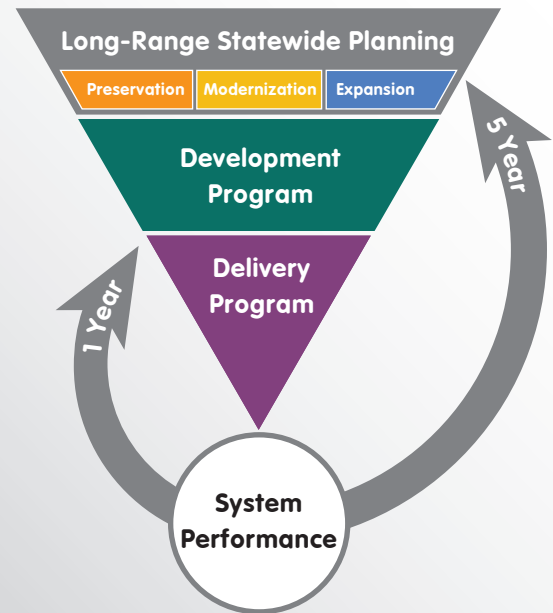




Linking the Long-Range Plan and Construction Program

P2P Link

P2P Link Methodologies & Implementation Plan
June 2014



Prepared for:
Arizona Department of Transportation
Multimodal Planning Division

Prepared by:

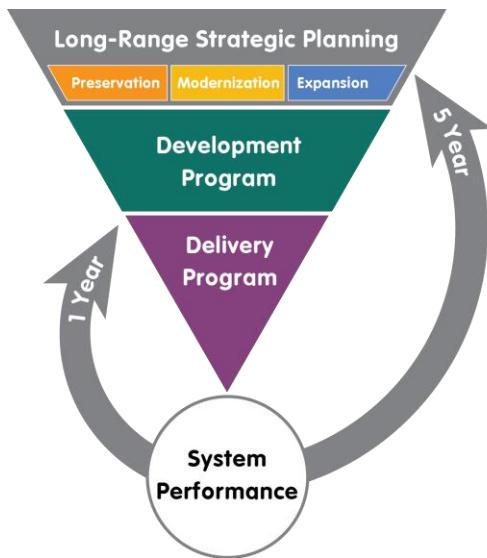




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Executive Summary

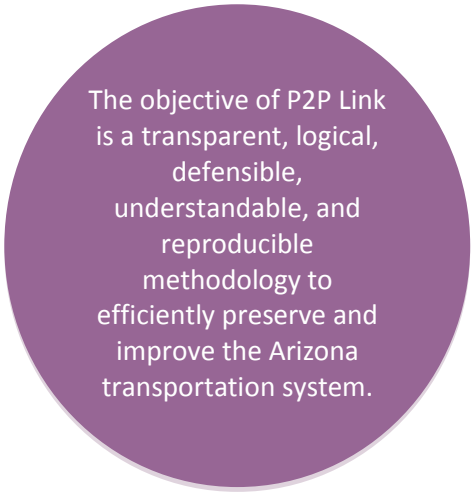
The Plan to Program (P2P) Link Methodologies and Implementation Plan describes Arizona’s process for linking transportation planning to capital improvement programming and project delivery. The accompanying report details how to establish the link and migrate from current departmental practices to the new process.

P2P Link is a performance-based approach to planning, programming, and financial decision making that ensures available funds are used in the most productive way to meet overall transportation system performance objectives. P2P Link connects the goals of the State’s Long Range Transportation Plan (LRTP) to the Arizona Department of Transportation’s (ADOT) Five-Year Construction Program. This connection ensures that the LRTP policy guidance is adhered to in improving the quality of the State transportation system.

P2P Link implementation is underway and integrates the new approach into the annual and multi-year cycles of planning and programming. P2P Link has incorporated all facets of the ADOT programming process and is expected to be refined over the next few planning and programming cycles by ADOT, its business partners, and its stakeholders through experience gained from initial implementation.

Objectives

The Multimodal Planning Division (MPD) of ADOT undertook the development of P2P Link to position Arizona for the future by designing and implementing a best practice methodology drawing on lessons learned by other agencies. The outcome is an approach that aligns expenditures with accomplishments to provide for the most cost-effective use of Arizona’s transportation dollars.



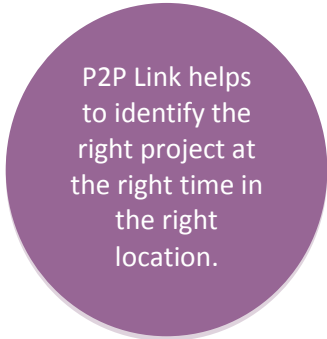
The objective of P2P Link is a transparent, logical, defensible, understandable, and reproducible methodology to efficiently preserve and improve the Arizona transportation system.

Background

P2P Link development started with ADOT’s multimodal visioning called “Building a Quality Arizona” (bqAZ), the 2010 Statewide Transportation Planning Framework Study that created a fiscally unconstrained vision for the state’s transportation system in 2050. bqAZ led to “What Moves You Arizona?,” the state’s LRTP 2010-2035, which applied financial constraint to the vision, identified anticipated revenues, and provided a recommended investment choice (RIC) that indicates how revenues will be allocated to four investment categories: preservation, expansion, modernization, and non-highway. The final step, and the subject of this report, is “Linking the Long-Range Plan and Construction Program,” or P2P Link, which focuses on how ADOT and its primary business partners, the Federal Highway Administration (FHWA), Metropolitan Planning Organizations (MPOs), and Councils of Government (COGs), plan, design, fund, build, maintain, and operate the transportation system.

Developing P2P Link

P2P Link was developed through the following process: understanding current practice, identifying redundancies or inefficiencies, proposing and testing plans for how to formulate future capital programs, and consulting with other states that have completed similar transitions and streamlining of practices for efficiency. This led to a recommended process to provide a clear performance-based link between the direction provided in the LRTP and the ADOT Five-Year Transportation Facilities Construction Program. As part of the process, the ADOT program has been expanded to add a “Development Program” representing an additional five years (years six through ten) that will “feed” the Five-Year Construction Program, or “Delivery Program,” and enable almost all projects to be delivered within the year and quarter for which they are programmed. These changes have been validated within ADOT and among regional partners responsible for program implementation. Each of these steps is detailed in this report.

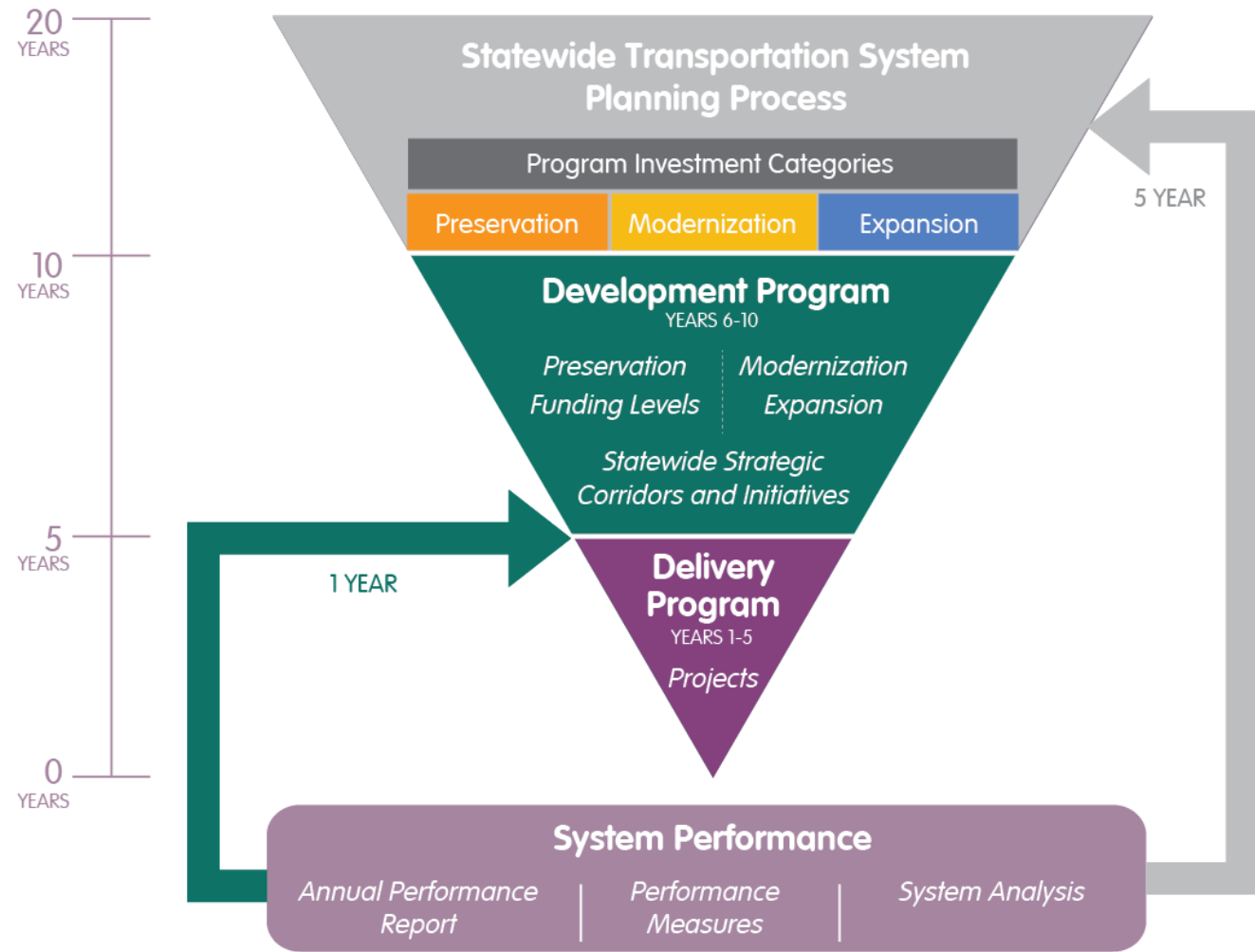


P2P Link helps to identify the right project at the right time in the right location.

Overview

The primary focus of P2P Link is optimizing transportation system performance. This focus on performance is not only mandated by the recent passage of Moving Ahead for Progress in the 21st Century (MAP-21) at the national level, but is also designed to allow the formulation of a logical, understandable, defensible, and reproducible process that makes the best use of the funding available. P2P Link helps to identify the right project at the right time in the right location. Projects implemented under P2P Link have a direct influence on system performance.

Linking Planning to Programming



- ▶ **Statewide Transportation System Planning Process:** Composed of the LRTP, modal, corridor, topical and regional plans, it is a coordinated, on-going process that is regularly updated and complies with federal and state statutory requirements. The plans detail the desired level of performance of the transportation system. They are outcome oriented, addressing mobility and safety, asset management, and all transportation modes. The performance requirement is the mechanism that links planning to programming.
- ▶ **Program Investment Categories: Preservation, Modernization, and Expansion:** The investment categories are established in the LRTP. Across the different levels in the planning process investment decisions allocate the funds needed to implement the performance requirements set by the LRTP and supporting plans for these categories. Each of the three categories is considered to be multimodal and to include pertinent non-highway elements.
- ▶ **Ten Year-Year Program Plan:** Comprises a Development Program and a Delivery Program, linking plans to implementation. The Development Program covers years six to ten and includes expansion, modernization, and statewide strategic corridors and initiatives¹. The Delivery Program, years one to five, includes projects that address all program investment categories. It represents a committed work program that ADOT holds itself accountable for delivering (Five-Year Construction Program).
- ▶ **System Performance:** P2P Link contains specific measures of performance and provides annual feedback that helps set or modify targets and relate state and regional plans. In this way, P2P Link encourages cooperation and consolidation of results in determining statewide system performance. System performance involves an annual assessment of the state transportation system that tracks and reports performance against targets established in the statewide LRTP. The assessment informs the next LRTP cycle of how well performance goals, strategies, and objectives have been met and the appropriate emphasis to be placed on investment categories in the next annual program update.
- ▶ **Fiscal and Financial Constraints:** Fiscal constraints are applied to the Delivery Program to ensure the program is available or “cash ready” and the program can be delivered. The financial constraint in the Development Program helps to manage the program by limiting funding to only that which is considered realistic over the next ten years. The Development Program allows for a pipeline of projects that can be moved into the Delivery Program at the appropriate time based on their contribution to system performance, accounting for the possibility that the fiscal capacity to finance projects increases at short notice.

¹ Strategic investments are defined as major areas of programmatic focus for investment over the 20-year plan horizon to meet planned performance targets and/or address risks to the accomplishment of desired transportation system performance. These strategic investment needs are identified broadly and provide a statewide focus in the LRTP as implementation priorities. The criteria for their inclusion are that they are of statewide significance and constitute large programmatic efforts, or what could be considered as “mega-projects” that warrant statewide focus. They could be implemented as a single initiative or built in phases as component projects, depending on the funding available.

Project Selection and Prioritization

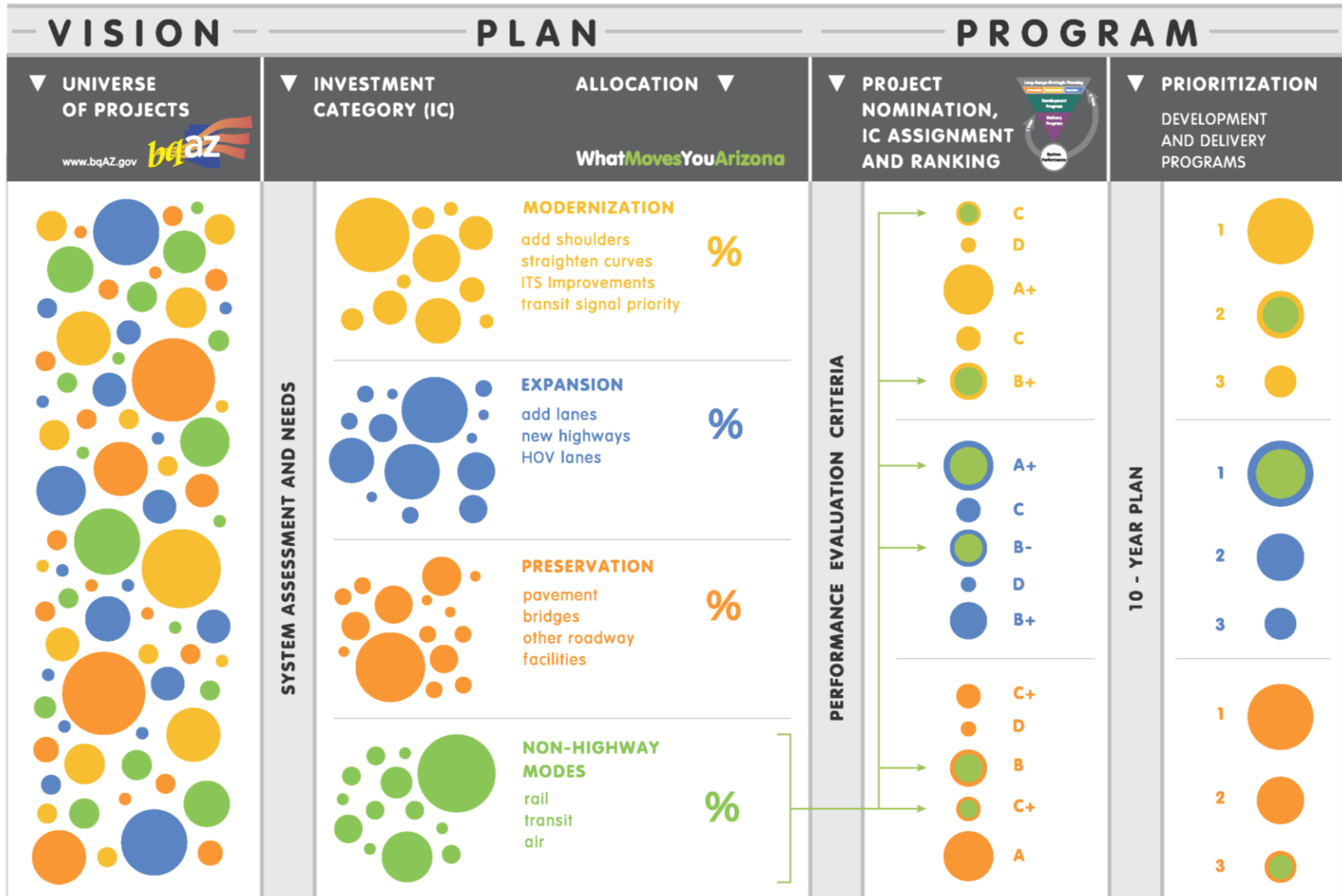
Projects will be selected for funding (programming) based on their contribution to the improvement of system performance compared to other projects. Once the programming list is complete, the system will be assessed based on the contribution that the program-selected projects will have on the system as a whole. System performance will help determine the most effective emphasis for the next program development cycle. The following figure illustrates the overall process of project identification, nomination, allocation, rating, ranking and prioritization in a graphical form.

Implementation

Implementation of P2P Link will require changes in ADOT's overall business approach to project programming, including a more comprehensive set of procedures for targeting and measuring performance. It will also require a more strategic allocation of resources based on priorities that reflect a project's contribution to system performance. These changes ensure the effective use of transportation funds by aligning project scope and priority with the priorities for improving the performance of the state transportation system.

The P2P Link process will mature and be refined through each program and plan update cycle. Migrating from current practice to the new process will occur over the next three years by integrating the new process into the regular planning and programming update cycles, concluding with the next update of the LRTP. The key steps to implement P2P Link include:

- ▶ Completing planning efforts needed to support the process, such as the Asset Management Plan, Strategic Corridor/Initiative Analyses, and System Performance Analysis. This will establish a planned level of system performance by defining performance criteria and targets and measuring current conditions.
- ▶ Restructuring the current Five-Year Construction Program into the Ten-Year Program Plan (Development and Delivery) according to investment categories and consistent with eligible work types for each category.
- ▶ Applying the new project selection and prioritization criteria developed through P2P Link work to select new projects into the Ten-Year Program Plan. This uses performance measurements that correlate to improving system performance.



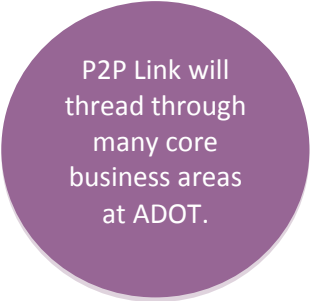


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1. Introduction

P2P Link is a continuous process, utilizing an integrated performance-based methodology to select projects for ADOT to fund and build. Although designed to achieve a specified level of transportation system performance, P2P Link will thread through many core business areas at ADOT, as well as those of federal and regional partners. These areas range from the planning efforts that will establish performance objectives, to the programming steps that will determine specific projects for system improvement, to the monitoring efforts needed to determine and understand system health.

This section introduces P2P Link, describing its development, framework, and impact. The overview provides the business requirements of the process and its goals and objectives, an outline of the process elements, and a description of how P2P Link positions ADOT for the future by meeting federal requirements, addressing risk, and strengthening accountability.



P2P Link will thread through many core business areas at ADOT.

P2P Link is central to ADOT's business:

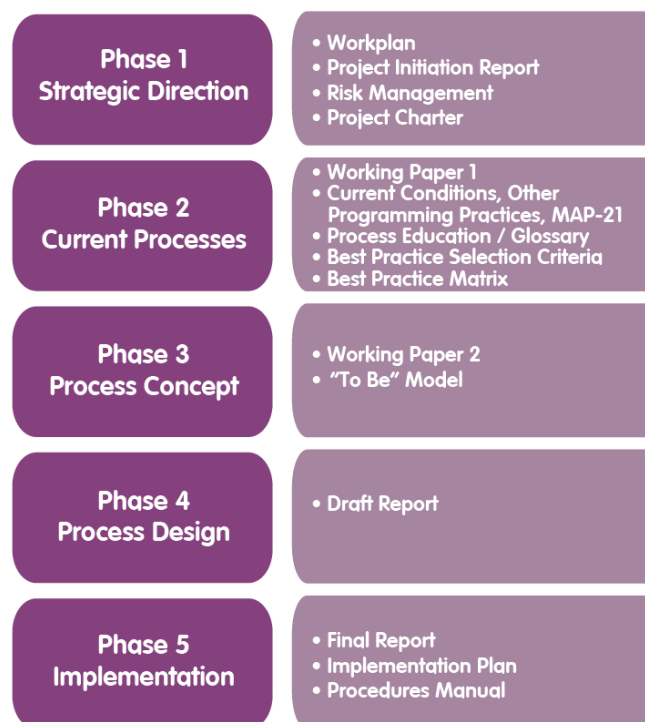
- ▶ Involving several core ADOT business areas and uniting the work effort of departmental sections to reduce redundancy and align with recent organizational changes
- ▶ Requiring results of several planning initiatives to continually update and refine the process
- ▶ Providing transparent movement of projects into the Five-Year Construction program (Delivery Program), and a commitment to implementing those projects, and a defined work plan for performance-based priority projects that will feed the Delivery Program
- ▶ Providing a mechanism to capture the importance of the state's strategic investments and providing a path to project delivery

1.1 Developing P2P Link

P2P Link was developed collaboratively by representatives of ADOT, FHWA, and MPOs/COGs. A Project Management Team (PMT) and a Project Advisory Committee (PAC) were formed initially to establish the strategic direction for P2P Link. Through the effort of the members of those teams in both small meetings and large workshops, the “business requirements” of the new process were defined and helped shape the foundation of P2P Link. Regular meetings were held throughout the project with ADOT leadership to ensure process development stayed true to the business requirements, considered all pertinent ADOT initiatives, and addressed any change management requirements to implement P2P Link.

The development of P2P Link consisted of five project phases that included several deliverables documenting its progression, as shown in Figure 1. The following paragraphs describe each phase.

Figure 1 – P2P Link Development



Phase 1 – Strategic Direction: A solid foundation for collaborative discussions was established during Phase 1 through a series of small and large group discussions. These ultimately yielded P2P Link goals and objectives, or “Business Requirements.” Individual meetings were held with ADOT Divisional Leadership groups and FHWA. The discussions from these meetings helped define a unified vision of the desirable P2P Link outcomes. The vision was then shared with the PMT and PAC, who worked together to identify the specific goals and objectives to be achieved by P2P Link. The efforts of Phase 1 resulted in the business requirements (see Section 1.2) that framed the design of the new process.

Phase 2 – Current Processes: Phase 2 involved identifying and evaluating current planning and programming practices at ADOT and other state transportation agencies to identify which ADOT practices lent themselves to P2P Link and which needed updating or revision. This phase also examined the new requirements imposed by MAP-21 and how they would impact ADOT’s programming practices. The premise of this phase was that by understanding the current practices and new performance-based requirements and building from ideas tested elsewhere, ADOT could make informed decisions about changes

needed to establish a programming process that would most effectively manage the Arizona State transportation system and comply with federal policies.

Best practices for planning and programming were discussed with the PMT in great detail to develop a collective understanding of which practices would be most meaningful to ADOT and to screen for states that would best serve as Peer States during P2P Link development. The PMT completed a self-assessment of how best practices are being utilized at ADOT. This exercise was used to explore those practices most important for P2P Link to embody. In combination with the self-assessment, the PMT reviewed practices implemented by other states. Four states – Colorado, Minnesota, Oregon, and Utah – were selected as Peer States based upon their similar capital improvement program size, economic base with concentrated population centers, and statutory or legislative structure. The project team consulted with these states because they have programming considerations similar to ADOT's and are recognized as best planning to programming practice agencies.

Project outreach during Phase 2 included ADOT Divisions, FHWA, and MPOs/COGs. The effort was documented in Working Paper No. 1, which is provided in Appendix A.

Phase 3 – Process Concept: The conceptual design for ADOT's new business model linking planning to programming was developed in Phase 3. The concept was designed to incorporate national best practices that work well for Arizona, address the business objectives specified by the project team and business partners, apply existing elements of ADOT's planning and programming process to achieve the stated business objectives, and implement MAP-21 requirements.

Several concept process models were developed and analyzed as part of P2P Link Phase 3. These included concepts centered around:

- ▶ Statewide Investment Categories (allocates funding on the basis of project categories)
- ▶ Strategic Statewide Investment (emphasis on critical projects of statewide significance)
- ▶ Regional or District Investment Priorities (building from the district or regional level up)
- ▶ Overall Statewide Performance Ranking (all projects ranked against each other)

A best practice workshop was held on January 29, 2013. The workshop provided a forum for discussion of best planning-to-program practices, as well as a concept model critique by the project team with input from peer State Departments of Transportation (DOTs). Workshop attendees included the PMT and PAC, along with representatives from the Colorado, Minnesota, Oregon, and Utah DOTs. The project team evaluated the merits of each concept at the workshop. The insights from the workshop served as the basis for the

recommended P2P Link model, which was a combination of a number of the concepts evaluated. This process is documented in Working Paper No. 2 (Appendix B).

Phase 4 – Process Design: Phase 4 involved designing the process methodologies for the new P2P Link process identified in Phase 3. The work included:

- ▶ Identifying adjustments or redesign required for the long-range planning process to meet P2P Link requirements
- ▶ Defining the new program structure and specifying eligible work types for each program category
- ▶ Developing project prioritization criteria and evaluation methods
- ▶ Detailing the annual process for updating the program

The process methodologies were discussed with ADOT, MPOs/COGs, and FHWA at three separate workshops held June 19, September 24, and October 23, 2013. The participants worked through the work type eligibility, project evaluation criteria, and the project selection process for three investment categories (i.e., preservation, modernization, and expansion). The Non-Highway investment category of the LRTP was incorporated into all others as a basic premise of all future work. Modifications to the methodologies were made as a result of the workshop discussions and tested as part of prototyping P2P Link using the current ADOT Five-Year Construction Program. Descriptions of the methodologies are provided in Section 3, of this report and details about the prototyping approach are provided in Section 4. The results of the prototyping will be included in an appendix to the final version of this report.

Phase 5 – Implementation: As part of Phase 5, a three-year migration strategy was developed for ADOT to move from the existing planning and programming process to P2P Link. During this transition period, several required planning efforts will be completed to inform P2P Link, including the LRTP update. The implementation approach addresses change management steps and practices to be taken and work required migrating the process, including how to manage existing commitments under the statutorily-driven planning and programming cycle. Implementation is covered in more detail in Section 7. Implementation planning included developing and prototyping project selection and evaluation criteria for the preservation, modernization, and expansion program elements.

1.2 Business Requirements

During development of Phase 1, the goals and objectives for P2P Link were captured in the form of business requirements. The business requirements resulted from project initiation meetings with FHWA and ADOT MPD, Intermodal Transportation Division (ITD), and Financial Management Services (FMS). Open discussions about what the members hoped to achieve and challenges to be met along the way were explored. All comments received during those meetings were compiled into a comprehensive document that was reviewed by the project team to determine common themes and categories. ADOT's business requirements for planning and programming were identified during Phase 1 and documented as P2P Link Goal, Objectives and Challenges.



A broad-based group of stakeholders, leadership, management, and regional agencies participated in the development of the Business Requirements. The Business Requirements were validated and endorsed by key internal stakeholders and ADOT's partners.

P2P Link Goal

The goal for P2P Link is to create a performance-based programming process that links the bqAZ (vision), What Moves You Arizona? (LRTP) and the ADOT Five-Year Construction Program that is transparent, defensible, logical, and reproducible. In achieving that goal, P2P Link will:

- ▶ Comply with MAP-21
- ▶ Establish a performance management mindset and approach
- ▶ Address asset management needs for managing infrastructure and resources
- ▶ Increase annual programming efficiency
- ▶ Continually adapt to changing requirements and needs
- ▶ Consider a range of funding sources and opportunities

Objectives

The objectives identify the desired outcome of P2P Link, as well as define the primary actions to be completed as part of its development.

- ▶ Build on programming procedures currently successful within ADOT augmented by national best practices as a basis for discussing changes that will improve the process and comply with new requirements
- ▶ Adopt procedures to integrate the RIC into the programming process, including project selection and prioritization
- ▶ Make the necessary changes required to implement the new programming process (statutory; organizational; planning, development, and operations processes, etc.)
- ▶ Expand the programming timeframe from five years to ten years to afford greater flexibility in program definition
- ▶ Establish a “development” element and a “delivery” element within the Ten-year Program. The five-year delivery program represents the current Five-Year Construction Program.
- ▶ Evaluate how Planning and Environmental Linkages can help move projects through the programming process
- ▶ Include all capital projects in all RIC categories (preservation, modernization, expansion, and non-highway) in the new process
- ▶ Develop a programming process that includes awareness of and commitment to non-highway modes in all programming activity

Change Management

The change management challenges to implementing P2P Link were explored and discussed by the PMT and PAC. Challenges were broadly grouped, as shown in Table 1.

Table 1: P2P Link Challenges

General
<ul style="list-style-type: none"> • Statutory changes may be required • Translating elements of a plan for year 2050 into the Statewide Transportation Improvement Program (STIP) • Prioritization among different types of projects within each RIC (e.g., pavement preservation, rockfall containment, bridge rehab, sign rehab, etc.) • Better use of the National Environmental Policy Act in the programming process to satisfy fiscal constraint requirements • Utilize comprehensive cost-benefits analysis or cost-effectiveness approaches in project prioritization
Stakeholders/Partners
<ul style="list-style-type: none"> • Changing role of stakeholders in programming process • Concerns about funding of projects already funded or believed to be next in line • Equipping stakeholders with the means to participate through effective communication • Role of the State Transportation Board • Need for consistent approach by MPOs and COGs to aid in programming and to comply with MAP-21
Funding
<ul style="list-style-type: none"> • Changing from current practice of programming to the types of funding available • Better understand and properly fulfill the requirements of federal aid
Project Delivery
<ul style="list-style-type: none"> • Disposition of programmed projects not implemented due to over-programming of funds • Reinvent how ADOT allocates funding and delivers projects (subprograms) • Expedite delivery of programmed local projects • Improve project development/delivery to avoid “fire drill” to obligate money at fiscal year end • Recognize the need for a public communication strategy
Sustainability
<ul style="list-style-type: none"> • Incorporate a long-term sustainable view on project delivery • Balance a practical vs. ultimate design approach for project scopes (“right-sizing” and “right-timing”) • Consider Sustainability Guidebook (also about bqAZ) – related project happening in parallel

Accomplishment of Goal and Objectives

In developing P2P Link, the project goal was achieved and remained unaltered from its original formulation. The objectives were also primarily met, although some adjustments were made to the manner in which the RIC categories from the 2010-2035 LRTP were incorporated into P2P Link. The investment categories were reduced from four to three – Preservation, Modernization, and Expansion. Instead, within P2P Link, all RIC categories are considered multimodal and must account for multimodal needs in project selection and system performance monitoring.

The allocation percentages to each investment category from the latest LRTP were considered flexible in P2P Link. The intent is that future plan updates take a performance-driven approach to updating and adjusting the allocation every five years for developing the long range plan performance objectives and annually for program update emphasis, when system performance demands it. The LRTP-defined allocations are used as a starting point for the program update during each LRTP cycle and are then adjusted according to how well each investment category meets its performance targets.

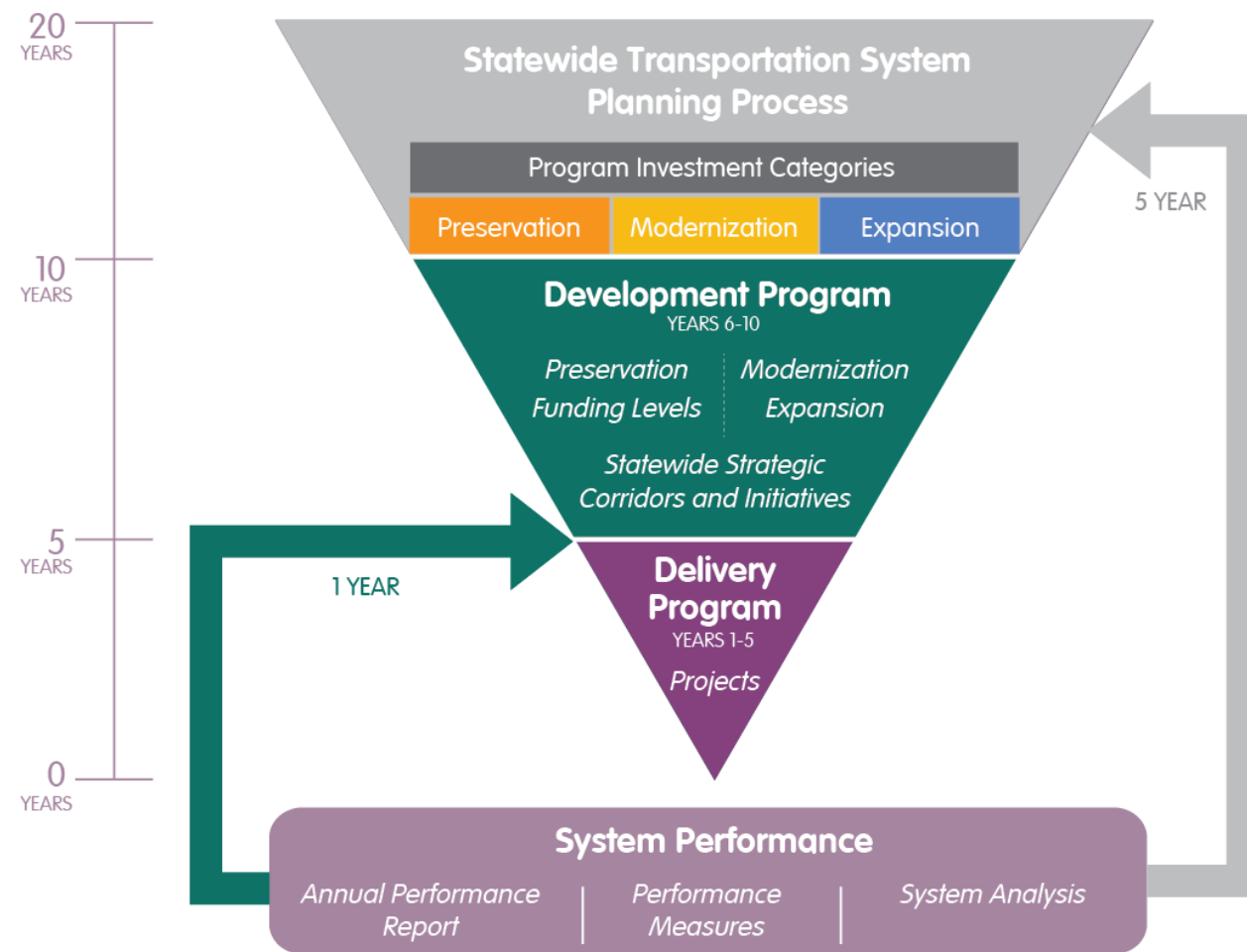
P2P Link achieves its goal by being:

- ▶ **Transparent** – by developing performance objectives with business partners as part of the statewide planning process then using these established objectives as the means to prioritize projects and initiatives.
- ▶ **Defensible** – by establishing project evaluation criteria for each performance category that support the planned performance objectives so that projects that are programmed for funding provide the greatest contribution to overall system performance.
- ▶ **Logical** – by delivering a planned level of performance. A ten-year work plan is developed for improvements to the system. The projects are ranked according to their contribution, then funding is applied to the ranked set.
- ▶ **Reproducible** – by following a defined process with clear project selection and evaluation criteria.

1.3 P2P Link Structure

P2P Link implements the statewide planning process through the Ten-Year Program Plan that is informed by system performance measurement. The overall process is shown in Figure 2 and involves the following components. The Program Structure is covered in more detail in Sections 3 and 4.

Figure 2 – Linking Planning to Programming



► **Statewide Transportation System Planning Process:** This is composed of the LRTP, modal, corridor, and special topical plans and regional plans. It is a coordinated, on-going process that is regularly updated and complies with federal and state statutory requirements. System planning also identifies strategic investments of statewide significance and provides a broad plan for future performance in those strategic elements. The planning process sets the planned level of performance for mobility and safety, asset management, and all transportation modes. Statewide Planning Requirements are covered in more detail in Section 2.

► **Program Investment Categories:** The statewide transportation system planning process includes investment categories, and P2P evaluates and plans for system performance in these categories at the system planning, corridor, program, and project selection levels. These categories address funding needed to achieve a planned level of performance of the transportation system as defined by the system planning process. The investment categories define performance metrics that measure and provide indicators of how plans, programs, and individual projects or planned investments will support the accomplishment of the planned level of performance of the transportation system. It is the use of these metrics that provides the mechanism that connects planning to programming.

► **Ten-Year Program Plan:** A ten-year capital improvement plan, composed of a Development Program and a Delivery Program, links the plans to implementation. The Development Program covers years six through ten and includes strategic investments, expansion and modernization projects that require time to undergo the necessary project development, environmental, and financial planning pre-delivery work. When projects reach the point at which delivery timelines can be predicted and managed and assuming they help to achieve the performance expectations of the system, they advance into a fiscally committed Delivery Program that moves the project through final design, environmental clearance, and construction or implementation. The Delivery Program includes projects that address all investment categories. It represents a committed work program that ADOT holds itself accountable for delivering. The Delivery Program is fiscally feasible with delivery costs balanced against forecast revenue budgets. These programs are updated annually.

► **System Performance:** The system performance component of P2P Link involves an annual performance assessment that tracks and reports performance against metrics established in the statewide LRTP as well as some required by MAP-21. The assessment informs the next LRTP cycle of performance goals, strategies, and objectives, as well as the emphasis placed on performance categories in both the LRTP and the annual program update. System Performance is covered in more detail in Section 5.

► **Fiscal and Financial Constraints:** The Delivery Program is fiscally constrained and complies with federal requirements. The Development Program applies a financial constraint that enables there to be a pipeline of projects that can be advanced into the Delivery Program, including advancing worthy projects should the fiscal capacity to finance projects increase upon short notice. Although not fiscally constrained, financial parameters for the Development Program that establish the overall allocation between strategic investments (if dedicated funding is made available), preservation, expansion, and modernization investment categories are established and adjusted every five years through system-level planning analysis in the statewide plan. This provides a financial constraint to be established based on broad policy-driven assumptions about the level of investment to plan for. This also provides the financial constraint upon which to base asset management plans. Fiscal and financial constraints are covered in more detail in Section 6.

Strategic investments are defined as major areas of programmatic focus for investment over the 20-year plan horizon to meet planned performance targets and/or address risks to the accomplishment of desired transportation system performance. These strategic investment needs are identified broadly and provide a statewide focus in the LRTP as implementation priorities. The criteria for their inclusion are that they are of statewide significance and constitute large programmatic efforts, or what could be considered as “mega-projects” that warrant statewide focus. They could be implemented as a single initiative or built in phases as component projects, depending on the funding available.

1.3.1 MAP-21 Performance Metrics and Targets

Performance metrics that address planning outcomes are used as criteria in the selection and evaluation of projects for inclusion in the Development and Delivery Program. A core set of metrics that includes those recommended by the American Association of State Highway and Transportation Officials (AASHTO) Performance Management Committee, supplemented by selected measures for ADOT's Asset Management Plan will be used:

- ▶ **To monitor and report system performance annually.** This will provide information for consideration in allocating funds to program performance categories in the annual Development and Delivery Program updates.
- ▶ **As the basis for modeling and forecasting future system performance over the next five-year, ten-year, and twenty-year periods as part of system performance analysis and program analysis.** This will be used to support the development of long-range plans, corridor profiles, and their performance-based links to the Development and Delivery Programs. The approach will enable performance risks and performance scenarios to be assessed as a basis for selecting the most effective program. The planning methodology will enable future system performance, determined by agreed upon metrics, to be forecast under different planning scenarios.
- ▶ **For setting targets and tiers for the statewide system.** MAP-21 requires the setting of performance targets. A target is the level of performance set for a specific performance metric. The ability to reach the target is determined by the type of investments (operational strategies and projects implemented to meet the target), the level of investment, and other factors such as the usage of the facility and impacts of external factors.

Transportation plans identify the level of performance to be achieved. P2P Link recognizes that in a resource-constrained environment, different targets will be set for each metric and for the different tiers of the transportation system. Plan development will set these tiers to recognize performance differences within the transportation system that reflect the varied characteristics of system facilities. The expectation is that the tiers will at a minimum distinguish between on and off the National Highway System (NHS) and between urban versus rural both on and off the NHS.

P2P Link is a best practice process that positions ADOT to address the requirements in MAP-21. The approach will accommodate the results of forthcoming federal rule making in a way that adds value and minimizes work that is merely a compliance exercise. In addition, P2P Link positions ADOT to address the future planning environment, in which the expectation is that:

- ▶ Revenue yields from current sources will decline in real terms
- ▶ Federal funding will at best be stagnant or decline in real terms
- ▶ Risk-based strategies will be required to set priorities for resource allocation
- ▶ Policy-makers and customers will demand efficient use of funds
- ▶ Multimodal solutions will be pursued as a fundamental mindset of program development
- ▶ Large-scale strategic investments will require dedicated financing to supplement existing revenue sources

1.3.2 Risk-Based Asset Management

Risk is at the core of asset management. Level-of-service or performance targets are set for assets based upon the associated level of risk to the ability of the asset to function as designed to meet the performance objectives set for the system. P2P Link addresses this risk at two levels:

- ▶ **Tiered Performance Targets:** As discussed above, the targets that are set for system performance, including those for pavement, bridge, and roadway asset preservation, will be tiered to reflect the risk associated with facility usage. The expectation is that lower use or a lower classification (e.g., off the NHS) would justify lower level of service and hence lower performance targets. Further, that the eligible work types for projects could be different, driven by risk.
- ▶ **Within Asset Management Plans:** P2P Link anticipates that ADOT's Asset Management Plan will identify risk-based levels of service or performance targets for each asset class. These targets will be tiered and risk driven both within and between asset classes.

1.3.3 Freight Requirements

MAP-21 includes requirements and expectations for addressing freight within the planning process. This also includes establishing freight-related metrics. P2P Link is developed so that a future ADOT freight plan will provide metrics and identification of strategic investment requirements to support measuring freight performance. The freight plan will provide the performance-driven link for identifying freight-specific project improvements. ADOT's strategic investments will address freight as well as passengers.

1.3.4 Providing Accountability for Transportation Investments

P2P Link provides ADOT the ability to communicate the level of performance that will be "bought" by the Delivery Program and the performance that can be achieved under different investment scenarios. P2P Link provides the basis from which realistic expectations can be set and for stakeholders and policy-makers to emphasize projects that will have the most beneficial impact on overall system performance.

The Development and Delivery Program elements of P2P Link improve clarity and accountability for project delivery. The process is designed so that the projects in the Delivery Program are delivered in the year in which they are programmed to be delivered. Management controls will ensure the Delivery Program is fiscally feasible and that projects are not committed for construction until they can be cleared, financed, and delivered.



2. Statewide Planning Requirements

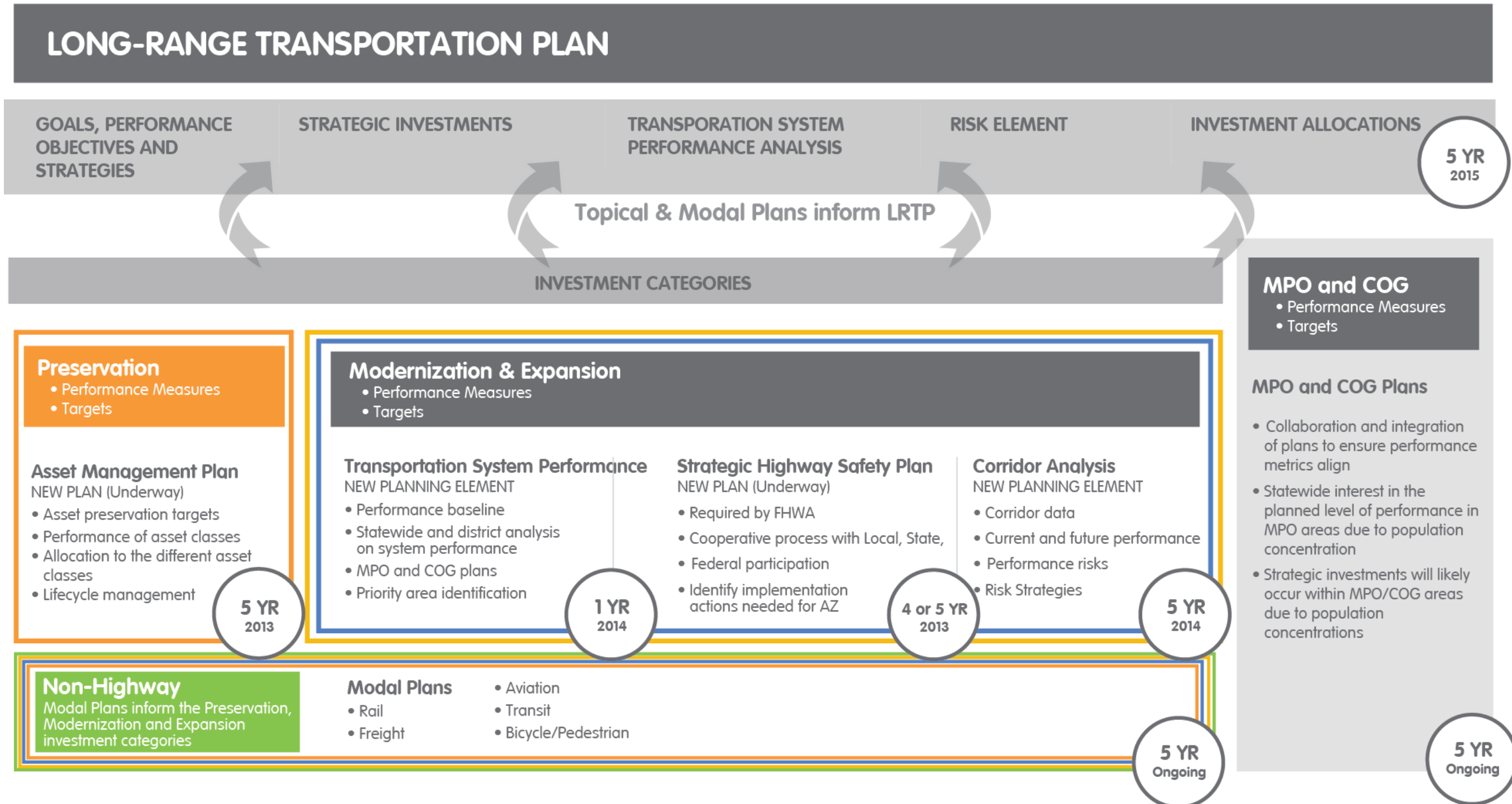
Section 2 outlines the new elements of statewide long-range planning that will be required to establish the performance objectives for the Arizona transportation system. These are the elements that P2P Link relies upon to guide decision-making regarding program investments. To enable P2P Link, the statewide transportation system planning process is now structured to directly guide the programming of system improvements. Figure 3, P2P Link Planning Requirements, outlines the methodology and scope of statewide plans needed to support performance-based planning and programming. The LRTP, system performance analysis, and corridor planning analysis will identify strategic investment needs and any further advance planning required to develop transportation solutions for inclusion in the program. At all levels, performance is the critical link between planning and programming. Figure 3 depicts this link, and each element is described below.

2.1 Statewide Long-Range Transportation Plan

The LRTP is the planning effort that sets overall investment direction, identifies strategic investment areas, and establishes performance objectives. It sets long-term priorities and objectives for the transportation system based on performance. The 2010-2035 LRTP identified investment categories, goal areas, and potential performance measures. The current LRTP is the starting point for P2P Link, but the approach and scope of the statewide plan in its next update will provide the overall system planning basis for P2P Link. A more specific performance emphasis will be necessary to fully comply with existing and future expectations for the transportation system. It will incorporate MAP-21 and other performance metrics, include a new risk element, and address P2P Link direction on how system priorities will be set.


The next update to the LRTP is anticipated to begin in 2015. As part of the next update, further clarity and definition are needed in the following areas to ensure the full benefit of P2P Link is realized.

Figure 3 – P2P Link Planning Requirements



Goals and Strategies

The LRTP includes overall policy goals for Arizona’s transportation system and strategies for accomplishing them. The next LRTP update will need to align with the national policy goal areas of MAP-21. It is recommended that the list of goals focus on a meaningful few manageable key areas since these will be the basis for setting system performance objectives. Measuring the accomplishment of these objectives should address the federal requirements by using performance measures that, to the extent possible, use existing data and information. ADOT will need to report performance on the National Highway System in accordance with the guidelines established through federal rule-making.



The LRTP includes overall policy goals for Arizona’s transportation system and strategies for accomplishing them.

The LRTP includes strategies that address system performance for each of the goal areas. ADOT’s plan, in cooperation with MPOs and COGs, is to identify and develop a statewide program that will focus on the areas of greatest benefit for the transportation system.

Performance Objectives

Arizona transportation system performance objectives will be updated in the next LRTP to drive P2P Link. The accomplishment of these objectives, which will address plan goals, will be measured through a set of performance measures that provide a quantitative indicator of progress toward plan goal. This includes establishing performance measurements and targets that address the national reporting requirements enacted through MAP-21. Anticipating and preceding federal MAP-21 rule-making, initial performance measurements can be utilized as described in Section 5.5.

P2P Link anticipates that the LRTP will, as a matter of policy, establish tiers for the State transportation system to differentiate various utilization elements of the system. The tiering of the system will result in different performance targets for the different tiers. It is anticipated that the system tiering will be based on consideration of NHS classification, functional role, travel demand, and freight movement among other factors. The performance objectives and targets will be defined for each tier. The risk element of the plan will address the tiering in terms of the performance objectives and targets that are established for the performance of the system.

System Performance Analysis

Central to P2P Link is a planning process that evaluates the level of performance that will be provided by different planning scenarios and the level of performance that will be delivered by the implementation of funded plans and programs. This requires ADOT to be able to assess and communicate predicted performance over the next five, ten, and twenty years to verify progress toward performance targets. This monitoring effort will rely on planning and program documents such as the LRTP and the annual program updates. The next five years will be based on the performance with the assumed completion of the Delivery Program and ten years with the completion of the Delivery and Development Programs.

The process also includes an annual statewide system performance report that documents trends in performance as measured by P2P Link performance metrics. This will produce an annual public performance report showing trends and how well performance targets have or have not been met.

System performance is expected to be reviewed annually, considering the effect of the proposed annual ten-year program, both Development and Delivery components, on anticipated system performance compared against a current performance baseline. The composition of the proposed program will be tested under different programmatic scenarios (i.e., different weightings in the allocation of resources between system investment categories (currently Preservation, Modernization and Expansion)). After the first few annual cycles, ADOT may determine that a different duration between performance reviews is more meaningful.

A system performance analysis that evaluates performance under different scenarios will also be completed every five years as part of the LRTP update process. This analysis will be used to establish the programmatic emphasis within the development and delivery program for that LRTP cycle and subject to refinement annually based on annual system performance results as noted above.

