	12,947	9,360	8,492
Total Lane Miles	1,171	1,333	927	945
Expressway Lane-Miles	250	22	44	44
Freeway Lane-Miles	921	1,311	883	901
Traffic Interchanges	127	156	125	125
Fully Directional Interchanges	0	14	10	10
Miles of Depressed Freeways	13	56	50	54

Source: Performance Audit of the Arizona Department of Transportation: Review of the Maricopa County Regional Freeway System, Sjoberg Evashenk Consulting, LLC, July 2000.
Arizona Department of Transportation, February 2005.

Note: As freeway building goes through the 30%, 60%, 90%, and final phases of design plan completion, the program features are more precisely defined. Because projects on the RFS are at various stages of design completion, these program features could change before the RFS is completed by the end of 2007.

Comprehensive Listing of RFS Projects [15]

Project Name	Cost [16] (in thousands)	Completion Date	Miles[17]
I-10 to Encanto Blvd	$ 47,013	Oct-01	0.8
Encanto Blvd to Camelback Rd	$ 48,966	Feb-00	2.7
Camelback Rd to Northern Ave	$ 50,360	Oct-01	2.6
75 Ave to 31st Ave	$ 25,571	May-98	--[18]
I-17 Traffic Interchange	$ 43,660	Jun-99	N/A
27th Ave/Thomas & 91st Ave. Ramps at 101L	$ 40,455	Jun-03	N/A
43rd Ave/Camelback & 51st Ave/Bethany Home	$ 46,884	Sep-04	N/A
55th Ave/Maryland	$ 8,767	Dec-04	N/A
59th Ave/Glendale	$ 35,342	Jul-06	N/A
67th Ave/Northern	$ 39,129	Nov-05	N/A
75th Ave/Olive	$ 12,678	Dec-04	N/A
I-17 to 56th Street	$ 51,796	Oct-99	8.6
I-17 to 19th Ave. East 1/2 of T.I.	$ 33,453	Mar-01	1.6
19th Ave. to Cave Creek Rd. (B)	$ 45,670	Apr-02	3.8
Cave Creek Rd. to 56th St. (B)	$ 44,131	Apr-02	4.2
56th St. to Scottsdale Rd.	$ 1,307	Jun-02	2.1
Scottsdale Rd. to Pima Rd.	$ 62,781	Oct-03	2.3
Pima Rd. to Shea Blvd.	$ 102,596	May-02	4.4
Shea Blvd. to McDonald Dr.	$ 77,515	Dec-00	4.8
McDonald Dr. to Thomas Rd.	$ 38,466	Jan-07	3.2
Pima Rd. Extension	$ 18,283	Feb-08	N/A
Red Mtn. TI Phase IV	$ 17,181	Apr-01	N/A
Warner Rd. to Frye Rd.Phase B	$ 45,079	Jan-02	2.7
Guadalupe Rd. to Warner Rd.	$ 100,034	Apr-02	2.0
Baseline Rd. to Guadalupe Rd.	$ 22,586	Mar-99	1.0
Price T.I. Phase II	$ 18,739	Jun-98	N/A
Price T.I. Phase III	$ 53,168	Mar-00	N/A
FMS U.S. 60 to 1st St.	$ 7,581	Jun-03	N/A
Price Freeway to McKellips Rd.	$ 61,460	Aug-99	2.9
McKellips Rd. to Country Club Dr.	$ 35,100	Sep-98	0.6
Country Club Driv. To Gilbert Rd.	$ 105,219	Aug-03	3.2
Gilbert Rd. to Higley Rd.	$ 84,732	Feb-06	4.5

[15] Source: ADOT Life Cycle Report, January 31, 2005
[16] Cost estimate amounts and schedule dates reflect project status as of January 31, 2005 Life Cycle Report
[17] Total miles related to projects as reported in the Life Cycle Report, January 31, 2005.
[18] Mileage data available only in aggregate, included in Camelback/Northern section.