Risk Element

The risk element identifies, assesses, evaluates, discloses, and manages risks to the accomplishment of the goals, strategies, and performance objectives established in the LRTP. The risk element will include the policies and risk management strategies that will avoid and reduce risk to the accomplishment of the overall plan goals. P2P Link identifies a risk management element for the LRTP to include a tiering of the Arizona transportation system to help place emphasis on system facilities commensurate with their potential to impact the performance of the system.

The risk element will include:

- ▶ **Tiers:** Definition of tiers based on system significance and usage (e.g., NHS, high traffic volume, high freight volume, etc.)
- ▶ **Targets:** Different performance targets by tier
- ▶ **Differing Performance Scenarios:** Specification of different planned level of performance under different funding scenarios. Financial risk is a big element of risk to plan accomplishment.

Investment Allocation

P2P Link consolidates the four investment categories in the 2010-2035 LRTP into three categories and eliminates many subprograms and consolidates them into investment categories that create a simplified and more unified performance-based approach. It includes investment categories for Preservation, Modernization, and Expansion.

In the LRTP update process, through consideration of plan scenarios, a planned investment allocation and finance strategy is established over the twenty-year planning horizon. This provides broad direction for the overall level of planned investment. It also includes policy decisions that link to the programming. For example, P2P Link is based on the premise that ADOT, as a matter of policy,

establishes that as a first call on funding, all technically warranted preventive maintenance treatments funded through the capital program will be performed for pavement and bridge. The LRTP then establishes direction for the balance of the funds, the selection and prioritization approach for which is detailed in Section 4.

Five- and ten-year investment allocations by investment category are required in P2P Link. The ten-year allocation provides direction on the allocation of revenue and expenditures among P2P Link investment categories. This provides the financial plan for ADOT's Asset Management Plan (under MAP-21 Asset Management Plans must include a finance plan). In this way, funding is distributed among the investment categories and is linked to improving the performance of the system as a whole. The five- and ten-year investment allocations will be set through the evaluation of system planning scenarios in the LRTP update process every five years. This implies that the Asset Management Plan is adjusted every five years based on any changes in allocation. The 2010-2035 LRTP established the RIC and allocated funding based on policy that resulted from the perceived needs within the State. Future allocations (2015 LRTP update) will be set by review of system performance analysis results against targets. The allocation could be reset every year if the performance results indicate a shift in need. This will ensure the available funding is spent on what will provide the most system benefit.

2.1.1 Strategic Investments

Strategic investments are defined as major areas of programmatic focus for investment over the 20-year plan horizon to meet planned performance targets and/or address risks to the accomplishment of desired transportation system performance. Defining criteria that specify how strategic projects/initiatives contribute to improving system performance will be required in the LRTP. The intent is that their inclusion will result in the identification of the highest priority improvements of statewide significance. Inclusion in the statewide plan will provide commitment and focus for implementation.

Strategic investment priorities will involve further analysis and development of a solution planned approach for addressing them. This will require consideration of likely financing strategies. While the LRTP is not financially constrained, there will be financial limitations and the requirement that a financing strategy be developed and refined as strategic investments are identified and implemented. Corridor or other investment planning will be required to develop solutions that address the strategic investments specified in the LRTP for corridors or initiatives that have statewide significance. Strategic investments will be identified through system and corridor planning as identified or directed through implementing actions for the statewide LRTP or in supporting modal or topical plans. The purpose of the strategic investment element is to establish the implementation strategy and plan for addressing the strategic risks to the State and the performance of the transportation system that are identified in the system planning analysis. Corridor plans, for example, represent a key element of P2P Link because they will evaluate risk to the accomplishment of the system performance objectives and result in agreed solutions or plans to manage these risks,

providing the basis for programming projects into the Expansion and Modernization elements of the Development Program. This planning will be multimodal.

Strategic investments will be identified through planning activities that:

- ▶ Identify risks to system performance among strategic facilities or programs (e.g., conditions that limit freight movement)
- ▶ Specify strategic multimodal investments required to meet performance objectives (e.g., mobility and system reliability performance risks in the corridor between Phoenix and Tucson)
- ▶ Identify the financing strategy for implementing the initiative

2.2 Supporting Planning Efforts

Several other plans are components of the overall statewide LRTP. These plans contribute to system performance objectives, measures and targets consistent with the requirements of program investment categories. The current components are detailed in the following subsections. Other plans could follow depending on the need for further measurement categories.

2.2.1 Asset Management Plan

Risk-based asset management plans will provide a strategy and plan for managing the preservation performance targets set for the different asset classes. The Asset Management Plan will conduct the technical analysis required to optimize the allocation of resources among asset classes and within asset classes to address preservation objectives. The Asset Management Plan optimizes the performance of the entire system based on the financial constraint that is set for the preservation elements of the Ten-Year Development and Delivery Programs through the LRTP updates. This asset management planning will consider relative risks among asset classes and among system tiers. It will also include the development of the resources to most effectively identify technically warranted work and enable the preservation project selection and prioritization approach established through P2P Link.

The expectation is that the plan will include an implementation strategy to guide how resources will be allocated and how technically warranted improvements will be defined over a near term (five-year asset management project planning horizon). Asset management plans will address bridge, pavement, other roadway assets, and facilities. The focus of the plans will be on improving lifecycle management and considering risk in doing so, as noted under System Performance and Risk Element, above.

The asset management planning effort will:

- ▶ Develop a ten-year, long-range Asset Management Plan for accomplishing asset preservation targets
- ▶ Analyze performance of asset classes, assessing target achievement
- ▶ Allocate funding to the different asset classes
- ▶ Consider lifecycle management as part of class allocation
- ▶ Implement risk management by evaluating performance of system tiers

2.2.2 Strategic Highway Safety Plan

The statewide transportation planning process incorporates the implementation actions that ADOT is responsible for within the federally required strategic highway safety plan. This is a statewide-coordinated safety plan that provides a comprehensive framework for reducing highway fatalities and serious injuries on all public roads. ADOT develops the plan through a cooperative process with local, state, federal, and private sector safety stakeholders. It is a four- to five-year comprehensive data-driven plan that establishes statewide goals, objectives, and key emphasis areas and integrates engineering, education, enforcement, and emergency medical services.

2.2.3 Corridor Analysis

The analysis of key facilities within the state transportation system will emphasize strategically significant corridors. The assessments will view the selected corridors as a microcosm of the full system and define a corridor-level program of expansion, modernization, and preservation, but will also help shape the understanding of critical statewide needs on the major facilities. These plans will be updated periodically and will support the development of the LRTP in addition to contributing projects to the Development Program.

2.2.4 Modal Plans

Several modal plans will provide guidance on the priorities to be considered by P2P Link. The primary plans are described below, but other plans, such as pedestrian or bicycle, may also inform the modal priorities.

- ▶ **Rail Plan:** The Arizona Rail Plan is prepared to meet the requirements of the Passenger Rail Investment and Improvement Act of 2008 for a Federal Railroad Administration-accepted State rail plan as an eligibility requirement for the capital grants authorized in the Act and those available under the High-Speed Intercity Passenger (HSIP) Rail program. The Arizona Rail Plan is incorporated into the statewide planning process. It links to the Construction Program by identifying state priorities for rail improvements.

- ▶ **Freight Plan:** A data-driven freight plan will be developed as an on-going process for addressing freight mobility at the policy and investment levels. The freight plan element will address MAP-21 requirements, incorporating a policy element that includes the consultative requirement for industry input and identification of project improvements that could then be eligible for a smaller state match per MAP-21 requirements. This plan will focus on intermodal connections and distinct freight industry performance requirements. The corridor plans will address freight performance at the corridor level and using consistent performance measures.
- ▶ **Aviation Plan:** The state aviation plan will be a component of the planning process and the information will be integrated into the system performance analysis. The state aviation plan addresses both Federal Aviation Administration requirements for continuous aviation system planning and ADOT's responsibilities with respect to airports that the state owns and operates.
- ▶ **Transit Plan:** The state will develop its first transit plan to ensure coordination of transit programs with an emphasis on non-urban areas. The plan will be designed to permit performance-based prioritization of resources and will require close communication with regional partners. The plan will serve as the policy and priority guideline for development and implementation of transit projects in the state that are regional and/or non-urbanized in nature.

2.2.5 Other Topical Plans

Topical plans provide some of the structure of the overall program development in that they establish many of the overarching goals the program is intended to meet with respect to elements, such as safety and sustainability that are required to be considered and incorporated into all projects.

- ▶ HSIP
- ▶ Asset Management Plan
- ▶ Sustainability Guidebook

2.2.6 MPO and COG Plans

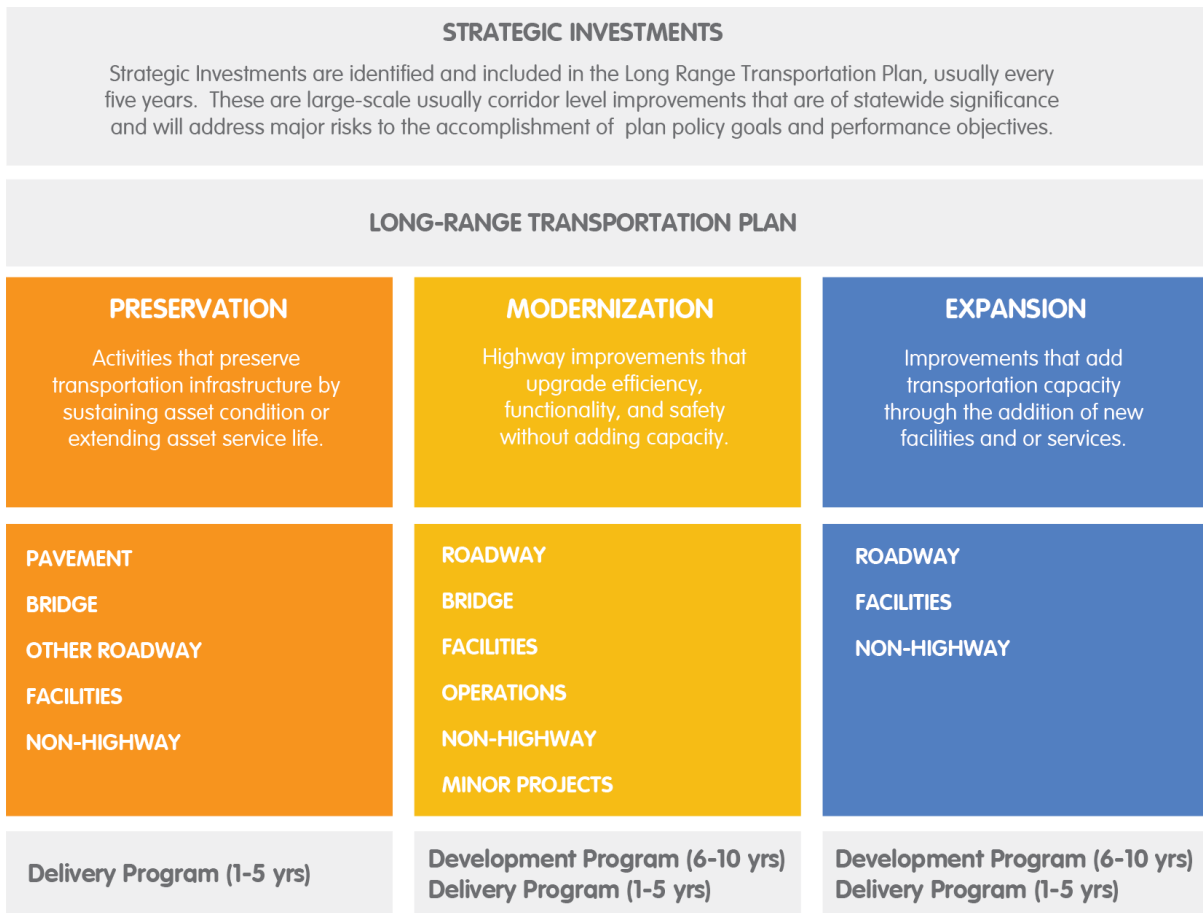
Coordination and consistency, to the extent possible, of MPO and COG plans with the statewide plans is needed to ensure that performance metrics align. Guidance for this alignment will be provided in the ADOT: MPO & COG Guidelines & Procedures Manual, currently under development by MPD. There is statewide policy interest in the planned level of performance in MPO areas because they constitute such a large proportion of economic activity and vehicle miles traveled (VMT) on the system. For this reason, it is likely that statewide strategic initiatives will occur within the MPO/COG areas.



3. Program Structure

The program structure for P2P Link is designed to ensure that project definition and selection accomplish performance objectives set through the planning process. Three performance-based investment categories for planning and programming have been established: Preservation, Modernization, and Expansion (shown in Figure 4). The statewide transportation planning process establishes the performance objectives and the plan to accomplish them for each investment category.

Figure 4 – P2P Link Investment Categories



System performance analysis provides information on how the transportation system will perform under different investment scenarios. This analysis supports a policy-driven allocation of resources based on understanding what level of performance is being planned for under the resource allocation.

A key element of P2P Link is to ensure that planned projects directly relate to performance outcomes. To realize this, eligible work types are defined for each investment category so that work performed directly contributes to the accomplishment of the performance outcome. This ensures that projects are developed in a way that directly contributes to achieving the performance objectives they were selected to address. This management control will help optimize the use of transportation funds. P2P Link provides guidance on eligible work types for projects that address system Preservation, Modernization, and Expansion.

Strategic Investments are also identified in the statewide planning process. These are large-scale investments that address performance risks of statewide significance. Their identification in the planning process and inclusion in the LRTP provides a statement of statewide importance and focus for implementation priorities.

3.1 P2P Link Program Areas

Each of the three program areas is subdivided into various asset classes within the investment category, as listed in Figure 4. The classes replace the subprogram approach in the current programming process and broadly organize the program by project types so that when implemented, they accomplish the performance goals for the investment category. Compared to the old program structure, this greatly reduces the number of categories to better manage the performance-based application of funds.

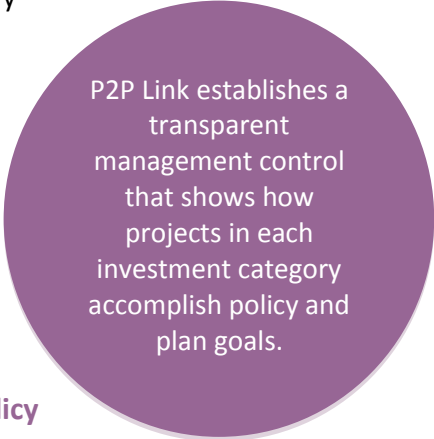
Policy decisions during the statewide planning process allocate resources among the investment categories based on the consideration of the results from system performance analysis. Within each investment category, there is a further technically driven process that allows the most effective allocation of resources among project types to achieve the performance goals set for the investment category. For example, the Asset Management Plan will determine, through the analysis of system performance, the funding split between pavement, bridge, and other roadway assets within the Preservation investment category to optimize the performance outcomes among these asset classes. The Asset Management Plan will make a further allocation of resources among preservation and minor or major rehabilitation or reconstruction work.

For the Modernization and Expansion categories, a different approach is recommended. Improvements for all classes within each investment category are ranked against each other and projects are selected for implementation based on overall contribution to system performance.

3.2 Linking Plans to Projects through Investment Categories

P2P Link transparently shows how projects in each investment category contribute to policy and plan goals. This is accomplished by defining project work types that directly relate to the achievement of goals set for each investment category. This ensures that funds are used in the most effective way to meet plan goals. For each investment class, the following approach to establishing this link is taken:

- ▶ **Policy goals are specified for the investment category:** The transportation system outcomes that are addressed by projects funded in each investment category are defined.
- ▶ **How system improvements (projects) accomplish the policy goals is defined:** The primary link between the work performed and the transportation system outcome (the beneficial impact of the project) is specified.
- ▶ **Eligible work types are established:** The type of work that can be funded through each program category directly addresses the policy goal. This is an important element of P2P Link and drives the efficiency of the program. It provides a management control linking project scope and project development to programming and plan goals.



P2P Link establishes a transparent management control that shows how projects in each investment category accomplish policy and plan goals.

3.3 Strategic Investments

In P2P Link, strategic investment needs are identified in the planning process and then linked to solutions through advanced planning and funding strategy development. When the solutions are defined to the appropriate level and a funding plan is identified, they advance into the Development Program. The inclusion of strategic investments in the LRTP provides focus to these large scope and potentially large cost items that require more detailed planning and usually the identification of multi-year financing approaches before projects that implement them can be programmed.

Strategic investments are highly likely to require financing beyond existing revenue sources, or even beyond funds that can be leveraged by such sources. If no funding is available to construct the full strategic initiative, the individual component projects can be rated and ranked as other projects are, but they will receive additional consideration as elements of a strategic initiative. This can be at the expense of not realizing the full benefit of the strategic improvement for a very long time, but maintains focus on projects that have statewide significance. Investment plans for these strategic investments will drive their project selection and development as comprehensive strategic projects.

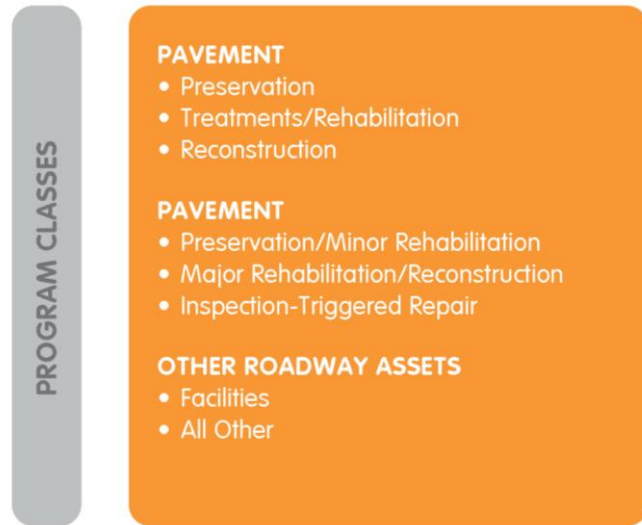
3.4 Preservation

P2P Link provides the broad framework within which ADOT’s Asset Management Plan is developed. The Preservation program structure is organized by work type and asset class, as illustrated in Figure 5.

Preservation addresses all types of planned maintenance (financed through the construction program), unplanned (reactive), and rehabilitation/reconstruction work performed across the lifecycle of highway assets. Assets are grouped by asset class into bridge, pavement, other roadway assets, facilities, and non-highway. Other roadway assets are sometimes referred to as ancillary

assets in this report. Investments within this category include planned or scheduled preservation work that is programmed through the Five-Year Construction Program.² Specific projects within the Preservation category are only identified in the Delivery Program.

Figure 5 – Preservation Program Structure



3.4.1 Asset Management Plan

ADOT’s Asset Management Plan is implemented through the Delivery Program Preservation category. The Delivery Program is a large element of the Asset Management Plan. The preservation program structure is designed to enable ADOT’s asset management planning to fully align with and accomplish P2P Link business objectives of linking plans to projects cost effectively.

The preservation program structure is organized into classes of work that address all capital work involved in asset management:

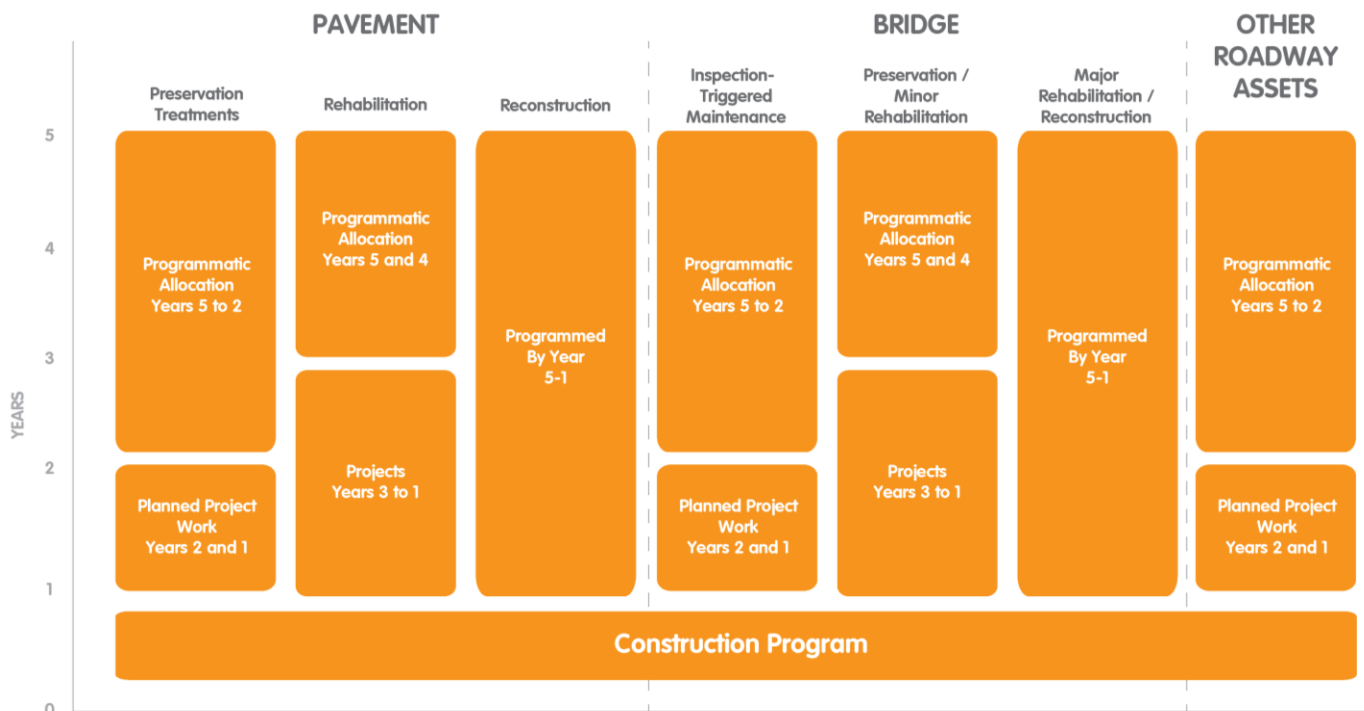
- ▶ **Preservation:** These are planned or scheduled maintenance activities funded through the capital program that when performed according to optimal lifecycle management practices maximizes the service life of a particular asset.
- ▶ **Minor and major rehabilitation or reconstruction work:** These are the planned projects that extend the service life of an asset or reconstruct it when necessary.

² Asset management plans for each asset class will address whole lifecycle management considering the relationships between maintenance activities performed through the maintenance budget and those in the Construction Program.

- **Inspection or other reactive work:** Bridge inspections, adverse weather events, crashes, and other factors result in the identification of project work that has not been planned.

P2P Link identifies the type of eligible work activities that can be performed through each program class. Asset management planning works to define and refine the work types. For asset management, the identification of eligible work types is technically driven and specifies the types of treatments or improvements that most effectively accomplish the particular lifecycle management objective. Figure 6 depicts the Delivery Program for Preservation subcategories.

Figure 6 – Delivery Program for Preservation Subcategories



The Asset Management Plan process drives P2P Link for preservation through the following mechanisms.

- **Financial Constraint:** The statewide planning process sets the financial constraint for the Asset Management Plan over the ten-year and five-year planning horizons. This provides the financial constraint that is used to develop the asset management plan and provides the basis for meeting the financial plan requirements for asset management plans specified in MAP-21.
- **Predicted Future Conditions:** Asset Management Plan development involves conducting the analysis of current and predicted future conditions under the ten-year financial constraint to allocate budgets among the preservation program classes.
- **Programmed Projects:** Projects are programmed according to the timeline depicted in Figure 6 and through the selection and prioritization procedures specified in P2P Link.

P2P Link and the Asset Management Plan have the following assumptions regarding preservation project selection and prioritization:

- ▶ **Preventive Maintenance:** The first call on funding in the preservation program is that for each asset class technically warranted preventive maintenance practices are followed and funded. The Asset Management Plan identifies the amount and type of preventive maintenance work required by asset class. It identifies and confirms the programmatic allocation of resources required by year. In this way, all preventive maintenance for bridge and pavement is performed according to an Asset Management Plan that specifies the timing and extent of these treatments.
- ▶ **Technically Warranted Work:** The project selection process is structured so that preventive maintenance can only be performed where it is technically warranted, unless there are special circumstances such as safety or other reasons. This prevents overlays from being performed on a roadway for which reconstruction is needed.
- ▶ **Utilization of Pavement and Bridge Management Systems:** Following the programmatic allocation to preventive maintenance by year, the Asset Management Plan process then uses the pavement and bridge management systems to establish a planned allocation between pavement, bridge, and other roadway assets and between work types to address major rehab/reconstruction backlog for pavement, bridge, and other assets. Figure 6 depicts whether these are programmatic or by project in the delivery program. This allocation is driven by considering policy priorities, risk, and the planned level of performance – measured condition anticipated from implementation of the Asset Management Plan.
- ▶ **Forecasted Performance:** The asset management plan builds and applies the tools to model and forecast performance under different scenarios within the preservation program. The pavement and bridge management systems will have the functionality to support such analysis.

Section 4.3 of this report discusses the selection and prioritization criteria for the preservation category. This is a component of the Asset Management Plan.

3.4.2 Programming Preservation Projects

P2P Link starts from the premise that, where technically warranted, ADOT will perform preventive maintenance as a priority, subject to programming influences such as risk tiering and identified safety needs. This is generally the most cost-effective programming approach.

The term “technically warranted” means that a preventive maintenance treatment will only be performed as a priority if the subject asset is at a point in its lifecycle that the treatment is considered a technically sound allocation of funds. Therefore, if a roadway needs reconstructing, an overlay will not be considered a technically warranted treatment for programming purposes.

Table 2 outlines how the agency policy goals are achieved by P2P Link for the Preservation pavement and bridge classes, along with their eligible works types.

Table 2: Preservation – Pavement and Bridge Classes

Policy Goals	Manage assets to reduce life cycle costs, set and manage preservation targets, and ensure safe, reliable operation of the transportation system
How Projects Accomplish Goals	<ul style="list-style-type: none"> • Improve reliability of the system by mitigating unexpected closures of failures • Maximize the service life of the facility by following technically defined preventive maintained treatments • <i>Pavement</i> - Provide consistent ride quality to users • <i>Bridge</i> – Manage the asset by pursuing lowest lifecycle cost strategies
Pavement Eligible Work Types	<ul style="list-style-type: none"> • Preservation Treatments <ul style="list-style-type: none"> ○ Surface Seal ○ Thin Overlay • Rehabilitation <ul style="list-style-type: none"> ○ Minor –Mill & Fill ○ Major – Structural Overlays or Resurfacing • Reconstruction <ul style="list-style-type: none"> ○ Major rehabilitation work at the end of pavement service life (NOT due to functional obsolescence or updating geometric design standards)
Bridge Eligible Work Types	<ul style="list-style-type: none"> • Inspection-Triggered Repair <ul style="list-style-type: none"> ○ Emergency Repairs • Preservation/Minor Rehabilitation <ul style="list-style-type: none"> ○ Deck joint replacement ○ Deck overlay (minor or major) ○ Substructure retrofitting • Major Rehabilitation/Reconstruction <ul style="list-style-type: none"> ○ Reconstructing bridges that are structurally deficient ○ Rehab/replacement (NOT due to functional obsolescence)

The ADOT Asset Management Plan will drive programmatic resource allocation for the Preservation investment category. This Plan is currently under development by the State Engineer’s Office. P2P Link is organized such that the Asset Management Plan establishes an optimized five-year plan for each asset class (optimized based on assumptions about available funding) establishing the strategy to allocate funding among Bridge, Pavement, and Other Roadway Asset work. This is accomplished by implementing risk-based asset management strategies for each of these asset classes.

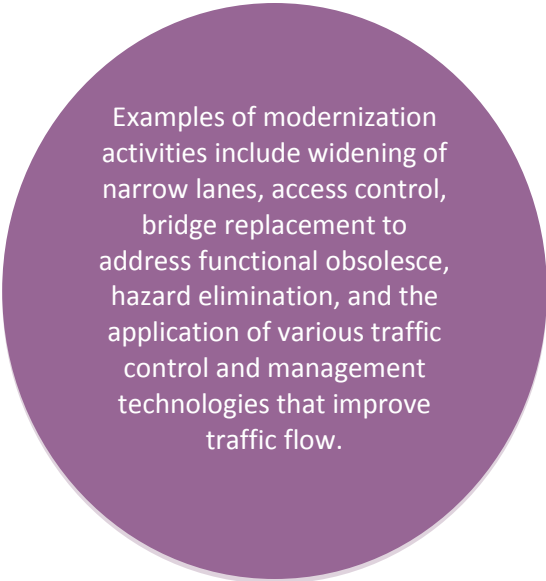
3.5 Modernization

The Modernization investment category funds improvements that modernize the transportation system to improve its productivity, reduce safety risk, and make travel times shorter and more reliable. The category addresses improvements to the transportation system that apply current standards and practices for efficient operation, safety, and reliability. Examples of modernization activities include widening of narrow lanes, access control, bridge replacement to address functional obsolescence, hazard elimination, and the application of various traffic control and management technologies that improve traffic flow.

Projects are selected and prioritized into this category as a ten-year program, with the exception of projects within the Minor Projects class. The ten-year time period reflects both the project development timelines for major improvement projects and the requirements for an orderly and predictable Delivery Program. In addition, the Delivery Program is fiscally constrained and complies with federal law. The Development Program provides a mechanism to respond quickly with projects that can be funded in the event of any program acceleration.³

Within the Minor Projects class, projects are nominated by ADOT Districts and selected for inclusion in the Delivery Program. It provides a statewide performance-based process for prioritizing projects for program years one through five. Minor Projects could be stand-alone or part of another project. The total individual project costs for development and construction are limited to \$4 million within a 2013 budget allocation of \$20 million. These projects represent immediate modernization needs as identified by the regions.

Table 3 outlines how the agency policy goals are achieved by P2P Link for the Modernization investment category, along with the eligible works types.



Examples of modernization activities include widening of narrow lanes, access control, bridge replacement to address functional obsolescence, hazard elimination, and the application of various traffic control and management technologies that improve traffic flow.

³ Sometimes referred to as “shelf projects,” this enables ADOT to respond when situations for shovel-ready projects arise.

Table 3: Modernization

Policy Goals	Improve safety and reliability, reduce congestion, improve economic vitality, increase multimodal usage
How Projects Accomplish Goals	<ul style="list-style-type: none"> • Improving productivity of the existing system • Reducing safety risk • Reducing travel time
Illustrative Eligible Work Types	<ul style="list-style-type: none"> • Widening existing lanes/shoulders • Intersection and interchange reconfiguration • Enhancements to address functional obsolescence • Traffic control and management • Safety modifications/enhancements • ITS modifications/enhancements • Bicycle lane improvement

Districts will identify projects consistent with the transportation system performance planning efforts for areas outside MPOs. Within MPOs, the District and MPO will collaborate on project identification. These projects will compete on a statewide basis using performance criteria for inclusion in the ten-year modernization program category. For projects within the MPO planning area, the MPO planning process drives the identification and prioritization of modernization projects consistent with the criteria for modernization work.

The specific criteria and the metrics used to evaluate, select, and prioritize projects based on comparing how well they impact the policy goals are described in Section 4.3.

3.6 Expansion

The Expansion investment category addresses the increase in system capacity required to provide reliable service and reduce congestion risk. This includes both any backlog of investments and the congestion risks that will arise from the forecast growth in travel demand over the near and long-range planning horizon. Typically, expansion investments are composed of the projects required to implement the LRTP, corridor profile plans, or other regional transportation plans. It provides a mechanism to address circumstances in which there is not acceptable capacity to meet demand and/or to plan ahead to develop a system that can meet future travel demand in a cost-effective way.

Table 4 outlines how the ADOT policy goals are achieved by P2P Link for the Expansion investment category, along with the eligible works types.

Table 4: Expansion

Policy Goals	Provision of transportation system capacity to provide mobility and support economic productivity
How Projects Accomplish Goals	Provide capacity to meet current and future travel demand at acceptable levels of service
Illustrative Eligible Work Types	<ul style="list-style-type: none"> • New routes • New lanes • New rail • New interchanges/intersections • Interchange/intersection capacity enhancement

The Expansion investment category addresses improvements to the current transportation system that involve significant capacity enhancement. Expansion activities include adding new highway lanes, expanding bus service through bus rapid transit (BRT) and other facility construction, constructing new highway facilities, and adding rail passenger service or facilities. Expansion projects are generally larger in scale and primarily address the need to provide additional planned capacity to meet travel demand growth. This differs from Modernization, which, while technically may also add capacity, addresses other performance objectives.

P2P Link is established by evaluating and prioritizing projects for inclusion in the ten-year Expansion program investment category. These projects should be in transportation plans that, through their technical analysis, demonstrate how their implementation will reduce congestion risk and improve system reliability. The statewide planning process will make an allocation to this performance category based on system needs. Each District then nominates its expansion improvements to be considered for programming based on their contribution to system performance.

Expansion projects implement modal, MPO, corridor, and other strategic investment plans. It is anticipated that due to the nature and scale of expansion projects, they will be programmed to implement corridor plans and/or more detailed planning studies that address strategic investment needs. These projects support economic development by improving productivity. They reduce time to market for freight and provide employers access to a larger labor market.



4. Ten-Year Program Plan

This section defines the Ten-Year Program Plan and the methods for updating the program plan annually. P2P Link includes methodologies to nominate and select projects for the program plan, along with risk-based scenarios to refine the funding allocations to investment categories.

4.1 Program Plan Structure

The statewide planning process is implemented through the Ten-Year Program Plan, which includes a five-year Development Program and a five-year Delivery Program.

- ▶ **Development Program (Years 6-10)** provides the pipeline and predictability for capital improvements to address modernization, expansion, and non-highway performance.
- ▶ **Delivery Programs (Years 1-5)** includes ADOT's committed five-year construction program for all plan performance categories, incorporating ADOT's requirements for the statewide transportation improvement program under federal law.

In the case of both the Development and the Delivery Programs, the intent is that the planning analysis would be able to communicate the *level of performance* that will be achieved when the program is implemented. The prior sections describe the performance-based planning process that results from the projects and programs included in the program. Figure 7 shows how a project originates from a system need to an improvement.

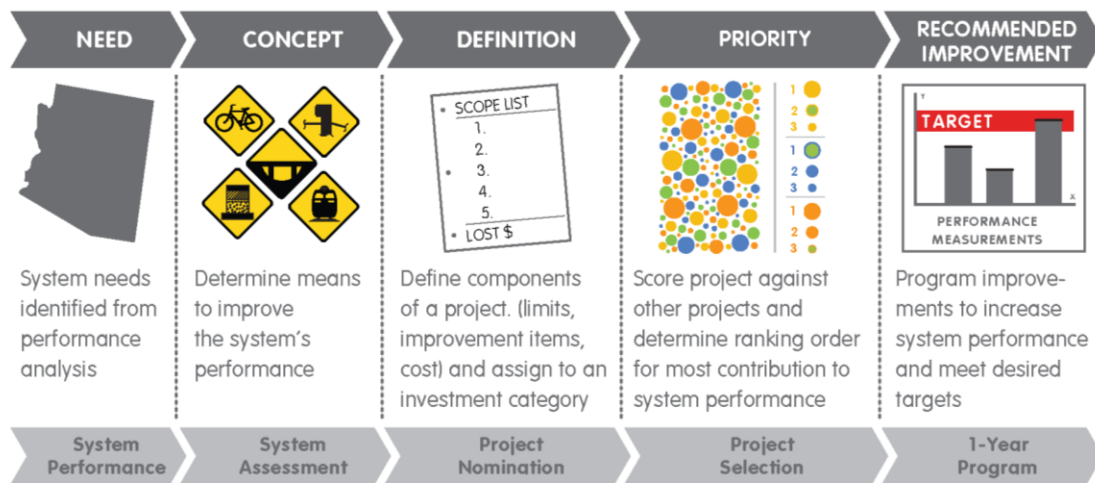
4.1.1 Development Program

The Ten-Year Program Plan includes the projects and programs needed to implement Arizona's transportation plans and deliver the planned level of service. The Development Program is financially constrained based on revenue projections and policy decisions regarding the funding level to plan for and a policy-driven program allocation of this financial constraint between performance categories. Implementation will likely involve the following process:

- ▶ **Funding Allocation.** Confirm Delivery Program funding allocation to preservation and committed modernization and expansion projects.
- ▶ **Funding Forecast:** Forecast revenue for years six to ten, and confirm or establish year six to ten program emphasis.
- ▶ **Performance Targets:** Set target for adding modernization and expansion projects into the Ten-Year Development Program.

The allocation reflects the best balance determined by ADOT, through the planning process, among the performance objectives for modernization, expansion, and preservation performance. In principle, the approach is that a source of funding needs to be identified before projects can be incorporated in the Development Program. To build the Development Program, assumptions will need to be made about the balance of resources among the categories. It is expected that some strategic investments will require assumptions regarding the development of new revenue sources.

Figure 7 – A Programmed Project: Need to Improvement



4.1.2 Delivery Program

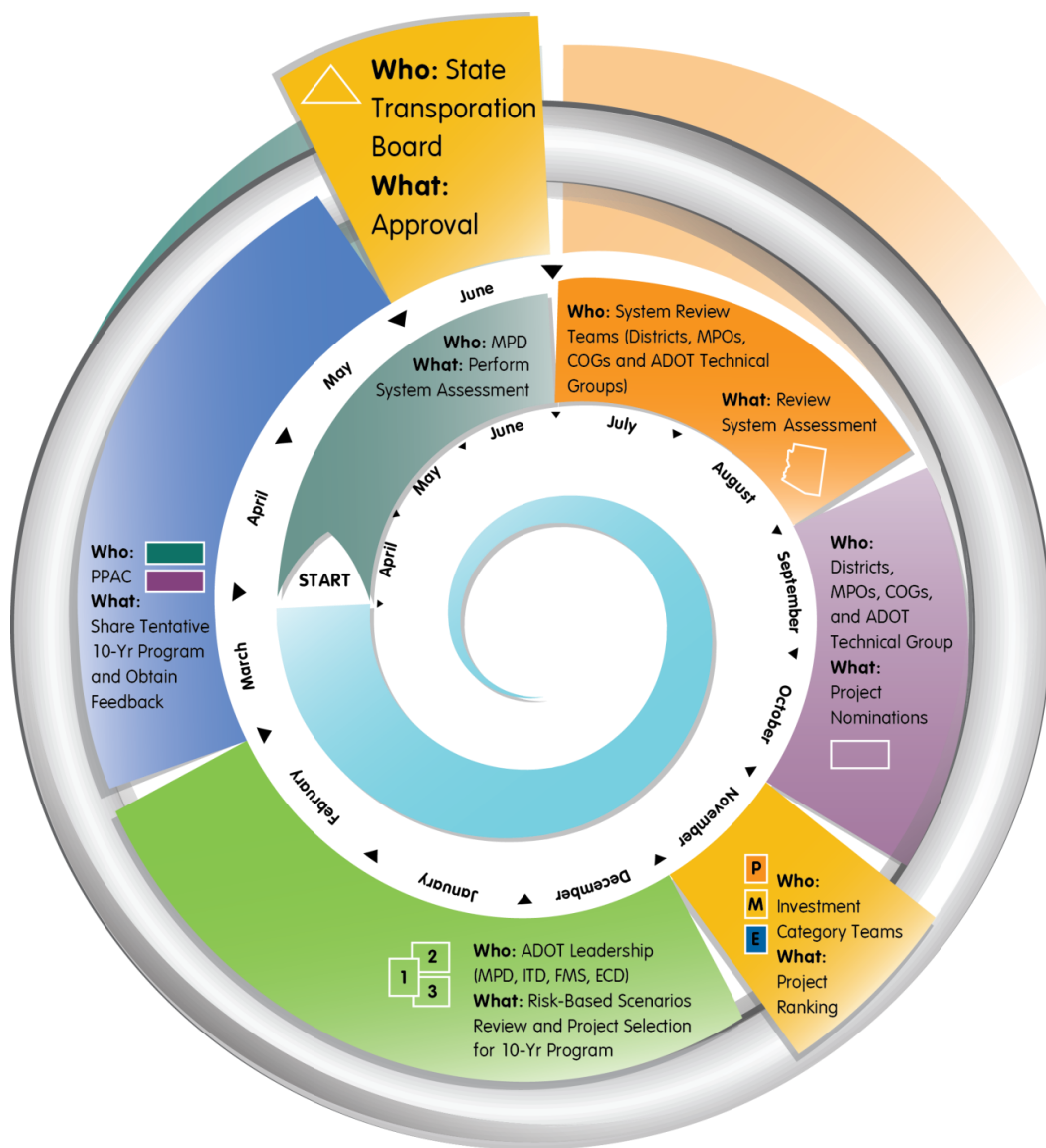
The Five-Year Delivery Program specifies the projects and programs to be constructed within the upcoming five-year time period. The intent is that this is ADOT's cash-feasible, implementable construction program. It includes projects and programmatic expenditures. Each year, as part of the program update, offsetting changes are made and the program is adjusted to ensure financial feasibility in the light of adjustments to revenue and expenditure forecasts.

For modernization and expansion projects to advance from the Development to the Delivery Program, they must have costs and schedules that ADOT can hold itself accountable for accomplishing. This provides an open and transparent approach that enables ADOT to meet performance targets for delivering projects when promised. By doing so, predictability is improved and ADOT staff can target efforts on specific tasks, saving staff time and making better use of limited resources.

4.2 Program Plan Update

Development and Delivery Programs are updated annually through P2P Link, as shown in Figure 8. The Delivery Program (years one through five) is composed of the Highway section of the Five-Year Construction Facilities Program.⁴ The Development Program (years six through ten) links to the Delivery Program for Modernization and Expansion projects and identifies the programmatic resource allocation that provides the financial planning assumptions for ADOT’s Asset Management Plan. By doing so, the Delivery Program provides ADOT’s improvement commitments and the Development Program provides a repository for the development of projects so that once they are advanced to the Delivery Program they can be completed on time and within budget.

Figure 8 – Program Plan Update



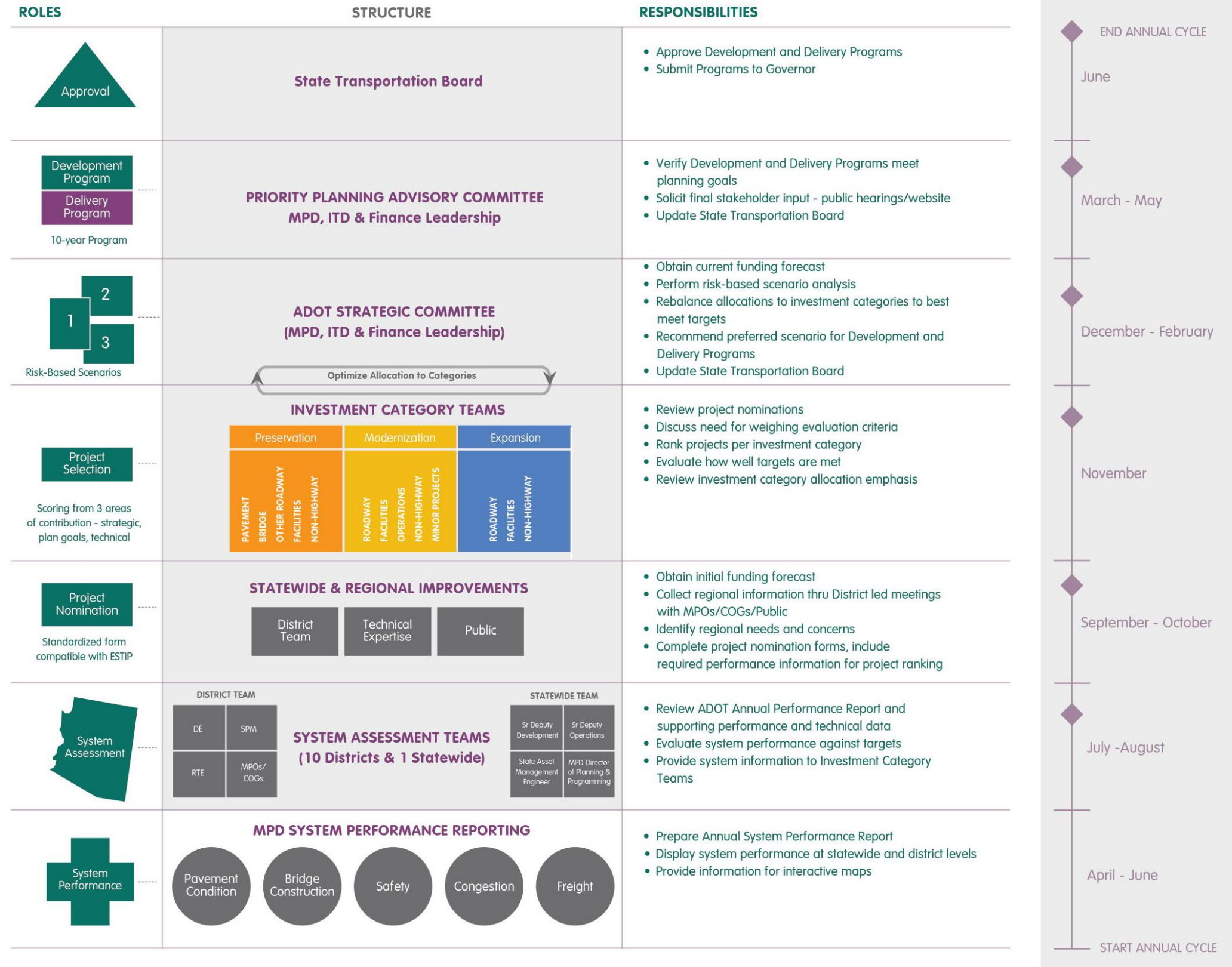
⁴ The Construction Program also covers Aviation and MAG Regional Transportation Plan Freeway Program Sections, which are developed separately and governed by specific funding requirements.

4.2.1 Roles for the Program Plan Update

The program update process for P2P Link follows the approach shown in Figure 7. The process involves the following functional groups. Their detailed responsibilities are described in Figure 7 and Section 4.2.2

- ▶ **System Assessment Teams:** 11 teams total; one team per ADOT District plus one statewide team, which provide the annual system performance assessment within their respective regions. The District team consists of the District Engineer, Senior Statewide Project Manager, Regional Traffic Engineer, and MPO/COG Representatives. The Statewide Team consists of the Director of Planning and Programming, Senior Deputy State Engineer – Development, Senior Deputy State Engineer – Operations, and the State Asset Management Engineer.
- ▶ **Investment Category Teams:** One team per investment category. The teams will be selected by the MPD Director and State Engineer. It is envisioned that the teams will be led by the State Asset Management Engineer, Deputy State Engineer for Development or Operations, and Director of Planning and Programming. Team representation should include a broad cross section of staff from the four ADOT Divisions, spanning the investment category classes.
- ▶ **ADOT Strategic Committee:** A committee composed of ADOT and regional leadership. The ADOT Director will select an eight- to ten-person panel. Representation should include all ADOT divisions to yield a comprehensive view of what defines the transportation system health.
- ▶ **Priority Planning Advisory Committee (PPAC):** A statutory public body appointed by the ADOT Director and subject to Arizona Revised Statutes (ARS) Title 38 Open Meeting Laws of Arizona. The committee is responsible for updating and preparing the Development and Delivery Programs. Adhering to ARS 28-6951 (B), the ADOT Director appoints members to the Committee.
- ▶ **State Transportation Board:** A seven-member panel established under ARS 28 Chapter 2, Article 1 whose members are appointed by the Governor. Members of the panel serve six-year terms and represent different geographical regions of the state.

Figure 9 – Annual Program Plan Update Process



4.2.2 Program Plan Update Process

The steps in the program update process are described in this section. Each of the P2P Link teams/committees described in Section 4.2.1 plays a role in this process and has specific responsibilities to be carried out with every update cycle.

System Performance Reporting



The System Performance Reporting yields the current health of the system on a regional and statewide basis. This is the first step in the update process. The MPD planning staff will develop the input for the system performance analysis noted in Section 3.1 and produce the ADOT Annual Performance Report. The resultant status report will be an understanding of how well the system performs against measurement targets. Step 1 will occur between April and June.

System Assessment Review



The System Assessment Review is the mechanism for the annual system analysis feedback loop that determines system-level needs and on which the annual allocation of resources to investment categories will be based. The ten District Teams and one Statewide Team lead the effort, which will be completed during July and August. The teams will review the ADOT Annual Performance Report prepared by MPD for MAP-21 compliance. Their assessment will then be used to confirm and recommend adjustment, if needed, to the allocation of resources among investment categories. The analysis of the ADOT Annual Performance Report will provide an understanding of how well the system performs against measurement targets and any performance risks to the system. With this information, improvements can be identified that address system needs.

Project Nomination

The Project Nomination step includes:

- ▶ Obtaining initial funding forecast per investment category
- ▶ Identifying regional needs and concerns of MPOs/COGs and public
- ▶ Completing project nomination forms and investment category designation

The District and Statewide Teams will lead the Project Nomination efforts, working with the Investment Category Teams. As part of the project nomination, the teams will need to gather performance information that is needed for project evaluation, selection, and ranking (specific measurements and criteria are provided under Project Selection). This information will be queried from the nomination “forms.” The most efficient method of nominating projects, in terms of resource management, would be through an on-line mechanism. Several considerations such as platform-based Oracle, mobile applications, and internal website entry were discussed as part of P2P Link development. Any of these approaches would support P2P Link. Approximately three months will be needed to complete this step.

Project Prioritization and Selection

P2P Link includes a two-step approach to project selection and prioritization. The first step involves the nomination of technically warranted projects that comprise eligible work types. These projects are prioritized and ranked through a scoring process designed to result in the selection of projects that add up to a program that is the most cost-effective for meeting the performance goals set for the transportation system. The methodology and approach for selecting and prioritizing projects in each investment category are detailed in Section 4.3.

Project Selection ranks the nominated project based upon established evaluation criteria that support the performance goals and objectives set forth in the statewide planning process. The Investment Category Teams manage this effort using “score cards” initiated by P2P Link development. The product of their work is a prioritized list of projects and a recommendation of those projects that should be considered for the Development and Delivery Programs. The basis for the recommendation will be on the initial allocation of funding to that investment category. The Investment Teams will work with ADOT Finance to apply the appropriate available funding to the projects beginning with the highest priority of project for a given funding type and working down the list until allocated funds are exhausted. Any modifications needed to ensure full utilization of funding sources would be reflected in the Investment Team recommendations. Additionally, the Investment Teams will assess how well the performance targets are met within their category based upon the projects selected for programming. This step in the P2P Link program update process should take approximately two months.

Project Selection ranks the nominated project based upon established evaluation criteria that support the performance goals and objectives set forth in the statewide planning process.