Project Name	Cost (in thousands)	Completion Date	Miles
Higley Rd. to Power Rd.	$ 36,140	Jun-06	2.0
Power Rd. to University Dr.	$ 156,504	Mar-08[19]	4.5
University Dr. to Southern Ave.	$ 66,053	Aug-08[20]	2.2
US60/202L Traffic Interchange Phase I	$ 68,035	Jan-05	1.0
US60/202L Traffic Interchange Phase II	$ 77,514	Aug-08[21]	--[22]
Santan/I-10 Traffic Interchange Phase I	$ 40,501	Dec-04	1.5
Santan/I-10 Traffic Interchange Phase II	$ 116,264	Dec-04	0.5
I-10/Wild Horse Pass Blvd. Traffic Interchange	$ 16,802	May-06	N/A
56th St. to Kyrene Rd.	$ 54,764	Nov-03	1.0
56th St. to Price Rd. (Drainage)	$ 23,969	Sep-00	4.8
Kyrene Rd. to McClintock Dr.	$ 14,449	Feb-02	2.3
Price/Santan Traffic Interchange West 1/2	$ 2,053	Sep-01	1.0
Price/Santan Traffic Interchange East 1/2	$ 80,348	Apr-05	1.0
Dobson Rd. to Arizona Ave.	$ 51,986	May-06	1.9
Arizona Ave. to Gilbert Rd.	$ 81,156	Sep-06	3.1
Gilbert Rd. to Frye Rd.	$ 103,626	Dec-07	3.5
Frye Rd. to Higley Rd.	$ 105,615	Dec-07	2.6
Higley Rd. to Power Rd.	$ 17,448	Feb-05	2.0
Power Rd. to Elliott Rd.	$ 95,053	Jun-07	3.9
Elliott Rd. to Baseline Rd.	$ 61,471	Feb-06	1.9
Superior Ave. to University Dr.	$ 29,148	Aug-08[20]	1.3
Shea Blvd. to Thunderbird Rd.	$ 51,117	Dec-99	2.1
Thunderbird Rd. to Bell Rd.	$ 62,682	Nov-98	2.0
Bell Rd. to Union Hills Dr.	$ 50,766	Aug-05	1.0
Union Hills Dr. to Pima Freeway	$ 6,791	Sep-01	1.3
FMS:Glendale Ave. to Bell Rd.	$ 5,296	Jun-00	8.0
Baseline Rd. to 19th Ave.[23]	$ --[24]	Aug-08	N/A
I-10 to 51st Ave.[25]	$ --[24]	N/A	10.0
51st Ave. to I-10[25]	$ --[24]	N/A	12.0

[19] Construction to be completed by August 2007, landscape construction to be completed by March 2008.
[20] Construction to be completed in September 2007, landscape construction completed by August 2008.
[21] Traffic Interchange construction to be completed by April 2007, landscaping project to be completed by August 2008.
[22] Mileage data included in Phase I calculation.
[23] MAG "Set-a-Side."
[24] Project funding was transferred to Regional Transportation Plan Freeway Program (not RFS).
[25] South Mountain Freeway-unfunded

Arizona Department of Transportation

Office of the Director

206 South Seventeenth Avenue Phoenix, Arizona 85007-3213

Janet Napolitano
Governor

Victor M. Mendez
Director

David P. Jankofsky
Deputy Director

June 22, 2005

Debra K. Davenport, CPA
Auditor General
Arizona Auditor General's Office
2910 North 44th Street, Suite 410
Phoenix, Arizona 85018

Dear Ms. Davenport:

The Arizona Department of Transportation (ADOT) has completed its review of the *Performance Audit for the Review of the Oversight and Management of the Maricopa County Regional Freeway System.* We appreciate the effort that went into the audit and the cooperative spirit shown by all parties involved.

We concur with the Report's overall thrust that ADOT's historical performance indicates that the Regional Freeway System (RFS) will be completed by the target date of December 31, 2007, and, absent unpredictable events, within budget.

The improvements utilized in the construction of the current RFS will be applied to the future transportation infrastructure outlined in the Regional Transportation Plan/Proposition 400 recently authorized by voters.

ADOT's specific responses to the six recommendations contained in the Final Report are as follows:

1. **Recommendation 1: The finding is agreed to and the audit recommendation will be implemented.**

   As the Report notes, ADOT's project management model is "appropriate and working well." Nevertheless, ADOT will continue to seek ways to improve its project management practices.

2. **Recommendation 2: The finding is agreed to and the audit recommendation will be implemented.**

   ADOT will develop a comprehensive chronological checklist to be included in centralized project files identifying types of documentation contained in

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the file as well as a comprehensive overview of engineering, financial and/or other project decisions throughout each project's development.

3. **Recommendation 3: The finding is agreed to and the audit recommendation will be implemented.**

   ADOT management has initiated coordination meetings with its management consultants and requested their expertise in recommending alternative information system models that will effectively incorporate the various databases into a single comprehensive database or coordinated multiple databases.

   In that light, ADOT concurs that a more efficient documentation of its direct and/or indirect project costs should be implemented to accurately capture "system-wide" expenditures for its Life Cycle Certification reporting of corridor specific obligations.

   ADOT management will also continue to closely monitor, right-of-way acquisition budgets and related budget changes to capitalize on opportunities to increase its ability to anticipate financial impacts on the overall project budget. In addition, ADOT Right-of-Way Management will intensify its efforts to closely monitor rapidly escalating real estate prices in Maricopa County as new market trends emerge.

4. **Recommendation 4: The finding is agreed to and the audit recommendation will be implemented.**

   ADOT will keep baseline budgets and estimated completion dates for each RFS project, not only for comparisons of delivery dates, but also to use in tracking Proposition 400 budget costs and delivery dates. Moreover, proposed changes will document the impacts on the performance indicators established for the RFS program. Finally, other metrics and benchmarks will be utilized to provide an analysis of cost efficiency and effectiveness.

5. **Recommendation 5: The finding is agreed to and the audit recommendation will be implemented.**

   ADOT will continue to identify and define performance indicators for the RFS to assist MAG and the State Transportation Board to monitor performance.

6. **Recommendation 6: The finding is agreed to and the audit recommendation will be implemented.**

   ADOT will continue to track, monitor and report on the completion of the Accelerated Program and do so separately from the funding, costs, and timeliness for projects resulting from the passage of Proposition 400.

ADOT is confident of completing the RFS by December 31, 2007. This would not have been possible without the continuous improvements made by the Agency, many of which are based upon the recommendations of your Office, as well as the active involvement of our partners in this endeavor, including the Governor's Office, the Legislature, the Maricopa Association of Governments and its individual member entities, and our contractors and consultants. This experience will make us better stewards of the process contemplated by Proposition 400.

Thank you again for the efforts of your staff, and that of Sjoberg Evashenk Consulting.

Sincerely,

Victor M. Mendez

cc: Dennis Smith, Maricopa Association of Governments
Dallas "Rusty" Gant, State Transportation Board, Chairman
Kurt Sjoberg, Sjoberg Evashenk Consulting

Arizona Department of Transportation

State Transportation Board

206 South Seventeenth Avenue Phoenix, Arizona 85007-3213

Janet Napolitano
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Chairman

Richard (Dick) Hileman
Vice Chairman

James W. Martin
Joe Lane
S. L. Schorr
Delbert Householder
Robert M. Montoya

June 22, 2005

Debra K. Davenport, CPA
Auditor General
Arizona Auditor General's Office
2910 North 44th Street, Suite 410
Phoenix, Arizona 85018

RE: State Transportation Board's Response to the Final 2005 Performance Audit of the Maricopa County Regional Freeway System

Dear Ms. Davenport:

On behalf of the State Transportation Board, I submit the following comments on the Final 2005 Performance Audit of the Maricopa County Regional Freeway System. For clarification, it should be noted that Mr. Joe Lane and I specifically represent Maricopa County. The other Board members represent other geographic regions of the state. Thus, this correspondence reflects only Mr. Lane's and my comments.

Mr. Lane and I were very impressed with the thoroughness of the audit and its findings. Having been directly involved in the administrative approval of funding for construction and adherence to the delivery dates for the freeways, the Board is acutely aware of the importance of budget, scope and schedule. The audit accurately describes the financial complexities associated with this process.

We agree with the audit's general thrust that ADOT and its partners in the Regional Freeway System (RFS) have made great strides in their management of the development of that system. As the audit report indicates, it is likely that the RFS Accelerated Program will be completed on time and on budget. Specifically we concur with the audit recommendations made by your office.

The Department's Highway Development Process will be improved by incorporating these measures, which are of particular importance to the Board with the imminent onset of Proposition 400.

The Board and I are most appreciative of the opportunity to participate in the performance audit and provide input into this important aspect of ADOT's financial

engineering and administrative roles, responsibilities and functions. I believe the audit accurately summarizes ADOT's progress during this five-year period and provides constructive recommendations, which will benefit the Department in the future.

Sincerely,

Dallas Gant
Chairman

cc: Dick Hileman
Delbert Householder
Joe Lane
Jim Martin
Robert Montoya
S.L. Schorr

MARICOPA ASSOCIATION of GOVERNMENTS

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June 22, 2005

Debbie Davenport
Office of the Auditor General
2910 North 44th Street, Suite 410
Phoenix, Arizona 85018

Dear Ms. Davenport:

A review of the 2005 Performance Audit for the Review of the Oversight and Management of the Maricopa County Regional Freeway System final report has been completed. We appreciate the work of both your office and the consulting team from Sjoberg Evashenk Consulting in conducting the performance audit and the report's recommendations to improve the effectiveness of the implementation of the program. We will use the recommendations from this report, as well as the findings from the previous audits of the Regional Freeway Program, to establish a sound foundation for the implementation of Proposition 400 that was passed by the voters in November 2004.