Risk-Based Scenario Analysis



Once the recommended list of projects to consider for programming is complete, the ADOT Strategic Committee performs Risk-Based Scenario Analysis. The intent is that this committee collectively examines the results for all investment categories, in terms of how well the projects selected meet performance targets under the initial funding allocations.

The Committee will obtain an updated funding forecast from ADOT FMS during this timeframe to ensure reliable accounting of the funds. They will consider any rebalancing that should occur to improve overall system achievement of performance targets. The Committee will work with the Investment Teams to finalize the recommended list of projects to be included in the Development and Delivery Programs. They will also provide an update to the State Transportation Board during this step of the process. This step is estimated to take three months to complete.

Public Outreach



Once the ADOT Strategic Committee finalizes the draft Development and Delivery Programs, the PPAC will oversee the Public Outreach step. The first activity of this step will be for the PPAC to verify that the Development and Delivery Programs address the

statewide planning goals. Once the content is validated, the final stakeholder input process will proceed through public hearings and website interaction. The timing of this input process is consistent with the current programming process (March to May), except it is anticipated to proceed more smoothly since this will be the second opportunity for involvement as the District Teams already sought input during the Project Nomination step. The PPAC will continue to update the State Transportation Board.

Program Approval



The final step in the update process is approval of the Development and Delivery Programs. This is provided by the State Transportation Board. The final programs are then submitted to the Governor. This must be completed by July 1st according to statute.

4.3 Project Prioritization and Selection Process

This section describes the project selection and prioritization and criteria for each P2P Link investment category. A consistent approach is used for each investment category, involving the following elements:

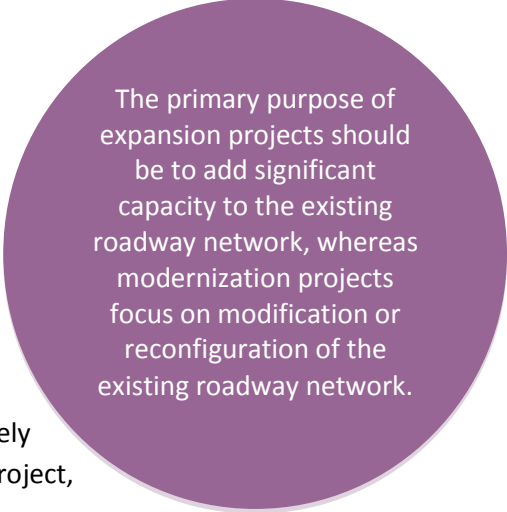
- ▶ **Specification of eligible work items.** This defines the work that can be performed using funds in this investment category. The approach prevents the risk of scope creep and consequently improves the efficiency of the use of funds programmatically.
- ▶ **Identification of technical project evaluation criteria.** In each investment category, a technical measurement of the impact that the project investment will have on accomplishing the investment goal is specified. These criteria are designed to be project-level metrics that can be easily computed and allow for comparison of different project types within an investment category.
- ▶ **Identification of system planning and other planning criteria.** Evaluation criteria related to system planning, such as consideration of future demand or freight impact, are also included.
- ▶ **Weighting of criteria to enable meaningful multi-criteria decision making.** For each investment category, the criteria are weighted so that multiple criteria can be included in the project prioritization.
- ▶ **Standardization to account for cost-effectiveness.** To compare projects, the prioritization approach accounts for project cost so that the cost effectiveness of different projects in accomplishing the programmatic goals are compared and used to rank projects.

The overall prioritization process for P2P Link is outlined in Tables 5 and 6. The goal is to build the program within each investment category. The first step is to determine the initial programmatic allocation based upon the performance outcome of the previous year's improvements. This is to be followed by verification that the projects within each category are eligible work types. Once the candidate projects are properly categorized, they would be ranked using the appropriate set of evaluation criteria. Each evaluation criterion receives a weighting, which reflects the relative

importance of the evaluation criterion. Initial weightings are set based on input from ADOT staff and from results of an initial prototyping of the prioritization and ranking process where data are readily available.

In certain cases, there may be significant overlap between modernization and expansions projects. This overlap can be addressed by scoring and ranking projects in both the modernization and expansion investment categories and choosing the category with the higher score and rank. Along similar lines, the eligible work types for modernization and expansion projects (as shown in Table 6) are illustrative and ultimately the designation of a project as either modernization or expansion is up to the project proponent.

The primary purpose of expansion projects should be to add significant capacity to the existing roadway network, whereas modernization projects focus on modification or reconfiguration of the existing roadway network. This being the case, certain projects may present co-benefits even though their primary purpose may not be expansion or vice versa. For example, upgrading an undivided two-lane roadway into a four-lane divided highway with the primary goal of improving safety is a modernization project even though capacity is increased. For this reason, the decision maker ultimately selects which investment category is best suited to a particular project, keeping in mind the evaluation criteria.



The primary purpose of expansion projects should be to add significant capacity to the existing roadway network, whereas modernization projects focus on modification or reconfiguration of the existing roadway network.

4.3.1 Evaluation Criteria

The evaluation criteria provide the connection between project and system performance. They are consistent with the performance measurements anticipated by MAP-21, thereby connecting project ranking with system performance. As performance goals and objectives change over time, the evaluation criteria may also need to be adjusted so that they implement the planned for system performance.

Each category included several considerations in determining what the best set of performance indicators would be to prioritize projects. The intent was to decide upon the fewest number of criteria as possible that would yield meaningful results in ranking projects. The approach focused on minimizing overlapping criteria, which would measure similar outcomes and result in unintentional weighting.

Preservation Projects

The preservation program structure and project selection criteria are consistent with and will become part of the ADOT Asset Management Plan. Preservation projects are inclusive of efforts to maintain the roadway system in a state of good repair and are technically warranted outputs of ADOT's Pavement and Bridge Management Systems. The specific criteria used to prioritize pavement and bridge

preservation projects are outlined below. Maintaining a safe roadway system is an essential part of all work that is performed at ADOT. Maintaining pavements and bridges in a state of good repair is paramount to the provision of a safe roadway network. This is to say that safety is an inherent component of all preservation projects. These projects emphasize the preservation of the existing geometric design of the roadway network and consider safety in a broad context of a well-maintained road being a safe road. No separate safety criterion is identified in the preservation investment category.

Pavement

To determine which projects should be subject to the pavement preservation evaluation criteria and prioritization and ranking process, P2P Link relies on the Pavement Management System (PMS) to produce “technically warranted” treatments (i.e., projects) at a given point in a pavement’s lifecycle. Using the PMS technically warranted treatments as an output, P2P Link evaluation and prioritization process intends to support decision making in a resource-constrained environment consistent with the condition built into ADOT’s PMS assessment algorithms.

The technical performance criteria used to evaluate pavement preservation projects include:

- ▶ **Ride Quality:** International Roughness Index (IRI) measures roadway smoothness
- ▶ **Pavement Structural Integrity:** This composite index is calculated based on weighting two pavement structural integrity metrics: cracking and rutting.

The system planning criteria used for pavement projects include:

- ▶ **Traffic Volume:** Average Annual Daily Traffic (AADT): measures traffic volume to determine relatively high or low traffic volumes.
- ▶ **Freight Flow:** The percentage of AADT attributed to truck traffic serves as a proxy for measuring freight volumes.
- ▶ **Corridor Significance:** Determines whether a given project is on a strategic corridor and which tier of strategic corridor.

Bridge

P2P Link uses the Bridge Management System (BMS) to produce “technically warranted” treatments at a given point in a bridge’s lifecycle. Using the technically warranted outputs of the BMS as an output, the evaluation criteria and prioritization and ranking process outlined below intends to support decision making in a resource-constrained environment.

Similar to the aforementioned discussion surrounding safety as it relates to pavement preservation projects, safety is considered an inherent component of all bridge preservation projects. ADOT stakeholders identified a desire to place greater emphasis on the technical justification for bridge

preservation projects, and as such concluded that the technical evaluation criteria should receive greater weightings than the system planning evaluation criteria.

The technical performance criteria used to evaluate bridge preservation projects include:

- ▶ **National Bridge Index (NBI) Sufficiency Rating:** Bridge sufficiency rating calculated for the NBI assesses whether a bridge is not deficient, structurally deficient, or functionally obsolete.
- ▶ **Composite Health Index:** A composite bridge health index calculated based on three NBI condition ratings: superstructure, substructure, and deck condition ratings. If any of these three condition ratings is unsatisfactory (i.e., a NBI condition rating less than five), then this evaluation criterion receives points. In the case of culverts, no composite health index is calculated, and if a culvert is in unsatisfactory condition it receives points.
- ▶ **Scour Criticality:** Determines whether a bridge is coded in the NBI as scour critical.
- ▶ **Fracture Criticality:** Determines whether a bridged is coded in the NBI as fracture critical.

The system planning evaluation criteria used for bridge projects include:


- ▶ **Traffic Volume:** AADT measures traffic volume to determine relatively high or low traffic volumes.
- ▶ **Freight Flow:** The percentage of AADT attributed to truck traffic serves as a proxy for measuring freight volumes.
- ▶ **Detour Length:** Analyzes the bypass length, as coded in the NBI, required if a bridge is out-of-service.
- ▶ **Corridor Significance:** Determines whether a given project is on a strategic corridor and which tier of strategic corridor.

Table 5: Preservation Program Prioritization Approach

	Preservation Projects – Pavement	Preservation Projects - Bridge
Build Preservation Program	<p>Step 1: Build the preservation program for pavement and bridge projects and determine programmatic allocations</p> <ul style="list-style-type: none"> Using pavement and bridge management systems, set five-year program funding, by year, to include all technically warranted preservation treatments 	
Program Other Classes	<p>Apply the process as follows to apply balance of preservation program funds</p>	
Work Type Eligibility Determination	<p>Step 2: Determine whether the project is eligible for rehabilitation or reconstruction activity</p> <ul style="list-style-type: none"> Review pavement management system recommendation to objectively determine if the recommended activity is technically warranted based on: <ul style="list-style-type: none"> (1) Number of years of service life left for the pavement (based on design life) (2) Number of years since last rehabilitation (3) Life-cycle benefit (in terms of cost) to undertake treatment 	<p>Step 2: Determine whether the project is inspection-triggered or major rehabilitation/reconstruction activity</p> <ul style="list-style-type: none"> Review bridge management system recommendation to objectively determine if the recommended activity is technically warranted based on: <ul style="list-style-type: none"> (1) Number of years of service life left for the bridge (based on design life), (2) Number of years since last rehabilitation (3) Life-cycle benefit (in terms of cost) to undertake treatment Program inspection-triggered repair
Evaluation Criteria	<p>Step 3: Evaluate projects in rehabilitation and reconstruction program class; apply performance criteria to prioritize available funds in delivery program</p> <ul style="list-style-type: none"> Pavement Ride Quality (IRI) Pavement Structural Integrity Average Annual Daily Traffic Traffic Volume Corridor Significance 	<p>Step 3: Evaluate projects in major rehabilitation program class; apply performance criteria to prioritize available funds in delivery program</p> <ul style="list-style-type: none"> NBI Sufficiency Rating (Structural Deficiency) Bridge Composite Health Factors Scour Criticality Fracture Criticality Traffic Volume Freight Flow Detour Length Corridor Significance

Modernization Projects

Projects in the modernization category encompass a wide range of improvements (see Table 6 for illustrative eligible work types) and include projects that modify or reconfigure the existing system to improve productivity, reduce safety risk, and/or reduce travel time. Projects may accomplish one or several of these goals. The primary goal of the majority of modernization projects is delay reduction. For this reason, cost effectiveness is evaluated based on delay reduction.



The primary goal of the majority of modernization projects is delay reduction.

Modernization and Expansion projects will benefit greatly from the P2P Link project prioritization tool since it will replace the existing, less rigorous approach with a new system that will directly tie into ADOT's performance measures.

The technical performance criteria used to evaluate modernization projects include:

- ▶ **Delay Reduction:** Estimate the volume to capacity (v/c) ratios using the AADT volumes as a proxy for congestion and estimated capacity by facility type.
- ▶ **Traffic Flow Improvement:** Assigns points for traffic flow improvement based on project type.
- ▶ **Freight Flow Improvement:** The percentage of AADT attributed to truck traffic serves as a proxy for expected impact on freight volumes.
- ▶ **Expected Crash Reduction:** If the project can reasonably expect to improve safety, the expected crash reduction is estimated using Crash Modification Factors (CMFs).

The system planning criteria used for modernization projects include:


- ▶ **Corridor Significance:** Determines whether a given project is on a strategic corridor and which tier of strategic corridor.
- ▶ **Supports Statewide Plans:** Points are assigned based upon the recommendations made by the Statewide Plans.
- ▶ **Multimodal Enhancement:** Determines whether the project connected directly to a transportation terminal or otherwise enhances multimodal connectivity.

Table 6: Modernization/Expansion Program Prioritization Approach

Modernization Projects		Expansion Projects
Build Mod/Exp Programs	Step 1: Build the modernization program; determine programmatic allocation based on balance after preservation program and allocation for expansion	Step 1: Build the expansion program; determine programmatic allocation based on balance of funds
Program Other Classes	Apply the process as follows to the balance of modernization funds	Apply the process as follows to the balance of expansion funds
Work Type Eligibility Determination – Illustrative Work Types	Step 2: Determine if the project is an eligible modernization activity <ul style="list-style-type: none"> • Widening existing lanes/shoulders • Intersection and interchange reconfiguration • Enhancements to address functional obsolescence • Traffic control and management • Safety modifications/enhancements • ITS modifications/enhancements • Bicycle lane improvement 	Step 2: Determine if the project is an eligible modernization activity <ul style="list-style-type: none"> • New routes • New lanes • New rail • New interchanges/intersections • Interchange/intersection capacity enhancement
Evaluation Criteria	Step 3: Evaluate projects in modernization program category; apply performance criteria to prioritize available funds in delivery program <ul style="list-style-type: none"> • Delay Reduction • Traffic Flow Improvement • Freight Flow Improvement • Expected Crash Reduction • Corridor Significance • Supports Statewide Plans • Multimodal Enhancement 	Step 3: Evaluate projects in expansion program category; apply performance criteria to prioritize available funds in delivery program <ul style="list-style-type: none"> • Travel Time Savings • Future Traffic Volume • Future Freight Flow • Corridor Significance • Supports Statewide Plans • Multimodal Enhancement

Expansion Projects

The primary policy goal addressed by expansion projects is to provide sufficient capacity to meet current and future demand. As such, the most important criterion is travel time savings, which is also used to assess cost effectiveness. Individual projects that significantly increase capacity typically result in network-level travel time savings, not just travel time savings in an area immediately surrounding a particular project. For larger projects where systems-level analysis, often in the form of network-level simulation modeling, can be conducted relatively easily, results of these network-level analyses will inform the travel time savings criterion. For smaller-scale projects where it is not feasible to perform network-level analysis, travel time savings will be estimated using calculation methods to compare estimated travel times between build and no-build scenarios.



The primary policy goal addressed by expansion projects is to provide sufficient capacity to meet current and future demand.

Since all new construction will meet or exceed safety standards, only those expansion projects in identified high crash locations that also are expected to improve safety receive additional priority in the prioritization and ranking process outlined below. Improvements in safety may be a co-benefit of an expansion project, but the primary goal of expansion projects is increasing system capacity.

The technical performance criteria used to evaluate expansion projects include:

- ▶ **Travel Time Savings:** Estimates the improvement in travel time between the build and no build scenarios for intersection/interchange projects and linear projects. For interchange/intersection projects, theoretical control delay under the build scenario is calculated using Highway Capacity Manual (HCM) 2010 guidelines for specific intersection types; for linear projects, it is calculated as the difference between current no build travel times and estimated travel times under build conditions.
- ▶ **Future Traffic Volume:** Estimates future AADT for a particular project location.
- ▶ **Future Freight Flow:** Estimates percentage of future AADT expected to be attributed to truck traffic; along with future AADT, serves as a proxy for expected future freight volumes.

The system planning criteria used for expansion projects include:

- ▶ **Corridor Significance:** Determines whether a given project is on a strategic corridor and which tier of strategic corridor.
- ▶ **Supports Statewide Plans:** Assesses whether a project is already contained in an adopted plan, such as a metropolitan transportation plan, regional transportation plan, or statewide transportation plan.
- ▶ **Multimodal Enhancement:** Determines whether the project connects directly to a transportation terminal or otherwise enhances multimodal connectivity.

4.3.2 Weighting and Use

Projects are scored, weighted, and ranked using a Multiple Criteria Decision Making approach. This technique allows users to assess the relative importance of different criteria by assigning relative weights to each. Weights can be assigned in a hierarchical process, such as the weights assigned to develop the pavement condition index, but weights in each level of the hierarchy must always sum to one. In addition, to ensure consistency in scoring, values used in P2P Link to develop scores are calibrated and defined based on project data.

The weighting, scoring, and ranking approach used in P2P Link accounts for the weights of the technical and system planning criteria (0.7), cost-effectiveness (0.2) for modernization and expansion projects, and local input (0.1).

Local input will be provided by the ADOT Districts based upon their regional knowledge and discussions with local MPOs/COGs. These discussions are initiated during the System Performance Review and continued through the Project Nomination process. Input into the P2P Link process by agencies and staff with local knowledge of the issues allows consideration of intangibles as well as objective measurement in prioritizing needs.

4.3.3 Input Sheets

The input sheets, or project scores, “score cards” for the Investment Categories are provided in Tables 7 to 10. Their development involved several “rules.” Those common to all three investment categories include:

- ▶ Weights for the evaluation criteria will be established annually by the ADOT Strategic Committee at the beginning of the programming update cycle based upon the results of the System Performance Analysis and Strategic Highway Safety Plan. Guidance for updates to weighting is discussed in Section 4.3.2. The weightings shown in Tables 7 to 10 are based on input from ADOT stakeholders during P2P Link workshops and reflect the relative importance of the various evaluation criteria. These weightings are user-defined and can be modified on an as-needed basis. For example, performance reporting may indicate increasing congestion on the transportation network so the weight of the delay reduction performance criterion can be increased. This flexibility allows decision makers to alter the relative weights, and thus rankings, as conditions warrant.
- ▶ Projects of different work types that occur at the same location should be evaluated as part of the Investment Category in which they belong and, where appropriate (e.g., is the work necessary on its own merits?) bundled, along with the applicable Investment Category funding allocation, into the project with the highest cost.
- ▶ All projects are rated for their contribution to improving multimodal mobility. Measuring person-carrying capacity of a project as opposed to vehicle capacity, for example, shifts the emphasis from moving vehicles to moving people, a broader and more sustainable objective. The concept of advancing projects that improve linkages to multimodal terminals over those that do not can also help expand the interpretation of projects. Projects that specifically add multimodal features such as bicycle lanes and bus stops also help create a mindset about how the project can contribute to a more comprehensive transportation system with more travel options. These can all improve a project’s rating in the P2P process.

- ▶ A “local input” factor is included as part of the final point total for each project. The added points are limited to no more than ten percent of the total project rating (**Rating = Quantitative Score + Cost Effectiveness (for Modernization and Expansion Investment Categories) + Local Input**).

Preservation Ranking Criteria

Several specific “rules” apply to the Preservation investment category:

- ▶ Preventive maintenance projects will be funded at the required level on an annual basis. The Asset Management Plan will identify the preventive maintenance work required on an annual basis.
- ▶ Major Rehabilitation/Reconstruction projects will need to be prioritized since there is not enough funding available for all reconstruction projects. A scoring method is preferred for determining project ranking within the Preservation investment category (vs. a benefit-cost method) to avoid a high AADT bias in the results which may not always be compatible with the preservation objectives.
- ▶ Pavement and Bridge programs should compete for an allocation of funding within the Preservation investment category. Projects would then only compete within the designated allocation (i.e., bridge or pavement).
- ▶ A preliminary list of projects will emerge from ADOT’s bridge and pavement management systems.
- ▶ In general, funds for ancillary assets (*Other Roadways and Facilities*) will be programmatically assigned instead of an asset-specific basis.

Pavement preservation project data can be obtained from the Highway Performance Monitoring System (HPMS), IRI reports, and pavement condition surveys. Bridge preservation project data can be obtained from the NBI. To determine corridor significance, refer to the Arizona’s Key Commerce Corridors Study, which identifies statewide significant corridors.

Modernization Ranking Criteria

Delay reduction and traffic flow improvement are calculated using HCM 2010 guidelines. In most cases, HPMS data, along with project-specific traffic data, can be used as inputs for Highway Capacity Software™ 2010, HCS 2010™ analyses. Estimated delay and traffic flow from this software can be used in the project ranking and prioritization process. Since modernization projects are contained both within the Development Program as well as the Delivery Program, as a project progresses from scoping and concept through to final design and construction, the accuracy of estimates of delay reduction and traffic flow improvement are likely to improve over time.

The identification of strategic investment projects and designation as a key commerce corridor can be identified using the Arizona’s Key Commerce Corridors Study in a similar fashion as with preservation projects. In order to assess whether a project supports statewide plans, points are assigned based upon the recommendations made by various planning efforts (i.e., Asset Management Plan, Strategic Highway Safety Plan, Topical Statewide Plans (Port of Entry, Rest Area, Passing Lanes, etc.), Corridor Profile Studies, and Design Concept Reports (DCR) or Feasibility Studies). A project provides multimodal enhancement if it serves multimodal terminals or expands multimodal options. Potential safety improvements associated with a project are assessed with the high crash location and expected crash

reduction criteria. As ADOT's safety analysis methodologies improve and become more robust over time, these criteria are likely to evolve and improve.

Cost effectiveness for modernization projects is assessed as dollars per reduction in delay. In order to facilitate comparison among projects of similar magnitude, projects are grouped into low, medium, and high cost and then projects in the each group are scored for cost effectiveness using different scoring scales for small, medium, and large cost projects.

Expansion Ranking Criteria

Most expansion projects are large-scale and result in network-level travel time savings, thus lending themselves to simulation analyses to estimate travel time savings. ADOT can utilize existing travel demand models to estimate the benefits of many expansion projects. Results of these model runs can be used in the ranking and prioritization process.

Similar to preservation and modernization projects, the identification of strategic investment projects and designation as a key commerce corridor can be identified using Arizona's Key Commerce Corridors Study. A project provides multimodal enhancement if it serves multimodal terminals or expands multimodal options. In order to assess whether a project supports statewide plans, points are assigned based upon the recommendations made by various planning efforts (i.e., Asset Management Plan, Strategic Highway Safety Plan, Topical Statewide Plans (Port of Entry, Rest Area, Passing Lanes, etc.), Corridor Profile Studies, and DCRs or Feasibility Studies). Potential safety improvements for expansion projects are assessed based on whether a project location is identified by ADOT as a high crash location and the project is reasonably expected to improve safety.

Cost effectiveness for expansion projects is assessed as per travel time savings. Similar to modernization projects, projects are grouped into low, medium, and high cost and then projects in the each group are scored for cost effectiveness using different scoring scales for small, medium, and large cost projects.

4.3.4 Prototyping

In order to ensure that the evaluation criteria and project prioritization and ranking approach can be implemented, a prototyping process using the 2014-2018 Transportation Facilities Construction Program was conducted. To the extent possible using the existing Five-Year Construction Program projects, each project was classified into one of the three investment categories: Preservation, Modernization, or Expansion. Projects that did not meet the eligible work types for each investment category as defined above were eliminated. During the prototyping process, the computation methodology, scoring scale, and initial weighting will be developed for each criterion. Preliminary results of the prototyping, where data are readily available, are provided in Appendix C.

These initial scoring scales and weightings are preliminary and based upon the results of the prototyping efforts where data are readily available. During the annual program update cycle, criteria weightings and scoring scales can be adjusted as deemed necessary. In addition, where data limitations are identified in ADOT's existing processes, the computation methodology for the evaluation criteria will evolve as ADOT's data analysis capabilities continue to advance.

Table 7: Preservation Ranking Criteria – Pavement

Candidate Evaluation Criteria	Description of Criterion	Computation Methodology	Scoring Scale	Max No. of Points	Weight*
Pavement Ride Quality	IRI rating	Different thresholds and scales used for Interstates and non-Interstates	Interstate >104 = 100 points >75 and <=104 = 75 points <=75 = 50 points	100	1
			Non- Interstate >142 = 100 Points >93 and <=142 = 75 points <=93 = 50 points	100	
Pavement Structural Integrity	Composite condition index	Composite index calculated based on structural/thermo cracking, rutting, and faulting	Scale shown below	100	1
Traffic Volume	AADT, to determine relatively high or low volume	AADT of vehicles	>=20,000 = 100 points >=5,000 and <20,000 = 75 points <5,000 = 50 points	100	1
Freight Flow	Truck volume as percent of AADT	Percentage of AADT attributed to trucks – proxy for freight volumes	>=25% = 100 points >=10% and <25% = 75 points <10% = 50 points	100	1
Corridor Significance	Is the project located in a corridor of statewide significance?	Yes/No	Key Commerce Corridors = 100 points NHS – Interstate = 75 points NHS – Non-Interstate = 50 points	100	1
TOTAL POINTS					

NOTES:

Weights will be established with prototyping. Multiple scenarios with different weights will be considered prior to making recommendations for weights.

PAVEMENT CONDITION INDEX CRITERION

Candidate Evaluation Criterion	Computation Methodology	Components of Criterion	Scoring Scale	Max No. of Points	Weight
Pavement Structural Integrity	Pavement condition index calculated based on cracking, rutting, and friction properties	Cracking (%)	>5 = 100 points >2.5 and <=5 = 75 points <=2.5 = 50 points		0.5
		Rutting (inches)	>0.015 = 100 points >0.005 and <=0.015 = 75 points <=0.005 = 50 points		0.5

Table 8: Preservation Ranking Criteria – Bridge

Candidate Evaluation Criteria	Description of Criterion	Computation Methodology	Scoring Scale	Max No. of Points	Weight
NBI Sufficiency Rating	Bridge sufficiency rating	Four status types: <ul style="list-style-type: none"> Structurally deficient: Significant load-carrying elements are found to be in poor condition Functionally obsolete: Function of geometrics of bridge in relation to geometrics required by current design standards Not deficient: Not structurally deficient or functionally obsolete Not applicable: Non-highways bridge 	Structurally deficient: 100 Not deficient: 0	100	1
Composite Health Factors	Superstructure condition rating Substructure condition rating Deck condition rating OR Culvert condition rating	NBI Condition Rating Scores are as follows: 7 to 9 = Good condition 5 or 6 = Fair Condition <5 = Poor condition	If either deck, substructure, or superstructure condition rating <5 then = 100 points Otherwise = 0 points	100	1
Scour Criticality	Scour Critical bridge conditions	Bridge coding as scour critical in the NBI	Scour Critical = 100 points Not Scour Critical = 0 points	100	1
Fracture Criticality	Fracture Critical bridge conditions	Bridge coding as fracture critical in the NBI	Fracture Critical = 100 points Not Scour Critical = 0 points	100	1
Traffic Volume	AADT, to determine relatively high or low volume relative to the geographical area.	AADT, forecast using historical data	>=10,000 = 100 points 5,000<=AADT<10,000 = 75 points <5,000 = 50 points	100	1
Freight Flow	Truck volume as percentage of AADT	Percentage of AADT attributed to trucks – proxy for freight volumes	>40% = 100 points 20 – 40% = 75 points <20% = 50 points	100	1
Detour Length	Length of bypass required if bridge is out of service	Bypass length (miles)	>50 miles = 100 points 20 to 50 miles = 75 points 0 to 20 miles = 50 points	100	1
Corridor Significance	Is the project located in a corridor of statewide significance?	Yes/No	Key Commerce Corridors = 100 points NHS – Interstate = 75 points NHS – Non-Interstate = 50 points	100	1
TOTAL POINTS					

NOTES:

Weights will be established with prototyping. Multiple scenarios with different weights will be considered prior to making recommendations for weights.

Table 9: Modernization Project Ranking

Candidate Evaluation Criteria	Description of Criterion	Computation Methodology	Scoring Scale	Max No. of Points	Weight
Delay Reduction	Approximation of level of congestion in project area	Calculate rough V/C ratios for projects using AADT and estimated daily capacity by facility type	v/c > 0.9 = 100 points v/c > 0.75 = 75 points v/c > 0.5 = 50 points	100	1
Traffic Flow Improvement	Approximation of impact of project type on traffic flow	Projects assessed based on type: traffic interchange improvements, passing lanes, roundabouts, intersection improvements, superelevation improvements, shoulder widening, other	TI = 100 points PL = 90 points RD = 80 points II = 70 points SI = 60 points SW = 50 points Others = 10 points		
Freight Flow Improvement	Truck volume as percentage of AADT – captures impact on goods movement	Percentage of AADT attributed to trucks – proxy for freight volumes	>=20% = 100 points >= 10% = 75 points < 10% = 50 points	100	1
Expected Crash Reduction	Expected reduction in crashes as a result of the project	Use Crash Modification Factors (CMF) to determine Crash Reduction Factor (CRF) which = 1 – CMF. Then estimate reduction in crashes over five years as the product of total crashes over five years and the CRF.	Expected crash reduction > 100 = 100 points Expected crash reduction > 75 = 75 points Expected crash reduction > 25 = 50 points	100	1
Corridor Significance	Is the project located in a strategic corridor? Which tier of roadway?	Yes/No	Key Commerce Corridors = 100 Points Statewide/Regionally Significant = 75 Points Other NHS = 50 Points	100	1
Supports Statewide Plans	Has this project been identified in the following plans with specific recommendations for improvement? (<i>Infrastructure Investments, Asset Management Plan, Strategic Highway Safety Plan, Topical Statewide Plans (Port of Entry, Rest Area, Passing Lanes, etc.), Corridor Profile Studies, and DCRs or Feasibility Studies</i>)	Yes/No	Top Tier Priority = 100 points Completes Implementation of a Corridor = 100 point Middle Tier Priority = 50 points Bottom Tier Priority = 10 points	100	1
Multimodal Enhancement	Does the project improve multimodal connectivity?	Yes/No	Significantly increases person-carrying capacity = 100 points Expands multimodal options = 75 points Directly serves a transportation terminal = 50 points	100	1
Subtotal					0.7
Cost Effectiveness (\$/delay reduction) 3 Project Categories – Low, Medium, High Cost				TBD – relative to project category	TBD
Local Input				TBD	TBD
Total Points					

NOTES:

Weights will be established with prototyping. Multiple scenarios with different weights will be considered prior to making recommendations for weights.

Table 10: Expansion Project Ranking

Candidate Evaluation Criteria	Description of Criterion	Computation Methodology	Scoring Scale	Max No. of Points	Weight
Travel Time Savings	Simulation-based/network-level analysis	Use simulation analyses to estimate travel time savings associated with implementation of expansion project links. Calculate as seconds per vehicle per day.	>5 sec/veh/day = 100 points >2.5 sec/veh/day = 75 points >0 sec/veh/day = 50 points	100	1
Future Traffic Volume	Projected traffic volumes	Use ADOT traffic projection data (at time of publication 2030 AADT Projections)	>= 25,000 = 100 points >= 10,000 = 75 points < 10,000 = 50 points	100	1
Future Freight Flow	Projected truck volume as percentage of AADT – captures impact on goods movement	Percentage of AADT attributed to trucks – proxy for freight volumes	>= 20% = 100 points >= 10% = 75 points < 10% = 50 points	100	1
Corridor Significance	Is the project located in a corridor of statewide significance?	Yes/No	Key Commerce Corridors = 100 points Statewide/Regionally Significant = 75 points Other NHS = 50 points	100	1
Supports Statewide Plans	Has this project been identified in the following plans with specific recommendations for improvement? (<i>Infrastructure Investments, Asset Management Plan, Strategic Highway Safety Plan, Topical Statewide Plans (Port of Entry, Rest Area, Passing Lanes, etc.), Corridor Profile Studies, and DCRs or Feasibility Studies</i>)	Yes/No	Top Tier Priority = 100 points Completes Implementation of a Corridor = 100 point Middle Tier Priority = 50 points Bottom Tier Priority = 10 points	100	1
Multimodal Enhancement	Does the project directly serve a transportation terminal (e.g. airport, train or bus station, rail yard)? Does the project expand multimodal options (e.g., rail line, reconfiguration of existing lanes to add a bike lane, HOV/HOT lane, BRT lane or freight truck lane)?	Yes/No	Significantly increases person-carrying capacity = 100 points Expands multimodal options = 75 points Directly serves a transportation terminal = 50 points	100	1
Subtotal					0.7
Cost Effectiveness (\$/travel time savings) 3 Project Categories – Low, Medium, High Cost				TBD – relative to project category	TBD
Local Input				TBD	TBD
Total Points					

NOTES:

Weights will be established with prototyping. Multiple scenarios with different weights will be considered prior to making recommendations for weights.



5. System Performance

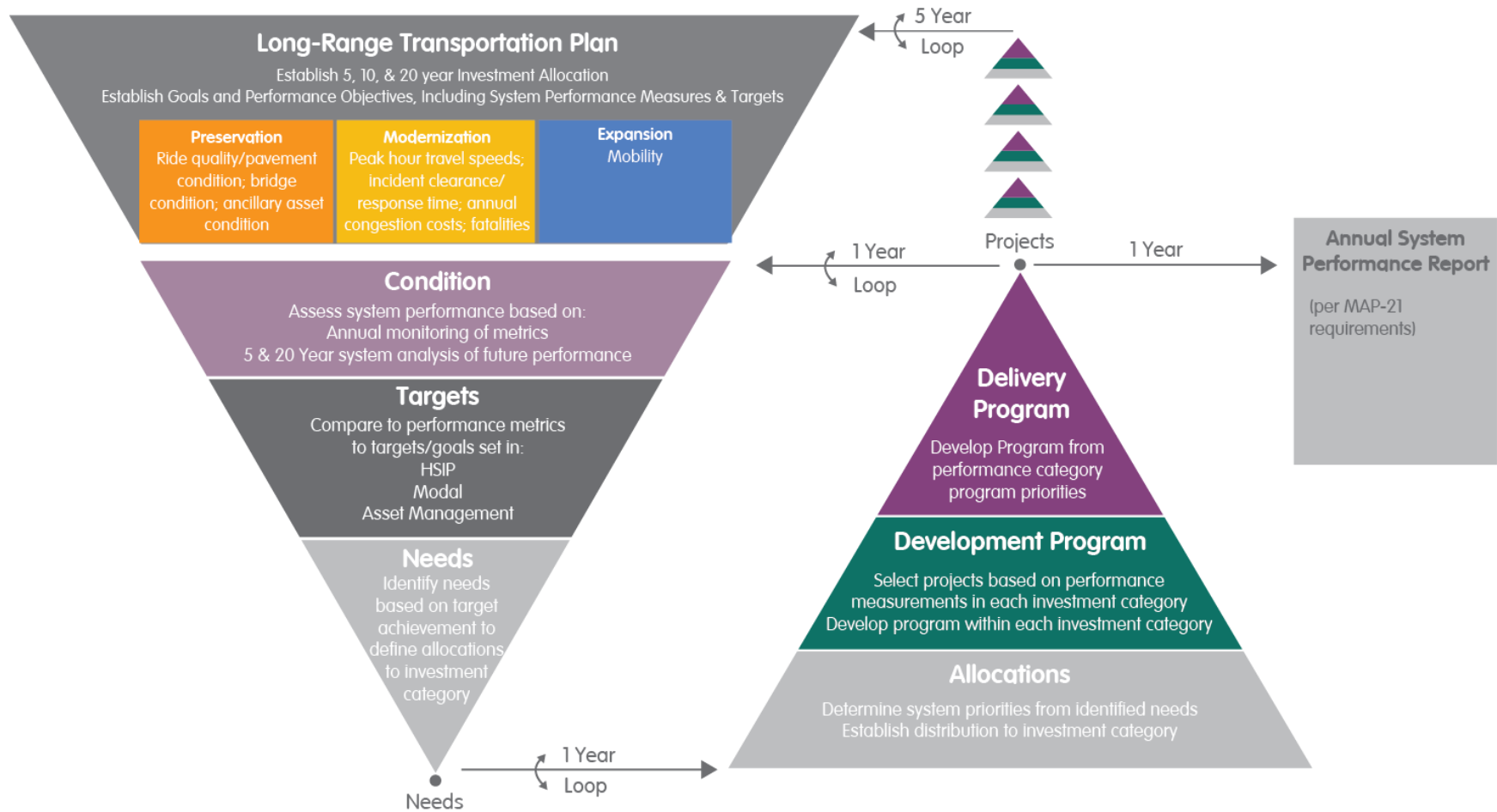
P2P Link uses consistent and integrated performance analysis to manage the link between long-range plans and the construction program. The measurement and interpretation of system condition are the basis for the decisions defining the Development and Delivery Programs updates each year. The approach to system performance analysis is shown in Figure 8, having two intervals of review and assessment, at one year with program updates and five years with plan updates.

5.1 Elements of Performance Analysis

Performance analysis is on-going and built into the cycles of the planning and programming processes with P2P Link. The LRTP sets long-term goals and direction for the state transportation system. At this level, the primary structure of the performance management process is established and performance objectives, measures, and targets for system goals are defined. How well or poorly targets for each goal are met determines the risk to the system of meeting overall performance expectations. The LRTP will include a system-level performance analysis that evaluates baseline conditions and predicts performance over five-year, ten-year, and twenty-year plan horizons. This information is used to establish overall funding allocations to investment categories. P2P Link investment categories align with the measurements used to evaluate system performance. Projects are selected using criteria that directly link the value of a project to the performance of the transportation system. The higher the value of the project, the more likely it will be included in the program.

The system performance analysis component of the LRTP provides the methodology for the evaluation of system performance. The LRTP establishes performance objectives and planning analysis then uses performance metrics to measure how well the objectives are met under different long-range plan scenarios. Planning scenarios could be policy or finance driven. The system performance analysis methodology is designed so that annual performance reports are produced that assess performance against specified targets. The annual performance report will provide guidance for the annual update of investment allocations.

Figure 10 – Performance Analysis Monitoring



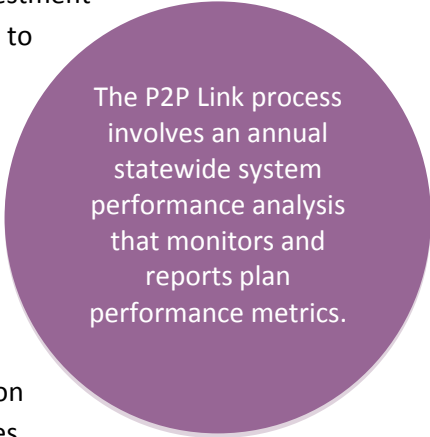
The system performance analysis will identify Modernization and Expansion needs. The methodology for this will require current and forecast volume data for people and freight mobility. The performance approach and metrics will be multimodal, although it is recognized that the solutions in the implementing program may be modal due to finance and statutory requirements governing the programming process.

A detailed scenario-based system performance analysis will be undertaken every five years as part of the LRTP update. The system performance analysis will incorporate consideration of freight and incorporate, as applicable, analysis from the freight plan.

5.2 Annual System Performance Analysis

An annual review of performance is undertaken to monitor trends in performance between plan updates. This information is also used to inform annual program updates. During the annual updates, performance will dictate adjustments in funding allocations to the investment categories and any rearranging of the Development Program priorities to best meet system needs.

P2P Link involves an annual statewide system performance analysis that monitors and reports plan performance metrics. This analysis is reported in a public document that provides trends and commentary on current and future conditions. The report addresses MAP-21 and Arizona-specific performance objectives, as well as how well performance targets have been or are being met. The analysis and reporting should be designed to identify and minimize risk based on a system-level identification of current and forecast performance issues.



The P2P Link process involves an annual statewide system performance analysis that monitors and reports plan performance metrics.

5.3 Performance Analysis of Tentative Programs

Each year to support the program update cycle the impact of the proposed ten-year program (Development and Delivery) on anticipated system performance is analyzed. This enables a comparison of its impact to the current performance baseline. The composition of the proposed program will be tested under different planning scenarios (i.e., projects will be added, removed, or exchanged) to maximize overall system benefit as determined by the aggregate performance of all system performance categories (currently, Preservation, Modernization, and Expansion).

5.4 Project Performance Analysis

The project selection criteria are defined so that they permit projects to be assessed and selected based entirely on their contribution to plan goals. Project performance is measured in terms of the effect the proposed project has on the policy goals set for each investment category (as illustrated in Tables 2, 3, and 4). P2P Link establishes a method for accomplishing this intersection of projects and system performance. Projects compete and are selected and prioritized based on how well they positively impact transportation system performance.

5.5 Initial Performance Measures

Metrics for system performance that can be used as a starting point for ADOT to address MAP-21 have been developed with P2P Link, as shown in Table 11. These metrics were derived from the AASHTO Performance Management Committee recommendations and can be revised over time to conform to local requirements in Arizona as long as they can generate the appropriate information to comply with federal requirements. Moving forward, the LRTP update should include the following steps:

- ▶ Confirm ADOT goals and performance objectives for the transportation system
- ▶ Align ADOT goals and performance objectives against national goal areas
- ▶ Review ADOT measures for MAP-21 compliance as outlined here
- ▶ Identify any other measures needed based on ADOT goals and performance objectives
- ▶ Measure performance baseline
- ▶ Establish Targets - Tier the system at a minimum NHS versus non-NHS on the state system

The metrics should be incorporated into and provide the basis for highway system performance analysis in the LRTP update. Similarly the freight modal plan will address freight performance measurements.

Table 11: Initial Metrics for System Performance

MAP-21 National Goal and Performance Measure Areas	Potential ADOT Metrics	Existing Data Source
SAFETY		
Number of fatalities	Number of fatalities – 5 yr moving average of the number of fatalities on all public and state roads in a calendar year	Fatalities data from Fatal Accident Reporting System from National Highway Traffic Safety Administration (NHTSA); VMT data from FHWA Highway Performance Monitoring System
Fatalities per VMT	Fatality rate – 5 yr moving average of the number of fatalities (above) divided by VMT for a calendar year	
Number of serious injuries	Number of serious injuries – 5 yr moving average of number of serious injuries on all public roads in a calendar year	Serious Injury data from Individual State crash data files (report the same way as in HSP); VMT data from FHWA Highway Performance Monitoring System
Serious injuries per VMT	Serious Injury rate – 5 yr moving average of number of serious injuries (above) divided by VMT for a calendar year	
PAVEMENT CONDITION		
Pavement condition on the Interstate system	Interstate pavement in good, fair, and poor condition based on IRI - Percentage of 0.1-mile segments of interstate pavement mileage in good, fair, and poor condition based on criteria. Good is defined as IRI below 95; fair is defined as an IRI between 95 and 170; and poor is defined as IRI above 170.	IRI data already collected by transportation agencies for HPMS; state can also submit data from its state database
Pavement condition on the non-Interstate NHS	Non-interstate NHS pavement in good, fair, and poor condition based on IRI - Percentage of 0.1-mile segments of interstate pavement mileage in good, fair, and poor condition based on criteria. Good is defined as IRI below 95; fair is defined as an IRI between 95 and 170; and poor is defined as IRI above 170.	
BRIDGE CONDITION		
Bridge conditions on NHS	Percentage of deck area on structurally deficient bridges – NHS bridge deck area on structurally deficient bridges as a percentage of total NHS bridge deck area	To be collected with data from the NBI
Bridge conditions on NHS	NHS Bridges in good, fair, and poor condition based on deck area - Percentage of NHS bridges in good, fair, and poor condition, weighted by deck area	Also to be collected with data from NBI, but in the future the use of element level data may change the metric. Recommendations on good, fair, and poor conditions to be determined by Task Force at later date
Additional measures for bridge conditions on	NHS Bridges in good, fair, and poor condition based on index of NBI elements – Major elements include Superstructure Condition, Substructure Condition, Culvert Condition, and Deck Condition. Set thresholds on good, fair, and poor condition based	NBI

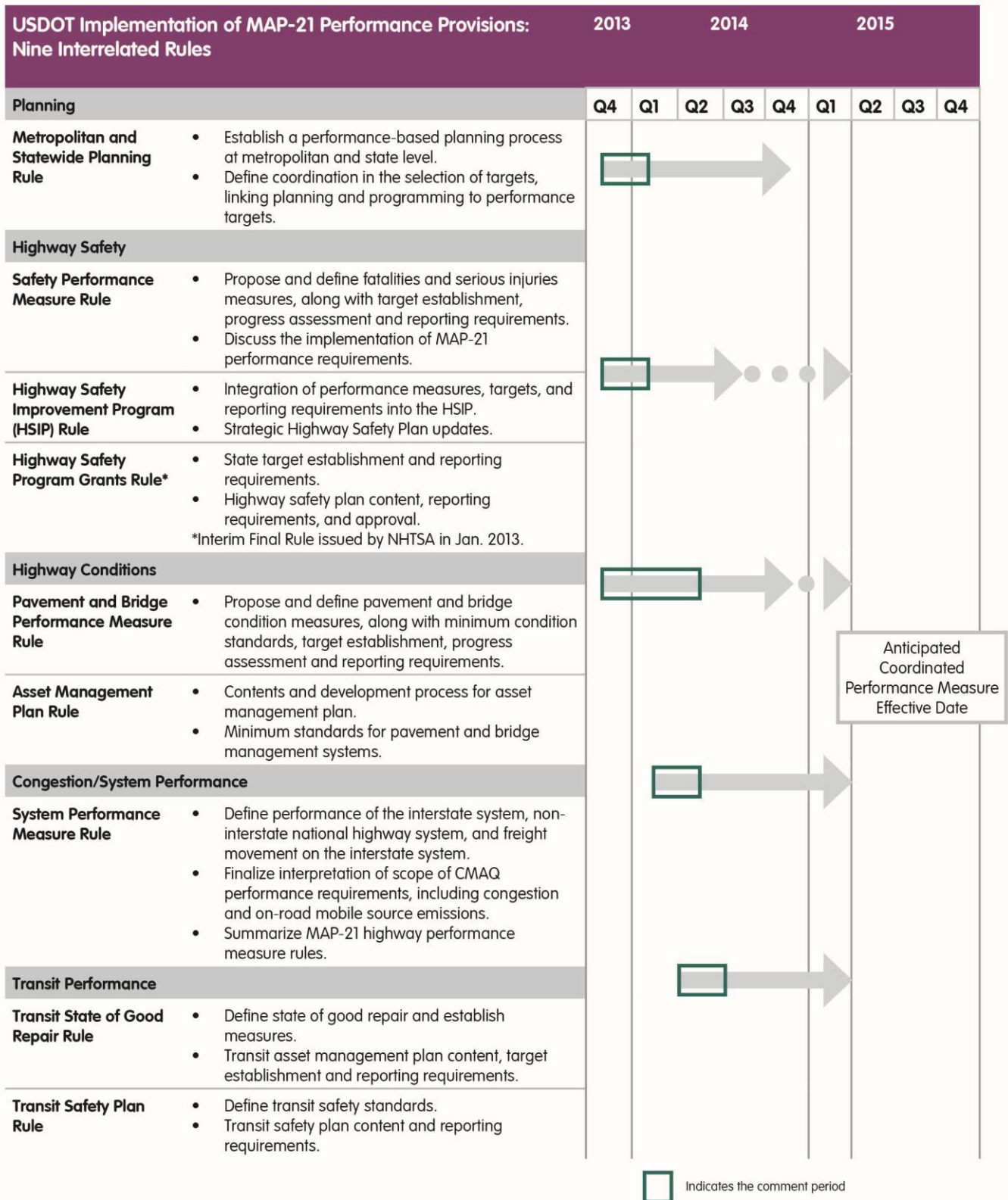
MAP-21 National Goal and Performance Measure Areas	Potential ADOT Metrics	Existing Data Source
NHS (to be considered)	on NBI ratings for each of the above elements (i.e., if NBI rating is greater than 6 for all elements, bridge is in good condition). Index can reflect all elements or some combination (i.e., three major elements)	
CONGESTION REDUCTION		
Traffic congestion	Annual Hrs of Delay – Travel time above a congestion threshold (defined by DOTs and MPOs) in units of vehicle-hrs and passenger hrs of delay reduced by annual program of Congestion Mitigation and Air Quality (CMAQ) projects	Data to calculate the metric come from regional forecasting models used by DOTs and MPOs in current planning practices and CMAQ reporting methodologies
SYSTEM PERFORMANCE AND RELIABILITY		
Performance of the non-Interstate NHS and Interstate System	Annual Hrs of Delay – Travel time above a congestion threshold (defined by DOTs and MPOs) in units of vehicle-hrs of delay on Interstate and NHS corridors. Congestion threshold can be defined in terms of percentage of corridor free-flow speed (i.e., corridor is not productive if vehicles travel below 80% of 60 mph) or other speed limit (set at 35 mph) determined by DOT.	Derived from combination of HPMS data and nationwide private-sector speed data combined with state-set threshold speed for congestion
Performance of non-Interstate NHS and Interstate System	Reliability Index (RI₈₀) – Ratio of the 80 th percentile travel time to agency-determined threshold travel time	
FREIGHT MOVEMENT		
Freight movement on the Interstate Highway	Annual Hrs of Truck Delay – Travel time above the congestion threshold in units of vehicle-hrs for trucks on the Interstate Highway System. Congestion threshold can be defined in terms of percentage of corridor free-flow speed (i.e., corridor is not productive if vehicles travel below 80% of 60 mph) or other speed limit (set at 35 mph) determined by DOT.	Derived from combination of HPMS data and nationwide private-sector speed data combined with state-set threshold speed for congestion
Freight movement on the Interstate Highway	Truck Reliability Index – Ratio of the total truck time needed to ensure on-time arrival to the agency-determined threshold of travel time (observed or preferred travel time)	
ENVIRONMENTAL SUSTAINABILITY		
On-road mobile source emissions	Criteria Pollutant Emissions – Daily kilograms of on-road, mobile source air pollutants [carbon monoxide (CO), volatile organic compounds (VOC), nitrous oxides (NO _x) particulate matter (PM)] reduced by the latest annual program of CMAQ projects	Data comes from current CMAQ reporting methodologies used by DOTs and MPOs

The initial metrics, in Table 11 above, position P2P Link to address MAP-21 requirements and the forthcoming federal rules guiding implementation. The federal rules are part of the process through which the US DOT aims to create streamlined and consistent guidance among state and local

transportation agencies for a set of national performance measures and reporting requirements aligned with MAP-21 national goal areas. This will be effective by spring 2015; see the initial schedule in Figure 11. Throughout the rulemaking process, the US DOT is accepting comments from national transportation experts and policymakers. Once the measures are determined, states will have flexibility in setting target values for the measures, as it is expected that the conditions leading to successful outcomes are diverse both within and among states. States will have 12 months after the national performance measure effective date to set targets and incorporate them into the planning process. States will have four years after MAP-21 enactment (October 1, 2016) to report progress toward goals to US DOT and continue the reporting process biennially thereafter.

As part of the P2P Link process, the federal metrics provide the basis for prioritizing projects during the annual program update. The evaluation criteria for the investment categories relate federal metrics for system planning to project ranking. Any updates to the federal metrics or to state policies should also be translated into updating the project ranking evaluation criteria.

Figure 11: US DOT Performance Measure Implementation Schedule



Source: US DOT



6. Financial and Fiscal Constraint

P2P Link is designed to enable Arizona to secure the most effective transportation performance for each dollar spent. The link between policy, planning, and programming is central to achieving that goal. The process applies financial constraint at the planning level and fiscal constraint at the programming level.

The following definitions and approach are used in P2P Link.

Financial Constraint

This is the revenue constraint that is applied to the development of long-range plans over a twenty-year planning horizon. It is established as a policy decision in the planning process. Long-range statewide, modal, and other plans will state their finance assumptions. Examples of assumptions for the statewide plan could be a range of scenarios: 1) plan assuming no change in state and federal revenue sources and rates over the planning horizon, 2) an assumption that future revenue increases would occur at the same rate over the next twenty years as in the past, 3) no change in state and federal revenue sources and rates, but with the assumption that all expansion projects would be financed through a new revenue source.

P2P Link is designed to enable Arizona to secure the most effective transportation performance for each dollar spent.

Financial feasibility and financing strategies are key components of transportation plans. Therefore, P2P Link is built on a long-range planning approach in which the inclusion of finance strategies is part of defining transportation solutions. The plans identify the level of performance that would be “bought” through implementation of a set of projects each year and over a period of years.

Fiscal Constraint

This is defined to be consistent with and address the federal requirements for fiscally constraining the statewide transportation improvement program over a five-year period. This means that the program is financially feasible with identifiable real revenues. The expectation is that ADOT will have a cash-based program that maximizes the use of federal dollars and through which each project specified in the delivery program can be funded by year. This can be thought of as “cash feasible.”

The following sections describe the process and applicability of these constraints in the P2P process elements.

6.1 Statewide Long-Range Transportation Plan

The long-range plan establishes a funding level as a financial constraint for the plan.⁵ The long-range plan financial constraint is policy-driven and is based on the planned level of funding or investment that will be available over the twenty-year planning horizon. The LRTP would forecast revenues from current and anticipated sources. Assumptions or decisions about the level of performance that can be achieved based on those specific financial constraints would help define the LRTP investment levels. It would also likely identify applicable transportation system performance risks and financing strategies, including a policy allocation of funding to investment categories, to implement the plan or components of the plan.

A method that will be effective for P2P Link is to consider different levels of performance that would be planned under different finance assumptions. These are often referred to as plan scenarios. This ultimately drives P2P link. The long-range plan would provide policy direction regarding the allocation of resources and the application of the fiscal constraint for the delivery and development program. This would be accomplished by specifying the investment emphasis between Preservation, Expansion, and Modernization over a five-year, ten-year, and twenty-year horizon. This emphasis drives the balance between program performance categories in the Development and Delivery Programs. The five-year emphasis would be updated and refreshed every five years, which is the anticipated update cycle for the LRTP. The LRTP would specify the level of performance that is planned over the next five, ten, and twenty years. The Development and Delivery Programs implement this strategy.

6.2 Modal, Corridor Plans (Multimodal and Modal)

A similar approach that aligns with, and is consistent with, the long-range plan would apply. It is likely that corridor plans could be charged with incorporating financing strategies as part of their implementation program. The methodology would include the identification of how large-scale and strategic projects would be financed; with the requirement that a financing mechanism be identified and agreed to before it can be advanced into the Development Program.

⁵ The statewide plan is not required to be fiscally constrained by federal law while MPO plans are to be constrained.

6.3 Development Program

The Development Program includes years six through ten. It will include projects that require more than five years to develop, as well as projects that don't require as much time. While this program is not fiscally constrained, the following financial constraint is applied to establish a funding level for the Development Program. The planned level of funding for Preservation over years six to ten is identified programmatically and this is also used as input for the Asset Management Plan. Similarly, a programmatic allocation to Modernization projects that are not likely to require more than five years development is identified (e.g., this would include the Minor Projects program ADOT is developing to replace the District Minor funding of the past.) The remainder of the forecast revenue over years six to ten is then applied to identify available funding as a financial constraint for projects to be included in the Development Program. The financial constraint in the development Program needs to be consistent with decisions made in the long-range transportation plan and corridor plans.

The general principle that controls the list is that a revenue source must be identified for the project to be included in the Development Program. This could be existing revenue sources, local or other contributions, or through an anticipated revenue program under consideration by a region or the state. This ensures that no project without a source of funding enters the development program. It is also a less restrictive fiscal constraint than that applied to the Delivery Program. The approach also provides a satisfactory pipeline of projects to enable a timely expansion of the delivery program if additional funding becomes available.

6.4 Delivery Program

The Delivery Program is fiscally constrained as defined above. It is cash feasible and managed as the Five Year Construction Program. Each year, revenue and expenditure assumptions are updated and the program is rebalanced. This process then identifies the dollar value available to add new projects from the Development Program into the fifth year of the Delivery Program.

While the long-range plan establishes the program emphasis regarding the balance among Preservation, Modernization, and Expansion as part of a multi-year program, current performance is monitored annually and the emphasis can be adjusted to account for changed circumstances on an annual basis. Using this information, each year's funds are allocated among investment categories to provide a financial constraint against which projects are prioritized using P2P Link criteria for inclusion in Year Five of the Delivery Program.



7

7. Implementation

Implementation of P2P Link will occur over the next three years as the new process is incorporated into different plan and program update cycles. The three-year duration is needed to establish the planning foundation that will inform programming priorities. The implementation will also involve time needed to modify existing planning policies and, if necessary, any related state statutes.

7.1 Change Management Considerations

One of the challenging aspects of P2P Link implementation is managing the changes to current practice while ensuring business continuity in terms of delivering projects and updating the construction program. The business areas affected by the new planning to programming approach are numerous and will require adaptation of established methods of planning and programming. While the department has widely accepted that a change is needed to, at the very least, comply with new federal requirements, change can be unsettling when it affects long-standing policy and practice.

The interdependencies among business areas have also been refined by the proposed P2P Link methodologies. Some business areas that have played prominent roles in determining the programming priorities in the past will no longer be needed or will assume a less visible function. The new method replaces previous practice that relied on individual subprograms competing for an allocation of funds with a performance-based, data-driven approach designed to maximize benefit to the transportation system and reduce performance risks. This new approach places heavier reliance on data and objective comparison than previous programming efforts.

Cooperation between ADOT business areas as well as regional partners will also be critical to successful implementation. The four ADOT divisions of MPD, ITD, Enforcement and Compliance Division (ECD), and Motor Vehicle Services Division (MVD) will need to collaborate with MPOs and COGs on regional needs, statewide strategic

Cooperation between ADOT business areas as well as regional partners will also be critical to successful implementation.

investments, and performance goals for Arizona. This communication will cover all elements of the statewide system and its lifecycle considerations. Consistency in terms of measurement among all affected organizations in these areas is necessary for the most effective and meaningful solutions to be put forward. While the processes need not be identical, they need to be compatible so that they can be accounted for in periodic statewide performance reporting.

7.2 Implementation Strategy

The strategy for implementing P2P Link over the next three-year period is described in the following sections and shown on Figure 12. The strategy provides a breakdown of planning and programming components, as well as their interdependencies. The primary objectives for each year are:

► Year 1 – Initiate Planning Efforts and the Ten-Year Program Plan

- **Objective 1:** Define broad scopes and timelines for Asset Management Plan, System Performance Analysis, and LRTP Update to implement approach that drives the planning to programming link. Implementation begins in Year 1 with the Draft Asset Management Plan to be used in the 2015 LRTP Update and Final Asset Management Plan to be used in the 2016 LRTP Update.
- **Objective 2:** Implement new program structure of the Ten-Year Program Plan utilizing the projects in the 2014-2018 Five-Year Transportation Facilities Construction Program. This will be done by assessing the collective contribution of the project list to performance risk reduction and overall system performance using the P2P-defined project evaluation criteria and overall system level performance.
- **Objective 3:** Prepare the first P2P Link Annual System Performance Report for internal use.

► Year 2 – Establish System Performance Criteria

- **Objective 1:** Establish overall transportation system performance objectives, measurements, and targets for the statewide system.
- **Objective 2:** Evaluate the current program balance among the investment categories between plan updates. Consider what the balance is among the program types once the existing program is reallocated into the new categories. This drives new project selection after the 2014 update. It also provides guidance on performance objectives needed for MPO/COG planning.
- **Objective 3:** Prepare the first P2P Link Annual System Performance Report for external use.

► Year 3 – Update the LRTP

- **Objective 1:** Establish overall methodology for system performance analysis and address the identified needs in the LRTP update.
- **Objective 2:** Identify strategic investments in LRTP update. Once identified, strategic investments would involve additional planning work to define the investment programs necessary to implement the initiative. These could be introduced into the Development Program in the 2016 update as an initiative or a series of component projects depending on funding.

The following sections detail the steps necessary to accomplish these objectives. How these steps can be executed most effectively by the organization will require guidance from ADOT leadership. The MPD Planning and Programming Group will be responsible for overseeing P2P Link and for ensuring that new planning activities are structured to support the new process.

1 YEAR

7.2.1 Implementation Strategy for Year 1

The first year of the P2P Link implementation strategy will initiate the incorporation strong focus on performance-based programming. Achieving **Objective 1** will require close cooperation among the ADOT Divisions and Districts, as well as regional and federal partners. Completion of major plan efforts will help to define measurements and targets to be applied to project ratings and system performance as P2P Link is introduced. The planning efforts currently underway or to be initiated this year are:

- **Key Commerce Corridors:** Underway by MPD. This planning identifies the strategic corridors of the state. Completion in late 2013.
- **Strategic Corridor/Initiative Analysis:** Upcoming by MPD. Informed by the Key Commerce Corridors planning effort, several corridors will be examined to identify current conditions, future needs, and potential risks to future performance. Initiation targeted for early 2014. These analyses will also be a fundamental component of the next LRTP update and provide substantial project options for the programming process.
- **Strategic Highway Safety Plan:** Underway by the Traffic Group. The plan addresses federal requirements regarding safety needs. Anticipated completion is mid 2014.
- **Asset Management Plan:** Underway by ITD. The State Asset Management Engineer is preparing a work plan that outlines ADOT's approach to developing its Transportation Asset Management Plan (TAMP), which is modeled after FHWA's recommendations. The first edition of ADOT's TAMP is anticipated in January 2015.
- **System Performance Analysis:** Upcoming by ITD and MPD. The planning effort will be led by MPD in close cooperation with the District Engineers to identify system condition within their districts. Support will be needed from ITD and the MPO/COGs. The analysis is envisioned to take three months to complete, from March to June annually.
- **Modal Plans:** A state freight plan is required by MAP-21 and will be prepared starting in mid 2014. A state transit plan will also be in development in 2014.
- **Regional Plans:** Ongoing.

As part of Year 1, the Ten-Year Program Plan will be established through the Development and Delivery Programs. The necessary steps to accomplish building the programs **(Objective 2)** include:

- 1) Associate all committed projects in the 2014-2018 Five-Year Transportation Facilities Construction Program with the most appropriate new programmatic investment categories (i.e., Preservation, Modernization, and Expansion) using the eligibility criteria defined in Sections 3 and 4. The Unfunded Projects listed on page 15 in the Program are included in the categorizing effort. These projects will establish the Development Program.
- 2) Update delivery status and cost estimates of all projects in the 2014-2018 Program.
- 3) Confirm revenue forecasts for all five years.
- 4) Identify if funding is available for more projects (positive) or if over-programmed (negative).
- 5) Establish policy regarding program emphasis (allocation of funding among categories). The first year will be by policy based on anticipated needs. This step will eventually be based on the overall system performance condition.
- 6) If negative funding situation exists, move lowest ranked projects in the Delivery Program identified through prototyping to the Development Program, as necessary.

Also during Year 1 Implementation, ADOT will formulate the structure of the System Performance Report that will provide the details of performance from year to year **(Objective 3)**. The analysis, a version of which will be made available to the public as part of the MAP-21 requirements, will present status and progress toward the stated performance objectives and targets for each program investment category and, as appropriate, each class within the category. The analysis will help draw conclusions about critical needs and greatest risks to performance in the future statewide and by District. This analysis will be used starting in Year 2 of P2P Link implementation.

YEAR 2

7.2.2 Implementation Strategy for Year 2

The federal rule-making for performance goals is expected in March 2014, which will allow ADOT to more definitively shape their performance objectives, measures, and targets. As part of Year 2 implementation, any changes resulting from the federal rule-making will be incorporated into P2P Link and applied to selecting projects starting with the 2015 program update. P2P Link will be largely in place after Year 2.

The necessary implementation steps for achieving **Year 2 - Objective 1** include:

- 1) Establish performance objectives (overall goals) for the Arizona transportation system.
- 2) Confirm evaluation criteria initially developed meet the rule-making requirements of MAP-21.
- 3) Measure system baseline condition.
- 4) Establish tiering of the system and performance targets for the tiers.
- 5) Set policy direction for allocation of resources among broad performance objectives in the Systems Analysis to drive programming.

These efforts will be formulated and documented in the various planning efforts supporting P2P Link (i.e., Asset Management Plan, Highway System Performance Analysis, etc). Updates of the Development and Delivery Programs for fiscal year 2015 will be influenced by guidance set forth by MAP-21. Project nomination and selection will utilize the methodologies provided in Section 4. The steps related to **Year 2 – Objective 2** for updating the programs using system performance criteria are detailed in Section 3.3 and summarized as follows:

- 1) Determine base statewide system condition using established measures based on MAP-21 and ADOT statewide guidance.
 - a. Compare baseline condition to established performance targets in each investment category
 - b. Compare future condition using the projects in the Delivery and Development Programs per investment category to assess where the greatest risk to performance will be in the future
- 2) Obtain revenue forecast for both the Development and Delivery Programs. Determine the initial allocations to the investment categories based on LRTP update guidance and System Performance Analysis results.
- 3) Evaluate the delivery and cost status for programmed projects in the context of available funding (reality check).
- 4) Nominate projects for the Development Program based on system condition. For the Delivery Program, nominate projects for all classes within Preservation and for Minor Projects within Modernization.

- 5) Prioritize projects using the system performance criteria defined in the evaluation input sheets for each investment category. The evaluation input sheets may require revisions as a result of the federal rule-making and subsequent Arizona performance criteria determination.
- 6) Select projects to be programmed for each investment category. Review resulting forecasted system performance from selected projects. Evaluate various scenarios by adjusting funding amounts allocated to the investment categories.
- 7) Update revenue forecasts.
- 8) Rebalance the allocations to the investment categories based on highest system performance outcome resulting from No. 6 and a final funding forecast from No. 7.

7.2.3 Implementation Strategy for Year 3

3
YEAR

The completion of initial P2P Link implementation will come with the next LRTP update, which is scheduled for 2015. The LRTP update will analyze the findings of multiple planning efforts and establish the system performance definition for the next five-year horizon. The LRTP update, either as a separate plan update or as discrete activities, will:

- ▶ Conduct system-level performance analysis (**Objective 1**)
- ▶ Identify strategic investments (**Objective 2**)

To achieve **Objective 1**, the baseline condition of the system will be assessed against the predicted condition for the five-year, ten-year, and twenty-year plan horizons. The system-level performance analysis conducted with the LRTP is informed by the cumulative results gained from the annual performance assessments detailed in the **Objectives** of **Year 2**. This information is used to establish overall funding allocations to investment categories.

Objective 2 of **Year 3** involves identifying strategic investments in the LRTP update. Strategic investments will then likely involve additional planning work to identify investment programs, which will possibly be included in the 2016 update of the Development Program. Inclusion of strategic investments will be achieved through the following steps:

- 1) Selecting strategic corridors or initiatives for short-term implementation.
- 2) Completing detailed analysis required for selected strategic corridors or initiatives. This analysis should identify how the strategic investment will be funded.
- 3) Including the strategic corridor or initiative in Development Program as a major project or a collection of smaller projects in accordance with how much and what type of funding is made available.

7.3 Alignment with MPO/COG Plans

A necessary part of the updated process is to ensure consistency between regional programs and ADOT's system of performance measurement. ADOT must be able to provide a picture of performance throughout the state, including the regions it comprises. In some cases, regional practices may help shape the best way to measure performance, but the ADOT program must aggregate to a statewide picture of system health.

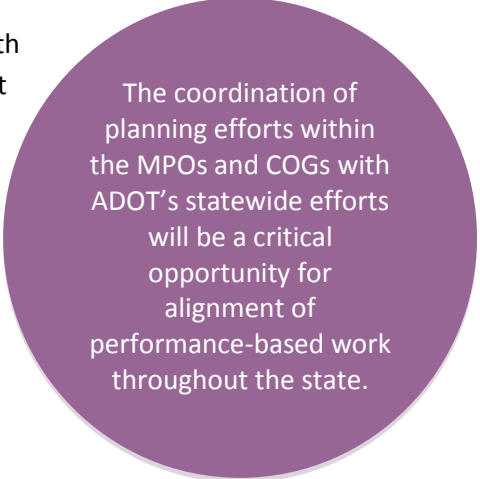
- ▶ **Metrics:** MAP-21 requires that the entire state be included in the statement of performance. P2P Link will apply statewide metrics to the entire system, but there will be additional measures and results generated by MPOs and COGs within their jurisdictions that will contribute to the overall view of the system health. The regional agencies will address the local systems at a higher level of detail, but they will need to present the measurements in a way that can be summed as part of the state system. Under MAP-21, these metrics are few and at a high level, which should make aggregation steps simple if they are structured in accordance with the statewide program.
- ▶ **Risks:** With respect to identification of performance risks, ADOT and MPO/COGs will collaborate on identifying critical risks that will help shape priorities and focus allocations of funds to mitigate them.
- ▶ **Prioritization:** Within each investment category, the implementing elements would address the reduction of risk in how projects are selected and ranked for consideration in the annual construction program. MPOs / COGs will develop their own performance-based programs that, along with ADOT's regional input, will need to build within the state to a statewide STIP that is compatible with the requirements of MAP-21.

The key to ensuring consistency among the various plans developed by the MPOs/COGs with ADOT plans will be through on-going and effective communication. On-going open lines of communication will strengthen joint efforts to share information and establish the basis of programming needs.

7.4 Other Planning Activities Underway

Other planning activities underway include Strategic Highway Safety Plan, State Freight Plan, State Rail Plan, State Transit Plan, State Asset Management Plan, Minor Projects Analysis, State Aviation Plan, bike/pedestrian, Key Commerce Corridors, etc. Each of these planning efforts will contain targets and measures that will be applied in that performance area. Some of the plans are already developed (e.g., State Rail Plan), but they may need to be updated to reflect their role in defining the performance expectations of the plan for use in the annual project selection and system performance processes.

The coordination of planning efforts within the MPOs and COGs with ADOT's statewide efforts will be a critical opportunity for alignment of performance-based work throughout the state. It will also set the stage for MAP-21 compliance and how statewide systems will establish a unified risk-based approach to addressing system needs. This will require ongoing coordination and sharing of information to ensure no elements are missed and the program addresses the identified needs.



The coordination of planning efforts within the MPOs and COGs with ADOT's statewide efforts will be a critical opportunity for alignment of performance-based work throughout the state.

7.5 Process Improvements and Tools

It is envisioned that the P2P Link approach will remain as described within this report; however, details of the methodologies may be refined over time as ADOT gains experience with the new process. The methodologies may also require adjustment once the supporting planning infrastructure is in place, as P2P Link depends on other efforts that are either underway or not yet started.

The methodologies may require updating depending on the results of:

- ▶ Supporting planning efforts (i.e., Asset Management Plan, System Performance Analysis, LRTP Update, etc.) that are currently underway or upcoming
- ▶ MAP-21 rule-making and corresponding Arizona determination of performance objectives
- ▶ Program update after a full cycle of P2P Link implementation

The methods used to compute the project selection criteria will require further refinement during their implementation. When complete, a process improvement that establishes a form-driven automated approach to support project nomination and evaluation will be valuable. This would enable project proponents to enter information about the project to which the criteria can be applied. The vision is that the project nomination form is automated, with input sheets that drive the entry of data in a consistent way across projects so that the project proponent can see how the project scores.

An automated project nomination form can also be linked to other ADOT initiatives beyond P2P Link. This form can be an input for ESTIP, the electronic process for populating the STIP. Other applications could include:

- ▶ **A-Plan:** ADOT is exploring the development of a GIS web-based application of Arizona features and infrastructure, called “A-Plan.” A-Plan could provide a centralized source for the evaluation criteria needed by P2P Link to prioritize projects.
- ▶ **Performance Dashboard:** Application to share information with the public on how well Arizona is meeting performance targets. The dashboard could correlate to the performance evaluation criteria of each investment category, thus connecting the performance of dollars spent through programmed projects.
- ▶ **Mobile Applications:** Application for collecting asset information that allows for real-time storage and retrieval of the statewide system condition. This can be useful to ADOT staff that customarily has to wait for field data to be input, as well as a means to assist with project nomination information in P2P Link and continually update A-Plan.

7.6 Policy or Statutory Requirements

P2P Link will not require change to the applicable planning State statutes. The proposed process retains the existing statutorily-defined decision-making structure within ADOT. None of the plans or processes formulated in this document requires a material change in ADOT administrative rules. The changes proposed as a result of P2P Link address the requirements of legislation already in place. Title 28, Chapter 2, Article 7 (Transportation Planning) 28-501 through 28-507 already specifies that performance measures should be the basis of planning and programming decisions. Chapter 20, Article 3 (Five Year Transportation Facilities Construction Program) 28-6951 through 28-6955 specifies that performance measures are required to establish the Five-Year Construction Program. As a result, changes are, for the most part, internal to ADOT. While the changes will affect the relationship between the ADOT program and the regional agencies, the changes are to process, not statute. The ADOT process is designed to work with the regional MPO or COG in developing the STIP.

One area of possible statutory change could result from the MAP-21 federal rule-making in spring of 2014. In general, the rule-making is not anticipated to be a significant departure from Arizona’s legislation, but it is impossible to know for certain until the details are known.

Policy changes may be needed if a new funding source is identified (e.g., sales tax increase, tax increment district financing, P3 opportunities, etc.) or if revisions to existing policy funding distributions, such as the Casa Grande Accords, are made. The policy change could require legislative approval. Those could include new sources of revenue such as tolls or more liberal use of gas tax funds (or a future replacement funding source), which are currently limited only to highway funding.

7.7 Future Considerations

P2P Link has many interdependencies with other ADOT business areas and will impact other internal processes. Other processes that may need to be adapted in the future include:

- ▶ **Project Scoping Process:** Under the current programming process, a project must be scoped before it can be considered for programming. With P2P Link, a project may be programmed in the Development Program before it is fully scoped. Basic project information will be needed to nominate the project, including order of magnitude costs. Once in the Development Program, a timeline should be established for the critical project components, including the scoping and environmental process.
- ▶ **Project Prioritization Process:** Project prioritization methods are currently conducted using spreadsheets where project data must be manually input or is obtained from outdated sources. New automation tools, as described in Section 7.5, would significantly improve efficiency, as well as likely improve accuracy and repeatability.
- ▶ **Technical Processes:** As technical areas advance in design standards and approaches, the evaluation criteria for prioritizing projects within the investment categories should reflect these advancements. One example discussed with ADOT Traffic Group related to safety criterion. At present, a method to predict crash reductions resulting from infrastructure improvements is not widely used at ADOT, although the Traffic Group is contemplating future use of a CMF. Any updates to technical practices should be reflected in the evaluation criteria for prioritizing projects, as appropriate.
- ▶ **Post-Implementation Measurements:** After a project is constructed, there is no formal mechanism for assessing the effectiveness of the solution within many technical areas or ADOT Districts. Establishing a process to measure the performance of projects and comparing them to anticipated performance and recording the analysis will help build a database of project performance that will be helpful in nominating projects, understanding their potential contribution and, ultimately, assessing system performance.
- ▶ **Interaction with MPOs/COGs:** MAP-21 legislation requires state and regional performance goals to align. As a result, the relationship between ADOT and its regional partners will need to ensure programs are coordinated and can be aggregated to measure system performance as required by MAP-21. Each regional agency may have different means of measuring performance or they may rely on ADOT's program to satisfy reporting requirements, but there will need to be a coordinating process built into the manner in which the regional agencies and ADOT consolidate all state programs. This coordination effort will need to be developed among ADOT and its regional partners as P2P Link is implemented.

Glossary

AADT – Average Annual Daily Traffic

AASHTO – American Association of State Highway and Transportation Officials

ADOT – Arizona Department of Transportation

ARS – Arizona Revised Statutes

Asset Management – A systematic process of cost effectively maintaining, upgrading, and operating physical assets. It combines engineering principles with sound business practices and economic theory, and it provides tools to facilitate a more organized, logical approach to decision-making. Thus, asset management provides a framework for handling both short- and long-range planning. [<http://www.fhwa.dot.gov/infrastructure/asstmgmt/amprimer.pdf>]

BMS – Bridge Management System

bqAZ – Building a Quality Arizona, 2010 Statewide Transportation Planning Framework Study

BRT – Bus Rapid Transit

CMAQ – Congestion Mitigation and Air Quality

COGs – Councils of Government

Corridor – A broad geographical band that follows a general directional flow connecting major sources of trips that may contain a number of streets, highways and transit route alignments. [FHWA Transportation Planning Capacity Building Glossary. <http://www.planning.dot.gov/glossary.asp>]

DOTs – Departments of Transportation

ECD – Enforcement and Compliance Division of ADOT

EMS – Emergency Medical Services

Expansion - One of the four Recommended Investment Choice (RIC) categories that pertains to improvements adding transportation capacity through the addition of new facilities and or services;

expansion activities include adding new highway lanes, expanding bus service, construction of new highway facilities, and adding rail passenger service or facilities. The recommended funding distribution for this category is 27 percent. [ADOT LRTP | "What Moves You Arizona?"]

FHWA – Federal Highway Administration

Financial Constraint – This is the revenue constraint that is applied to the development of long-range plans. It is established as a policy decision in the planning process. Long-range statewide, modal, and various strategy plans will state their finance assumptions.

Fiscal Constraint – This is defined to be consistent with and address the federal requirements for fiscally constraining the statewide transportation improvement program. This means that the program is financially feasible with identifiable real revenues.

FMS – Financial Management Services Division of ADOT

Goals – A broad statement that describes a desired end state.

HCM – Highway Capacity Manual

HCS – Highway Capacity Software

HPMS – Highway Performance Monitoring System

IRI – International Roughness Index

ITD – Intermodal Transportation Division

LRTP – Long-Range Transportation Plan, a document resulting from regional or statewide collaboration and consensus on a region or state's transportation system, and serving as the defining vision for the region's or state's transportation systems and services. [FHWA Transportation Planning Capacity Building Glossary. <http://www.planning.dot.gov/glossary.asp>.]

MAP-21 – Moving Ahead for Progress in the 21st Century Act, Federal Aid Funding Authorization for 2012 – 2014

MCDM – Multiple Criteria Decision Making

Metropolitan Planning Area – The geographic area in which the metropolitan transportation planning process required by 23 U.S.C. 134 and Section 8 of the Federal Transit Act (49 U.S.C. app. 1607) must be carried out. [FHWA Transportation Planning Capacity Building Glossary. <http://www.planning.dot.gov/glossary.asp>.]

Modernization - One of the four RIC categories that pertains to highway improvements upgrading efficiency, functionality, and safety without adding capacity; examples of modernization activities include widening of narrow lanes, access control, bridge replacement, hazard elimination, lane reconstruction, aviation upgrades, and bus system upgrades. The recommended funding distribution for this category is 29 percent. [ADOT LRTP | What Moves You Arizona?]

MPD – Multimodal Planning Division of the Arizona Department of Transportation

MPO – Metropolitan Planning Organization,. [23 CFR 450.104.] Regional planning body, required in urbanized areas with a population over 50,000, and designated by local officials and the governor of the state. Responsible, in cooperation with the state and other transportation providers, for carrying out the metropolitan transportation planning requirements of federal highway and transit legislation. Formed in cooperation with the state, develops transportation plans and programs for the metropolitan area. [23 U.S.C. 134(b)(1) and Federal Transit Act of 1991 Sec. 8(b)(1).]

MVD – Motor Vehicle Services Division of ADOT

NBI – National Bridge Index

NEPA – National Environmental Policy Act

NHS – National Highway System

Non-Highway - One of the four RIC categories that pertains to investments in non-highway modes like transit, freight and passenger rail, and aviation; ADOT’s role will be either participant or partner. The recommended funding distribution for this category is ten percent. [ADOT LRTP | “What Moves You Arizona?”]

Objective – A specific, measurable statement related to the attainment of a goal. [FHWA Transportation Planning Capacity Building Glossary. <http://www.planning.dot.gov/glossary.asp>.]

P2P – Plan to Program

PAC – Project Advisory Committee for P2P Link Development

PEL – Planning and Environmental Linkages

Performance-based planning and programming – refers to the application of performance management within the planning and programming processes of transportation agencies to achieve desired performance outcomes for the multimodal transportation system. Attempts to ensure that transportation investment decisions are made – both in long-term planning and short-term

programming of projects – based on their ability to meet established goals. [FHWA Performance Based Planning and Program web site: http://www.fhwa.dot.gov/planning/performance_based_planning/]

Performance Management – A strategic approach that uses data and information to support decisions that help to achieve performance outcomes.

Performance measurement – A quantitatively driven process of assessing progress toward achieving goals using data.

Performance measure – A metric used to assess progress toward meeting an objective; an indicator of transportation system outcomes.

PMS – Pavement Management System

PMT – Project Management Team for P2P Link development

PPAC – Priority Planning Advisory Committee of ADOT

Preservation - One of the four RIC categories that pertains to activities protect transportation infrastructure by sustaining asset condition or extending asset service life; preservation includes regular maintenance and resurfacing of pavements, replacing aged transit vehicles, upgrading rail track, and airport runway rehabilitation. The recommended funding distribution for this category is 34 percent. [ADOT LRTP | "What Moves You Arizona?"]

PRIIA – Passenger Rail Investment and Improvement Act of 2008

Programming – The process through which funds are applied to projects selected for inclusion in a capital improvement plan.

Project – Well-defined, individual actions and activities that make up a program. The implementation of projects is how the program is realized. [FHWA, "Freeway Management and Operations Handbook", FHWA-OP-04-003, September 2003]

Project selection – The process applied to nominated projects for consideration in the Statewide Ten-year program to determine their eligibility and contribution to improving the statewide transportation system

RIC - Recommended Investment Choice

SHSP – Strategic Highway Safety Plan, a statewide-coordinated safety plan that provides a comprehensive framework, and specific goals and objectives, for reducing highway fatalities and serious injuries on all public roads, developed by the State DOT in accordance with U.S.C. 148(a)(6). [23 CFR 450.104.] The SHSP is a data-driven, four to five year comprehensive plan that integrates the 4Es:

engineering, education, enforcement, and emergency medical services. The SHSP strategically establishes statewide goals, objectives, and key emphasis areas developed in consultation with Federal, State, local, and private sector safety stakeholders. [FHWA, Strategic Highway Safety Plans: A Champion's Guide To Saving Lives, Guidance to Supplement SAFETEA-LU Requirements, April 5, 2006, <http://safety.fhwa.dot.gov/safetealu/shspguidance.htm>.]

STB – State Transportation Board, a seven-member panel established under ARS 28 Chapter 2, Article 1 whose members are appointed by the Governor. Members of the panel serve six-year terms and represent different geographical regions of the state.

STIP – Statewide Transportation Improvement Program, a document that defines the current priority programming process used by ADOT

TAMP – Transportation Asset Management Plan

Target – A specific level of performance that is desired to be achieved within a certain timeframe.

Technically Warranted Work - Means that a preventive maintenance treatment will only be performed as a priority if the subject asset is at a point in its lifecycle such that the treatment is a technically sound allocation of funds.

Tier – Layers within the transportation system defined by functional classification or usage.

TIP – Transportation Improvement Program, A prioritized listing/program of transportation projects covering a period of four years that is developed and formally adopted by an MPO as part of the metropolitan transportation planning process. Must be consistent with the metropolitan transportation plan; required for projects to be eligible for funding under title 23 U.S.C. and title 49 U.S.C. Chapter 53. [23 CFR 450.104.]

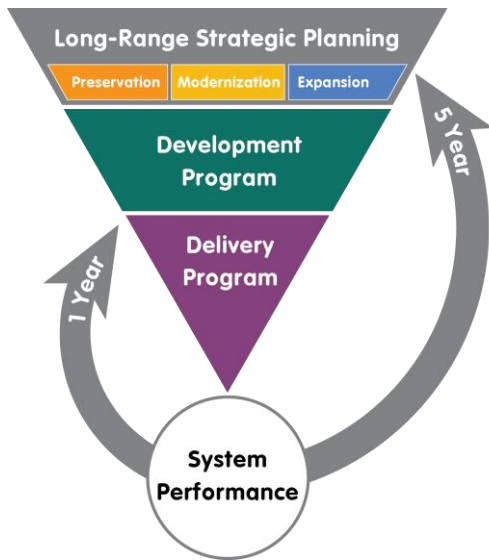
VMT – vehicle miles traveled



Linking the Long-Range Plan and Construction Program

Appendix A

Working Paper No. 1





Linking the Long-Range Plan and Capital Improvement Program P2P Link

Working Paper No. 1

December 2012

Prepared for:

**Arizona Department of Transportation
Multimodal Planning Division**

Prepared By:

**PARSONS
BRINCKERHOFF**

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Acronyms and Glossary

- ▶ 15 Percent Funds – 12.6% statutory requirement (ARS 28-6538) plus 2.6% of ADOT HURF funds allocated to MAG and PAG for limited improvements on limited access facilities by the STB.
- ▶ AASHTO – American Association of State Highway Transportation Officials
- ▶ ACIP – Airport Capital Improvement Program
- ▶ ADOT – Arizona Department of Transportation
- ▶ ADOT Discretionary Funds – A portion of HURF funds that are combined with Federal Aid Highway Funds to provide the basis for the ADOT Highway Construction Program.
- ▶ APMS – Airport Pavement Management System
- ▶ ARS – Arizona Revised Statutes
- ▶ bqAZ – Building a Quality Arizona, a 2010 Statewide Transportation Planning Framework Study
- ▶ Casa Grande Resolves – A 1999 agreement between ADOT, the COGs, and MPOs of Arizona to guide the transportation planning and programming for the state.
- ▶ CE – Categorical Exclusion
- ▶ CMAQ – Congestion Mitigation and Air Quality Improvement Program initiated in 1991 as part of ISTEA
- ▶ COG – Council of Governments
- ▶ DBE – Disadvantaged Business Enterprise
- ▶ DE – District Engineer
- ▶ DPS – Department of Public Safety
- ▶ FHWA – Federal Highway Administration
- ▶ FTA – Federal Transit Administration
- ▶ FFY – Federal Fiscal Year
- ▶ GHG – Greenhouse Gas
- ▶ Highway Construction Program Manual / Statewide Transportation Improvement Program – Document that defines the current priority programming process used by ADOT.
- ▶ HMC – Highways Management Committee
- ▶ HSIP – Highway Safety Improvement Program initiated under SAFETEA-LU
- ▶ HTF – Highway Trust Fund
- ▶ HURF – Highway User Revenue Funds are comprised of funds from the gasoline and use fuel taxes, a portion of the vehicle license tax, registration fees, and other miscellaneous sources.

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- ▶ ICAP – Indirect Cost Allocation Plan
- ▶ ISTEA – Intermodal Surface Transportation Efficiency Act of 1991, Federal Aid Funding Authorization from 1992 – 1997
- ▶ ITD – ADOT’s Intermodal Transportation Division
- ▶ LRTP – Long-Range Transportation Plan
- ▶ MAG – Maricopa Association of Governments
- ▶ MAP-21 – Moving Ahead for Progress in the 21st Century Act, Federal Aid Funding Authorization for 2012 – 2014
- ▶ MPD – ADOT’s Multimodal Planning Division
- ▶ MPO – Municipal Planning Organization
- ▶ MVD – Motor Vehicle Division
- ▶ NEPA – National Environmental Policy Act
- ▶ NHPP – National Highway Performance Program initiated under MAP-21
- ▶ NHS – National Highway System
- ▶ P2P Link – Linking the Long-Range Plan and Capital Improvement Program project
- ▶ PAC – Project Advisory Committee
- ▶ PAG – Pima Association of Governments
- ▶ PMT – Project Management Team
- ▶ PNRS – Projects of National and Regional Significance
- ▶ PPAC – Priority Planning Advisory Committee
- ▶ PPP – Priority Programming Process
- ▶ PPT – Priority Programming Team is a subgroup of the TAC, which administers, tracks, and monitors the PPP and the scoping process.
- ▶ PRB – Project Review Board, which serves as a forum for hearing requests for projects already under design requiring cost or schedule program changes, technical conflicts, or problem issues with management.
- ▶ PRF – Project Request Form
- ▶ RAAC – Resource Allocation Advisory Committee which recommends revenue and distribution of funds for the Five-Year Transportation Facilities Construction Program.
- ▶ RARF - Regional Area Road Fund
- ▶ RIC - Recommended Investment Choice
- ▶ RTPFP – Regional Transportation Plan Freeway Program

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- ▶ SAFETEA-LU – Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users, Federal Aid Funding Authorization (2004 – 2009)
- ▶ STB – State Transportation Board, a seven-member panel established under ARS 28 Chapter 2, Article 1 whose members are appointed by the Governor. Members of the panel serve six-year terms and represent different geographical regions of the state.
- ▶ STB #20 – State Transportation Board Policy #20 stating that approval by the PPAC is required for material cost changes derived from quantity or unit price changes for items that are part of the approved scope of the project if they exceed a specified amount.
- ▶ State Statute ARS 28-6538 – 12.6% of the HURF funds flowing to ADOT are earmarked for MAG and PAG.
- ▶ STIP – State Transportation Improvement Program
- ▶ STP - Surface Transportation Program
- ▶ TA – Transportation Alternatives
- ▶ TAC – Technical Advisory Committee is an internal ADOT staff committee that reviews and evaluates programming requests, funding availability, coordinates with stakeholders, and recommends the priority program for PPAC review.
- ▶ TE – Transportation Enhancements
- ▶ TEA21 – Federal Aid Funding Authorization from 1998 – 2003
- ▶ THPP – Tribal High Priority Projects
- ▶ TIFIA – Transportation Infrastructure Financing and Innovation Act, which provides federal credit assistance to eligible STP projects.
- ▶ TIP – Transportation Improvement Program
- ▶ TMA – Transportation Management Area
- ▶ US DOT – U.S. Department of Transportation
- ▶ VLT – Vehicle License Tax
- ▶ VMT – Vehicle Miles Travelled

1

Introduction

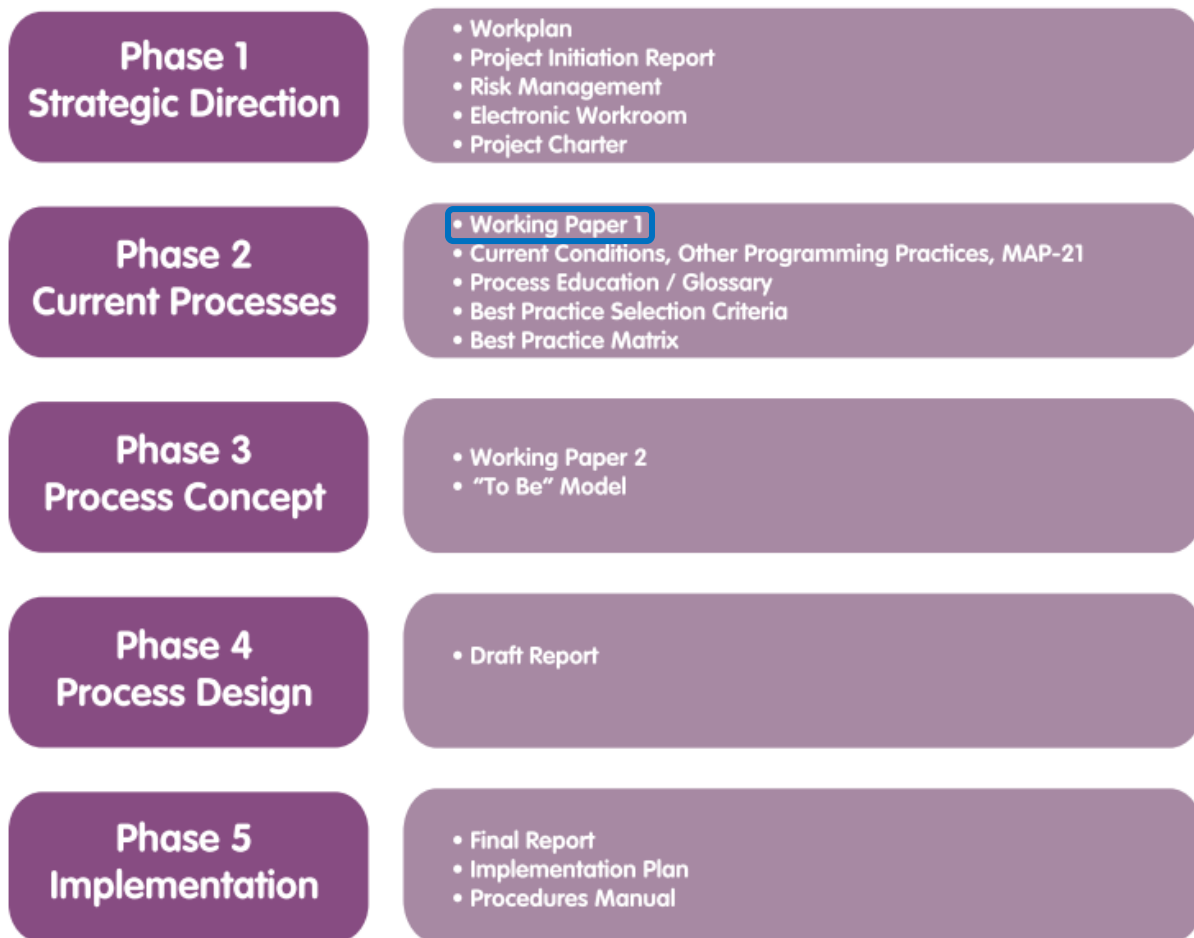
The principal basis of *Linking the Long-Range Plan and Capital Improvement Program (P2P Link)* is to establish a well-documented, understandable, logical, and defensible means of selecting and prioritizing projects in the capital improvement program that will allow the Arizona State Transportation System to meet the objectives identified in the Long Range Transportation Plan (LRTP). The approach preferred by the leadership of the Arizona Department of Transportation (ADOT), and now supported by Moving Ahead for Progress in the 21st Century (MAP-21) legislation, requires that the system be evaluated from a variety of critical perspectives and that decisions be made on the basis of system performance. Within ADOT, performance is well-defined for some system measures, such as pavement and bridge conditions, while other measures, such as congestion mitigation, economic development, and freight, do not have a strong history of performance-based guidance in Arizona. ADOT intends to develop clear objectives for how the system elements will be expected to perform so they can help identify system priorities and strategically select projects for a capital program that will meet ADOT's policy objectives. P2P Link is designed to implement a "best-in-class" performance-based planning process, which will include recommendations about what ADOT should consider under performance categories to comply with MAP-21. Implementation of a revised process will require changes in ADOT's overall approach, including a more comprehensive set of procedures for measuring performance. It will also require a more strategic allocation of resources based on priorities set in accordance with performance. These changes will allow the resulting program to more directly address State transportation policy. A revised process will also help to make the most efficient use of resources in these financially constrained times.

P2P Link is being approached through five project phases that include a series of deliverables documenting its development, as shown in Figure 1-1. Early phases include a thorough review of the current practice at ADOT and at similar agencies across the nation, which is captured in Working Paper No. 1. This will serve as a foundation for gaining a comprehensive

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understanding of the issues and opportunities to be addressed and permit formulation of an updated and relevant process for linking plans with implementation. In later phases, the P2P Link effort will include designing methodologies that will help not only link the long-range plan to the capital improvement program, but will also show how projects are distributed among the four Recommended Investment Choice RIC categories.

Figure 1-1: Project Documentation



1.1 Intent of Working Paper No. 1

Working Paper No. 1 presents a view of current practices both at ADOT and around the country, as well as a look at the new requirements imposed by MAP-21. The premise is that by understanding the current practices and requirements, and taking advantage of ideas tested elsewhere, ADOT can make informed decisions about changes needed to establish a programming process to most effectively manage the Arizona State Transportation System. This section provides an introduction to the Working Paper's primary objectives.

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Section 2 summarizes the current ADOT programming process. The current process has evolved over time and, historically, has served the program reasonably well. Under changing economic and financial conditions and under new requirements imposed by recent legislation, the current process no longer offers the flexibility now needed to manage the capital program where projects may need to be shifted depending on available funding. An understanding of what ADOT does today is critical to determining which elements of the process must be eliminated, which must change, or which must remain in any future processes developed. As part of the review of ADOT practices, information was collected from interviews with staff charged with managing various aspects of the programming process. The findings show some of the opportunities to improve coordination among many smaller programs and areas of responsibility and also the ways in which the programming process can take advantage of new rules.

Section 3 presents opportunities from programs tried elsewhere. As with ADOT, other states have gone through or are going through similar transitions in their programming practices. Some have moved toward a new approach based on system performance in which the condition of the system, or parts of the system, help to determine how resources can be most effectively distributed. This fits with legislative mandates and with a need to make the best use of limited resources while delivering the best possible transportation system as defined by state priorities. Some of the states that have undertaken changes in the programming process can offer ADOT and Arizona good examples to emulate. Their best practices will allow ADOT to avoid many of the pitfalls of overhauling an established process and move more seamlessly to a performance-based programming practice that includes all aspects of the State's transportation system.

Section 4 recognizes the effect of the new federal legislation on how programming should be accomplished at the state level to comply with federal expectations for the national transportation system. The recently passed MAP-21 establishes requirements that states must incorporate into their programming processes. In particular, it emphasizes performance and asset management as basic tools for decision-making. ADOT is studying the bill and assessing the requirements as they apply to Arizona. As noted above, the experience in other states can help ADOT develop and facilitate updated procedures that will also address MAP-21 requirements.

Moving forward in the P2P Link development, the information and analysis presented in Working Paper No. 1 will equip the project team with background knowledge needed to advance to the next project phase, which includes the following:

- ▶ Identifying changes needed to the current process, organizational structure, and state statutes
- ▶ Ensuring planning goals are comprehensive and meet MAP-21 requirements
- ▶ Establishing specific targets for the planning goals
- ▶ Determining the best practices that will work well for Arizona

Such decisions will be the basis for developing conceptual “to-be” programming models for Arizona.

2 Existing Programming Process

ADOT's current process for developing the Five-Year Transportation Facilities Construction Program, referred to as the Priority Programming Process (PPP), was established in the early 1990s. Since that time, changes in the economic landscape, the agency's organizational structure, and the linking of planning to programming philosophy, as well as changes in federal and state guidance, have impacted the PPP, resulting in incremental adjustments to the process. The current practices that have evolved over the years have resulted in a cumbersome process, where tracking project prioritization are not fully integrated with system goals and are not coordinated among the many participants in the process.

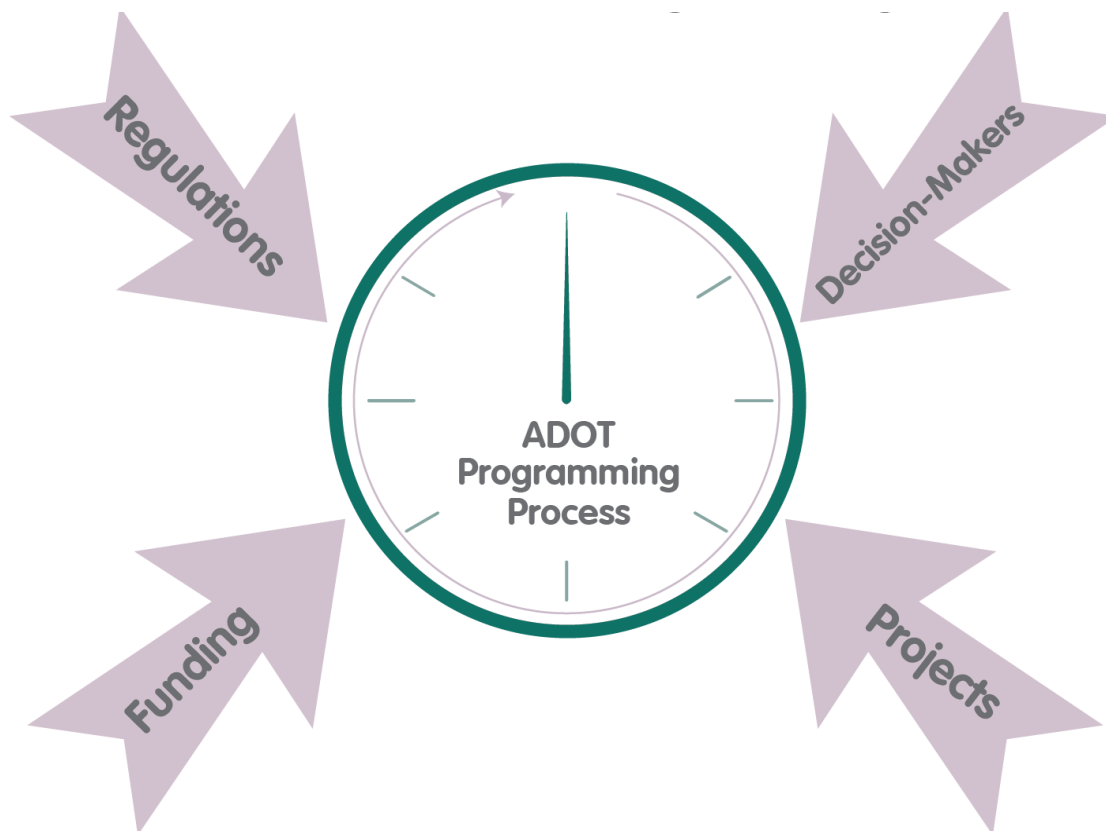
This section presents a simplified overview of the PPP as documented in the "Highway Construction Program Manual / Statewide Transportation Improvement Program" as understood by involved staff at the time of development. The presentation of current practice is guided to a large degree by a baseline assessment of the process strengths and weaknesses, possible areas of change, process improvement, and statute modifications. It includes information on state and federal statutes; State Transportation Board (STB) Guidelines; funding availability and distribution; and project selection and prioritization. The purpose of reflecting on the documented process, including the way staff and partners view it, is to understand the changes that will be required to overhaul the process.