We have carefully reviewed all of the recommendations contained in the draft report. We have provided a response to each recommendation that is applicable to the Maricopa Association of Governments (MAG), specifically, recommendations four, five and six.

Recommendation 4: Require comparisons of historical budgets and estimated completion dates – and memorialized explanations for all prior changes to them – when evaluating newly proposed changes. Proposed changes should also require the presentation of impact on key performance indicators established for the RFS program and other metrics of comparison to enable analysis of cost-efficiency and effectiveness (e.g. budgeted, estimated and actual costs per mile for similar projects).

MAG Response to Recommendation 4: The finding is agreed to and the audit recommendation will be implemented. For projects that have the necessary historical budget information available, MAG will include prior project budget and schedule information when presenting requests for material project changes in the MAG committee process. Historical information for the remaining projects for the Accelerated Program will also include past budget and schedule data where this information is available.

MAG is instituting a similar practice for the Proposition 400 projects. For the new Proposition 400 program, we are establishing a tracking system that will allow a project that was listed as part of Proposition 400 to be followed through completion. This system includes the tracking of projects as they are subdivided and refined for implementation to provide a clear lineage back to the original Proposition 400 project. Although the tracking system will start with the planning-level project budgets listed in the Regional

Transportation Plan, we understand through our discussions with Sjoberg Evashenk Consulting that the base cost estimate for a project should be the first-level estimate that results from preliminary engineering and design work such as a design concept report.

Recommendation 4 also includes the provision that proposed changes should also require the presentation of the impact on key performance indicators established for the RFS program and other metrics of comparison to enable analysis of cost-efficiency and effectiveness. These performance indicators, referenced in more detail as part of Recommendation 5, provide a context for the proposed change. MAG will establish performance indicators that will provide a gauge of how both the specific project and the overall program is performing with respect to budget and schedule.

Recommendation 5: Define key performance indicators for the RFS program that will help ADOT, MAG and STB recognize trends of performance that might trigger greater analysis for opportunities to improve cost-efficiency and effectiveness. For example, consider setting and tracking program success at delivering projects with 95 percent (of) the original schedule, or having actual projects costs come with 10 percent of the first design estimate (plus inflation) and/or other indicators, as proposed by ADOT, MAG and/or STB.

MAG Response to Recommendation 5: The finding is agreed to and the audit recommendation will be implemented. MAG is committed to establishing a performance monitoring system that will effectively improve the delivery of Proposition 400 projects. As part of the MAG Unified Planning Work Program and Annual Budget for FY 2006, MAG has established a Transportation Performance Monitoring work element and created a new position of a Performance Monitoring Engineer. The new work program element and staff resource will provide the means to focus on the development and implementation of performance measures for Proposition 400. In addition, the MAG Annual Report, which is a statutory requirement of MAG, next year will contain a section dealing with performance measurement including the budget and schedule performance of specific projects.

Recommendation 6: Require separate tracking, monitoring, and reporting on the completion, including funding and actual costs, of the Accelerated Program, separately of the funding, costs, and timelines for initiatives resulting from the passage of Proposition 400.

MAG Response to Recommendation 6: The finding is agreed to and the audit recommendation will be implemented. MAG separately tracks, monitors and reports on the Accelerated Program separately from the new Proposition 400 projects. For example, the 2005 Annual Report, which is a statutory requirement of MAG, will have a

separate section dealing with the status and expected completion of the Accelerated Program. The Annual Report will provide a summary of the costs and revenues for the Accelerated Program and a schedule of completion for the remaining projects. Furthermore, when material changes are requested for projects, we will note whether the change is for a project in the Accelerated Program or in the Proposition 400 program.

Since the first performance audit in 1991, the oversight and management of the Regional Freeway Program has improved dramatically. With the passage of Proposition 400, we now have an opportunity to expand the best practices to the transit and arterial street programs. We will continue to seek new and improved methods to deliver the needed transportation projects in a efficient and cost-effective manners.

Thank you again for the good work of your staff and the consultant, Sjoberg Evashenk Consulting.

Sincerely,

Eric J. Anderson
Transportation Director

c: Dennis Smith, MAG
Victor Mendez, ADOT
Kurt Sjoberg, Sjoberg Evashenk Consulting