The development of a comprehensive grasp of current practices and the documented process has occurred through research and interviews with key staff. Their perspectives on the programming process, which include both challenges and opportunities for improvement, are also provided in this section.

2.1 Programming Process

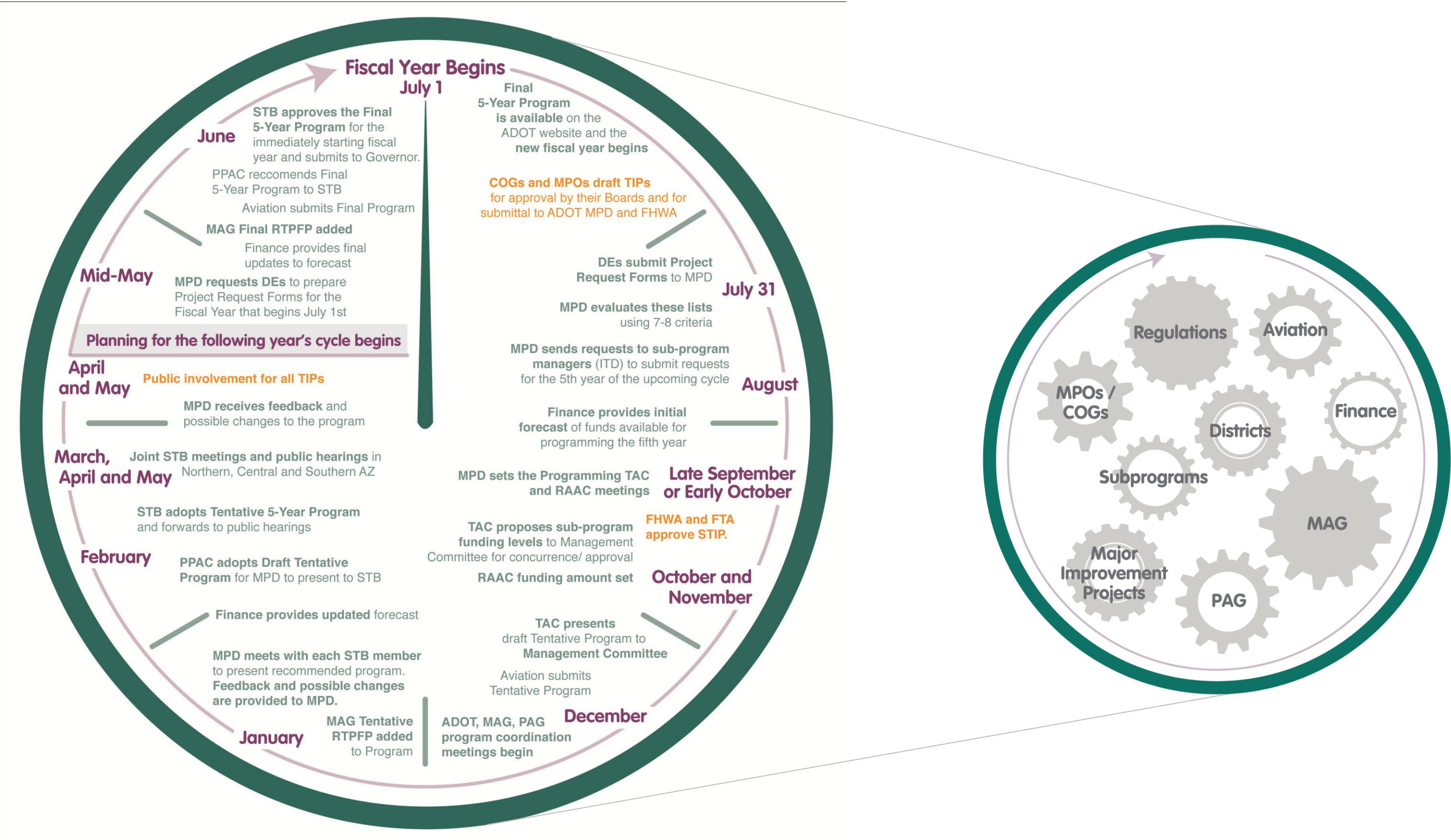
Several factors influence the programming process – Regulations, Decision-Makers, Funding, and Projects. The following sections describe these influences and assess their effectiveness against changed conditions from the development of the PPP.

Figure 2-1: Influences to the Programming Process



ADOT’s programming process follows an annual cycle as mandated by state statute, which is outlined in Figure 2-2. The program includes Highway, Metropolitan Planning Organization/Council of Governments (MPO/COG), and Aviation components, resulting in the Five-Year Transportation Facilities Construction Program. Key activities are required throughout the fiscal year by the process decision-makers. As currently managed, working through these activities takes approximately 14 months, starting in May with requests to the District Engineers (DEs) to prepare Project Request Forms (PRF) and ending June 30 of the following year with the STB approval and submission of the Five-Year Program to the Governor. Many sub-processes support the key activities as integral parts of the annual cycle. Each sub-process is composed of several activities, sometimes independent and sometimes interrelated to other sub-processes.

Figure 2-2: Programming Process



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ADOT has a solid record of delivering the program each year. However, the list of challenges to be navigated each cycle is growing with activities that may detract from the logic, transparency, and reproducibility of the process. When considering the new regulations of MAP-21 and “best in class” performance-based planning practices, the current programming process is:

- ▶ **Inflexible** – The current programming process worked adequately when sufficient state and federal funding was available. With the downturn in the economy, the state is faced with removing projects from the program while remaining accountable for delivering a safe and functional transportation system. Along with establishing project priorities, processes to adjust project placement in the program must be developed to account for these conditions.
- ▶ **Incomplete** – Not all elements of the transportation system have the necessary performance measurements needed to be accurately assessed as required by the new regulations. In addition, the current process lacks an evaluation loop. Systems are not in place to judge how well projects, once constructed or implemented, meet their intended goals or move the system closer to its intended goal.
- ▶ **Decentralized Data** – Performance information is collected for key technical areas, but it is incomplete across all units. In addition, the metrics are inconsistent with achieving a common objective of delivering a safe and reliable transportation system. Further, the information collected isn’t centrally accessible to provide a system-wide snapshot of conditions and information, making it difficult to obtain a qualitative overall system assessment or identify “hot spots” with cross-technical needs.
- ▶ **Inconsistent Vocabulary** – A common language of planning and programming vocabulary does not exist across the department and among the partner agencies. Many planning and programming terms and functions have different meanings to staff involved with the programming process. This is further complicated with the offset state and federal fiscal years.

2.2 Regulations

Both state and federal regulations guide the planning and programming process within Arizona. These regulations were adopted in the 1990s, with some policy revisions implemented by the STB in 2011. The adoption of MAP-21 by the U.S. Congress in 2012 has imposed a series of additional requirements on how the programming process must be conducted to ensure system-wide performance.

The following sections provide insight on the current regulation structure. The intent is to provide an understanding of the existing regulations and where change may be desirable. The state regulations are generally not in conflict with the requirements of MAP-21; however, implementation of best practices in planning and programming may require new state legislation. Some potential examples include expanding the program timeline (from 5 to 10 years), implementing the LRTP RIC (how do the goals apply to MPOs/COGs), and simplifying the programming structure (reduce the layers of decision-making). How much change to state legislation, if any, will depend on choices made by ADOT staff during the development of the P2P Link.

Linking the Long-Range Plan and Capital Improvement Program

2.2.1 State

The transportation section of the Arizona Revised Statutes (ARS), Title 28, provides authority and guidance for ADOT activities. The key sections of ARS Title 28 are as follows:

- ▶ Chapter 2 addresses Transportation Administration, including the STB and ADOT Director. Article 7 establishes the Transportation Planning Division with requirements for a LRTP and the use of performance-based programming in the development of the LRTP and Five-Year Transportation Facilities Construction Program.
- ▶ Chapter 17 guides regional sales taxes distribution and regional transportation planning.
- ▶ Chapter 18 deals with the distribution of Highway User Revenue Funds (HURF).
- ▶ Chapter 20, Article 3 provides guidance for the development and modification of the Five-Year Transportation Facilities Construction Program.
- ▶ Chapter 21 addresses state highway financing and bonding.
- ▶ Chapter 25 includes guidance on aviation and responsibilities of the ADOT Aeronautics Division.

In January 2011, the STB issued revised policies, which are grouped into the following categories and provide general guidance and support to the planning and programming processes. All current ADOT operations fall into one or more of these categories:

1. Multi-Modal System Planning and Development
2. System Management
3. Programming and Funding
4. Fiscal and Administrative Accountability
5. External Relations

2.2.2 Federal

The Code of Federal Regulations provides authority and guidance on the use of federal transportation funds. Title 14 addresses **Aviation**, Title 23 addresses **Highways**, and Title 49 addresses **Transit**. The latest federal surface transportation legislation, MAP-21, includes a number of provisions that require states to adopt performance-based programming practices. MAP-21 will also set minimum criteria for critical aspects of the program.

Each past federal authorization included changes in funding categories, guidance, and procedural requirements. In 2004, the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) significantly increased funding to states by spending down the Highway Trust Fund (HTF) to a zero balance. The current authorization, MAP-21, remains at the same level. While earlier funding acts provided greater flexibility in the use of federal funding, the more recent authorizations (SAFETEA-LU and MAP-21) have focused on safety, congestion, and system preservation. As federal funding makes up a majority of the funds available to ADOT, the federal funding categories and requirements will have a significant effect on the focus of the Five-Year Transportation Facilities Construction Program.

2.3 Decision-Making Groups

The programming process at ADOT involves a large number of decision-making bodies that have been established, in some cases, to oversee or advise on specific elements of the program. Some of the areas of the decision-making structure appear to be redundant while some areas do not perform their function as originally defined having morphed into a different role or expanded to cover other roles. While many of the decision-making elements are needed to manage the program as it is formulated each year, it would be appropriate to investigate which elements should be retained and which eliminated to simplify the programming approval process as well as the program oversight once the program is in place. The decision-making groups currently involved in the programming process are described in the subsequent sections.

In Maricopa and Pima Counties, ADOT shares responsibility for project selection with the Maricopa Association of Governments (MAG) and the Pima Association of Governments (PAG), respectively. MAG, by state statute, is responsible for establishing project priority within the MAG region. The highway portion of the MAG TIP is developed cooperatively between MAG and ADOT. PAG and ADOT also work cooperatively to develop the highway program for the PAG area, but the PAG projects are included in the ADOT program.

2.3.1 State Transportation Board

The STB is a seven-member panel established under ARS 28 Chapter 2, Article 1 whose members are appointed by the Governor. Members of the panel serve six-year terms and represent different geographical regions of the state. This panel presides over the establishment of priorities and also awards all highway contracts. ARS 28-304 defines the powers and duties of the STB. With respect to highways and the programming process, the STB has the following functions:

- ▶ Establish a complete system of state highway routes
- ▶ Determine which state highway routes, or portions of the routes, are accepted into the state highway system and which state highway routes to improve
- ▶ Establish, open, relocate, or alter a portion of a state route or state highway
- ▶ Vacate or abandon a portion of a state route or state highway
- ▶ Establish policies and the relative weights given to criteria to guide the development or modification of the Five-Year Program, award all construction contracts for transportation facilities, and monitor the status of the construction projects
- ▶ Determine the priority program planning with respect to transportation facilities

2.3.2 Resource Allocation Advisory Committee

The Resource Allocation Advisory Committee (RAAC) recommends priorities and distribution of funds for the Five-Year Transportation Facilities Construction Program to the ADOT Director. Resources are allocated by the RAAC for three categories: System Preservation, System Improvements, and System

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Management. The committee comprises representation from the following ADOT departments and agencies:

- ▶ ADOT Deputy Director
- ▶ ADOT Director MPD
- ▶ ADOT State Engineer
- ▶ ADOT Chief Financial Officer
- ▶ COG Executive Director
- ▶ MAG Executive Director
- ▶ MPO Executive Director
- ▶ PAG Executive Director
- ▶ TMA Transit Director

2.3.3 Priority Planning Advisory Committee

The Priority Planning Advisory Committee (PPAC) is a statutory public body appointed by the ADOT Director and subject to ARS Title 38 Open Meeting Laws of Arizona. The committee is responsible for updating and preparing the Five-Year Transportation Facilities Construction Program. Adhering to ARS 28-6951 (B), the ADOT Director appoints members to the Committee. The PPAC members by position are as follows:

- ▶ **Chairman** – Division Director of MPD
- ▶ **Vice-Chair** – State Engineer
- ▶ Aeronautics Manager
- ▶ Assistant Director of Finance and Accounting
- ▶ Deputy State Engineer of Development
- ▶ Deputy State Engineer of Operations and Valley Transportation
- ▶ Director of Planning and Programming
- ▶ Director of Transit Programs and Grants
- ▶ Director of Enforcement and Compliance Division
- ▶ Three Non-Voting Members – Chairman of the Citizens Transportation Oversight Committee, Director of Government Relations, Director of Communications

The PPAC responsibilities include the following:

- ▶ Assist in the development of the Five-Year Program
- ▶ Recommend priorities on transportation facilities construction projects
- ▶ Hold meetings to review the Five-Year Program and make changes as necessary
- ▶ Review priority changes in costs and schedule
- ▶ Review the adopted Five-Year Program and make recommendations in a written report to the STB for priority changes

The PPAC assists the STB in setting priorities for the PPP. The committee oversees a Technical Advisory Committee (TAC) and recommends the final program and any changes to the existing program to the STB. The work of the PPAC is guided by the Transportation Board Policies, which are reviewed periodically and updated as needed. The PPAC holds public meetings each month to review proposed changes to the Five-Year Transportation Facilities Construction Program and to determine which

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projects will be recommended to the STB for approval. All construction project changes submitted to the PPAC must be approved by the Project Review Board (PRB), described in Section 2.3.4, prior to PPAC approval. Approval by the PPAC is required for material cost changes derived from quantity or unit price changes for items that are part of the approved scope of the project if they exceed a specified amount, consistent with STB Policy No. 20. MAG programmed projects require both PPAC and MAG approval of for schedule and material cost changes of projects prior to submittal to the STB per ARS 28-6353. Modifications to programmed projects must be approved by the STB.

2.3.4 Support Committees

Project Review Board

The PRB is a forum for hearing requests from individual project managers about projects already under design that require cost or schedule changes to the program. The PRB also discusses technical conflicts or issues with project development. The Deputy State Engineer for the Development Program is responsible to the State Engineer for administering the Project Development Process and chairs the PRB. He/she and the PRB approve or recommend to the PPAC the requested changes in project scope, budget, and schedule. Issues requiring program changes are forwarded to the PPAC for approval to be changed or added to the adopted Five-Year Program. Meetings are held approximately every week.

Programming Technical Advisory Committee

The TAC is an internal ADOT staff committee. This committee reviews and evaluates programming requests and funding availability, coordinates with stakeholders, and recommends the draft program for PPAC review. The TAC has the important function of coordination and communication among the participants of the PPP. The TAC, for example, facilitates meetings with the DEs, as well as with MPOs, COGs, and other involved parties to establish the pool of possible projects for the program. The Priority Programming Team is a subgroup of the TAC, which administers, tracks, and monitors the PPP and the scoping process. Currently, the TAC consists of 12 staff members, three from the Intermodal Transportation Division (ITD), four from the Multimodal Planning Division (MPD), one member from Finance and Accounting, one member for Enforcement and Compliance Division and three non-voting members.

Highways Management Committee

The Highways Management Committee (HMC) consists of representatives of the State Engineer's Office and the MPD Director and Chief Financial Officer. This team reviews the overall financial funding projections and provides funding-level guidance and direction on sub-program allocation amounts to the TAC as well as pre-draft review of the Draft Tentative Five-Year Program prior to PPAC submittal.

2.4 Funding

As a reflection of the economic times, Arizona, like many states, has faced significant shifts in how capital improvements are funded, by both amount and source. Financial forecasts for the immediate horizon indicate this trend will continue. In addition to not having sufficient funding to address the state's transportation system needs, the reduced available funding has also created logistical

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programming challenges. Systematic mechanisms to remove projects from the program are not defined, resulting in constituent suspicion about “what happened to my project?” from the various constituent groups like DEs, Program Managers, MPOs/COGs, etc. Shifts in funding sources have also presented challenges for ADOT. State funds have dwindled to the point that federal funding now supports many functions previously funded by the state. Use of federal funding comes with many requirements and procedures not always familiar to ADOT staff.

Aside from issues related to the economy, implementation of best practices may also cause changes in ADOT’s funding structure. The LRTP prescribes a desired funding distribution among four improvement categories. Traditionally, three funding categories were used, which does not conform to the latest LRTP. Several areas will need to be addressed with P2P Link, including the following:

- ▶ Definition of the categories
- ▶ Adjustment of discretionary funds distribution to achieve the RIC goals
- ▶ Where possible, ensure consistent implementation of the RIC goals by MPOs and COGs
- ▶ Incorporation of MAP-21

Background on how funding sources and resource allocation interact is provided in the following sections. The information provides a baseline understanding of the current processes and conditions from which impacts associated with proposed changes can be discerned. The implications of changing the funding structure will need to be factored into the overhaul of the programming process.

2.4.1 Funding Sources

ADOT funding sources include HURF, Federal Aid Highway Funds, and other miscellaneous sources. In the past, HURF comprised a large portion of the funds available, but that has changed as state revenues have declined as a result of the economic downturn. Most funding currently available is from federal sources and ADOT’s program has had to learn how to process federal funding within the current programming context. Over time, funding sources could come from federal, state, or other sources (private, toll, public-private partnership, etc.). The programming process will need to be able to incorporate any of these funding sources.

HURF

The HURF comprises funds from the gasoline and use fuel taxes, a portion of the vehicle license tax, registration fees, and other miscellaneous sources. Of the total HURF revenue collected in FFY 2012, 37.6% came from the gasoline tax and another 14.9% came from the sale of diesel fuel. The portion of the Vehicle License Tax (VLT) that flows into the HURF accounted for 26.5% of total HURF funds. According to the Arizona constitution, HURF funds can only be used on highways and streets; therefore, HURF funds cannot be used for transit purposes.

ADOT, Arizona counties, cities, and towns, and the Department of Public Safety (DPS) receive an allocation from HURF. Of the funds remaining after the allocation to DPS, ADOT receives 50.5%. For the purposes of revenue forecasting, total HURF funds are projected based on projected population and economic growth, assuming no change in tax rates. Total HURF funds are then distributed to ADOT and

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the other entities based on the current statutory formula and policy. From the ADOT HURF allocation, State Statute ARS 28-6538 provides that an additional 12.6% of the HURF funds flowing to ADOT are earmarked for MAG and PAG. In addition, the STB #20 established that another 2.6% of ADOT HURF funds would be allocated to the two regions. These funds are divided into 75% for the MAG and 25% for the PAG. These funds are referred to as “15 Percent Funds” and are spent for improvements on limited access facilities on the State Highway System, as well as HURF bond repayment.

After the deduction of the “15 Percent Funds,” ADOT must pay for operations and maintenance and debt service on outstanding bonds. This includes funds for the Motor Vehicle Division, administration, highway maintenance, and additional funding for DPS. The remaining HURF funds are then combined with Federal Aid Highway Funds and in total are referred to as “ADOT Discretionary Funds,” which provide the basis for the ADOT Five-Year Transportation Facilities Construction Program.

Federal Aid Highway Funds

Under MAP-21, states are allocated federal funding through fiscal year 2014. Traditionally, the federal funding legislation included numerous funding categories with eligibility requirements, which limited the use or required local or off-system distribution. MAP-21 has reduced the number of categories while adding significant requirements to use performance measurements. More information is provided in Section 4 of this paper.

Previously, nearly all federal funds programmed were used for construction. Development costs for projects are now being programmed, but have not been included for all projects programmed and obligated in earlier years. As a result, the amount available for construction in a given year will effectively be reduced. Tracking or estimating this impact will take time and programming iterations.

Regional

The MAG Regional Area Road Fund (RARF) Transportation Excise Tax is a half cent sales tax applied in Maricopa County for transportation uses. By statute these funds are distributed to three categories: Freeways/Highways (56.2%), Arterial Streets (10.5%), and Transit (33.3%). The RARF Freeway/Highway funds are combined with ADOT and Federal funds to form the Regional Freeway/Highway Life Cycle Program. These funds are allocated for the construction, maintenance and operation of new and existing controlled access facilities within the MAG Region; most of which are ADOT facilities. Project identification and programming is a cooperative effort between ADOT and MAG.

Distribution

The distribution of the “Discretionary Funds” drives the identification of projects and development of the new fifth year of each Five-Year Program. The Casa Grande Resolves defined the process for the distribution of “Discretionary Funds”. As a result of this process, the RAAC was established and set the distribution of “Discretionary Funds” at 37% for MAG, 13% for PAG, and 50% for the other state counties. ARS 28-304 C. 1 states that the percentage of ADOT discretionary monies allocated to the MAG region in the Regional Transportation Plan shall not increase or decrease unless the STB, in cooperation with the regional planning agency, agrees to change the percentage of the discretionary monies.

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Numerous system-wide allocations are removed from the “Discretionary Funds” amount prior to calculating the distribution amount. These system-wide items are known as “RAAC Off the Top” items. Additionally, the regional share amount is also reduced by the estimated sub-program expenditures for the region to identify the amount of funding available for major projects for the regions. These amounts are presented and discussed at the RAAC meeting, and used by MAG and PAG in the development of their regional program for inclusion in the state’s Five-Year Program.

2.4.2 Resource Allocation Categories

Under current practice, all items in the ADOT Five-Year Transportation Facilities Construction Program fall under one of three major Resource Allocation Categories. These three major categories represent the three fundamental functions of the program:

- ▶ **System Preservation (Series 100 Projects)** – Focuses on managing assets and preserving the existing system infrastructure, including pavements, bridges, safety features, transit facilities, and roadway-related features.
- ▶ **System Management (Series 200 Projects)** – Funds a variety of contingency items and outside services that support the development and operation of the transportation system. This category generally does not generate construction projects; however, many of the development support items are used on preservation and improvement projects. The funding sources also allowed for scope and funding changes without impacting other programmed projects.
- ▶ **System Improvement (Series 300 Projects)** – Focuses on improving the operation, capacity, and mobility provided by the system, including major and spot improvements, District Minor projects and traffic signals.

Each major category contains several specific targeted program areas, which in turn contain focused subprograms. These programs and subprograms have their own code series within their respective category series.

The Resource Allocation Categories allowed for a simplified way of defining and viewing the funding allocations in the program under the existing system. Funding requests for the specific categories are reviewed by the TAC/HMC prior to development of the Draft Tentative Five-Year Program. System Preservation and Management allocations have historically been fairly stable amounts. When adjustments to overall funding are necessary, they usually occur in the System Improvements category. The District Minor subprogram portion of the System Improvements Category, which provided a minimum of funds to each District to assign at their discretion, was traditionally unaffected. Adjustments usually occurred in the Major Corridor and Spot improvement programs.

Current programming allocations do not follow the RIC identified in the most recent LRTP. A clear definition of expenditure areas will need to be established by ADOT. A sample of the kinds of questions that will arise includes the following:

- ▶ Where do system management expenditures fit?
- ▶ Are rest areas and ports of entry included in highways or non-highway?

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- ▶ Development-support subprograms could be used for preservation, modernization, expansion, or non-highway
- ▶ Where do operating support subprograms fit?
- ▶ When combining maintenance and modernization, how do you classify, prioritize, and measure projects?

The previous resource allocation system was intended to be linked to GASB 34 asset management requirements for updating infrastructure value. Considering the requirements of MAP-21, the new RIC classifications tie funding allocations to system goals as set forth in adopted state transportation policy. These will be instrumental in identifying an asset management foundation for infrastructure administration.

2.5 Projects

Projects to be included in the Five-Year Program are identified through several sources then prioritized by the decision-making groups noted in Section 2.3. The project sources include a culmination of input from the Districts, Technical Development Groups, MPOs and COGs, local agencies, and the public. Under current practice, each source uses criteria specific to its area of expertise to identify and prioritize projects. An overall framework for a statewide systematic approach to assessing conditions is not yet defined in a way that provides for a clear linkage to the LRTP.

2.5.1 Highway Project Selection

MAG

MAG and ADOT (Valley Project Management) work together using MAG's Life Cycle Program to identify major construction projects to be funded in the MAG area. Funding includes not only ADOT discretionary allocation, but also 12.6%, 2.6%, and Regional Area Road Funds to be used on the ADOT system. This Regional Transportation Plan Freeway Program (RTPFP) is included as a separate section in ADOT's Five-Year Construction Program. Projects identified and funded by ADOT subprograms are listed in ADOT's portion of the Five-Year Program.

PAG

PAG's program is developed in cooperation with ADOT and also includes 12.6%, 2.6%, and Regional Transportation Funds, as well as ADOT "Discretionary Funds." Unlike MAG, the PAG program is included as an integral part of ADOT's Five-Year Program.

Subprograms

Numerous subprograms are used to allocate funding to various technical areas to address specifically identified system deficiencies or desired improvements to the state transportation system. Approximately 90% of the projects in the current Five-Year Program are derived from subprograms. The range of subprograms has evolved over time, resulting in an oversight process that is complex to manage. Over the past few programming cycles, efforts to reduce the number of subprograms have been successful. Further consolidation may be desirable to simplify and homogenize project makeup.

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Table 2-1 shows the current subprograms in use. Traditionally, the subprograms programmed specific projects for the first three years of the program and worked from a list of potential projects to fill the last two years. This was done so that scoping could occur to better define the cost and delivery issues associated with the projects.

Table 2-1: Subprograms for System Preservation

Technical Area	Subprogram	Traditional Funding Sources
Bridge	Inspection and Inventory	BR / NHPP STP
	Bridge Replacement (ADOT)	BR / NHPP STP
	Bridge Replacement (Local)	BR / NHPP STP
	Scour Retrofit	BR / NHPP STP
Materials	Pavement Pres	STP IM NH / NHPP STP
	Slope Management	IM NH STP / NHPP STP
Traffic	Highway Safety Improvement Program (ADOT)	HSIP / HSIP
	Highway Safety Improvement Program (LOCAL)	HSIP / HSIP
	Safety Slope Program	HSIP / HSIP
	Sign Rehabilitation	IM / NHPP
	High Risk Rural Roads	
	Railway Highway Crossing	HRC / HSIP
	New Signals	HURF
District	District Minor Program	STP / STP
Statewide Project Management	Local Government Program	STP HURF / STP
	Enhancement Program (ADOT)	STP (TEA) / TA
	Enhancement Program (Local)	STP (TEA) / TA
Others	Rest Area Program	STP / STP
	Climbing Lane Program	STP / STP
	ITS / FMS System Program	
	Border Infrastructure Program	CBI / STP
	Statewide Scoping	STP / STP
	Ports of Entry	IM NH / NHPP
	State Parks Program	HURF / HURF

System Preservation subprograms produce most of the construction projects in the Five-Year Program—about 70%. Approximately 25% of the projects come from subprograms in the System Improvements Category. System Management funds do not generate any construction projects but rather support the development of construction projects as well as the management and administration of ADOT.

Each subprogram develops a list of projects and sets independent priorities by using various performance factors that relate to the type of projects they produce and funding utilized. Some

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subprograms were initiated with a statewide study, such as the Passing/Climbing Lane and Minor Interchange categories.

- ▶ **Bridge:** The statewide bridge management system is evaluated based upon condition and prioritized “worst first.” Needs are also addressed by including bridge replacements and repairs with previously programmed projects.
- ▶ **Materials:** The pavement management system evaluates statewide resources and prioritizes needs to maintain a defined system condition.
- ▶ **Traffic:** The safety program has subsections to address specific issues or conform to federal funding categories. Project funding eligibility requires a positive benefit-to-cost ratio; however, candidate projects are not ranked against each other. Project lists are developed and prioritized by district. This effort is coordinated by the Regional Traffic representatives.
- ▶ **District:** District minor projects are identified by each engineering district. The programming process relies on the subprogram manager to gather the data needed, complete the analysis, and produce a prioritized list of projects for their program.

Subprogram managers coordinate with the Districts and local governments when working on project prioritization. Priorities may be affected by other projects developed in other groups if they can combine projects with another group, such as shoulder widening with a pavement preservation project.

Major and Spot Projects

Major and spot projects fall under the System Improvements Resource Allocation Category. ADOT staff identifies projects on the major corridors, while DEs recommend and suggest spot improvements based on their knowledge of the specific circumstances and the input from various entities. The current practice requires a scoping document for each project before it can be programmed. The following procedures are used in developing the project pool, then selecting projects:

- ▶ The lists of projects that have been scoped are forwarded to the Districts. Only projects on this list can be candidates for the program.
- ▶ The scoped projects are reviewed with the TAC and PPAC to ensure that they meet the goals of ADOT.
- ▶ The District completes the project request form (PRF). The Districts and COGs coordinate on the project request. All projects must have a completed PRF to be considered as a candidate for the program. If a PRF is not completely filled out, the Priority Programming Team (PPT) will return it to the requestor.
- ▶ The PPT screens the project to determine if the project has been scoped. If the project has not been scoped, then the project is not a candidate for the program.
- ▶ The PPT compiles the data for each project. All projects must have the data sheets completed.
- ▶ The submitted projects are prioritized by rank based on performance and strategic criteria.

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- ▶ The PPT submits the data and priorities to the TAC for evaluation. Revisions to the data and priorities are made if necessary and the TAC identifies the projects to be recommended for the program.
- ▶ The TAC determines the funds available for both Major Projects and for Major Spot Projects and the TAC prepares a final recommended list of projects. The funds must be consistent with the RAAC priorities.

Highway Project Prioritization

Historically, project priorities were developed for both candidate major construction projects and for potential scoping projects using an Excel spreadsheet, as described in Chapter 6 of the “Highway Construction Program Manual / Statewide Transportation Improvement Program.” Priorities are computed on performance-based and strategic criteria. The process for prioritizing both major capital and scoping projects includes the following steps:

- ▶ Obtain project request forms from ADOT Districts for both major projects and scoping projects, including the District project priorities.
- ▶ Collect or compute data for each criterion from established data sources.
- ▶ Enter the data for each criterion.
- ▶ Assign a number of points based on the data for each criterion.
- ▶ Compute a score for each project for each criterion in relation to the other projects. The scoring process is discussed in a later section.
- ▶ Compute a total score representing the project priority for each project across all the criteria.
- ▶ Order projects by priority and group into tiers. Projects are grouped into tiers in recognition that projects with small differences in rank basically have the same order of rank.

The methodology used in the project prioritization process compares basic performance-based and other criteria for each project against all other candidate projects. Projects are then selected by the Project Advisory Committee (PAC) from the projects that have the highest scores in the prioritization process. As stated above, by using the tier system the PAC has a broader choice of projects that are grouped in closeness of rank and not just left to choose projects based solely on score. There may be projects that are separated by as little as one-tenth of a point. While this is a complex set of steps, a version of it could lend itself well to a revised structure to comply with performance management and other MAP-21 requirements.

2.5.2 Aviation

The aviation portion of the Five-Year Transportation Facilities Construction Program—the Five-Year Airport Capital Improvement Program (ACIP)—has a program development process similar to the highway program and is also governed by the STB. Full details are available in the “Airport Development Guidelines,” October 2011.

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Funding sources for aviation are different and exclusive from those used for the highway program. Funding of the State Aviation Fund comes mainly from flight property tax, aircraft lieu tax, aircraft registration, and aviation fuel tax. Funds are allocated to five program areas per STB guidance:

1. Federal/State/Local Grants
2. State/Local Grants
3. Airport Pavement Management System (APMS)
4. Airport Loan Program
5. Statewide System Planning and Services

ADOT Aeronautics contacts all public airports in the state to obtain their desired projects. Projects are reviewed for acceptance into the ACIP database. The proposed projects are then rated and prioritized using Project Component and Airport Measure rating systems, funding levels for each airport development program, and applied to the prioritized list. All federal/state/local grant projects are included. This Draft ACIP is then included in the Draft Five-Year Transportation Facilities Construction Program and uses the ADOT public involvement process.

2.5.3 Transit

ADOT operates no transit systems directly but functions as administrator or in an oversight capacity for a number of Federal Transit Administration (FTA) programs, notably FTA Sections 5310 and 5311, although other funding grants can also be part of the program. Most funds are distributed through a grant application process using ADOT, COG, and MPO representatives for the regional and state selection process. Projects are not included in the ADOT Five-Year Transportation Facilities Construction Program; however, lump sum Surface Transportation Program (STP) flex funding is programmed to support the FTA funded programs and are included in the STIP.

Depending on the level of transit activity and the extent of any non-highway programs in the future, ADOT could face a higher demand for transit (bus or rail) funding support as part of multimodal efforts statewide. The planning and programming structure will need to accommodate such possibilities in how it is developed.

2.6 Current Practice Assessment

The current ADOT programming practices have been summarized above to serve as a framework for overhauling the process. This section provides a collective evaluation of the current practices from ADOT staff, as well as the P2P Link team. Broad observations of the overall process are provided, followed by common challenges voiced by ADOT staff during interviews.

2.6.1 Summary of Programming Process Observations

Considering the current practices with respect to the goals and objectives of P2P Link, some general observations have been made by ADOT and the P2P Link team. These include the following:

- ▶ Current content of the Five-Year Program exceeds available funding given today's economy and the economy forecasted for the next few years.

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- ▶ Process is not easily adaptable for changing conditions. The process worked well when available funding better aligned with system needs, but the current process doesn't address how to handle the lack of funds to deliver the program.
- ▶ System performance information is incomplete and is not centrally stored, which impacts not only the accessibility of the information to decision-making groups, but the ability to holistically analyze the system.
- ▶ Programming terms have different meanings to the different people involved with the programming process.
- ▶ Processes are not in place to assess how well projects, once constructed or implemented, meet their intended goals.
- ▶ Some current practices do not comply with the requirements of MAP-21. Changes are needed for Arizona to continue to receive its full federal funding allocation.
- ▶ Federal funding for development of previously programmed projects is not accounted for in the current Five-Year Program and may affect available funding.
- ▶ Current programming allocations do not follow the RIC identified in the most recent LRTP.
- ▶ A statewide systematic approach to assessing condition is not in place, which then leads to project identification and prioritization not necessarily working to accomplish the LRTP goals.
- ▶ The number of subprograms adds complexity to the programming process.

2.6.2 Common Challenges Identified by Staff

The P2P Link team met with ADOT staff during September and October to develop an understanding of current practices documented in this paper, as well as to identify challenges with current programming process and opportunities for improvement. Some common themes emerged from the interviews:

- ▶ Districts are highly involved with identifying projects. In addition to their input on major, minor, and scoping projects, all subprogram managers factor their input into identifying and prioritizing subprogram projects. With the exception of pavement and bridge subprograms, work is prioritized per District, not statewide.
- ▶ The current programming process is not broadly understood by staff.
- ▶ The federal-aid process has created confusion for staff. An internal committee has been formed to educate staff on how to use federal funds for project development. Staff uses the Indirect Cost Allocation Plan (ICAP) to account for internal ADOT administration costs. Additional considerations include the following:
 - Appears to transfer non-project-specific ADOT administrative costs to construction program funding.
 - Appears to be applied to 15% and Regional Area Road Fund (RARF) funded construction projects even though these are not federally reimbursable.

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- Annual adjustments in ICAP rates require program adjustments unless they apply to only the new program year. This perpetuates a program maintenance issue.
- ▶ Offset federal and state fiscal years is challenging. Staff tends not to talk the same language. Efforts are underway to improve this now with 15-month programming cycle and internal training.
- ▶ The process is not flexible for changes in project costs, and changes are generally viewed badly. All changes must go through the PRB/PPAC/STB.
- ▶ Statewide guidance on priorities (such as corridors or networks) would be helpful to the various sources generating project priorities.
- ▶ The need exists for statewide studies to be conducted to assess condition, test best practice concepts, and incorporate innovation.
- ▶ Recent ADOT organizational changes create support opportunities for implementing the overhauled programming process. Examples include newly defined positions in the State Engineer's Office for Performance Management, Programming Development (Development), Conditions Assessment (Operations), and restructuring of the Statewide Project Management Group to align with Districts.

3

Attributes of Best Practice for Linking the Statewide Transportation Planning Process to Capital Programming

The purpose of Section 3 is to identify the attributes of best practice for linking statewide planning and programming, and to identify candidate states that have instituted some of these best practices. Follow-up research, analysis, and dialogue with the identified states will be structured to provide guidance on how to modify or improve ADOT's existing planning and programming processes to implement these best practices. The approach is to identify states from which ADOT can learn because they have mature practices that are recognized as best practice, because they are pursuing the types of improvements that ADOT needs, and because they are further along in implementation. Particular emphasis will be placed on learning from these states how to manage and make the changes required to implement improved practices.

Definitional note

Federal law and Arizona statute address the transportation planning process. The Federal Highway Administration, the Federal Transit Administration, and the Federal Railroad Administration establish rules and provide guidance for implementing federal law. In general terms, federal law defines the transportation planning process to include the steps through which a statewide long-range plan, MPO long-range plan, the State Transportation Improvement Program, and Transportation Improvement Programs are established. For the purposes of this document, these general definitions are followed.

3.1 Best Practice Attributes

This section provides an overview of best practices for both planning and programming because linking programming and planning requires a planning process that includes performance-based system or network-level analysis. The attributes of best practice are also discussed.

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3.1.1 Statewide Transportation Planning Requirements for Best Practice – Overview

In simplest terms, best practice involves establishing plans for the current and future performance of the transportation system. The task for programming is then to identify, select, and prioritize projects that become a program of projects that implement the plan. In this way, programming commits funds to projects. When the linkage is tight and well managed, it should be possible to provide transparency and accountability to policymakers and stakeholders regarding what level of performance will be delivered through the implementation of the program. While the concepts are simple, the execution is complex because there are always different, and at times competing, interests and priorities for the overall plan and its implementation through the programming process.

Contemporary best practice requires a system planning process through which objectives are set for the management, operation, and development of Arizona’s transportation system. Best practice is to establish a series of measurable performance objectives for the current and planned future performance of the transportation system. Typically, these are identified in the statewide transportation planning process and included in long-range planning documents, such as the LRTP.

The lessons learned from best practice indicate that to link planning and programming in a performance-based approach requires a robust capability to analyze and evaluate the performance of the transportation system. This can include any combination of network analysis at the state, corridor, MPO, and COG levels. Transportation system analysis at the statewide level, the MPO level, and for major corridors quantifies system-level needs for meeting the planned level of performance for the transportation system. Needs are generally grouped into categories such as capacity or mobility, system preservation, and safety, among others. Best practice is for these categories to be policy-driven, therefore, they vary from state to state albeit with many common themes. In Arizona, the four identified categories of need are reflected in the adopted RIC developed during the formulation of the LRTP. They are: preservation, modernization, expansion, and non-highway needs.

Best practice involves using the results of system planning analysis to identify what level of transportation system performance is “bought” when different investment decisions are made. By doing so, planning analysis is used by policymakers to establish strategic investment priorities by allocating funds between broad policy objectives such as mobility, system preservation, safety, or economic development. Under best practice, the process is policy driven and supported by technical analysis that explains the level of performance implications of different investment decisions. For example, if a state funds pavement preservation at a level that minimizes life-cycle costs, the analysis explains which funds are left to address capacity projects. Such analysis enables policymakers to make broad system-level tradeoffs between different categories of need.

Best practice provides the policy direction and investment priorities to drive the allocation of resources among the major categories of performance evaluated in the planning process and set by the plan. In a best practice process, the system planning and analysis and programmatic decision-making is the first step in a performance-based programming process. The second step is the selection and prioritization of projects into a program that addresses the planned level of performance for each of the categories. This involves different planning and analysis approaches for different performance categories.

3.1.2 Performance-Based Programming Best Practice – Overview

Programming is the process by which projects are selected and funds are committed to them. In a performance-based process, funds are committed in a way that most effectively meets the performance objectives for the transportation system established by system-level analysis. As previously noted, system performance should be established in statewide, MPO, or corridor plans. Since programs are short term and plans address longer-term horizons, there needs to be clear procedures for scoping projects and prioritizing them in the near term as part of the program to meet the overall system performance objectives.

ADOT's major work activity in this area is selecting projects for inclusion in the Five-Year Program and updating the LRTP. The selection of projects is constrained by the availability of funds for each type of project. Under best practice, planning analysis is not just conducted at the project level, but also at the corridor and system levels. The preferred approach is to identify and prioritize projects to implement corridor and system plans. This requires a strong link between planning and programming, such that projects are selected to implement the plan. In this way, individual project selection decisions, when added together, develop the planned transportation system.

In general terms, best practice can be characterized as having a program structure that allocates resources between broad categories of need (i.e., the LRTP RIC categories), and then applies prioritization criteria within these categories of need to build the program. The overall program structure is planning-driven and based upon the types of needs or planning objectives, such as mobility, safety, or economic development. With such an approach, the "color of money" does not drive programming. To the extent possible within the constraints governing their use, funds are allocated to meet planning and programming priorities. It is understood that constraints on the use of federal and state funds must be followed. Under best practice, it is not the funding source restrictions that should drive the process, but ADOT's overall policy objectives.

3.1.3 Performance-Based Project Prioritization Best Practice – Overview

Project prioritization is the process through which projects that meet a particular programming category are prioritized. Generally, this involves evaluating the merits of comparable types of projects. Prioritization approaches within categories will reflect policy, stakeholder, and technical criteria. Under best practice, the categories are based on type or category of need and not funding categories.

Best practice involves a transparent and reproducible process. The decision-making criteria used to allocate resources between categories of projects and prioritize projects within categories are known. In general, best practice requires that objectives be defined for each category of project and then a procedure be established for ensuring that the project achieves these objectives. For example, many states have established a policy-driven objective that supports economic development and economic development projects. Best practice would involve establishing a reproducible procedure for determining economic benefit and prioritizing projects according to the anticipated benefit. In the areas of pavement management, bridge management, and benefit/cost analysis of capacity improvement, there are well established technical procedures for prioritizing projects.

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3.1.4 Attributes of Best Practices in Performance-Based Planning and Programming

The following are the attributes of best practice:

- ▶ **Accountability is provided through a transparent and reproducible process.** Decision-making criteria used to allocate resources between program categories and to program and prioritize projects within categories of need are transparent and known. This provides for accountability and broad participation in the process.
- ▶ **There is a common language and understanding within the state department of transportation and among all parties within the planning process – the planning process is implemented by the planning function but is owned by the whole department.** Under best practice, there is a clear understanding across the agency and in regions and districts of the process, and all managers and leaders understand and are able to explain “where projects come from” and what the plan is.
- ▶ **There is broad-based “buy-in” and agreement or informed consent on the process – “all agree to the rules of the game and to play by them.”** There are many participants in the process. A performance-based process allocates resources in the most effective way to get to the agreed outcomes. This will involve compromises. The process, to be successful, requires the participants to accept project outcomes.
- ▶ **The program structure provides a systematic, explicit link between planning, funding, and implementation (programming and project prioritization).** This enables policy decisions regarding resource allocation to be made at the program or planning level. Long-range planning documents such as the statewide plan, corridor plans, and regional plans have the specificity to guide investment. They set priorities between performance categories (types of need), establishing a direct link between system-level analysis and implementation.
- ▶ **In addition to mobility or system development, the planning process addresses the life-cycle management of the existing system (asset management) and operations.** The planning process provides the information basis from which to set policy and plan priorities and then to program between categories of need as well as within them. This enables system-level (versus project-level) planning and priority setting. Since the transportation system is a network of different modes of transportation, and within modes different facilities, planning decisions are often best based on a system-level perspective. This is especially important in a fiscally constrained environment because this level of analysis enables consideration of how best to provide the infrastructure to meet a region and the state’s diverse travel demands given the funds likely to be available.
- ▶ **Accountability for performance is provided by identifying and communicating what level of transportation system performance is “bought” by the Capital Improvement Program.** The process is used to communicate to customers the “performance” that is bought through the planning and programming decisions. Policymakers can establish strategic investment priorities by allocating funds between broad policy objectives such as mobility, system preservation, safety, or economic development. This process should be policy-driven and supported by

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technical analysis that explains the level of performance implications of different investment decisions. This type of analysis enables policymakers to make broad, system-level tradeoffs between different categories of need. It requires tools to monitor and predict performance under different plan decisions.

- ▶ **The program structure is not overly complex; it addresses broad categories of need; and the programming process applies prioritization criteria within these categories of need to build the program.** There is a trend to reduce the number of program categories and sub-categories to enable planning considerations, not the “color of money,” to drive the process. This enables the overall planning structure program to be performance-driven and based upon needs or planning objectives. With such an approach, the “color of money” does not drive programming. To the extent possible, funds, within the constraints governing their use and regardless of source, are allocated to meet performance objectives.
- ▶ **Projects are defined that implement corridor and system plans.** Planning and programming are linked so that projects are selected to implement the plan. In this way, individual project-selection decisions, when added together, develop the planned transportation system. This recognizes that many performance decisions are better made at the system, region, or corridor level than on a project-by-project basis. In this way, the performance objectives guide project scope and project definition.
- ▶ **There is a continuity of decision-making from planning through programming and project development with plans providing guidance for project-level planning and the identification of design concepts.** This ensures better continuity in decision-making and a more seamless transition regarding project scope and project commitments between planning and project delivery. It also enables stronger management and control of program delivery against scope, schedule, and budget. A planning framework should provide policy direction and identify the specific linkages between region and subarea plans and project development. This is an important planning consideration because without it there is a risk that project design does not address planning intent and avoidable potential rework occurs as project engineers duplicate planning-level work to identify project objectives and establish a design concept.
- ▶ **Flexibility is included to address economic development or market-driven needs for transportation improvement.** The transportation planning process addresses future needs that can be identified and planned for. However, many needs related to economic development are market driven and change over relatively short time horizons, so the long-range planning process should be flexible to account for these unforeseen changes.
- ▶ **Program categories align with performance or needs categories.** The program structure is not driven by “color of money” but organizes and aligns resources so that they can be allocated to the extent possible without “color of money” considerations.
- ▶ **Project prioritization and selection within categories of need applies a technically defensible, transparent, and reproducible performance-based approach.** While the program structure varies between states, best practice applies a technically sound performance-based approach to

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project prioritization. In each of the following areas there are well defined best practices for project prioritization: mobility projects, bridge preservation and rehabilitation, pavement preservation, economic development, and safety. Areas for which there are no stabilized best practice, but states are working to improve the process include: prioritizing between asset classes for asset management or preservation type projects.

- ▶ **Project eligibility and scoping controls are in place so that projects that are selected and developed meet the program category requirements.** A performance-based approach is designed to ensure the most effective use of funds in meeting the performance objectives established for the system. A best practice approach includes controls so that only work items that meet the program area objectives are eligible for funding. In addition, controls are in place so that scope does not change. For example, a project primarily involving paving would meet pavement preservation objectives and fall under such a category. Other objectives would require separate funding if they were warranted.

The best practice attributes are implemented by states through different combinations of statewide, regional, corridor, or mode-specific plans. This variation is understandable given the different statutory, governance, and transportation system characteristics in different states.

3.2 Candidate States for Best Practices Review

The following states are identified as candidate states for more detailed best practices review. They provide ADOT with peer examples of states with generally similar characteristics. ADOT can engage in dialogue with these states regarding success factors and change management steps that are needed to implement a performance-based process that links planning and programming. Both Oregon and Minnesota have performance-based processes that are recognized as being “best-in-class” and they continue to work to improve them. Colorado has some similarities and continues to work to improve its process and integrate all performance categories into its overall process.

Table 3-1 provides background on the three states recommended for facilitating more detailed peer review and exchange: Minnesota, Oregon, and Colorado. Some interesting attributes of four other states are identified: North Carolina, Utah, Kansas, and Pennsylvania. The considerations for using each state for comparison and best practices dialogue are identified along with their best practices attributes.

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Table 3-1: Candidate States for Best Practice Review

Minnesota (MnDOT) – Recommended	
Considerations	Best Practice Attributes
<ul style="list-style-type: none"> ▶ Minnesota has been working to establish a performance-based planning framework through a number of plan iterations. ▶ Similar to Arizona, the state is characterized by a large metropolitan area and much less populated areas. ▶ MnDOT is establishing a risk-based planning and programming process. ▶ The MnDOT process has a number of attributes of interest to Arizona. ▶ MnDOT is developing a new corridor-based/context-driven investment prioritization process. ▶ MnDOT is in the final stages of implementing a new system plan. ▶ MnDOT continues to innovate and is now using risk tolerance to guide investment levels among categories of need. 	<ul style="list-style-type: none"> ▶ Policy-based program allocations are based on a mix of needs data and system performance characteristics. District allocations of federal funds are based on bridge needs (20%), heavy commercial vehicle miles traveled (VMT) (5%), average pavement needs (35%), three-year crash average (10%), congested VMT (15%), transit (5%), and future VMT projections (10%). ▶ Long-term targets are based on goals. ▶ Investment needs are defined “systematically.” ▶ Financial resources are allocated within investment categories. ▶ The statewide Multimodal Plan established key policies (goals) in 10 areas. Each policy is supported by key strategies (objectives or actions to be taken). Targets and indicators are established under each policy area to track progress on the goal and strategies the indicators support.
Oregon (ODOT) – Recommended	
Considerations	Best Practice Attributes
<ul style="list-style-type: none"> ▶ Oregon has a long-established system planning process that is performance based and links to programming and project prioritization. ▶ Oregon has worked extensively on how to be multimodal, especially in regard to the multimodal corridor between Portland and Eugene, which could be compared with the Phoenix – Tucson corridor (although land use considerations are very different). 	<ul style="list-style-type: none"> ▶ A portion of available funds are distributed based on policy. For example, “modernization” funds are allocated to regions by a formula that includes vehicle registrations, truck ton-miles, VMT, population, gas tax revenues, and needs from the Oregon Highway Plan. ▶ The statewide multimodal planning process focuses on goal-based approaches, but performance targets are identified as well. For example, greenhouse gas (GHG) planning includes objective-driven targets. ODOT also sets performance targets for transportation safety planning and measures results annually.

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<ul style="list-style-type: none"> ▶ Oregon is characterized by a large dominant metropolitan area/corridor between Portland and Eugene and geographically diverse and less populated regions elsewhere with very different needs. ▶ Oregon has a well established approach for customer, regional, and MPO collaboration in the process. ▶ Oregon has experienced financial circumstances similar to that of Arizona. 	<ul style="list-style-type: none"> ▶ ODOT has mature statewide modeling and analytical capabilities and can model and evaluate system performance under different investment scenarios very well. ODOT thoroughly considers and analyzes outcomes at the statewide programmatic level with sufficient detail to include specific projects in the formation of strategy.
<h2 style="margin: 0;">Colorado (CDOT) – Recommended</h2>	
<p>Considerations</p>	<p>Best Practice Attributes</p>
<ul style="list-style-type: none"> ▶ Colorado is similar to Arizona with its large metro area and smaller mountain towns. The state has experienced growth, which is likely to resume in the planning horizon. ▶ In Colorado, regional planning organizations and regional project-specific plans play a strong role. ▶ Colorado has been working to have statewide investment priorities drive the statewide approach and regional project-specific plans. ▶ CDOT has experienced very similar financial circumstances to ADOT. ▶ CDOT has a new plan update underway and relatively new leadership working to improve the process, which can be a good sounding board for ADOT. 	<ul style="list-style-type: none"> ▶ CDOT sets long-term targets based on goals and has a mature performance-based planning and investment allocation approach. ▶ CDOT allocates financial resources within investment categories effectively using performance measures in the process. ▶ CDOT is beginning to incorporate cross-asset programming and prioritization and is recognized as a national leader in this area. ▶ Colorado has a regional planning process that establishes project specifics. ▶ CDOT has been very active in addressing freight and multimodal freight within the planning process.
<h2 style="margin: 0;">Utah (UDOT)</h2>	
<p>Considerations</p>	<p>Best Practice Attributes</p>
<ul style="list-style-type: none"> ▶ Utah is similar to Arizona with its large metro area and travel demand growth focused on the Wasatch front. The state has experienced rapid growth in the past, which is resuming following the economic downturn. 	<ul style="list-style-type: none"> ▶ UDOT has a nationally regarded approach for prioritizing asset management-related projects between pavement and bridge. ▶ Mobility projects tend to be set at MPO regional levels. ▶ UDOT’s Geographic Information System planning framework (U-Plan) is an excellent tool.

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North Carolina (NCDOT)	
Considerations	Best Practice Attributes
<ul style="list-style-type: none"> ▶ NCDOT has an improvement process underway to link investment decisions, planning, and programming. ▶ NCDOT places a strong emphasis on multimodal approaches and addressing freight in the planning process. ▶ Much of North Carolina’s mobility/capacity projects are driven by unique state funding requirements that may limit applicability of lessons learned for ADOT. ▶ North Carolina has a relatively dispersed population and economy with a number of metropolitan areas that represent concentrations of travel demand. 	<ul style="list-style-type: none"> ▶ NCDOT aggressively pursues the application of tolling for new and existing facilities. ▶ NCDOT has other attributes to be evaluated if it is selected for further analysis.
Kansas (KDOT)	
Considerations	Best Practice Attributes
<ul style="list-style-type: none"> ▶ KDOT has mechanisms for prioritizing projects related to economic development. ▶ KDOT has successfully increased the state motor fuel tax, in part based on analysis of the level of performance “bought” through the application of new revenue streams. ▶ Kansas’ population and economy may pose some limitations on comparability to ADOT. 	<ul style="list-style-type: none"> ▶ Local consultation with stakeholders across Kansas was central to the T-Works Program. ▶ Economic development and local priorities were included along with the engineering aspects of project selection. ▶ Relationships were maintained with local, state, and national elected officials throughout the programming process.
Pennsylvania (PennDOT)	
Considerations	Best Practice Attributes
<ul style="list-style-type: none"> ▶ Pennsylvania has a decentralized planning process with well developed regional planning organizations. ▶ PennDOT faces a significant funding shortfall. ▶ State law and current practice results in a sub-allocation of funds to regions. Consequently, PennDOT does not provide a peer process for comparison to ADOT. 	<ul style="list-style-type: none"> ▶ State law and the sub-allocation process for funding do not provide a good comparison basis to ADOT.

4

Moving Ahead for Progress in the 21st Century Act

MAP-21 includes a number of performance management and related requirements for performance-based programming that are consistent with the intent of the P2P Link project. The P2P Link project can provide the pathway through which these requirements are addressed. Among the key requirements of MAP-21 that directly affect ADOT and Arizona agencies are the following:

- ▶ States must establish targets for each performance measure and must use a performance-based approach in planning and programming surface transportation projects.
- ▶ MPOs also must establish targets for each performance measure and must use a performance-based approach in planning and programming surface transportation projects.
- ▶ Transit agencies receiving federal funding must develop transit asset management plans, report on system conditions, develop targets for DOT-specified “state of good repair” performance measures, and report on progress toward meeting performance targets.
- ▶ Regarding the National Highway Performance Program (NHPP), the Highway Safety Improvement Program (HSIP), the Congestion Mitigation and Air Quality Improvement Program (CMAQ), and Freight Policy, additional specific requirements apply, including some penalties or limitations on funding.
- ▶ States, MPOs, and transit agencies must report to the U.S. Department of Transportation (US DOT) on progress in achieving targets and commit to increasing funding in programs that do not meet them.

In keeping with the new regulations, a primary objective of P2P Link is to update ADOT’s capital improvement programming process to be compliant with the requirements of MAP-21. As noted above, one of the key requirements is that states and MPOs must report their progress in achieving performance targets to the US DOT. If a state’s report shows inadequate progress in some areas, the state must take appropriate corrective action.

Linking the Long-Range Plan and Capital Improvement Program

4.1 Overview

Section 4 provides highlights of MAP-21, provisions impacting ADOT's programming process, and specific work tasks that will be addressed as part of this project. P2P Link efforts to address the requirements of MAP-21 related to capital improvement programming will need to be coordinated with other state efforts. The recommended new programming process must comply with the current legislation yet maintain flexibility to adapt to future requirements and needs.

The approach to addressing MAP-21 implementation for ADOT will occur on two levels. First, the P2P Link team will coordinate with the local efforts of ADOT and the Arizona Division of the Federal Highway Administration (FHWA), supporting their initiatives as requested. Secondly, the P2P Link will bring information to ADOT on how other states are progressing toward implementing provisions related to the programming process.

Work tasks to be undertaken by the P2P Link team will investigate the planning process as well as the programming process since these areas are closely interwoven.

P2P Link Work Tasks to Assist in MAP-21 Implementation:

- ▶ Determine what changes are needed to the ADOT planning process to include performance measures and targets in the long-range plan, as well as assessing progress in achieving the performance targets
- ▶ Establish a planning goal that correlates to the MAP-21 goal of "System Reliability"
- ▶ Identify desirable performance measures for the planning goals areas
- ▶ Identify initial targets for performance measures
- ▶ Determine application of performance measures across the statewide transportation system (National Highway System (NHS) vs. rest of system)
- ▶ Establish a comprehensive asset management approach and program for ADOT
- ▶ Support ADOT's efforts to assess programming changes that must occur to be compliant
- ▶ Identify and incorporate freight program requirements to promote improved freight movement

The programming "to be" model developed in the next phase of P2P Link (Phase 3) will identify where and how the MAP-21 requirements will be addressed within the new planning and programming structure. This will also require alignment between MPO and state metrics and targets, which could necessitate substantial coordination to establish a reasonable level of compatibility between them. The timeline for this work will enable ADOT to be well positioned to address the rules as they are promulgated by FHWA/US DOT over the next two years.

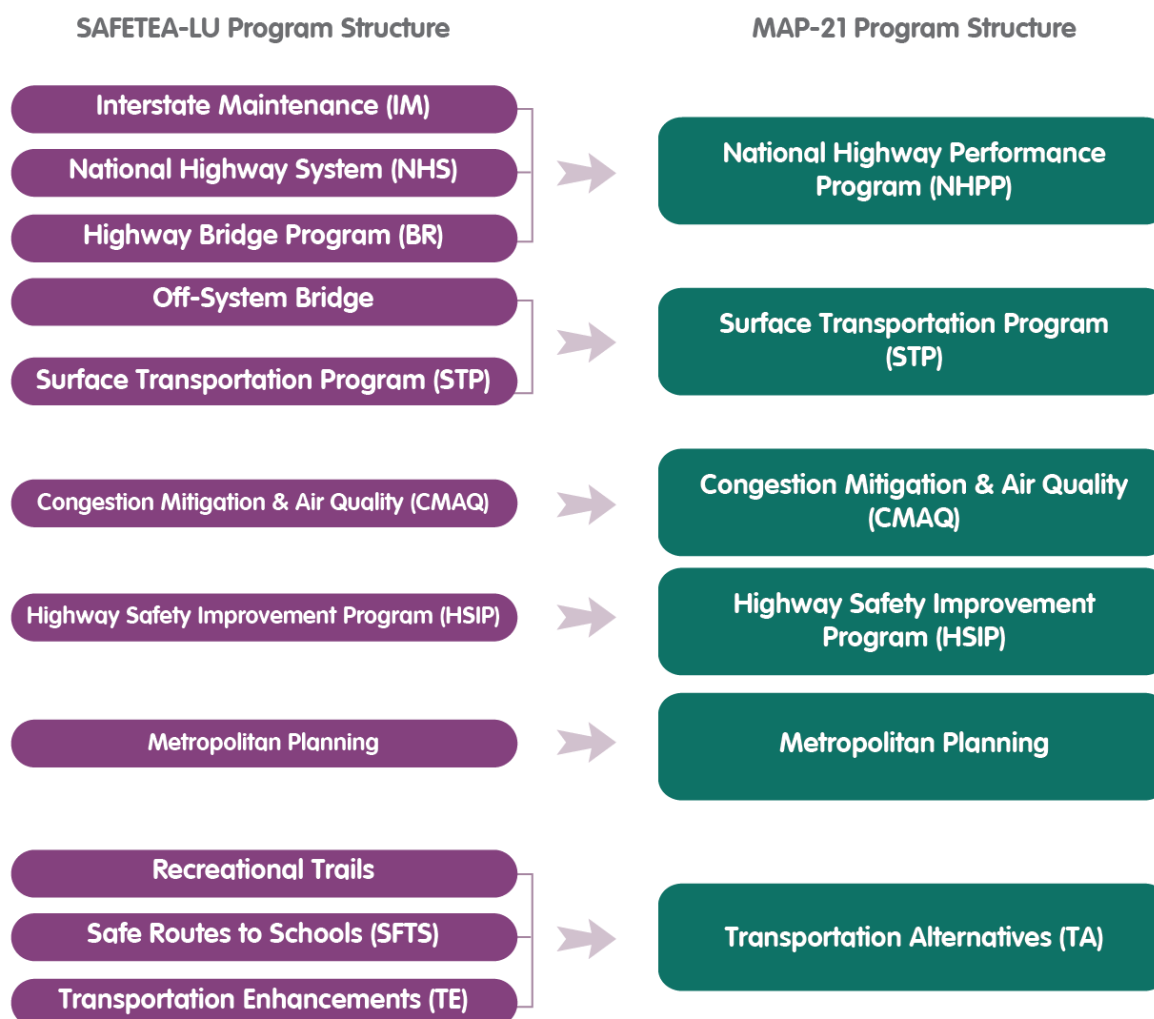
4.2 MAP-21 Provisions

MAP-21 was signed into law P.L. 112-141 on July 6, 2012. It is the first long-term highway authorization enacted since 2005, replacing the SAFETEA-LU legislation. Surface transportation program funding is authorized by MAP-21 at \$105 billion for fiscal years (FFY) 2013 and 2014, with HTF contribution and tax collection extended through FFY 2016 to provide additional financial stability. As noted by the American Association of State Highway Transportation Officials (AASHTO), MAP-21 includes many of the reforms and recommendation long advocated by the states. The legislation became fully effective on October 1, 2012, which is referenced to as the date of enactment. Implementation of the requirements varies as noted in the following sections.

4.2.1 Programs

The number of federal highway programs has significantly been reduced under MAP-21, from roughly 90 to fewer than 30. Restructuring of the highway programs has been developed around the programs shown in Figure 4-1.

Figure 4-1: MAP-21 Programs Structure



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MAP-21 eliminates most current discretionary programs, but many of the eligibilities have been transferred to other programs. It also creates a new discretionary program, Tribal High Priority Projects (THPP), and continues the following discretionary programs:

- ▶ Projects of National and Regional Significance (PNRS)
- ▶ On-the-Job Training Supportive Services
- ▶ Disadvantaged Business Enterprise (DBE) Supportive Services
- ▶ Highway Use Tax Evasion (intergovernmental enforcement projects)
- ▶ Work Zone Safety Grants

4.2.2 Investment

Federal authorization is \$40.4 billion from the HTF for FFY 2013 and \$41.0 billion for FFY 2014, which maintains FFY 2012 levels with adjustments for inflation. MAP-21 establishes an annual obligation limitation of \$39.699 billion for FFY 2013 and \$40.256 billion for FFY 2014 for the purpose of limiting highway spending each year. This guarantees 95% return to the states on HTF contributions.

The distribution of formula funds to each state under MAP-21 is similar to SAFETEA-LU:

- ▶ **Step one** – *Authorize lump sum.* A single amount (approximately \$38 billion/year) is authorized to fund the core programs.
- ▶ **Step two** – *Calculate each state's share of the total,* adjusted, if necessary, to ensure that no state receives less than 95 cents of every dollar it contributed to the Highway Account of the HTF.
- ▶ **Step three** – *Divide the total amount among programs for each state.* Amounts are set aside for Metropolitan Planning and CMAQ based on the relative size of the state's FFY 2009 apportionment of those programs. The remainder is then divided among the rest of the formula programs as follows: NHPP (63.7%), STP (29.3%), and HSIP (7%). An amount is set aside from HSIP to fund the Rail-Highway Crossings program, and amounts are set aside proportionally from each state's NHPP, STP, HSIP, CMAQ, and Metropolitan Planning apportionments to fund the state's Transportation Alternatives program.

MAP-21 expands availability of innovative financing by significantly increasing funding for the Transportation Infrastructure Financing and Innovation Act (TIFIA). The TIFIA program provides federal credit assistance to eligible STP projects. MAP-21 authorizes \$750 million in FFY 2013 and \$1 billion in FFY 2014 to pay the subsidy cost of supporting federal credit.

State ability to use federal funds for tolling is also enhanced with MAP-21. Statutory provisions governing tolling on highways that are constructed or improved with federal funds (23 USC 129) have been changed. One significant change is the removal of the requirement for an agreement to be executed with the US DOT prior to tolling under the mainstream tolling programs, except under toll pilot programs. Other changes include the mainstreaming of tolling new interstates and added lanes on

Linking the Long-Range Plan and Capital Improvement Program

existing interstates. MAP-21 also requires that all federal-aid highway toll facilities implement technologies or business practices that provide for the interoperability of electronic toll collection by October 1, 2016 (four years after the enactment of MAP-21's new tolling requirements).

4.2.3 Transportation Planning

In MAP-21, the metropolitan and statewide transportation planning processes are now required to use a performance-based approach. Planning efforts must incorporate performance goals, measures, and targets into the process of identifying needed transportation improvements and project selection.

Section 1203 declares the federal aid highway program should focus on seven national goals:

1. Safety
2. Infrastructure condition
3. Congestion reduction
4. System reliability
5. Freight movement and economic vitality
6. Environmental sustainability
7. Reduced project delivery delays

Requirements for a long-range plan and a short-term Transportation Improvement Program (TIP) continue, with the long-range plan to incorporate performance plans required by MAP-21 for specific programs. The long-range plan must describe the performance measures and targets used in assessing system performance and progress in achieving the performance targets. The TIP must also be developed to make progress toward established performance targets and include a description of the anticipated achievements. In the statewide and nonmetropolitan (areas with population less than 200,000) planning process, selection of projects in nonmetropolitan areas, except projects on the NHS or funded through the remaining funds of the discontinued Highway Bridge Program, must be made in cooperation with affected nonmetropolitan officials or any regional transportation planning organization.

The US DOT is required to establish criteria for the evaluation of the new performance-based planning processes. The process will consider whether states developed appropriate performance targets and made progress toward achieving the targets. Five years after enactment of MAP-21, the US DOT is to provide to Congress reports evaluating the overall effectiveness of performance-based planning and the effectiveness of the process in each state and for each MPO.

4.2.4 Performance Management

MAP-21 emphasizes performance planning and performance management for highways and public transportation. The cornerstone of MAP-21's highway program transformation is the transition to a performance and outcome-based program. States will invest resources in projects to achieve individual targets that will collectively make progress toward national goals. Performance requirements will be established in the following sections of MAP-21:

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Highway Provisions:

- ▶ Section 1106: National Highway Performance Program
- ▶ Section 1112: Highway Safety Improvement Program
- ▶ Section 1113: Congestion Mitigation and Air Quality Improvement Program
- ▶ Section 1115: National Freight Policy
- ▶ Section 1201: Metropolitan Transportation Planning
- ▶ Section 1202: Statewide and Nonmetropolitan Transportation Planning

Transit Provisions:

- ▶ Section 20005: Metropolitan Transportation Planning
- ▶ Section 20006: Statewide and Nonmetropolitan Transportation Planning
- ▶ Section 20018: Transit Asset Management

MAP-21 establishes (or will establish) national performance goals for federal transportation programs. The US DOT must establish performance measures for safety, pavement conditions, bridge conditions, operational performance of the Interstate, operational performance of the non-Interstate NHS, freight movements, mobile source emissions, and congestion. For transit, US DOT must establish a national transit asset management system and performance measures for keeping transit in a state of good repair. This sets the foundation for state and MPO performance requirements that must contribute toward the national goals.

The requirements that states and MPOs report progress in achieving targets to the US DOT is significant because if a state's report shows inadequate progress in some areas, most notably the condition of the NHS or key safety measures, the state must undertake corrective actions, such as the following:

- ▶ **NHPP:** If no significant progress is made toward targets for NHS pavement and bridge condition, the state must document in its next report the actions it will take to achieve the targets.
- ▶ **HSIP:** If no significant progress is made toward targets for fatalities or serious injuries, the state must dedicate a specified amount of obligation limitation to safety projects and prepare an annual implementation plan.

In addition, because of the critical focus on infrastructure condition, MAP-21 requires that each state maintain minimum standards for Interstate pavement and NHS bridge conditions. If a state falls below either standard, that state must spend a specified portion of its funds for that purpose until the minimum standard is exceeded.

4.2.5 Project Delivery

MAP-21 provides reforms to accelerate project delivery:

- ▶ **Efficiency is gained** by broadening the ability for states to acquire or preserve right-of-way for a transportation facility prior to completion of the review process required under the National

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Environmental Policy Act of 1969 (NEPA), providing for a demonstration program to streamline the relocation process by permitting a lump-sum payment for the acquisition and relocation if elected by the displaced person, enhancing contracting efficiencies, and encouraging the use of innovative technologies and practices.

- ▶ **Coordination is streamlined by** increasing the linkage between the planning and environmental review processes, using a programmatic approach where possible, and consolidating environmental documents. MAP-21 establishes a framework for setting deadlines for decision-making in the environmental review process, with a process for issue resolution and referral, and penalties for agencies that fail to make a decision. Projects stalled in the environmental review process can get technical assistance to speed completion within four years. One area in particular that MAP-21 focuses on to speed up project delivery is expanded authority for use of categorical exclusions (CEs).

4.2.6 Other Provisions of Interest

MAP-21 includes a number of provisions designed to enhance freight movement in support of national goals. MAP-21 firmly establishes national leadership in improving the condition and performance of a National Freight Network by identifying the components of the network, which will be designated by the Secretary of Transportation. It includes incentives to prioritize projects that advance freight performance targets. US DOT, in consultation with partners and stakeholders, will develop a national freight strategic plan. States are encouraged to develop individual freight plans and establish freight advisory committees. No changes to current truck size and weight provisions are included in MAP-21, but a new study and inventory of current state laws is required.

4.3 Considerations for Arizona

4.3.1 Implementation Status

Shortly following the enactment of MAP-21, ADOT and the local division of FHWA began working on its implementation in Arizona. A work group was formed to systematically gain a comprehensive understanding of the law and identify areas that would require ADOT to change how business is currently being conducted. The early activities of the work group included assigning teams to specific sections of MAP-21 to complete a Preliminary Implementation Assessment. The assessment outlined the following questions:

Section Analysis

- ▶ What will ADOT have to do differently under MAP-21?
- ▶ What additional flexibilities will ADOT have?
- ▶ Will any stakeholders be affected and, if so, how? Which stakeholders will be affected? How will stakeholders be affected? (e.g., delays in approved plans, project delivery).
- ▶ Are there any major policy implications to either ADOT or its stakeholders? If so, what are they? (ADOT policy implications; stakeholder policy implications).

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- ▶ What questions need to be answered by ADOT or FHWA to enable implementation?

Preliminary Assessment

- ▶ Will additional resources be needed to implement this Section of MAP-21?
- ▶ Will any statutory, rule, or policy changes be needed to implement this Section of MAP-21?
- ▶ What ADOT or FHWA process changes will be needed?
- ▶ Will ADOT need to develop any implementation tools or training materials?
- ▶ Is there anything else that will be needed for a successful implementation?

To date, a compilation of the information was reviewed by the ADOT Executive Team then submitted to the Arizona Division of FHWA. Next steps will be determined based upon the input provided. Implementation efforts have similarly begun between MAG and ADOT, but in general efforts of other state MPOs have not yet been coordinated with ADOT.

4.3.2 Planning Considerations

Prior to the enactment of MAP-21, ADOT had already taken steps toward developing a performance-based programming process. In November 2011, ADOT completed the LRTP for 2010-2035, “What Moves You Arizona?”. The LRTP advanced ADOT’s vision of defining an investment strategy and establishing planning goals based upon performance factors initiated in the 2010 Statewide Transportation Planning Framework “bqAZ”. On the heels of LRTP completion, ADOT initiated the study to Link Planning to Programming, the P2P Link project.

Statewide

The goals established in MAP-21 are compared alongside of the LRTP plan area goals in Table 4-1. Substantively, the MAP-21 and LRTP goals correlate with the exception of “System Reliability,” which was not identified in the LRTP.

MAP-21 requires Arizona to integrate the national performance measures and targets into its statewide transportation planning process and other plans. Arizona must consider these performance measures and targets in state transportation policies, programs, and investment priorities. A system performance report presenting the performance measures and targets is to be prepared for US DOT evaluation. The State Transportation Improvement Program (STIP) must also include a discussion of how the STIP will help achieve the state’s performance targets.

Section 1202 of MAP-21 further notes that the US DOT must not require Arizona to “deviate from its established planning update cycle to implement changes made by this section”. However, ADOT must reflect changes to its plan and STIP updates within two years after US DOT issues guidance on this section.

Table 4-1: Planning Goals

MAP-21 Goals	L RTP Goals
Congestion Reduction	Improve Mobility and Accessibility
Infrastructure Condition	Preserve and Maintain the State Transportation System
Freight Movement and Economic Vitality	<ul style="list-style-type: none"> ▶ Support Economic Growth ▶ Strengthen Partnerships
Environmental Sustainability	<ul style="list-style-type: none"> ▶ Consider Natural, Cultural, and Environmental Resources ▶ Link Transportation and Land Use
Safety	Enhance Safety and Security
Reduced Project Delivery Delays	Promote Fiscal Stewardship
System Reliability	

Metropolitan Areas

MPOs are also required to include “system performance reports” as part of their transportation plans. More specifically, states must include in their statewide transportation plan an assessment of how MPOs are achieving progress toward performance targets in their regions. Both the S/TIP must also be developed to demonstrate progress is being made toward established performance targets and include a description of the anticipated achievements. Five years after enactment of MAP-21, the Secretary of Transportation is to provide to the Congress reports evaluating the overall effectiveness of performance-based planning and the effectiveness of the process in each state, including each MPO within it.

The proposal takes a performance-based approach to the transportation planning process. Five national goals are set for the planning process: safety, infrastructure condition, system reliability, freight movement, and environmental sustainability. All state and metropolitan LRTPs must describe how project selection decisions will help meet performance targets related to national goals. Failure to establish performance targets and comply with other elements of the planning process can result in a plan not being certified and up to 20% of planning funds being withheld.

4.3.3 Programming Considerations

With specific regard to ADOT’s programming process, MAP-21 requires changes to how ADOT must address performance management and asset management.

Linking the Long-Range Plan and Capital Improvement Program

Performance Management

The US DOT is required to establish performance measures and standards as specified by the following program and policy areas:

- ▶ Minimum standards for bridge and pavement management systems to be used by states (NHPP)
- ▶ Performance measures for pavement condition on the Interstate system (NHPP)
- ▶ Performance measures for pavement condition on the non-Interstate NHS (NHPP)
- ▶ Performance measures for bridge conditions on the NHS (NHPP)
- ▶ Performance measures for the performance of the Interstate System (NHPP)
- ▶ Performance measures for performance of the non-Interstate NHS (NHPP)
- ▶ Minimum levels for pavement conditions on the Interstate System (which may be differentiated by geographic regions of the United States) (NHPP)
- ▶ Performance measures to assess serious injuries and fatalities per VMT (HSIP)
- ▶ Performance measures to assess the number for serious injuries and fatalities (HSIP)
- ▶ Performance measures for traffic congestion (CMAQ)
- ▶ Performance measures for on-road mobile source emissions (CMAQ)
- ▶ Performance measures to assess freight movement on the Interstate System (Freight Policy)

Within 18 months of enactment, the US DOT, in consultation with states, MPOs, and other stakeholders, is directed to publish a rulemaking establishing measures for states to use. The US DOT is limited to the above performance measures and may not establish other measures and standards under Section 1203.

Within one year of US DOT publishing rulemaking, Arizona must set performance targets for the established performance measures. In establishing performance targets, ADOT may establish different targets for urbanized and rural areas of the state.

Within four years of enactment (and biennially thereafter), ADOT must submit a report to US DOT describing the NHS condition and performance of the NHS within the state, the effectiveness of Arizona's investment strategies in the NHS asset management plan, progress in achieving the performance targets, and the way the Arizona is addressing freight congestion.

Table 4-2 summarizes various features of the performance requirements imposed by MAP-21 that affect ADOT.

Asset Management Highway

Arizona must develop an asset management plan for the NHS to improve or preserve condition and performance of the NHS. The asset management plan must contribute to achieving the state's NHS performance targets. States are encouraged to include all infrastructure assets within the right-of-way corridor.

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Table 4-2: Performance Measures for Major Programs

Program	New Performance-Based Features
NHPP	<ul style="list-style-type: none"> ▶ Performance measures to be set by US DOT for Interstate and NHS pavement condition, NHS bridge condition, and Interstate and NHS performance. ▶ Minimum standards to be set by US DOT for developing and operating bridge and pavement management systems. ▶ Minimum conditions to be set by US DOT for Interstate pavements – may vary geographically. ▶ Data elements to be set by US DOT necessary to collect and maintain standardized data to carry out a performance-based approach. <p style="background-color: #e0e0e0; padding: 5px;">If ADOT does not meet or make significant progress toward targets for two consecutive reporting periods, ADOT must document in its next report the actions it will take to achieve the targets. In addition, if more than 10% of the total deck area of NHS bridges in Arizona is on structurally deficient bridges for three consecutive years, ADOT must devote NHPP funds in an amount equal to 50% of the state's FFY 2009 Highway Bridge Program apportionment to improve bridge conditions during the following fiscal year.</p>
HSIP	<ul style="list-style-type: none"> ▶ Measurements to be set by US DOT for the number of serious injuries and fatalities and the number per vehicle mile of travel. ▶ US DOT is required to carry out a study of High Risk Rural Road “best practices.” ▶ ADOT to incorporate strategies that focus on older drivers and pedestrians if fatalities and injuries per capita for those groups increase. ▶ Although MAP-21 eliminates the requirement for every state to set aside funds for High Risk Rural Roads, ADOT is required to obligate funds for this purpose if the fatality rate on such roads increases. <p style="background-color: #e0e0e0; padding: 5px;">If ADOT fails to make progress toward its safety targets, it will have to devote a certain portion of its formula obligation limitation to the safety program and submit an annual implementation plan on how Arizona will make progress to meet performance targets.</p>
CMAQ	<ul style="list-style-type: none"> ▶ Measurements to be set by US DOT to assess traffic congestion and on-road mobile source emissions. ▶ Each MPO with greater than one million in population representing a nonattainment or maintenance area is required to develop and update biennially a performance plan to achieve air quality and congestion reduction targets.
STP	<ul style="list-style-type: none"> ▶ Although there are no measures tied specifically to this program, it supports national performance goals.

Linking the Long-Range Plan and Capital Improvement Program

The asset management plan must include at least the following:

- ▶ Summary list, including condition, of Arizona's NHS pavements and bridges
- ▶ Asset management objectives and measures
- ▶ Performance gap identification
- ▶ Lifecycle cost and risk management analysis
- ▶ Financial plan
- ▶ Investment strategies

The US DOT must review and certify ADOT's asset management process. If US DOT determines that ADOT has failed to develop and implement such an asset management plan, the federal share for the state for that fiscal year shall be lowered to 65%.

Transit

All federal aid grant recipients are required to prepare asset management plans. The FTA will develop rules governing this requirement. The expectation is that these rules will reference the Transit Asset Management Guide. ADOT can be expected to continue to provide assistance to grant recipients to comply with this requirement.

Freight

According to Section 1115, the US DOT must prepare a report describing the conditions and performance of the national freight network within two years of MAP-21 enactment (and biennially thereafter). In addition, within one year of enactment, US DOT must begin developing new tools and improvement of existing tools for "an outcome-oriented, performance-based approach to evaluate proposed freight-related and other transportation projects." The performance provisions for freight are not as detailed as the NHPP, CMAQ, and HSIP presumably because they channel funding to states and MPOs, whereas MAP-21 does not provide for freight program funding.

5 Conclusions

ADOT is expected to update its programming processes to meet the new requirements imposed by MAP-21, but even more importantly, to be able to more effectively meet state-adopted policy for the state transportation program. To accomplish these objectives, significant changes must occur in the way projects identified in the LRTP are brought into the capital improvement program. These changes will affect ADOT, as well as partner agencies, in that all programming of projects will be expected to rely on established performance monitoring targets and be part of a statewide asset management program. How the performance requirements will be defined is part of this effort and will include a review of existing ADOT programs that already comply and an analysis of other agencies that have developed innovative ways to manage their transportation programs. During the review of these programs and practices, ADOT will have to consider how they relate to Arizona's needs and how they implement the state's policy direction for the transportation system while remaining compatible with national requirements. Among the findings related to how the LRTP can be most effectively translated into implementation steps through the capital program are the following:

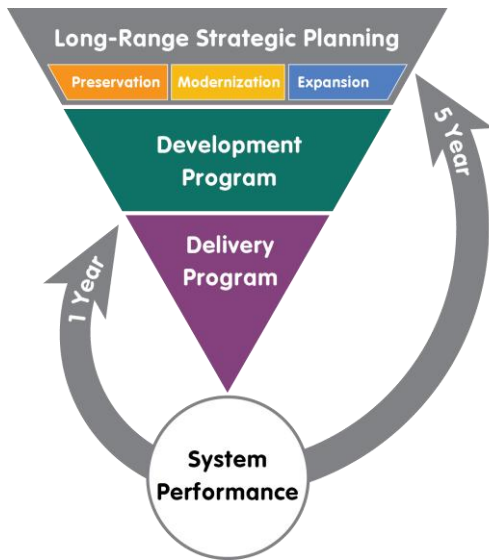
- ▶ ADOT has successful examples of performance-based programs in pavement preservation and bridge that provide an example that can serve as a guide to other requirements.
- ▶ MAP-21 has imposed substantially more—and potentially more complex—performance requirements on overall transportation system management that will need to be incorporated into the ADOT planning and programming process.
- ▶ Current ADOT internal programming procedures are not widely understood within the organization, which provides an opportunity to broaden that understanding even as additional requirements become part of the annual process.
- ▶ ADOT internal procedures will change to accommodate the new requirements and to establish a “best in class” system of planning, programming, monitoring, and management.



Linking the Long-Range Plan and Construction Program

Appendix B

Working Paper No. 2





Linking the Long-Range Plan and Capital Improvement Program

P2P Link

DRAFT Working Paper No. 2

“To-Be” Planning to Programming Process

April 2013

Prepared for:

Arizona Department of Transportation
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Acronyms and Glossary

ADOT – Arizona Department of Transportation

ARS – Arizona Revised Statutes

Asset Management – A systematic process of cost effectively maintaining, upgrading, and operating physical assets. It combines engineering principles with sound business practices and economic theory, and it provides tools to facilitate a more organized, logical approach to decision-making. Thus, asset management provides a framework for handling both short- and long-range planning.

[<http://www.fhwa.dot.gov/infrastructure/asstmgmt/amprimer.pdf>]

bqAZ – Building a Quality Arizona, a 2010 Statewide Transportation Planning Framework Study

CIP – Capital Improvement Program

CMAQ – Congestion Mitigation and Air Quality Improvement Program initiated in 1991 as part of ISTEA

COG – Council of Governments

Corridor – A broad geographical band that follows a general directional flow connecting major sources of trips that may contain a number of streets, highways and transit route alignments. [FHWA Transportation Planning Capacity Building Glossary. <http://www.planning.dot.gov/glossary.asp>]

DOT – Department of Transportation

Expansion - One of the four RIC categories that pertains to improvements adding transportation capacity through the addition of new facilities and or services; expansion activities include adding new highway lanes, expanding bus service, construction of new highway facilities, and adding rail passenger service or facilities. The recommended funding distribution for this category is 27%. [ADOT LRTP |What Moves You Arizona?]

FAA – Federal Aviation Administration

FHWA – Federal Highway Administration

Financially Constrained or Fiscal Constraint – The metropolitan transportation plan, TIP, and STIP includes sufficient financial information for demonstrating that projects in the metropolitan transportation plan, TIP, and STIP can be implemented using committed, available, or reasonably available revenue sources, with reasonable assurance that the federally supported transportation system is being adequately operated and maintained. For the TIP and the STIP, financial constraint/fiscal constraint applies to each program year. Additionally, projects in air quality nonattainment and maintenance areas can be included in the first two years of the TIP and STIP only if funds are “available” or “committed.”[23 CFR 450.104.]

FTA – Federal Transit Administration

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FRA – Federal Railroad Administration

Goals – A broad statement that describes a desired end state.

ISTEA – Intermodal Surface Transportation Efficiency Act of 1991, Federal Aid Funding Authorization from 1992 – 1997

LRTP – Long-Range Transportation Plan, a document resulting from regional or statewide collaboration and consensus on a region or state’s transportation system, and serving as the defining vision for the region’s or state’s transportation systems and services. [FHWA Transportation Planning Capacity Building Glossary. <http://www.planning.dot.gov/glossary.asp>.]

MAP-21 – Moving Ahead for Progress in the 21st Century Act, Federal Aid Funding Authorization for 2012 – 2014

MPD – ADOT’s Multimodal Planning Division

Metropolitan Planning Area – The geographic area in which the metropolitan transportation planning process required by 23 U.S.C. 134 and Section 8 of the Federal Transit Act (49 U.S.C. app. 1607) must be carried out. [FHWA Transportation Planning Capacity Building Glossary. <http://www.planning.dot.gov/glossary.asp>.]

Modernization - One of the four RIC categories that pertains to highway improvements upgrading efficiency, functionality, and safety without adding capacity; examples of modernization activities include widening of narrow lanes, access control, bridge replacement, hazard elimination, lane reconstruction, aviation upgrades, and bus system upgrades. The recommended funding distribution for this category is 29%. [ADOT LRTP | What Moves You Arizona?]

MPO – Metropolitan Planning Organization, the policy board of an organization created and designated to carry out the metropolitan transportation planning process. [23 CFR 450.104.] Regional planning body, required in urbanized areas with a population over 50,000, and designated by local officials and the governor of the state. Responsible, in cooperation with the state and other transportation providers, for carrying out the metropolitan transportation planning requirements of federal highway and transit legislation. Formed in cooperation with the state, develops transportation plans and programs for the metropolitan area. [23 U.S.C. 134(b)(1) and Federal Transit Act of 1991 Sec. 8(b)(1).]

NEPA – National Environmental Policy Act

NHS – National Highway System

Non-Highway - One of the four RIC categories that pertains to investments in non-highway modes like transit, freight and passenger rail, and aviation; ADOT’s role will be either participant or partner. The recommended funding distribution for this category is 10%. [ADOT LRTP | What Moves You Arizona?]

Objective – A specific, measurable statement related to the attainment of a goal. [FHWA Transportation Planning Capacity Building Glossary. <http://www.planning.dot.gov/glossary.asp>.]

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P2P Link – Linking the Long-Range Plan and Capital Improvement Program project

PAC – Project Advisory Committee

Performance-based planning and programming – refers to the application of performance management within the planning and programming processes of transportation agencies to achieve desired performance outcomes for the multimodal transportation system. Attempts to ensure that transportation investment decisions are made – both in long-term planning and short-term programming of projects – based on their ability to meet established goals. [FHWA Performance Based Planning and Program web site: http://www.fhwa.dot.gov/planning/performance_based_planning/]

Performance Management – A strategic approach that uses data and information to support decisions that help to achieve performance outcomes.

Performance measurement – A process of assessing progress toward achieving goals using data.

Performance measure – A metric used to assess progress toward meeting an objective; an indicator of transportation system outcomes.

PMT – Project Management Team

PPAC – Priority Planning Advisory Committee

Preservation - One of the four RIC categories that pertains to activities protect transportation infrastructure by sustaining asset condition or extending asset service life; preservation includes regular maintenance and resurfacing of pavements, replacing aged transit vehicles, upgrading rail track, and airport runway rehabilitation. The recommended funding distribution for this category is 34%. [ADOT LRTP |What Moves You Arizona?]

Programming – Prioritizing proposed projects and matching those projects with available funds to accomplish agreed upon, stated needs. [FHWA Transportation Planning Capacity Building Glossary. <http://www.planning.dot.gov/glossary.asp>.]

Project – Well-defined, individual actions and activities that make up a program. The implementation of projects is how the program is realized. [FHWA, “Freeway Management and Operations Handbook”, FHWA-OP-04-003, September 2003]

Project selection – The procedures followed by MPOs, States, and public transportation operators to advance projects from the first four years of an approved TIP and/or STIP to implementation, in accordance with agreed upon procedures. [23 CFR 450.104.]

PRIIA – Passenger Rail Investment and Improvement Act of 2008

RCIP – Regional and Community Improvement Priorities

RTPFP – Regional Transportation Plan Freeway Program

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STB – State Transportation Board, a seven-member panel established under ARS 28 Chapter 2, Article 1 whose members are appointed by the Governor. Members of the panel serve six-year terms and represent different geographical regions of the state.

STIP – Statewide Transportation Improvement Program, a document that defines the current priority programming process used by ADOT.

STP - Surface Transportation Program

SHSP – Strategic Highway Safety Plan, a statewide-coordinated safety plan that provides a comprehensive framework, and specific goals and objectives, for reducing highway fatalities and serious injuries on all public roads, developed by the State DOT in accordance with U.S.C. 148(a)(6). [23 CFR 450.104.] The SHSP is a data-driven, four to five year comprehensive plan that integrates the 4Es: engineering, education, enforcement and emergency medical services (EMS). The SHSP strategically establishes statewide goals, objectives, and key emphasis areas developed in consultation with Federal, State, local, and private sector safety stakeholders. [FHWA, Strategic Highway Safety Plans: A Champion's Guide To Saving Lives, Guidance to Supplement SAFETEA-LU Requirements, April 5, 2006, <http://safety.fhwa.dot.gov/safetealu/shspguidance.htm>.]

TAM – Transportation Asset Management, a strategic and systematic process of operating, maintaining, upgrading, and expanding physical assets effectively through their life cycle. It focuses on business and engineering practices for resource allocation and utilization, with the objective of better decision-making based upon quality information and well defined objectives. [<http://www.fhwa.dot.gov/infrastructure/asstmgmt/tpamb.cfm>]

Target – A specific level of performance that is desired to be achieved within a certain timeframe.

Tier – Layers within the transportation system defined by functional classification or usage.

TIP – Transportation Improvement Program, A prioritized listing/program of transportation projects covering a period of four years that is developed and formally adopted by an MPO as part of the metropolitan transportation planning process. Must be consistent with the metropolitan transportation plan; required for projects to be eligible for funding under title 23 U.S.C. and title 49 U.S.C. Chapter 53. [23 CFR 450.104.]

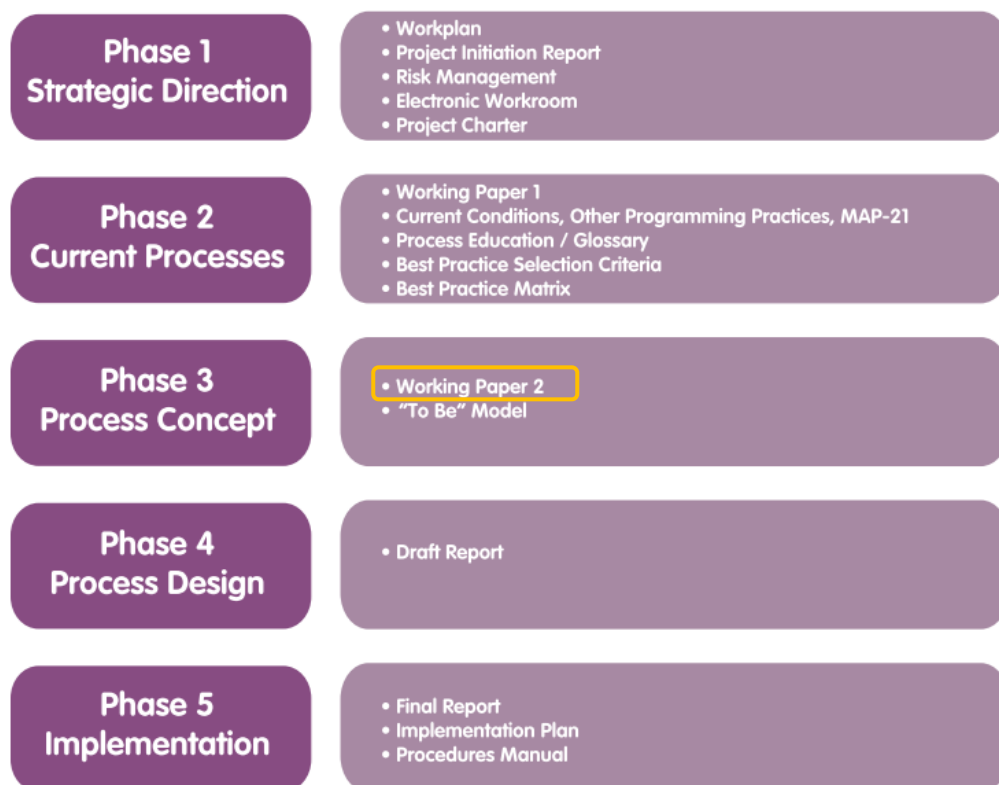
TMA – Transportation Management Association, an urbanized area with a population over 200,000, as defined by the Bureau of Census and designated by the Secretary of Transportation, or any additional area where TMA designation is requested by the Governor and the MPO and designated by the Secretary of Transportation. [23 CFR 450.104.]

TSP – Transportation Systems Plan

1 Introduction and Overview

The principal basis of *Linking the Long-Range Plan and Capital Improvement Program* (P2P Link) is to establish a well-documented, understandable, logical, and defensible means of selecting and prioritizing projects in the capital improvement program that will allow the Arizona State Transportation System to meet the objectives identified in the Long Range Transportation Plan (LRTP). P2P Link is being approached through five project phases that include a series of deliverables documenting its development, as shown in Figure 1. The project is currently in Phase 3: Process Concept, where Working Paper No. 2 describes the desired process concept for ADOT, the “to-be” business model. The process concept has been designed to incorporate national best practices that work well for Arizona, address the business objectives specified by the project team, apply existing elements of the planning and programming process to achieve the stated business objectives, and implement MAP-21 requirements.

Figure 1 – Project Documentation



1.1 Background

1.1.1 Concept Process Models

Several concept process models were developed and analyzed as part of P2P Link Phase 3. The project team evaluated the merits of each concept at a best practices workshop held on January 29, 2013. The team input served as the foundation for the “to-be” business model. The concept themes are listed below and described in more detail in Appendix A.

- ▶ Concept 1 – Statewide Investment Categories
- ▶ Concept 2 – Strategic Statewide Investment Priorities
- ▶ Concept 3 – Regional Investment Priorities
- ▶ Concept 4 – Statewide Overall Performance Ranking

1.1.2 Best Practices Workshop

The best practice workshop held on January 29, 2013 provided a forum for discussion of best planning to program practices, as well as concept model critique by the project team with input from other participating Departments of Transportation (DOTs). Workshop attendees included the PMT and PAC, along with representatives from the Colorado, Minnesota, Oregon and Utah DOTs. These states were selected by the project team during Phase 2 of P2P Link as agencies with similar programming considerations to ADOT that have implemented recognized best planning to programming practices.

The workshop content focused on two areas – 1) best practices implemented in other states and 2) concept process model evaluation. Representatives from each state presented an overview of their planning to programming process, which included:

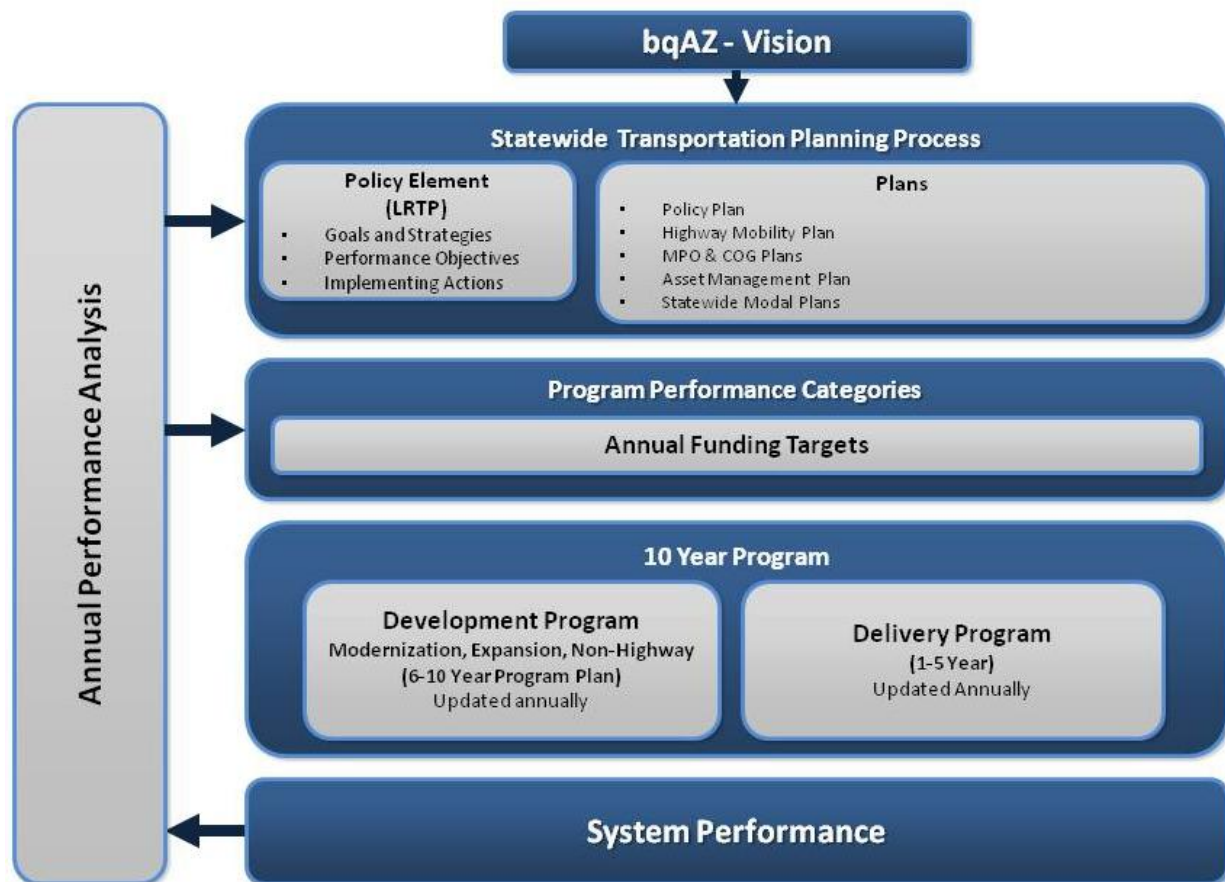
- ▶ Overview of the DOT’s Planning and Programming Process
 - Program length (5 years, 10 years, other)
 - Program structure (centralized, decentralized, etc)
 - How long has the process been implemented?
 - How do projects move through the process, planning to programming?
 - Are projects ranked? If so, how?
- ▶ Challenges encountered while developing and implementing their process
- ▶ Lessons learned

The presentations were concluded by a panel discussion of questions posed by the PMT and PAC. Following the best practice presentations, the concept models were described, evaluated and debated by the attendees. The workshop summary and state presentations are provided in Appendix B.

1.2 Intent of Working Paper No. 2

Working Paper No. 2 summarizes the “to-be” planning and programming process for ADOT. The new approach utilizes an integrated performance-based, data-driven methodology that will provide Arizona with an on-going process to ensure the most effective use of scarce transportation dollars. The overall process is summarized in Figure 2 and involves the following components.

Figure 2 – ADOT P2P Link Process



- ▶ **Statewide Long-Range Transportation Planning Process.** This is composed of the statewide long-range transportation plan (LRTP), modal and special topical plans, and the MPO plans. It is a coordinated, on-going process that is generally updated every five years and complies with federal and state statutory requirements.
- ▶ **Program Performance Categories.** The statewide transportation planning process includes program performance categories. These detail the planned level of performance of the transportation system. Established through the planning process, they are outcome oriented, addressing mobility and safety, asset management, and all transportation modes. The performance requirement is the mechanism that links planning to programming.
- ▶ **10-year Development Program.** A 10-year work plan, comprised of a development program and a delivery program, links the plans to implementation. The development program covers

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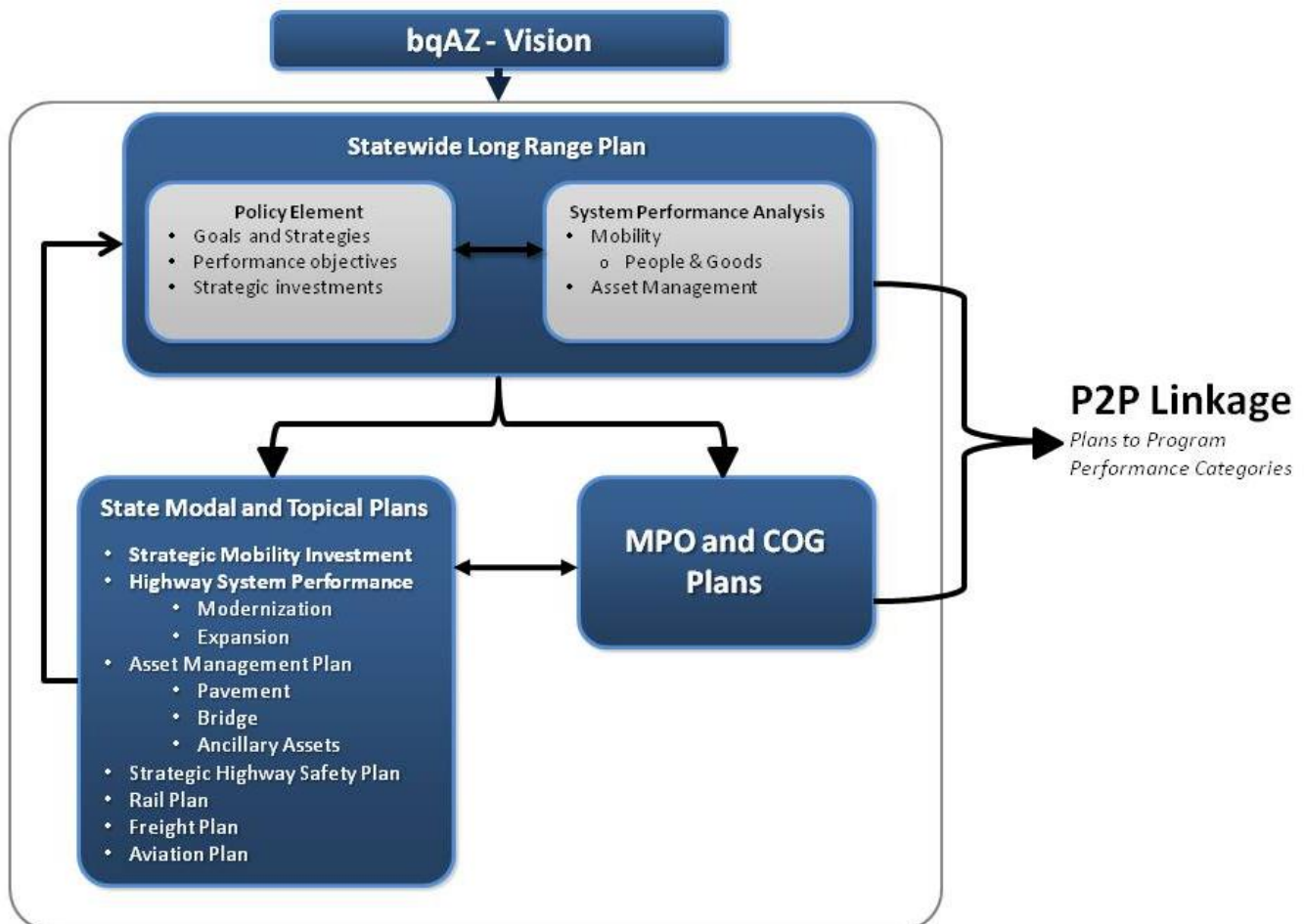
years 6 to 10 and includes expansion, modernization and non-highway projects. When the projects reach the point at which delivery timelines can be predicted and managed, they advance into a delivery program for construction or implementation. The development program is updated annually.

- ▶ **5-year Delivery Program.** The delivery program includes projects that address all program performance categories. It represents a committed work program that ADOT holds itself accountable for delivering. The delivery program is fiscally feasible with delivery costs balanced against forecast revenue budgets. This program is also updated annually.
- ▶ **System Performance.** The system performance involves an annual performance assessment that tracks and reports performance against metrics established in the statewide LRTP. The assessment informs the next LRTP cycle of performance goals, strategies and objectives, as well as the emphasis placed on performance categories in both the LRTP and the annual program update.

2 Statewide Transportation Planning Process

The statewide transportation planning process of the “to-be” model is a continuous process comprised of integrated and coordinated components as depicted in Figure 3. Through the statewide long-range planning process, ADOT establishes policy-driven goals, strategies and objectives for the performance of the transportation system. The components are detailed in the following subsections.

Figure 3 – Statewide Transportation Planning Process



2.1 Statewide Long-Range Plan

2.1.1 Policy Element

The policy element sets goals, strategies, and performance objectives for the multimodal transportation system. Through a collaborative process, this includes performance within MPOs and COGs .

Goals and Strategies

The policy element establishes goals, strategies, performance objectives, metrics and targets consistent with Arizona and MAP-21 requirements. It is data-driven using system-level performance analysis to develop targets and consider scenarios for the performance of the transportation system based on different investment levels, policy priorities for performance, and broad allocations of resources. The policy element addresses Arizona and MAP-21 established national performance goal areas of:

- ▶ Safety
- ▶ Infrastructure condition
- ▶ Congestion reduction
- ▶ System reliability
- ▶ Freight movement and economic vitality
- ▶ Environmental sustainability
- ▶ Reduced project delivery delays

The performance objectives and targets established in the statewide LRTP will provide a statement of the level-of-performance that is planned for the transportation system. In a cooperatively developed performance-driven process, the implementation of modal and topical plans, MPO and COG plans, and the delivery of capital improvements, as programmed, would result in the *planned level of performance*.

- ▶ **Goals.** The LRTP will identify Arizona’s broad policy goals for the transportation system and its performance.
- ▶ **Strategies.** The LRTP will identify the strategies to be pursued that accomplish the goals. This includes the overall strategies for effectively using resources to accomplish planning goals. *This is a foundational element of the P2P Link process.* These strategies closely link investments to performance objectives, and as discussed below, stratify or “tier” the performance objectives for the transportation system based on functional role and travel demand.

Performance Objectives

The statewide planning process establishes overall goals and strategies for meeting performance objectives. System performance analysis will identify any systemwide performance issues. This is a data-driven process that will evaluate baseline or current year performance against policy objectives and has the capability to assess future performance under different planning and investment scenarios.

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A risk-based approach will be used to set performance targets. This will be policy-driven through the identification of risk tolerances in the policy element of the LRTP. The expectation is that a risk-based approach to setting targets will benefit from “tiering” the system. As a matter of policy, different performance objectives and targets will be established for different tiers. The risk-based process for tiering would likely combine, at a minimum, the functional role (functional classification) and current and forecast travel demand as a means to differentiate the allocation of resources based on risk.

The performance categories are established in the planning process; however the expectation is that for ADOT’s P2P Link process, performance objectives will fall into the following broad areas. ADOT’s current LRTP, “What Moves You Arizona?” (November 2011), established the Recommended Investment Choice (RIC) categories, which are consistent with these broad performance areas. The RIC includes the performance categories of Expansion, Modernization, Preservation and Non-Highway.

- ▶ **Mobility.** Mobility performance addresses the ability of the multimodal system to support the accomplishment of desired economic and quality of life outcomes. Performance metrics will be determined during implementation; however they will include reliability, capacity, and productivity among others. The metrics selected will provide a snapshot of system performance. (RIC categories Expansion and Modernization)
- ▶ **Asset Management.** Asset Management will address the risk-based lifecycle management of the highway system. This performance category will include delivering the performance objectives and targets agreed to for the lowest lifecycle cost consistent with safety and reliability. Performance objectives and targets are risk-based and will follow the policy approach established for tiering the system. The tiered performance targets are established using input from the asset management planning analysis. (RIC category Preservation)
- ▶ **Modal.** The statewide LRTP will establish policy priorities and objectives for other modes. (RIC category Non-Highway)

Strategic Investments

The statewide LRTP will identify strategic investments that are required to meet the goals and performance objectives established for the transportation system. It will be necessary to define criteria that specify how these projects or initiatives contribute to improving system performance. The intent is that strategic investments will result in the identification and inclusion in the statewide LRTP of the highest priority improvements of statewide significance. Inclusion in the LRTP will provide commitment and focus for implementation.

Once identified as strategic investment priorities, the statewide planning process will involve further analysis and implementing actions to develop a planned solution. Criteria will be developed to ensure that the strategic investments represent those most critical for transportation system performance and this will require consideration of likely financing strategies. While the plan is not fiscally constrained, there will be financial constraints and the requirement that a financing strategy be developed and refined as strategic investments progress. This is important for the integrity of a performance-based planning process because it is dependent on the link between planning and implementation.

2.1.2 System Performance Analysis

The analysis will support the evaluation of system performance, measured in terms of the performance objectives and metrics established in the policy element under different plan scenarios. These could be policy or finance driven. The system performance analysis methodology will be designed so that annual performance reports are produced that assess performance against specified targets. The annual performance report will provide guidance for the annual update of investment allocations.

The system performance analysis will identify modernization and expansion needs. The methodology for this will require current and forecasted volume data for people and freight mobility. The performance approach and metrics will be multimodal, although it is recognized that the solutions in the implementing program may be modal due to finance and statutory requirements governing the programming process.

In general, at the system level, performance area will address the following categories. The system performance analysis will incorporate consideration of freight, and incorporate as applicable analysis from the freight plan.

Strategic Mobility

Includes the identification of strategic performance requirements for ensuring the economic competitiveness and efficiency of the transportation system (likely corridor based or within major intrastate travel markets or into and out of state). This will involve modernization and expansion that is strategically important for the performance of the transportation system and will influence all performance categories.

- ▶ **Modernization.** Risk driven, tied to safety and impact on system performance around reliability both at the strategic level and for performance areas with more regional or localized performance issues.
- ▶ **Expansion.** Connected to improvements in reliability and providing the multimodal capacity required to meet mobility performance targets for travel demand growth at the strategic level and for performance areas with more regional or localized performance issues. Regional or localized, expansion projects are likely to involve addressing bottlenecks and other actions that improve the operational reliability and productivity of the highway system.
- ▶ **Asset Management.** The asset management performance will be assessed, applying the analytical tools and procedures used to develop the risk-based asset management plan. The analysis will address the performance or condition of the assets under different plan scenarios and apply the technically warranted optimization procedures. The intent in the performance analysis is to optimize performance with the financing available for highway system asset management. This analysis will apply the asset management planning capabilities used to prepare the asset management plan.
- ▶ **Non-Highway Performance.** Modal performance analysis will use the results from modal plans to identify performance issues that impact the accomplishment of overall statewide goals and objectives for the transportation system. This could result in inclusion of strategic investments

Linking the Long-Range Plan and Capital Improvement Program

and/or strategies that address modal performance. The system performance analysis draws on the statewide modal plans.

2.2 MPO and COG Plans

The statewide transportation planning process builds in close collaboration and integration with MPO plans and COG plans, as applicable. The expectation is that state and MPO performance metrics will align, while the planned level of performance in the MPO areas will be established through the MPO plans. In turn, there is a state interest in the planned level of performance in the MPO areas because a large proportion of the population lives and works there. It is also anticipated that the strategic investments identified in the statewide LRTP will have termini or be entirely located in some of the MPOs and COGs.

2.3 State Modal and Topical Plans

The statewide transportation planning process and the statewide transportation plan incorporate modal and topical plans. These plans address modal performance and provide enough specificity to drive the development of the Capital Improvement Program and the development of long-range statewide transportation plan implementing actions that are operational or do not involve direct project development.

The modal plans also provide data and analysis to support the LRTP system performance analysis. They provide the data-driven performance results to develop the solutions and projects to meet the performance objectives.

The following is guidance on the scope and role of modal and topical plans:

Strategic Mobility Investment Plans

Corridor or other investment planning will be required to develop solutions that address the strategic investment specified in the LRTP. Strategic mobility planning will occur as identified or directed through implementing actions for the statewide LRTP. The purpose of the planning will be to establish the implementation strategy and plan for addressing the strategic performance risks identified in the system planning analysis. This planning will be multimodal.

Highway System Performance

Highway system performance will be addressed through a combination of statewide analysis, district analysis and in the plans conducted by MPOs and COGs. The planning methodology would identify priorities and criteria driving the prioritization of strategies and projects to address these performance areas. The intent here is not to have a process-heavy approach, but to combine district and statewide identification of modernization and expansion plans. The methodology would likely involve collaboration between a statewide, district, and MPOs. The highway system performance planning will also address bicycle and pedestrian facilities.

Asset Management Plan

Risk-based asset management plans will provide a strategy and plan for managing to the performance targets set for the different asset classes. This will be accomplished through the LRTP policy process, but

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will require the technical analysis conducted through asset management planning. The expectation is that the plan will include an implementation strategy to guide how resources will be allocated and technically warranted improvements defined over a near term (5-year asset management project planning horizon). Asset management plans will address bridge, pavement, and ancillary assets. The focus of the plans will be on improving lifecycle management and considering risk in doing so.

Strategic Highway Safety Plan

The statewide transportation plan incorporates the implementation actions that ADOT is responsible for within the federally required strategic highway safety plan. This is a statewide-coordinated safety plan that provides a comprehensive framework for reducing highway fatalities and serious injuries on all public roads. ADOT develops the plan through a cooperative process with Local, State, Federal, and private sector safety stakeholders. It is data-driven and is a 4 to 5-year comprehensive plan that establishes statewide goals, objectives, and key emphasis areas and integrates engineering, education, enforcement and emergency medical services (EMS).

Rail Plan

The Arizona Rail Plan, is prepared to meet the requirements of the Passenger Rail Investment and Improvement Act of 2008 (PRIIA) for a FRA-accepted State rail plan as an eligibility requirement for the capital grants authorized in the Act and those available under the High-Speed Intercity Passenger Rail program. The Arizona Rail Plan is incorporated into the statewide planning process. It links to the CIP by identifying state priorities for rail improvements.

Freight Plan

A data driven freight plan will be developed as an on-going process for addressing freight mobility at the policy and investment levels. The freight plan element will address MAP-21 requirements, incorporating a policy element that includes the consultative requirement for industry input and identification of project improvements that could then be eligible for a smaller state match per MAP-21 requirements. This plan will focus on intermodal connections and distinct freight industry performance requirements.

Aviation Plan

The state aviation plan will also be a component of the planning process and the information will be integrated into the system performance analysis. The state aviation plan addresses both FAA requirements for continuous aviation system planning and ADOT's responsibilities with respect to airports that the state owns and operates.

3

Program Performance Categories

The statewide transportation planning process implements plans through policy actions, operational activities and the capital improvement program. The process, which encompasses the statewide LRTP, modal plans, and MPO plans, is linked to implementation through the program performance categories.

The statewide planning process is performance driven. The plans specify the strategies and implementing actions to improve performance or address risks to performance decline. The planning analysis, through the identification of risks and targets, determines what level of performance to plan for and what the overall performance priorities are over the planning horizon. The basis for the P2P linkage is the performance categories established in the statewide planning process. The “to-be” program performance categories utilize the current LRTP RIC categories, as shown in Figure 4. The plans include a 10-year project-specific improvement horizon.

Figure 4 – Program Performance Categories, Plan Linkage to the Program



3.1 Strategic Investments

Strategic investments, and priorities for the 20-year horizon, will be specified in the statewide LRTP. These include investments that are of scale and scope of statewide strategic importance because of their impact on system performance objectives. The statewide plan involves more detailed planning activities to define transportation solutions. These are specified at the project level, then selected and prioritized for inclusion in the strategic mobility performance category, which is a 10-year program.

Strategic investments will address modernization, expansion, non-highway and overall system performance. It is their scale and strategic impact that defines inclusion in this performance category. Strategic investments are identified and developed through the statewide planning process. Performance analysis and prioritization occurs at the state level based on relative contribution to meeting statewide performance objectives.

The P2P Link process implementation (Phase 4) will develop criteria and further specificity regarding this program category. As noted earlier, projects in this category will implement improvements that address statewide strategic performance. The P2P linkage into the program performance category is project prioritization on a statewide competitive basis. The expectation is that the 10-year strategic mobility performance category provides the blueprint for strategic investments that will determine the planned level of performance – the forecast performance metrics for the system assuming the 10-year program is delivered as planned.

3.2 Modernization

The modernization performance category addresses improvements to the highway system that apply current standards and practices for efficient operation, safety, and reliability. Projects are selected and prioritized into this category as a 10-year program. This time period reflects both the project development timelines for major improvement projects and the requirements for efficient delivery of an orderly and predictable delivery program. Improvements in the modernization category address performance impacts that are regionally or more locally significant. Districts will identify projects consistent with the Highway System Performance Plan for areas outside of MPOs. Within the MPOs, the District and MPO will collaborate on project identification. These projects then compete on a statewide basis using performance criteria for inclusion in the 10-year modernization program category. For projects within the MPO planning area, the MPO planning process drives the identification and prioritization of modernization projects consistent with the criteria for modernization work.

3.3 Expansion

This performance category addresses improvements to the current highway system that involve its expansion. Criteria governing the type of work eligible under this category will be developed in P2P Link Phase 4. The projects will address performance improvements of regional and local significance. The P2P linkage will occur with Districts identifying candidate improvements or improvements contained within strategic investment corridors based on performance criteria established through the statewide transportation planning process. Inside of MPO areas, these improvements will be identified in MPO plans.

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The linkage is affected by evaluating and prioritizing projects for inclusion in the 10-year expansion program performance category. The statewide planning process will make an allocation to this performance category. Each District then nominates its expansion improvements.

3.4 Preservation

The condition of the Arizona highway system is maintained and improved through the allocation of resources and the programming of projects in the preservation performance category. Highway assets are grouped by broad asset class into pavement, bridge (this includes at a minimum all structures on the National Bridge Inventory), and ancillary assets.

The statewide long-range transportation planning process includes decision-making regarding program emphasis between the mobility and safety performance area and asset management. To develop the Asset Management Plan, a five-year forward-looking budget for asset management is established as part of the LRTP update and annual targets made each year as part of the program update.

The Asset Management Plan establishes an optimized five-year plan for each asset class (optimized based on assumptions about available funding). The statewide transportation planning process provides the policy emphasis for the allocation of resources between program performance categories. The asset management plan analysis establishes the strategy regarding the allocation between bridge, pavement, and ancillary asset work. This is accomplished by implementing risk-based asset management strategies for each of these asset classes.

3.4.1 Pavement Preservation

The pavement preservation performance category addresses achieving performance targets established for pavement condition. More specifically, the asset management plan will establish a lifecycle management strategy for Arizona's pavements that identifies the optimized use of funds given a planned five-year expenditure level. Projects are nominated by Districts and headquarters, but prioritized applying performance criteria on a statewide basis.

3.4.2 Bridge Preservation

The Asset Management Plan establishes the strategy and multi-year program plan for bridge preservation. Similar to pavement preservation, bridge preservation projects are nominated regionally and centrally, but prioritized applying performance criteria on a statewide basis.

3.4.3 Ancillary Assets

The Asset Management Plan establishes performance targets and the risk-based plan for these assets by asset class. These include guard rail, signs, gantries, ITS devices among others. A number of the ancillary assets will include maintenance features. The overall asset management plan will determine the allocation to this category. Risk-based guidance will be used to identify and prioritize the timing and type of improvement. It will also utilize different performance targets to the tiered system.

The Asset Management Plan will provide guidance for the allocation of funds for ancillary assets. Applying the criteria for technically warranted work that are established statewide, each District will nominate projects that address ancillary asset needs.

3.5 Non-Highway

The Non Highway performance category includes mode-specific improvements identified through the State Rail Plan and Aviation Plan. Under current laws, these include projects that are funded through revenue sources that may only be applied to specific types of improvements.

3.5.1 Rail

For inclusion in this category, projects must be included in the Arizona State Rail Plan.

3.5.2 Aviation

For inclusion in this category, projects must be included in the Arizona Aviation Plan.

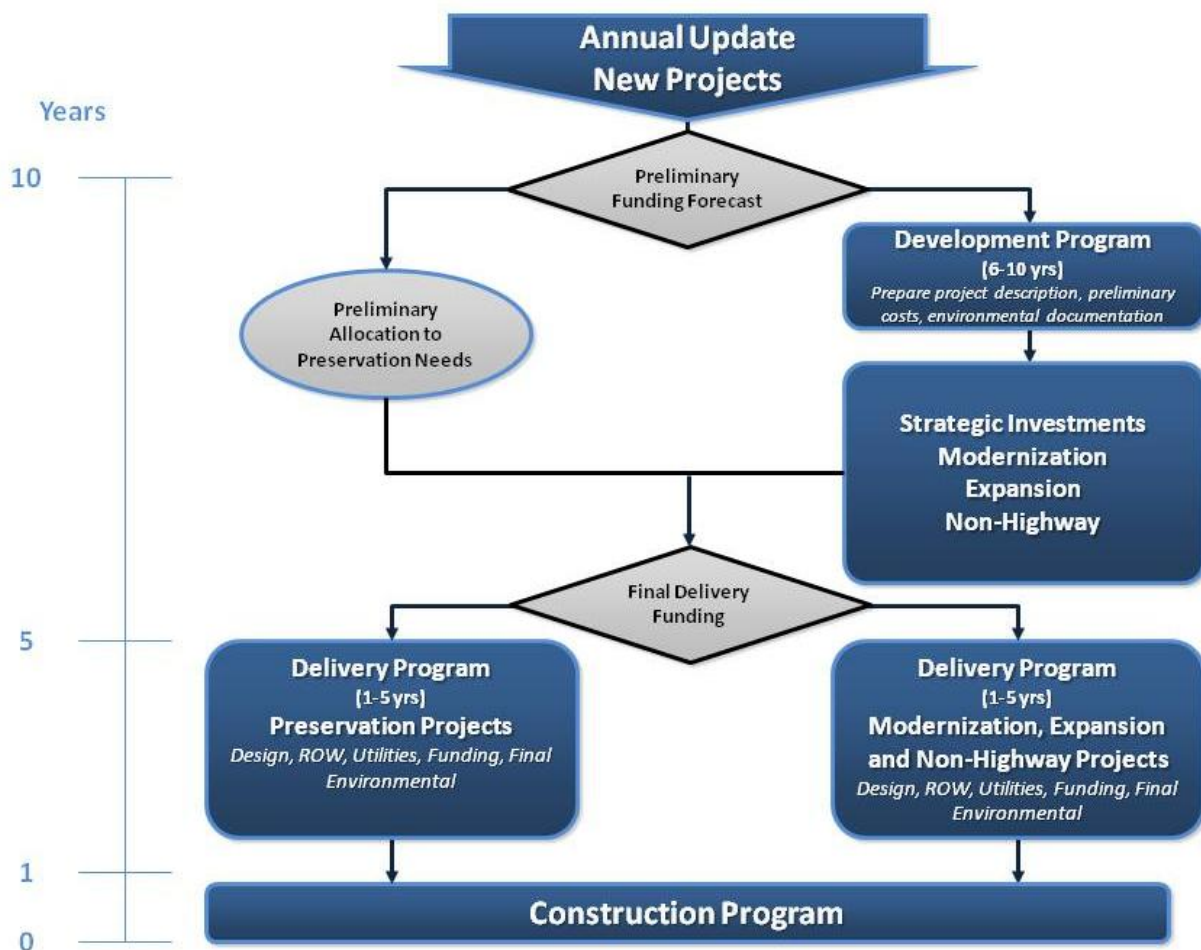
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4

10-Year Program Plan

The statewide planning process is implemented through the 10-Year Program Plan, which includes a 10-year Development Program and a 5-year Delivery Program. The timeline for modernization and expansion project development is designed to provide an efficient, predictable and accountable process, as illustrated in Figure 5.

Figure 5 – Development to Delivery Programs



Linking the Long-Range Plan and Capital Improvement Program

The 10-Year Program Plan is structured such that a:

- ▶ **Development Program (Years 6 – 10)** provides the pipeline and predictability for capital improvements to address modernization, expansion and non-highway performance.
- ▶ **Delivery Program (Years 1 - 5)** includes ADOT’s committed 5-year construction program for all plan performance categories, incorporating ADOT’s requirements for the statewide transportation improvement program under federal law.

In the case of both the Development and the Delivery Programs, the intent is that the planning analysis would be able to communicate the *level of performance* that will be achieved when the program is implemented. The prior sections describe the performance-based planning process that results in the projects and programs included in the program.

4.1 10-Year Development Program

The 10-Year Program Plan includes the projects and programs needed to implement Arizona’s transportation plans and deliver the planned level of service. The 10-Year Development Program includes revenue projections and is based on policy-driven program emphasis between performance categories. Implementation will likely involve the following process:

- ▶ **Funding Allocation.** Confirm Delivery Program funding allocation to preservation and committed modernization and expansion projects.
- ▶ **Funding Forecast.** Forecast revenue for years 6 to 10, and confirm or establish year 6 to 10 program emphasis.
- ▶ **Performance Targets.** Set target for adding modernization, expansion and non-highway projects into the 10-Year Development Program.

The allocation reflects the best balance determined by ADOT, through the planning process, among the performance objectives for modernization, expansion, non-highway and asset management.

A financial constraint is established for the Development Program that reflects the program emphasis and revenue forecasts in order to be financially feasible. In principle, the approach is that a source of funding needs to be identified before projects can be identified in the Development Program. To build the Development Program, assumptions will need to be made about the balance of resources among the categories. It is expected that some strategic investments will require assumptions regarding the development of new revenue sources.

4.2 5-Year Delivery Program

The 5-Year Delivery Program specifies the projects and programs to be constructed within the upcoming five-year time period. The intent is that this is ADOT’s cash-feasible, implementable construction program. It includes projects and programmatic expenditures. Each year, as part of program update, offsetting changes are made and the program is adjusted to ensure financial feasibility.

Linking the Long-Range Plan and Capital Improvement Program

For modernization, expansion and non-highway projects to advance from the Development to the Delivery Program, they must have costs and schedules that ADOT holds itself accountable for accomplishing. This provides an open and transparent approach that enables ADOT to meet performance targets for delivering projects when promised. By doing so, predictability is improved and ADOT staff can target efforts on specific tasks, saving staff time and making better use of limited resources.

4.3 From Development to Delivery Program

Generally, modernization, expansion and non-highway projects cannot enter the Delivery Program unless they have been in the Development Program. The transition from the Development and Delivery Programs will greatly improve ADOT's performance in delivering projects according to committed schedules. Projects with significant delivery risks will not advance. For a project to be included in the Delivery Program, it must have secured, or be expected to secure, all necessary permits and approvals during the five-year delivery period, whereas the Development Program includes projects that are approved and funded to reach identified milestones. After a project is included in the Delivery Program, management of the final design and construction occurs through the project delivery process.

5

System Performance

The critical element of the proposed “to be” process is how performance will influence programming. As mentioned earlier, performance is the link between the plan and the construction program. Performance is also a requirement of MAP-12. While it is clear that the program will need to be performance-based, how and when performance is measured will dictate many of the decisions about how the program is shaped annually and with every LRTP, modal plan or asset management plan update. The objective of making any improvement is to produce a positive change in the condition of the transportation system. That change, and the plans for making further changes into the future, must be measured or forecast from year to year and from plan to plan. Over time, the changes are designed to result in a measurable travel-based benefit to the citizens of the State that, in turn, contributes to how decisions about resources allocation will be made in the next programming cycle. This section describes how the performance update process in the proposed P2P Link model will work.

5.1 Annual Program Update Process

The program is updated annually. Guided by transportation planning, an annual performance review and an assessment of the financial feasibility of the existing 5-year Delivery Program, ADOT recommends funding levels to apply to the updated Development and Delivery Programs. Figures 6 and 7 illustrate this process.

Figure 6 - P2P Linkage

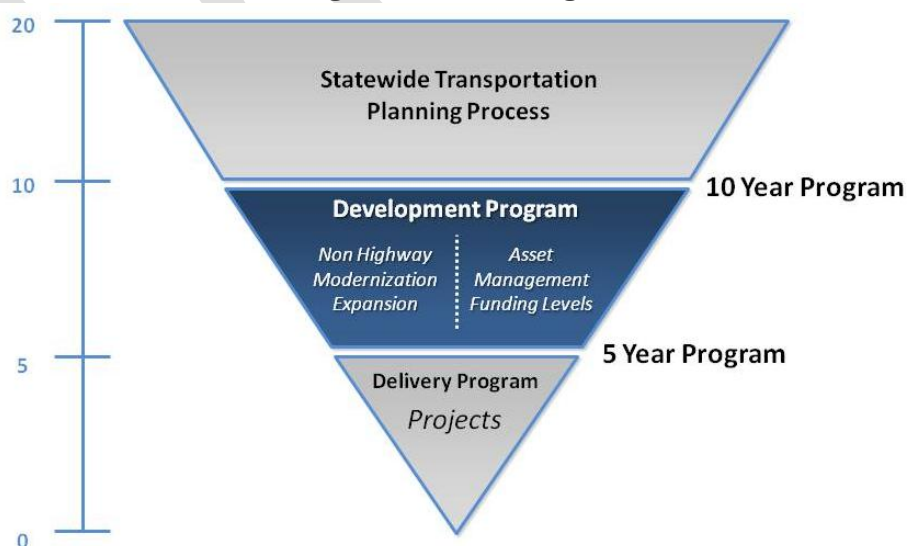
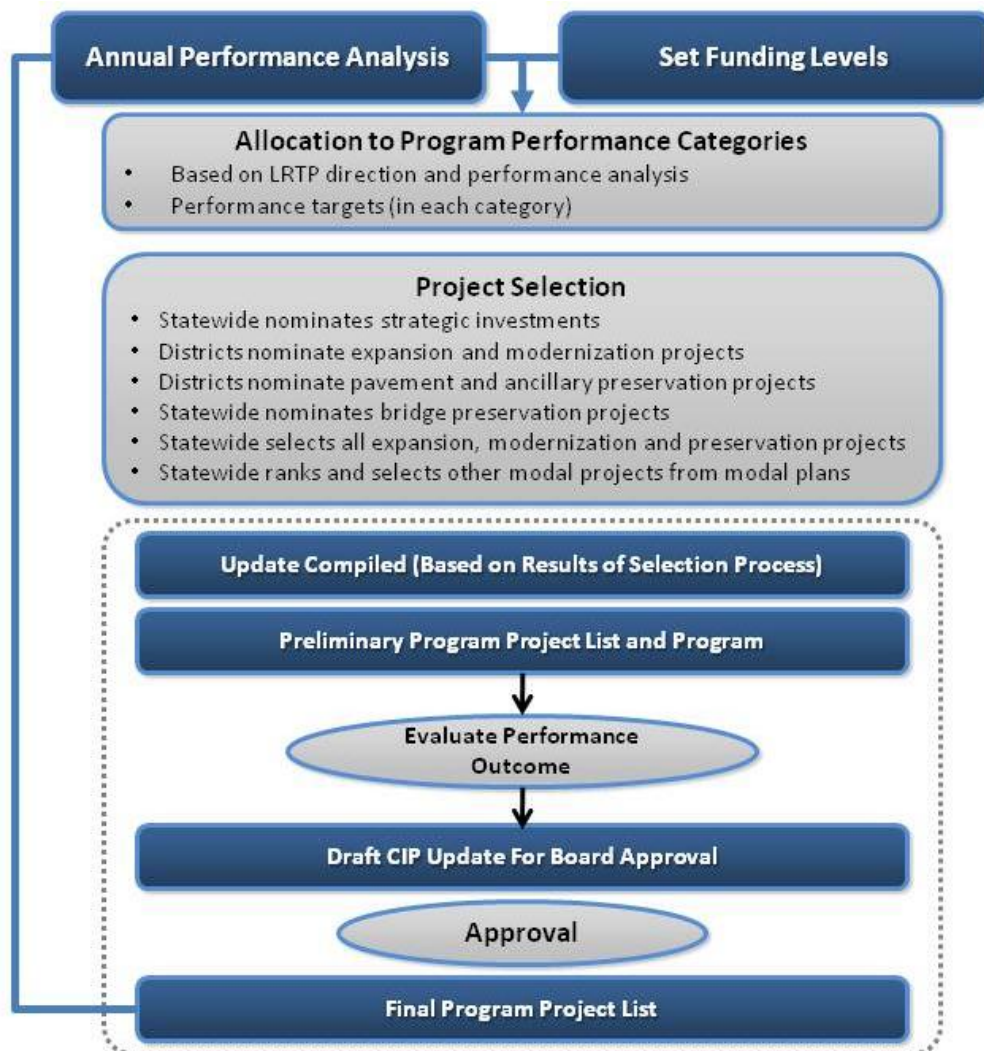


Figure 7 – Annual Program Update Process



The Arizona State Transportation Board (STB) meets to review policy and fiscal issues, and sets resource allocation levels for the program performance categories. Through the P2P Link procedures summarized in Figure 7 and discussion about the individual projects with applicable stakeholders, projects are prioritized and matched to available funding. These projects are compiled into draft Programs, which then go through a 45-day public review process. All comments are considered and the Programs are adjusted as appropriate before a final version is adopted by the STB. Once the STB has approved the Programs, the document goes to FHWA and FAA for review of compliance with federal rules for the Statewide Transportation Improvement Program (STIP) and final approval. Depending on the Program content, FRA and FTA must also review for federal compliance.

5.2 Annual Performance Analysis

The starting point for the annual program update is the annual performance analysis, which reviews performance against objectives and targets. This review also identifies any significant changes in ADOT’s risk exposure. It allows some flexibility to address any rapid changes in performance or risks to the

Linking the Long-Range Plan and Capital Improvement Program

accomplishment of performance objectives that have arisen since the most recent iteration of analysis in the statewide transportation planning process. The LRTP is updated every 5-years. Each update will revisit and refresh the performance priorities regarding plan investment emphasis. This plan investment emphasis will help structure annual performance measurement within the performance categories in each annual program update.

Measuring performance each year against performance objectives may not warrant the effort involved. This is because annually the “needle” may not move much. This issue should be addressed during implementation and be driven by the procedures to be used for performance monitoring.

5.3 Set Funding Levels

At the beginning of each program annual update, the Finance Office determines available funding. This involves conducting a near term revenue forecast for the 5-year Delivery Program and a longer term forecast for the Development Program. On the expenditure side, any updated changes in the cost to deliver the committed program are identified. This information is then used as input into any program rebalancing that might be necessary. The analysis results in the identification of funding available to enter projects into the Development Program and the Delivery Program.

5.4 Allocate Revenue to Program Performance Categories

Annual updates bring new projects into the Programs. This occurs through modernization, expansion and non-highway projects entering the Development Program and through setting annual program levels for preservation performance categories. The program emphasis established by the LRTP provides a starting point for a preliminary allocation of investment among program performance categories.

5.5 Project Prioritization and Selection

The prior sections detailed the linkage from the statewide transportation planning process to the development and delivery CIPs. The procedure for the annual update involves the nomination of projects that meet the specified eligibility criteria for each program performance category. The eligibility criteria are restated (?) and accompany the funding targets established for each category.

5.5.1 Strategic Mobility

These are initiatives prioritized through statewide analysis and which provide an added emphasis for component modernization, expansion, non-highway and preservation projects to be included in the Development Program. Considerations will need to be developed for this, but it is anticipated that prioritization criteria will likely include the extent to which projects within these strategic initiatives leverage other revenue sources or generate economies of scale in the various performance categories. In turn, if they include other revenue sources, it will increase the program size.

5.5.2 Modernization

Projects are selected based on criteria for modernization eligibility (criteria established through the LRTP). Districts nominate projects within their areas. The performance of these projects will then be evaluated against the mobility metrics and evaluated on a statewide basis. This process is used to enter projects into the Development Program.

Linking the Long-Range Plan and Capital Improvement Program

5.5.3 Expansion

Expansion projects are nominated and prioritized by Districts following a standardized performance-based identification process. Districts may or may not compete against each other, depending on the preference for Option 1 or 2.

Modernization and Expansion projects, when ready for delivery, advance through the annual update into the delivery program. The Development Program is not financially constrained by year and some prioritization is necessary to manage the timing of projects advancing into the delivery program. The Delivery Program may include programmatic activities that improve mobility performance, but that are not project specific if they are funded through the capital program. For example, a multi-year contract for incident management. These are included at the programmatic level in the Delivery Program because they are a fiscally constrained program and in ADOT's program budget.

5.5.4 Non-Highway

These projects are prioritized for inclusion from modal plans

5.5.5 Preservation Performance Categories

The Asset Management Plan provides guidance for the programmatic allocation of asset management resources. The methodology for the risk-based asset management plan is yet to be developed. This P2P linkage "to-be" document is based on a close connection of the asset management plan to program and project strategies for the lifecycle management of the Arizona transportation system. The approach will enable ADOT to establish the optimal allocation between types of work under whatever finance budget is assigned over a five-year period to each preservation performance category.

The performance targets for preservation are met through asset management projects and work performed under programmatic work categories. These may involve bundled or aggregated projects such as "pave only" projects. The preservation program performance categories are all managed within the five-year Delivery Program. The Asset Management Plan provides the data analysis used to allocate funding targets between pavement, bridge and ancillary assets. Within these asset class categories, the Asset Management Plan includes the lifecycle management strategy. This is a system-level balancing of work types between what is effectively preventive maintenance activities that are funded through the capital program and major rehabilitation and reconstruction. As a result, projects that are programmed over five-years by year and programmatic work with funding levels identified by year over five-years and for which projects are specified within a 12 to 24 month window. The optimal approach to this will be refined in the development of ADOT's Asset Management Plan.

Pavement Preservation

The Asset Management Plan specifies the implementing approach for applying the financing available for pavement preservation over the long-range planning horizon and the near term five-year Delivery Program. This identifies the optimal programmatic balance between pavement treatments. While the detail is to be developed in the risk-based Asset Management Plan, the P2P linkage will result in five-years of project programming on a year-by-year basis for major reconstruction and then, for other work

Linking the Long-Range Plan and Capital Improvement Program

categories, a programmatic allocation for Years 5 through 3, with specific roadways to be identified and bundled in the 12 to 24 month time frame, this is Year 2, with letting in Year 1.

The approach for project selection and prioritization involves Districts being provided with finance targets and the statewide asset management office providing guidance on work types that correspond to a specific category of asset management work such as overlay or major reconstruction in the case of pavement. Districts are then asked to nominate up to a funding target of technically warranted work. The Statewide asset management office applies the results from the program call to develop an optimized pavement program within the statewide funding constraints. Management control is applied to these projects such that only technically justified work types can be performed on projects programmed under this category. This means that during the delivery process it will not be possible to change the work type.

Bridge Preservation

The statewide Asset Management Plan establishes the strategy for risk-based bridge asset management. It is likely that replacement of structures due to structural and/or functional obsolescence may be considered as a modernization project. The bridge preservation strategy will include a five-year work program. This will be built at the statewide level, with District input, to maximize the accomplishment of bridge preservation performance targets.

Ancillary Assets

The statewide Asset Management Plan establishes risk-based performance targets. The plan also identifies the optimal timing and mechanism for the identification and specification of capital improvement program financed work to address ancillary asset performance. This will likely not require project specificity in Year 5. However, predictability regarding the funding level over a 5-year period will be provided to enable optimized investment decision-making. Ancillary asset improvements will be nominated by the Districts using consistent statewide criteria. District will be able to apply funding up to their allocation either as standalone projects or to fund ancillary asset management work within planned construction projects. In either case, the decision-making criterion will be the performance contribution of the project work.

5.6 Update Approval

The selected and prioritized projects are balanced against the program funding allocations to develop a preliminary project list and program. The impact that this program has on performance is evaluated and prepared as a draft for public comment and then STB approval.

5.7 Performance Management and Evaluation

The planning process is on-going. Annual performance assessment tracks and reports performance against the metrics established in the statewide LRTP. The statewide plan and modal plans are typically updated on a five-year cycle.

6

Implementation Considerations

The next steps in the P2P Link project are to design the major elements of the “to-be” process and prepare an implementation plan. These work efforts will be performed as part of Phases 4 and 5. The PMT and PAC will be instrumental in guiding the development through small group meetings and an implementation planning workshop.

6.1 Design of “To-Be” Process Major Elements

As part of Phase 4, the project team will identify any adjustments or redesign required for the long-range planning process to meet the requirements for the updated programming process and structure. This will include adjustments to address MAP-21 requirements and the overall P2P Link objectives. Best practice methods for project selection and prioritization will also be applied, as well as further detail on asset management and system performance. A summary of the major elements requiring refinement and specificity includes:

- ▶ Long-Range Planning Policies
- ▶ Program Areas
- ▶ Project Nomination & Selection
- ▶ Asset Management
- ▶ System Performance
- ▶ Finance

6.2 Implementation Considerations

To prepare and execute an implementation plan to migrate the existing programs into the new structure. Phase 5 will address the cycle of upcoming process dependencies, change management within the ADOT, and existing commitments under the statutorily- driven planning and programming cycle. Implementation considerations include:

- ▶ Process Dependencies to Migrate into the “to-be” Model (e.g. Next program updates and Asset Management Plans)
- ▶ Statutory Requirements
- ▶ Policy Changes
- ▶ Process Changes
- ▶ Change Management

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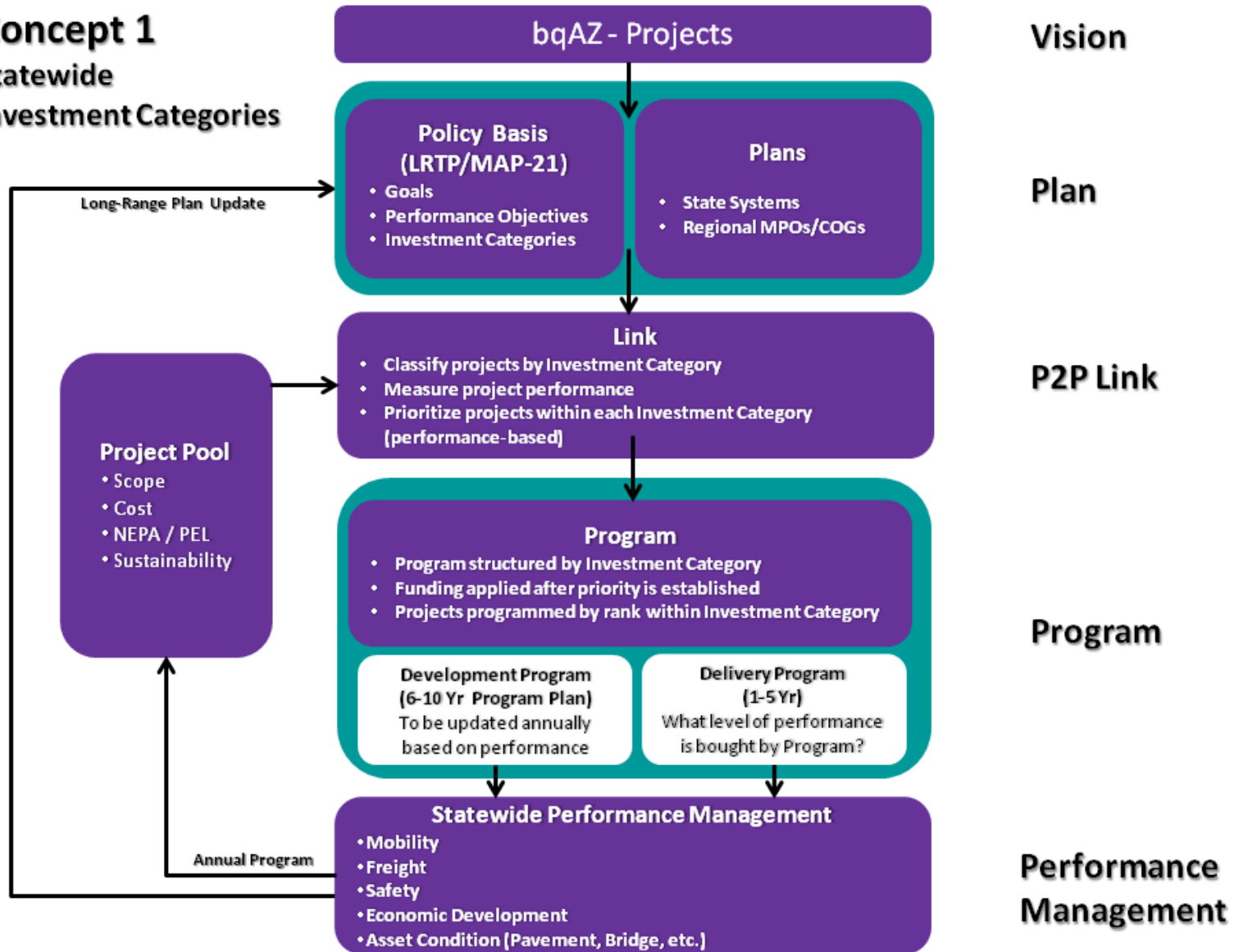
APPENDIX A: Process Concepts

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Process Components for the Following Concepts:

- **Statewide Planning Process** – the process through which statewide long-range plans, modal plans, corridor plans, and MPO/COG plans are developed. This process includes the development of the Statewide Transportation Improvement Program.
 - **Programming** – the process through which funds are committed to projects that have been selected and prioritized for implementation.
 - **System Performance Needs** – the transportation system development, modernization, preservation, operations and maintenance required to accomplish a specified level of performance.
 - **Fiscal Constraint** – the fiscally constrained planning requirements that govern the Statewide Transportation Improvement Program and the MPO/COG planning processes.
 - **Financial Constraint** – the financial plan or revenue scenario used to address the desired (or planned for) level of transportation system performance.
-

Concept 1
Statewide
Investment Categories



Concept 1 Description:

Concept 1 is built around planning and programming to investment categories. This involves a policy-driven statewide planning process through which transportation system performance objectives are set for broad categories of need. The statewide analysis of system performance is used to inform the policy decision regarding how much funding to apply to each investment category. The process builds a long-range plan(s) for accomplishing the specified performance objectives in each investment category over the planning horizon. The specific investments and projects required to meet this performance are identified. The program is then built by selecting and prioritizing projects that best meet the performance objectives in each of the investment categories.

The statewide transportation planning process addresses all modes. The statewide long-range transportation plan (LRTP) incorporates modal, freight, asset management, and MPO/COG plans that need to be coordinated and consistent. The LRTP sets the statewide policy goals and will need to address MAP-21 compliance. Within the LRTP Policy Basis, the Recommended Investment Choice (RIC) sets the funding distribution by investment category. Objectives and targets are determined for each category. Within the State System, the system performance analysis informs allocation of investment between plan and program categories.

The P2P Link structures the program to include funding categories that align with the policy goals and performance objectives in the LRTP. A pool of projects is generated based on system needs as indicated by performance. The projects are assigned to a category, measured for performance, and ranked according to priority of need. The 10-year program includes a 5-year development and a 5-year delivery element.

The planning to programming process includes 3 feedback loops through statewide system performance monitoring. An annual performance feedback loop after the implementation of the program to inform stakeholders and the public of what is being bought with their investment. Another feedback loop serves the P2P Link where any improvement made to the system will affect overall performance every year, which subsequently could affect the projects in the pool. Finally, the outer feedback loop informs updates to the long range planning efforts.

Overview:

- Statewide LRTP sets policy goals and overall performance objectives for the management and development of Arizona's multimodal transportation system
 - Overall performance objectives in the LRTP are policy-driven
 - P2P Link structures the program to include programmatic funding categories that align with the policy goals and performance objectives in the LRTP
 - Projects are prioritized and selected based on project evaluation criteria and available funding in a way that ensures they most effectively meet the performance targets
-

Concept 1 Process:

- LRTP investment categories are the same as the RIC program categories (modernization, expansion, preservation, non-highway in the present plan)
- LRTP analysis sets performance and investment priorities for the categories
- Statewide system performance analysis is used to allocate funds among investment categories
- Projects are prioritized and selected to conform to the investment categories

Best Practice Attributes:

- Policy priorities and planning analysis drive investment decision-making
- Projects are selected based on performance and prioritized to implement the LRTP
- Process is transparent and will tell customers “what level of performance” is bought for different investment decisions; i) total level of investment ii) allocation among different investment categories

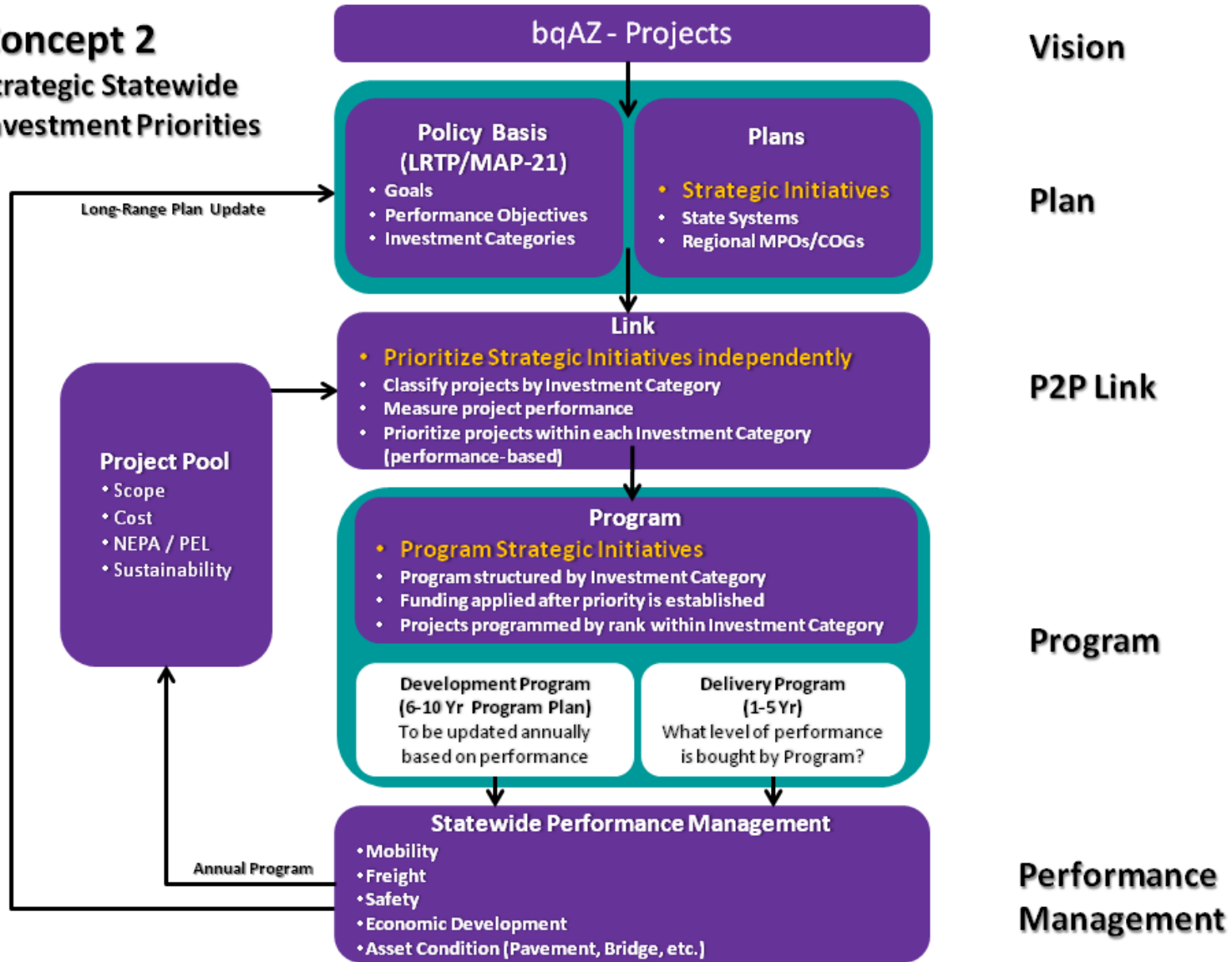
Implementation Considerations:

- Extent of system-level technical performance analysis undertaken to support decision-making regarding investment
 - o Best practice involves system-level performance analysis under different investment scenarios to support investment allocations to programmatic categories
- Robust system-level analysis would build the “State System” into the statewide planning process that addresses mobility, safety and risk-based asset management
- Exact mechanics of the methods used to allocate funds to program categories need to be developed

Critical Process Decisions for Concept 1:

- Are the RIC categories still the best starting point?
 - Should the P2P Link process build a 10-year program plan? If so, for which categories of need?
 - Should some categories be built around a shorter term plan, like asset management?
 - How should MPO/COG plans link to the LRTP?
-

Concept 2
Strategic Statewide
Investment Priorities



Concept 2 Description:

Concept 2 adds the identification of statewide strategic investments into the process described for Concept 1. These are large scale strategic investments of statewide significance. The strategic investments address areas of critical needs. The statewide planning process includes analyzing the system performance needs and developing plans that specify the specific transportation solutions to address those performance needs. This work provides more definition and development of strategic projects for inclusion in the program. The P2P Link occurs by establishing a program category of “strategic investments”.

The statewide long-range transportation plan (LRTP) provides the analysis from which Statewide Strategic Investment Priorities are identified. Strategic investment priorities are evaluated then advanced for further planning work and inclusion in the 10-year program plan based upon policy and financial analysis. This can be accomplished by conducting further multimodal planning analysis and other studies to develop the solution – a go forward plan that will result in implementation projects for inclusion in the program. These studies would develop the priorities and advance them if a funding strategy can be defined.

For the LRTP, and in allocating funds for the program, policy decisions will need to be made regarding the allocation of funds among investment categories. It is likely that for strategic investments, unique financial plans will be required.

The planning to programming process includes 3 feedback loops through statewide system performance monitoring. An annual performance feedback loop after the implementation of the program to inform stakeholders and the public of what is being bought with their investment. Another feedback loop serves the P2P Link where any improvement made to the system will affect overall performance every year, which subsequently could affect the projects in the pool. Finally, the outer feedback loop informs updates to the long range planning efforts.

Overview:

- Concept includes the identification of strategic investments that are of statewide significance. Strategic investments are large scale improvements that are identified and included in the LRTP. These are projects vital for the competitiveness of the state and whose benefits extend beyond their location.
 - Strategic investments may cross multiple planning areas
 - Inclusion in the LRTP provides focus, fostering statewide collaboration and commitment to address such strategic transportation needs
 - P2P Link occurs through identification of the needs in the LRTP and then linking through further planning refinement into a program category of “strategic investments”
 - Strategic investments are identified as broad planning level needs over a 20 year long-range horizon to address key multimodal performance needs
-

Concept 2 Process:

- Statewide planning process identifies strategic investments in the LRTP
- Further planning analysis, as part of the statewide process, will develop the detail for the “solution” that best addresses the statewide strategic investment need
- P2P link will involve identifying the general financing strategy for the strategic investment as it moves into the longer-range part of the program
- LRTP balances broad investment allocation between strategic investments and other categories

Best Practice Attributes:

- Provides focus and momentum for addressing large-scale investment needs and enables multimodal approach
- Addresses lessons learned in statewide planning, that strategic investment needs can be moved forward more quickly if they are addressed in the statewide plan and more detailed planning and finance plans developed for their implementation
- Process is transparent and will tell customers “what level of performance” is bought for different investment decisions; i) total level of investment ii) allocation among different investment categories

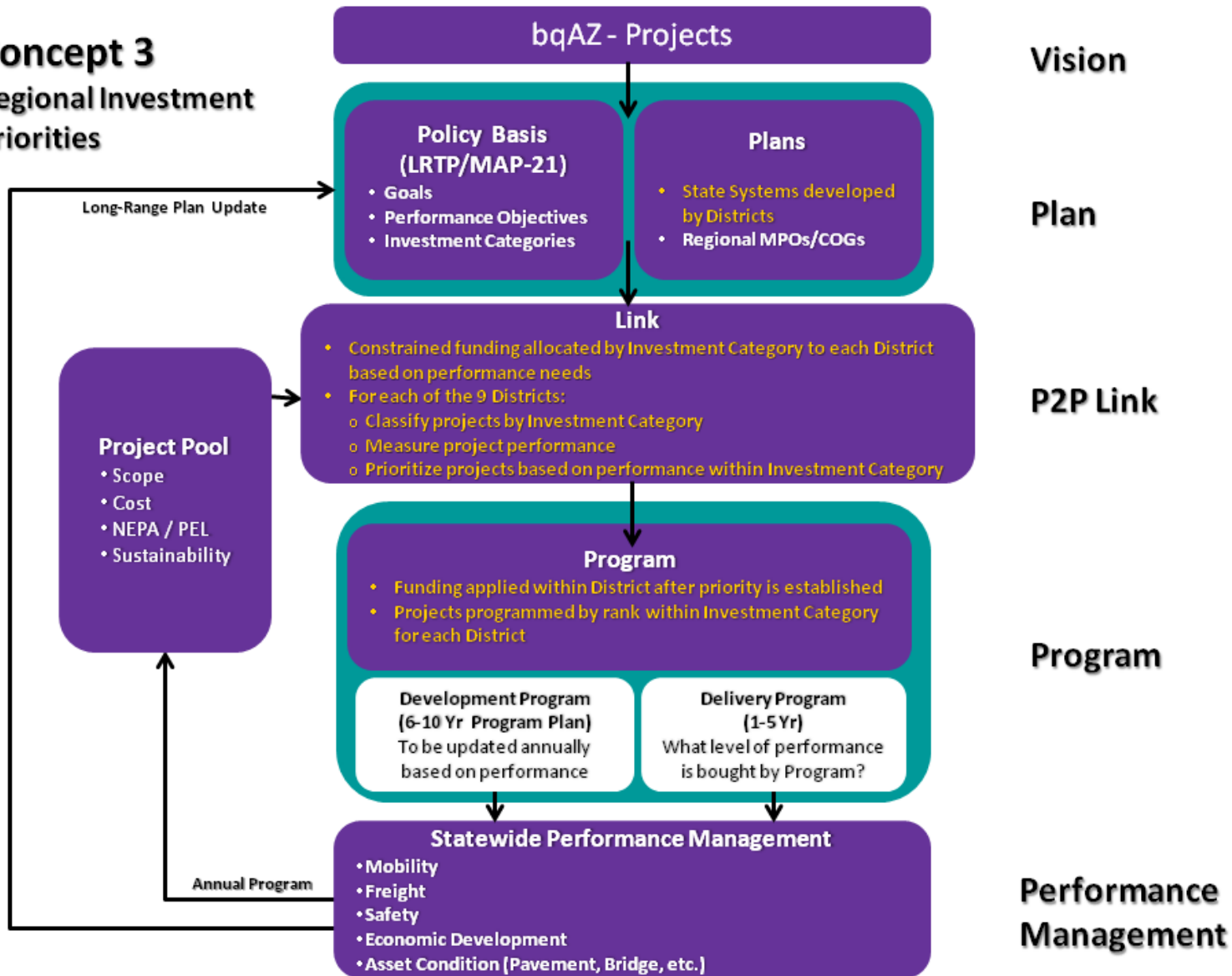
Implementation Considerations:

- Important to clearly define what constitutes a strategic investment
- Specific planning work, like corridor studies or program development studies, will be needed to develop plans for the strategic investments
- Financial considerations will be required to identify potential approaches to funding and ensure the planning process focuses on strategic investment priorities

Critical Process Decisions for Concept 2

- How should the needs of strategic investments be identified in the LRTP?
 - How should financial considerations be addressed when establishing strategic investment priorities? (to avoid having un-fundable plans)
 - What is the best way to coordinate with the MPO/COG processes as strategic investments will likely, in part, fall within MPO/COG plans?
-

Concept 3
Regional Investment
Priorities



Concept 3 Description:

Concept 3 provides a policy-driven, decentralized framework – each District develops a long-range plan. Together these plans identify the projects in the statewide plan. The District plans are constrained by broad investment allocations made by RIC investment category to 9 Districts using statewide system-level performance analysis.

The long-range transportation plan (LRTP) sets the statewide policy goals, allocates funding to each investment category, determines the performance objectives and addresses MAP-21 compliance to be utilized in District Plans. Each District develops a long-range plan that identifies specific investments and projects required to meet the performance objectives of the LRTP. The District planning process selects and prioritizes projects to meet regionally agreed upon performance targets.

The statewide transportation planning process coordinates and collaborates with MPO/COG and modal planning. Strategic investment priorities can also be considered in Concept 3. If the long-range planning process identifies strategic statewide priorities through the LRTP, the district plans would focus on identifying improvements of regional significance.

Asset management can be pursued through two approaches, Statewide or District. A technically driven approach to asset management projects generates a pool of projects for each District based on regional need defined by performance. Priority of need type (i.e., pavement, bridge, safety, etc.) is set by transparent stakeholder process where needs are weighted in an open process. Eligible projects are determined in accordance with performance within the region. Separate District project pools are established for first level ranking, development, submittal for programming. Final programming is performed centrally based on available funding. The 10-year program includes a 5-year development and a 5-year delivery element.

The planning to programming process includes 3 feedback loops through statewide system performance monitoring. An annual performance feedback loop after the implementation of the program to inform stakeholders and the public of what is being bought with their investment. Another feedback loop serves the P2P Link where any improvement made to the system will affect overall performance every year, which subsequently could affect the projects in the pool. Finally, the outer feedback loop informs updates to the long range planning efforts.

Overview:

- Districts develop performance-based plans that address mobility, safety, and risk-based asset management. Performance requirements are set by policy at the state level.
 - District plans must also address the broad policy goals and investment categories established through the LRTP
 - District plans can be developed with or without a strategic investments element
-

Concept 3 Process:

- Statewide planning process, through the LRTP, establishes policy goals and investment categories
- Statewide planning process sets investment levels to financially constrain District plans
- District planning process establishes a program plan within the financial constraints
- A regionally driven process prioritizes and selects projects that implement the District plans to build the statewide program

Best Practice Attributes:

- Establishes a performance-based methodology
- Enables more direct customer and stakeholder involvement in the planning and programming processes
- Process is transparent and will tell customers “what level of performance” is bought for different investment decisions; i) total level of investment ii) allocation among different investment categories

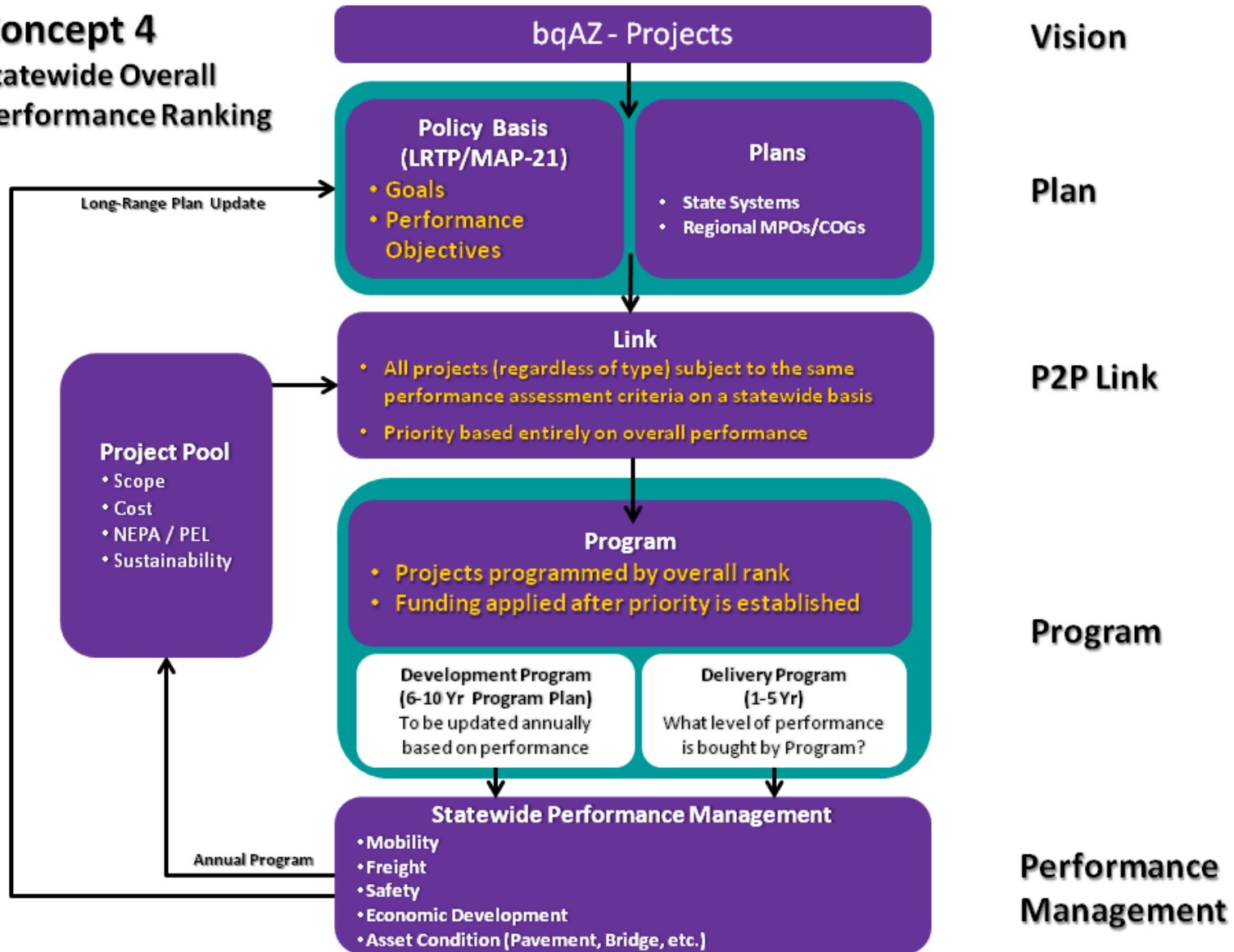
Implementation Considerations:

- Planning and investment approach is regionalized and decentralized
- Need a consistent planning methodology and guidance on building 10-year program
- Requires guidance regarding consistency of approach and methods
- For risk-based asset management, a bottoms-up approach limits optimization at the system or network level

Critical Process Decisions for Concept 3

- How are funds allocated among Districts?
 - Are consistent performance targets or measures required among District plans?
 - What is the approach to setting financial constraints or planning targets for the District plans?
-

Concept 4
Statewide Overall
Performance Ranking



Concept 4 Description:

Concept 4 is comprehensive process in which all proposed projects compete against the same set of performance criteria, are then prioritized and selected for implementation in the program. In this way, the projects compete with each other based on their contribution to policy and performance goals set forth in the statewide long-range planning process. There are, effectively, no investment categories that differentiate projects.

The concept is designed to promote a broader view of what projects accomplish. For example, instead of defining a project solely for its pavement management benefit, this method encourages a project proponent to identify multiple areas of benefit. The pavement preservation project may also improve economic development, or safety, or other performance category areas.

In Concept 4, the statewide long-range transportation plan (LRTP) is a policy plan that sets broad goals for the management and development of the transportation system. The State System establishes performance objectives for the policy goals. Projects are evaluated and selected based on their contribution to these goals. Through a stakeholder involvement process, performance categories are weighted to reflect the priority of statewide condition. Through the P2P Link process, all projects are evaluated and ranked against a common set of criteria, even those that may not be directly applicable to the type of project. Final programming is determined based on available funding. The 10-year program includes a 5-year Development and a 5-year Delivery element, where those projects with the best ranking are entered into the delivery program.

The planning to programming process includes 3 feedback loops through statewide system performance monitoring. An annual performance feedback loop after the implementation of the program to inform stakeholders and the public of what is being bought with their investment. Another feedback loop serves the P2P Link where any improvement made to the system will affect overall performance every year, which subsequently could affect the projects in the pool. Finally, the outer feedback loop informs updates to the long range planning efforts.

Concept 4 can also incorporate strategic and regional considerations.

Overview:

- No investment categories are involved
 - All projects are evaluated together against a common set of criteria to assess their contribution to statewide performance goals
-

Concept 4 Process:

- Statewide planning process provides policy direction and is MAP-21 compliant
- Program is built by evaluating all projects competitively based on their contribution to the long-range plan policy goals

Best Practice Attributes:

- Establishes a performance-based methodology
- Enables all projects to be evaluated against all others
- Process is transparent and will tell customers “what level of performance” is bought for different investment decisions; i) total level of investment ii) allocation among different investment categories

Implementation Considerations:

- An evaluation process will be required since the technical ability to compare all projects against all others is limited
- This approach may not align projects with current plan priorities

Critical Process Decisions for Concept 4:

- What is the best way to link this approach to the LRTP?
 - What is the best way to compare different types of projects against others in a meaningful way?
-

B

APPENDIX B: Best Practices Workshop Summary (Jan 29, 2013)

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Linking Long-Range Plan and Capital Improvement Program
AKA P2P Link
Peer State Workshop
January 29, 2013

Meeting Summary

Guests from Peer States

Jerri Bohard, Oregon Department of Transportation (ODOT)
Brian Gage, Minnesota Department of Transportation (MnDOT)
Mark Gieseke, MnDOT
Erik Havig, ODOT
Sandi Kohrs, Colorado Department of Transportation (CDOT)
Bill Lawrence, Utah Department of Transportation (UDOT)

Members in attendance

Bret Anderson
Eric Anderson
Thor Anderson
Brock Barnhart
Barbara Bauer
Steve Boschen
James Bramble
Chris Bridges
Tom Deitering
Mark Griiffin
Charles Gutierrez
Chaun Hill
Jason Kelly
Mike Kies

Dianne Kresich
Aryan Lirange
Carlos Lopez
Jean Nehme
Mike Normand
Scott Omer
Karla Petty
Annette Riley
Jodi Rooney
Ed Stillings
Alvin Stump
Jennifer Toth
Romare Truely
Dave Wessel
Jim Zumpf

Support Staff

Kristin Bornstein
Ryan Cook
Steve Hogan
Frank Medina
Joy Melita
Scott Pitera
Amy Rosar
David Rose

Welcome and Introductions

Jim Zumpf, Arizona Department of Transportation (ADOT) Project Manager, opened the meeting and welcomed participants. He explained the day's agenda was very robust and would include the following activities:

- Peer State Overviews and Panel Discussion (page 2)
- P2P Link Concept Process Components and Models



Linking Long-Range Plan and Capital Improvement Program AKA P2P Link Peer State Workshop January 29, 2013

- Concept Model Team Exercise
- Team Report of Concept Models (page 26)
- Concept Model Team Debates (page 29)
- Workshop Takeaways (page 31)

Jim led the participants through a brief introduction and noted the extensive attendance of ADOT employees and that he was looking forward to hearing their input. The goal of the day was to identify best practices and learn what other department of transportation's (DOT's) are currently doing that is working well, their growing pains, and lessons learned.

ADOT wants to ensure that business requirements are met. Working Paper #1 has been completed and the comment period is at an end. Working Paper #1 identifies the current process, discusses the current components of the process, and takes a snapshot of the last 25 years. ADOT continually revisits the business requirements and ensures the process is on track. These form the basis of the goals and objectives.

Peer State Overviews

Minnesota

Jim then welcomed guests from peer state Minnesota, Brian Gage and Mark Gieseke. Mark Gieseke, MnDOT Director of the Office of Capital Programs and Performance Measures, thanked the group for the opportunity to speak. He explained MnDOT is divided into two sections, highway planning and programming. Brian Gage is the Director of the Programs Section. Even with the structure of having both planning and programming within the same office, the discussion of how to smooth out the process of planning to programming is challenging.

Overview of MnDOT Planning and Programming Process

Minnesota has a performance based plan that is currently in the third cycle of the development process. In this particular cycle, the department is starting to move away from the formula resource distribution process that had been used earlier. There is still a basic formula but it is moving toward a risk-based selection process on both the programming and project levels. The department is preparing to begin the next cycle to include an asset management component as well as maintenance costs.

The corridor planning process is somewhat connected to planning and programming but is more of a supporting process. The new process that was developed and in use is the corridor investment management strategy. This strategy is a method of communicating with stakeholders



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that could include a corridor coalition that may want to see improvements to a particular corridor, or lane expansion. This is a way of discussing what the stakeholders needs are and what resources they can provide, and to begin the conversations to determine the best use of available funds. Mark then turned the presentation to Brian Gage.

Brian explained that the department has approximately a one billion dollar construction program, made up of federal, state and bonding dollars. It is the largest program the department has ever had. Brian then provided a quick overview of the department and state agencies as follows:

- 4-Year State Transportation Improvement Program (STIP) updated yearly.
 - MnDOT operates on a decentralized basis. Each of the eight districts provide plans that are combined into one spreadsheet.
- Eight Metropolitan Planning Organizations (MPOs) with four- to five-year Transportation Improvement Plans (TIPs) updated yearly.
- 10-Year State Highway Investment Plan (MnSHIP) usually updated yearly.
- 20-Year Investment Plan updated every four years.
- 50-Year Vision (Minnesota GO), which is the first plan of with this long-range timeframe.

Brian noted that due to political conflicts and director changes, a real 20-year investment plan document has not been produced on an annual basis. Because the department is using an Excel spreadsheet, it is becoming unmanageable. The spreadsheet tries to encompass performance in addition to the programming process. Minnesota GO feeds 20-Year Investment Plan, that feeds MnSHIP where investment dollars are tied to goals and objectives.

Decentralized Approach

Brian continued to explain the MnDOT structure. It is decentralized with eight districts. The largest of the eight is the Metro Area which has its own MPO. The term Area Transportation Partnership (ATP) is interchangeable with the the word “districts”. ATPs are the public input process by which the district selects projects. It comprises elected officials, county engineers, representatives from those areas, and each ATP is different. The largest ATP is the District 1 – Iron Range - which current has 54 members. Each ATP has rotating members but is well represented by the community. Since MnDOT ATPs are decentralized, each district has its own process for selecting projects.

MnDOT Previous and Current Planning Process

In 2005, MnDOT had the first performance-based process that was linear. The plan was developed with policies, which were then turned into investments. For the update in 2009, the performance-based review was based on a parallel process which involved creating policy simultaneously with investing money. In the third update, the current one for 2013, the legislature



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got involved and decided that planning would be included in the law. MnDOT is now working to review the law and deadlines and how to develop the plan to adhere to those requirements.

The traditional process has been used for the first two cycles of developing the plans; identifying needs including the bridge model, pavement model, safety models, and performance-based measures on other infrastructure. Based on the needs, revenue was reviewed and goals were created.

Old five step planning process:

1. Identify Investment Needs
2. Project Future Revenues
3. Set Investment Goals
4. Develop Investment Plan
5. Identify High Priority Investment Options for Potential Additional Funding

New five step development process:

1. Project Revenue
2. Determine Investment Outcomes
3. Evaluate Investment Approaches
4. Set Investment Direction
5. Identify Alternative Priorities

Challenges

Like other DOT's, many challenges have been encountered. One is the decentralized structure in which each district feels it is unique and selects their projects based on different priorities. Each district also identifies risks which differ from the risks of the state and other districts. From a state perspective, the pavement is poor, but several districts place a higher value on job creation and expansion. There are several pressures that result from politics. Corridor groups often bypass the planning process, some identified projects ignore this process. MnDOT has to decide how these identified projects can fit into the planning process. This can be challenging as some groups know how to access the state legislature through the back door. Currently, there is no MnDOT board or commission, so it is the responsibility of MnDOT internal decision-making to select the projects to be funded, and in the case of politically-defined projects, sometimes performance does not support the selection of the projects.

Another challenge is funding versus needs. In 2005 there was enough funding to meet all preservation needs. MnDOT assumed that preservation needs could be met first and whatever is left could be used for other priorities. In 2009, preservation needs used all the available funding, which left nothing for safety and mobility. No one was willing to accept that, so a balanced



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program was sought. It took three years to figure out how to create a balanced program that invests in preservation, safety, mobility, and the things the public wants. In 2013, needs now exceed the money available. So the process was shuffled again to look at needs first and determine where the funding the funding priorities are. This concept was presented to the public. The public was engaged interactively to allow MnDOT to shift priorities. The result of this activity showed that the public's input aligned with the needs where the majority of the public resides.

Lessons Learned

Several lessons have been learned:

- don't oversell the mentality of "if you can measure it you can fund it". This was attempted, but did not work. A lot of the needs were developed in silos and priorities had not been assigned to the silos. One big need is economic development which is still being assessed.
- avoid rewarding bad performance, meaning the worse the pavement the more funding that is awarded. It was the perception that if a particular district has bad paving that the awarded funding would be used to improve pavement, which is not always the case because districts would use pavement funding for mobility projects. This resulted in little to no accountability within the districts.
- when projects leapfrog into the program because the governor chose them it was difficult to justify those projects.
- how can a consistent story be told with the visions developed at a district level. It is difficult to teach people that just because a small corridor has a long term vision to expand that it is not part of the program but simply an idea for the future. Visions die hard and once they are written they are hard to erase.

Brian wrapped up the presentation and again thanked ADOT for this opportunity.

Jim Zumpf thanked him and explained that it seems almost like déjà vu. He reminded the group to hold off on questions until the panel discussion portion of the workshop. He then introduced Sandi Kohrs with CDOT.

Colorado

Sandi Kohrs, CDOT Multimodal Planning Branch Manager, gave a quick overview of CDOT structure. Statewide long-range plan and long-range regional plans occur in the Division of Transportation Development. However the STIP development is handled in the Finance Division. Headquarters is assigned to put the STIP together, but the regional districts provide the information for the STIP. The STIP is an electronic process that is tied to the budget so the STIP



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and the budget are the same. All amendments to the STIP occur overnight as CDOT does not have the capability to run them during the day.

Project selection is similar to MnDOT in that it is conducted at a regional level, but with constraints. At the headquarters level the money is allocated into program pots, so if money is assigned for pavement projects, it can only be used for pavement. This method puts limitations on the districts and how they can spend the money.

Statewide Planning

CDOT is in a plan update mode with a target year of 2040, which was set by how far out the MPO's were able to reasonably run a travel demand model. The focus is now on MAP 21 requirements and what the requirements will be in 2040. Colorado state law requires a fiscally constrained Statewide Long-Range Plan. Specific projects are not included in the plan but corridors are assigned dollars that are included in the plan.

Policy Directive 14 (PD14) lays out the goals, objectives, targets, and sets up the framework to divide the money. CDOT has a smaller budget than some other states, which is \$1.1 billion total.

At one point, there were investment categories which included system, quality, mobility, safety, and program delivery and during the last two cycles the money went into those categories. The budget structure has changed and now includes *Maintain, Maximize, and Expand*. In PD14 the goal areas include safety, infrastructure condition, system performance, maintenance, and project delivery. All of these have been established to mirror the national Map 21 goal areas. Maintenance and project delivery each have their own sets of goals as well. There isn't a separate freight or environmental area.

The language in PD14 was written around a balanced approach to optimize the system. This provides the governor-appointed transportation commission flexibility. This eleven member committee allocates money and provides overall direction of the department.

In the past CDOT conducted two cycles using performance-based planning. The performance measures focus on the investment categories or the new budget categories. Projections are based on hard asset categories and maintenance. A new division was created a few years ago for transit and rail. They are creating a goal under PD14 and are starting with transit asset information as MAP 21 requires. CDOT is working to change the mobility measure to include reliability and not just mobility.



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Another new division, Operations, was created and the director just started in January. For CDOT, operations means traffic operations including traffic, safety functions, etc not organizational operations.

CDOT has performance measures but no longer has a category for safety because the theory is that everything begins from the premise of safety. There is a maintenance level objective that includes nine program areas, including snow and ice removal, striping, pavement, etc. For project delivery there are objectives that include Chief Engineering objectives which outline goals for completing projects on time and on budget.

Structure

CDOT's structure is decentralized and allocates funds to regions from program areas based on formulas and resource allocations. Each region builds their STIP depending on those numbers.

Because there is a new director, the senior management staff mentality has changed and CDOT is now reverting back to a more centralized structure. This emphasizes asset management. The project selection decisions will be driven more by asset management models. Additionally, CDOT is looking to set up a corridor operations system, so the major corridors would then fall under the more centralized structure and the smaller corridors would remain under the regions. The decisions are made by senior management staff and the commission. Because Colorado has tax and revenue restrictions, CDOT is restricted on bonding and raising revenue. The legislature developed the High Performance Transportation Enterprise which focuses on corridors that are good candidates for toll roads or Public Private Partnerships. This is an entirely separate enterprise that has flexibility beyond CDOT's normal operating limitations. It is viewed as a subsidiary. In addition, the legislature created a Bridge Enterprise to impose fees to solely fund bridges.

Asset Management

CDOT is in the process of developing a multi-asset management system to include pavement, bridges, maintenance, fleet, ITS assets and property. The purpose is to go to the commission and present all assets and move money among them based on performance changes. This is trying to be accomplished via software that can look at the potential impacts of investment in those assets. In addition, risk based work is being conducted and used as an element in decisions. The condition targets of existing systems could vary by facility type (i.e. interstates vs. smaller state highways), so there is categorization regarding the condition of the roads.

Resource Allocation



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Resource allocation is by program, but it will be put into the Maintain and Maximize buckets. In the past, funds would go to the regions. In Colorado, there are three Transportation Management Associations (TMAs), with two of the TMAs required to track funding through the MPOs. This will not be continued at the end of this fiscal year because it is too complicated to track.

One structure is the Statewide Advisory Committee (STAC), which is composed of one representative from each of the 15 different planning regions. They meet monthly and are the main planning advisory group that discusses how to allocate funds to program budgets and makes recommendations to the commission. They are the strongest allies when support from the public is needed.

Money is sub-allocated to the TMAs per federal requirements, as well as sub-allocation of money to Congestion Mitigation Air Quality (CMAQ), Transportation Action Plan (TAP), and MPO and Regions as required by MAP 21.

Project Selection and Programming

Colorado has a 4P project selection and programming process which includes county meetings, region meetings, and engineering district meetings that all feed into the statewide plan. The asset management models drive those discussions.

There used to be strategic projects, aka the seventh pot, for major statewide corridor projects. This source of funding went away and this program is essentially gone, but stakeholders have not forgotten.

CDOT has spent a lot of time on tiering in order to develop solutions for roads with different volumes or classifications. Currently a drivability standard is being developed to replace the "remaining service life" standard to help fund minor treatments. Additionally, cost benefit analysis is being improved.

Planning Partners

CDOT strives to work with partners and meet with the MPO's to determine fiscally constrained numbers for the long range plan for their use in developing their regional plans. MPO's determine the sub-allocation of funds. CDOT submits projects for federal funds and state funds. If those projects need to be in the TIP, CDOT submits them and the MPO includes them in their TIP. This process is completed with the engineering regions. The Denver region has one-on-one meetings with local jurisdictions. Each MPO includes representation from a CDOT member. In the smaller rural areas, CDOT staff administers the funding as well as helps develop the regional plans.



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STIP

At this time the STIP is based on the decentralized process but in the coming years will become more centralized. There used to be a Regional Priority Plan that used “political” money, but over time the money has dried up.

The STIP is a “four plus two year” plan. The Feds recognize the first four years. The additional two are for CDOT. In addition, an update to the long-range plan is being conducted. The state fiscal year is tied to the budget and does not match the federal fiscal year which can often be challenging.

Overall, the plan is corridor-based and not project-based. The projects need to match strategies. When a region planner puts a project in the STIP, they need to assign strategies to get funding. This allows CDOT to look at the strategies to help determine the funding allocation.

Oregon

Jim Zumpf introduced and thanked the participants from ODOT, Jerri Bohard, ODOT Transportation Development Division Administrator and Erik Havig, ODOT Planning Section Manager.

Jerri Bohard began by explaining that ODOT is going through a transformation, and has been challenged by the Governor and Commission to become more multimodal. Headquarters is responsible for providing guidance and policy and making decisions.

ODOT has a five member transportation commission appointed by Governor. The Commission approves the Long-Range plan and the STIP, as well as everything in between. The Long-Range Plan is a policy document and not a project document.

Department Structure

Erik Havig explained that Oregon is a decentralized state. There are regions and districts that are broken down to provide maintenance and project delivery. Some key facts about Oregon, there are 242 incorporated cities and 36 counties, and six MPOs that the DOT works with, with the possible addition of 2.5 new MPOs.

There are interesting changes about how projects are programmed in the STIP. In addition to the federal requirements that all states abide by, Oregon has some unique state laws and requirements. In 1973, the legislature included new language into land use planning and



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transportation planning. It contains requirements for statewide goals that must be met through the comprehensive planning process. Implementation through this process involves working with local governments and not on a statewide level. All plans need to be consistent and there is a hierarchy and tier of planning that need to work together. No one tier controls any other.

Oregon Transportation Plan

Top of board is Oregon Transportation Plan (OTP), which is not only required by federal law but also by state law. Under that is a higher degree of policy, expectations, and performance around the system. This level includes the Modal and Topic Plans. The OTP is high on policy, but the Modal and Topic Plans bring it down to a more specific level. For example, there is a Public Transit Plan that talks about goals and expectations regarding how the transit system works. There is also a Bicycle Pedestrian Plan (currently in the process of being updated) and a recently completed Freight Plan per MAP 21 requirements. Finally, ODOT is also working to develop a Rail Plan with FRA and the State of Washington. Each of these plans is policy driven, but have performance goals and objectives that need to be achieved as part of the next tier of planning, the Local Transportation Systems Plans (TSP).

Statewide goals require ODOT to have locally adopted transportation plans for every community over 2,500 in population. This is also the level where the planning with MPO is conducted at a regional level. The local TSPs define the projects that will be needed over the next 25 years. This is where the performance targets are tied to the projects that will meet those expectations. The Regional Transportation Plans (RTPs) from the MPOs need to be financially constrained. Although the RTPs are fiscally constrained by federal law, state law does not require the Local TSPs to be. However, there are expectations that should be tied to expectation of revenue, but there is no process like there is for the MPOs.

The next tier of planning is Project Planning, which is defined in statewide planning program and statewide laws. At a system planning level, projects and needs are defined. This is where NEPA begins to help further define the details of the project.

The OTP is the multimodal policy level planning document for Oregon. There are no projects listed in the document, because it covers the goals for the system and tries to address funding. When this plan was adopted in 2006, there was strong recognition that funding would be the lifeblood of the future plans. The Plan recognizes what will be affected if the revenues decrease, remain the same, or increase. The OTP covers a 25-year planning horizon and includes the goals and policies for the entire system and what modes need to be improved.

Programming in Oregon



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When projects come out of the planning process, there is an interesting public involvement process. Twenty years ago, the Oregon Transportation Commission felt there was a need for a more local public involvement process to help select projects. Area Commissions on Transportations (ACT) were formed for geographically similar areas to engage local partners. ACTs can discuss goals and needs across many areas. They also advise on policy changes and planning/programming decisions. The Commission has the final approval on the selection of projects, but they rely heavily on the input from the ACTs.

Each region has at least one ACT, some have up to four that need to work together to reach a compromise. Each area has different needs and funding availability must be considered before project recommendations are made. This can often become a political process.

Jerri elaborated on the formation of the ACTs. She explained that the Commission forms the policies, approves the ACT membership and reviews the member charter every two years. The ACTs are created to represent entire areas and members include tribes, universities, elected officials, etc.

Previous STIP Process

She discussed the previous STIP process and that it is a 4-year STIP, updated every two years, but programming is done 6 years out. The Commission would meet every two years to determine the program level. For example, in the bridge and pavement programs, ODOT staff would review performance levels and provide scenarios for different levels of funding and the outcomes those funding levels would ultimately provide. This information was presented to the Commission to make a decision. In the Oregon Highway Plan there were performance standards relative to pavement. This was broken down by the functional classification of the roadway, where interstates would be maintained at a higher level than smaller state highways.

The programs vary and the selection process for each is different. The ACTs are very involved in modernization projects. There is an objective management system for bridge, pavement, and safety and it sets the stage for the projects in each category. These projects were selected at the headquarters level. A list of projects would be distributed to the regions for approval. This was mainly a statewide focus. Each year a matrix would be completed that included the funding levels for each category and this would be distributed as well for review.

Programming Change in Oregon

ODOT is changing this process. For the 2015-2018 STIP it was decided that priority should be placed on fixing or enhancing the system. ODOT has mainly been in maintenance and preservation mode since 1991. The overall objective is to care for existing assets. There is an



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Asset Management Strategic Plan and an implementation plan. Before all assets were recorded in separate databases, now all have been combined into one master database based on geographic location. This single source of information has helped develop lifecycle costs. The Federal program has been divided into two categories:

1. Fix, enhance, and preservation
2. Operations

The ACTs have been challenged to develop a 150% list of projects to share with the Commission. This includes all modes except rail and aviation and it needs to be eligible for STP funds. In Oregon, the state gas tax is for highway only, so there is that constitutional limitation that needs to be considered.

The idea of the new program is focused on enhancing the system and selecting the best projects to achieve that goal. It also helps to determine how to fund those projects. One percent of the gas tax is set aside for bike and pedestrian. The STIP used to be run in the Finance division but has since been connected to the Planning division.

Oregon has been through a serious recession. The director and Commission challenged staff to think about how to balance the STIP to not be hit as hard in the future and finding ways to flex funds to the greatest extent possible.

Goals of the Process Changes

ODOT really wants to involve local jurisdictions by getting input into all the projects that are included in the STIP and not just local highway projects. There were several great projects being selected, but not necessarily the ones that were bringing the state together. It was important to find the projects that would enhance the system's intermodality. With the right projects selected, it is then determined how to find funding. This is more of a philosophical change to really emphasize projects that would not only be multimodal but connect the system as a whole.

In the previous process, it was projects were often selected locally but did fit into strategic connections. There was an application process for bike and pedestrian projects and as a result, funds were flexed to take STP funds for bike projects. There were several application processes available and criteria varied slightly, but local governments were applying several different times.

What is Driving this Change?

Reduced available funding is driving this process to change. It is widely understood that federal funds are going to be reduced in the next few years and ODOT is trying to be proactive to better prepare for that time by identifying the right projects. The Governor instructed Oregon to



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evaluate the least cost options, review members of the Commission, and challenged the DOT to evaluate how they do their business.

With the Fix It and Enhance It philosophy, ODOT is focusing on the expanding/improving or fixing/preserving the transportation system. This does not include funding for maintenance, planning, or DMV. Approximately 75% of the Capital Program funds are allocated to fix-it projects and 25% to enhancement projects, both transit and highway. After reviewing several scenarios, the Commission approved that balance, but wanted to put all additional funds (if ever available) towards the fix-it funds.

The New Allocation Process

The Commission then developed guiding principles for ODOT staff to consider when thinking about fix-it projects. They are as follows:

- Balance
- Leverage
- Maintenance
- Safety
- Regulatory Compliance
- Economy
- Cost Effectiveness
- System Continuity

ODOT staff determined of the 75% of fix-it funds, 60% goes to pavement, 20% to make sure key corridors are maintained and in the best condition possible. These funds are going towards strategic freight corridors, I-5, I-84, and couple key highways. These are corridors that the legislature invested in earlier with additional funds.

The remaining 25% of enhancement funds is divided among the following:

- Bike and Pedestrian funds
- Flexible funds
- Modernization
- Safe Routes to Schools
- Scenic Byways
- Transportation Enhancements
- Transportation Demand Management
- Transit Capital Projects



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ODOT is trying to focus on what are needs, priorities, and least cost options. Once there is a solution, it will lead the way to an action, ultimately showing the color of money needed.

The New Application/Selection Process

Now ODOT accepts a single application for all enhancement projects. Applicants are now required to provide narrative around the benefits of the project. The benefits need to link to the seven goals in the OTP. The application process is limited to government agencies. The Commission provides comments back to the ACT's for their review and prioritization based on qualitative values, not quantitative. Overall, the ACTs and MPOs provide project recommendations to the Commission for ultimate selection. The ultimate goal of this new process is that it is to have the ACTs balance the funds. So far, ODOT staff was surprised that the list was balanced with highway projects as opposed to bike and pedestrian projects as it once was.

Jerri wrapped up her presentation by providing additional ODOT contacts and thanked the group for the opportunity to speak.

Utah

Jim Zumpf then introduced Bill Lawrence with the Utah Department of Transportation.

Bill explained that in UDOT there is a program development group and within that group there are four areas: Programming, Asset Management, Research, and Planning. Within the programming component there is the STIP, transit group, aeronautics, and finance. Additionally, UDOT is decentralized into four regions and is overseen by a seven member Transportation Commission. The Commission is the approving body of all programs and projects within the STIP. Staff is allowed to make administrative changes once approved, but there are limitations. UDOT has an electronic STIP within the Electronic Program Management (EPM) and everything is funneled through that system.

Planning

How does UDOT go from plan to program? There are MPOs that put together the RTPs, but UDOT is responsible for the remaining rural areas. The Plan is a 30-year plan including all federal requirements and is updated on four-year cycle.

Unique within UDOT, all RTPs and long-range plan are combined to make one central plan to cover the entire state. Everything is in one location for the public to review. There are legislative requirements in regard to project prioritization that need to follow the department's strategic goals. Because of this, the department wrote a rule to meet the requirements of that law. In line



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with the rule, the department uses strategic goals to preserve and optimize current infrastructure, improve technology, make safety improvements, and add new capacity. All projects that fall under the department's four strategic goals:

1. Preserve Infrastructure
2. Optimize Mobility
3. Zero Fatalities
4. Strengthen Economy

Every project must be approved by the Transportation Commission. Though prioritization processes are in place for new capacity projects, the decision still needs to be made by the Commission. The Commission can also override that prioritization process as long as there is public support to do so.

Project Selection Process

Recommendations for projects included in the STIP come from the Asset Management Division, Structures Division, UDOT's Regional Workshop, traffic and safety, Traffic Operation Center, capacity projects from the LRP, MPOs, and Joint Highway Commissions. All recommendations need to be approved by the Transportation Commission prior to inclusion in the STIP.

All recommendations must fall into one of the four department strategic goals. Through each of those goals, recommendations are further categorized and become a project that can be included in the STIP.

"Preserve infrastructure" includes rehabilitation and preservation projects. They are developed using UDOT pavement and bridge condition data. Cross-asset analysis has not occurred yet, but the endpoint would be to make the determination of whether a bridge or pavement preservation project is a higher priority. At this point, they are still in different categories. They are input into a program that incorporates the level of funding. The result is a recommendation that tells the level of funding by fund type, how much funding, and what sections should be worked on. Once this is complete, each Region receives their respective list to work on at the Region workshop. The final recommendations from each region are combined and go to the Transportation Commission for approval.

Additionally, for each of the different types of roads there are condition levels that UDOT requires be met based on the level of funding. Going through this process, roads are classified into three categories: interstate, level 1 and level 2. The difference between the level 1 and level 2 is that level 2 is based on traffic volumes. Those roads will only receive code one type maintenance. Level 1 roads receive preservation and rehabilitation treatments. Decisions are made as to where additional funds should be placed based on the asset management practices.



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There were regions that needed to do work above and beyond what was provided for in the process, so another category of asset management was created for major rehabilitation. This was designed for projects to be completed quickly.

Under the Optimize Mobility strategic goal, those projects come from ITS, access management and capacity projects. Within each of those categories there are ranking criteria. The Zero Fatality goal looked at improvements to the safety management system and used prioritization factors that would provide the greatest reduction in fatalities and improvement to overall safety. These types of projects are often coordinated with other upcoming projects for efficiency purposes.

Strengthening the economy is a new goal and UDOT staff has not quite figured out how to structure these goals. Employment growth, employment retention, tourism growth, freight movements, retail growth, tax base increase, etc. are all being considered.

In summary, each of the department's strategic goals produce a list of projects, with "preserve infrastructure" being subdivided into two categories – major and minor.

Currently the STIP process is updated annually and is an ongoing cycle. The department is always identifying current conditions and needs, holding workshops, analyzing local needs and improvement projects, coordinating between MPOs and UDOT, compiling the draft STIP, and advertising the draft STIP. Once the public has reviewed and provided comments, the Transportation Commission needs to approve the program.

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Peer State Panel Discussions

Jim introduced David Rose, Parsons Brinckerhoff, to lead the group through the panel discussion. David emphasized that the presentations were great and informative. He opened the floor to participants to ask questions.

Question: *There was a lot of discussion about process Minnesota changing from a risk based perspective and Oregon changing the pots of money to going to the right projects. How are you dealing with the culture change among internal staff and with stakeholders buying into the process?*

Answer: Jerri Bohard, ODOT
As part of the fix-it and enhance process, ODOT is going through a change within the agency. One of the things ODOT did was change the leadership structure. At first, when this transformation started, the leadership structure was changed and an Intermodal Leadership Team was created. Each of the region managers was brought to the table, as well as other staff. The goal of the new structure is to challenge the team to figure out how to educate engineering managers about rail, bike, pedestrian, and transit. From the external standpoint, the ACTs have been a benefit. The Commission has met with the chairs of the ACTs to explain the direction of the agency. As ODOT continues to go through this transformation it is important to always have some key individuals that can be contacted for rail, transit, bike and pedestrian, etc. because there needs to be a consistent linkage. Oregon is fortunate because there is enough staff to do the work but small enough where one can reach the appropriate individual by the second phone call to answer questions.

Erik Havig, ODOT

The Governor mandated that the ACTs needed to include the right person to make a decision. Local government representatives are at the table, but we wanted to make sure that freight, bike, and pedestrian were there as well. Part of the cultural change was changing the perspective of the outside groups, because the bike and pedestrian groups thought this was a power play by highway advocates to get funding for highway improvements. Work still needs to be done to ensure that everyone is on the same page.

Jerri Bohard, ODOT

In addition, there are different advisory committees – freight, public transit, bike and pedestrian, etc. These groups will get a preview of the 150% list that the ACTs develop. These committees will not see the projects, but will be able to provide comments on the themes of the overall direction back to Commission.



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Brian Gage, MnDOT

MnDOT is in the third step of an unknown number of steps process. Luckily we were finishing a 50 year vision and the first step was to align Map 21 with that since they both relate to performance and are the backbone of the system. This allowed MnDOT to establish a statewide performance program, where the money taken off the top is for the central program. The specialty offices identify projects for interstate, bridges, NHS, etc. Everyone liked Minnesota Go, the policy program with the vision, that aligned with MAP 21 so we had a statewide program to address the needs to meet performance goals. Secondly, MnDOT is going through a transition process where the current STIP identified projects between 2013 and 2016 and everything is being done to try to deliver those projects. Finally, the districts need to be convinced of this change because there isn't as much money to divide among local projects.

Question: Where do you think MnDOT is in having districts engaged in planning process that is useful to them or a tool for them?

Mark Gieseke, MnDOT

Each district has a planner that works closely with the central planner. A lot of communication is necessary to make this plan work. In addition, there is a public involvement component incorporated into the process. As far as the culture change, there has been a lot of communication with external stakeholders, especially with the local jurisdictions. A lot of communication prior to MAP 21 was conducted to ensure that when it was implemented everyone was prepared. The districts understand that there is less funding available now.

Brian Gage, MnDOT

The planning office is located in the central office. Until recently one employee was in charge of preparing for MAP 21 until her retirement. Now, one of the District Planners has been leading the process, so the overall process has been led by the districts and their perspective.

Sandi Kohrs, CDOT

There is so much change that there is a bit of culture shock. Personnel change and organization change have played a major role in the CDOT culture. For the last six months, the Executive Director and Chief Engineer have been working through ideas with the engineers in charge of the regions. At this point, there is a fair amount of discomfort. Once the asset management side is fully established it will ease some of

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that discomfort and at the end of the day it will not be all that different from what it was before. There is no money for capacity projects in the CDOT budget. The Maximize Category is the area where there is the most change right now. In particular, rural area planning partners are feeling like there won't be much for them to discuss because they have few congestion issues. They do not see the need to meet with CDOT because the asset management program will dictate use of most of the funds.

Question: Historically in transportation, the process takes a very long time for a project to go through the planning, programming, development and construction phases. Sometimes this could take up to 20 years. How do ensure that every project is the right project at the right time and location? Do you reevaluate every year?

Bill Lawrence, UDOT

I cannot recall any projects that have been funded that weren't delivered. Because of UDOT's track record, the legislatures are continuing to help provide funds. We try to send the message that "what you program you get." The federal funds are steered towards preservation because their timeframe is approximately one year, followed by rehabilitation projects because they are approximately two years. UDOT does often experience project changes in the rehabilitation program depending on needs.

Jerri Bohard, ODOT

ODOT has approached this challenge three different ways in the past. Some projects have been around for a while and they eventually die. It is important to set the expectation in the planning process so that the local governments can be supportive. If there is no local support or they are not included in the local RTP or TIP, then the projects don't move forward. There is also a development section in STIP, where projects take several years to put together due to NEPA or other outside factors. It is required that the local governments contribute enough money to keep the project moving towards the next milestone. Projects have been removed from the STIP and the ACTs are required to reevaluate the projects and look at ways to reduce funding needs and help prioritize projects. Recently, all money has been cut from modernization projects. ODOT has been tougher on local governments requiring them to show that the project is needed before including it in the STIP.

Brian Gage, MnDOT

MnDOT has two internal processes. The first is every year we complete a Highway Investment Plan (HIP) and follow it with a HIP check-in meeting. All districts attend and show how the investments are broken down to align with the STIP and

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investment guidelines. Also, a Major Projects Committee has been established to allow district engineers, and various other offices, that look at major projects to ensure that they align with MnDOT's goals. This helps get all the districts on the same page. The external process is a little tougher. Current legislation in place requires MnDOT to report on all major projects for the next 15 years. This is a different kind of planning process. This 15 year list of projects sometimes confuses outside parties because it can conflict with the Minnesota Go and STIP.

Mark Gieseke, MnDOT

In addition, MnDOT tries to reduce previous expectations and explain the reality of the funding situation. At times, it is necessary to tell the districts and local jurisdictions "no we can't do what you want".

Bill Lawrence, UDOT

As far as transparency in UDOT, everything in the STIP is publicly available for review. This has been an interesting transition and those who provided data to complete the STIP want to ensure that all information is absolutely correct.

Sandi Kohrs, CDOT

CDOT experienced a change when the funding stream for the "Seventh Pot" list of projects went away, those were the large state strategic projects. Those who didn't get those projects completed continued to lobby for them. This caused CDOT to reevaluate those projects. CDOT doesn't prepare a long-range project list, the STIP is a four plus two year plan. Some money in STIP is put in pools and the projects are decided upon as they get closer to the year in which they were planned. Not all projects are listed out, but they are compiled electronically so that the projects can be viewed at any point and reconsidered. Changes can be made, but the public is most interested in preservation projects, so there are few capacity projects being considered.

Question: Today we have spent time discussing fix-it first projects, no money for capacity projects, and different performance measures for different functional classifications. To what degree if any, given that preservation and capacity comes from the same pot of money, does the public help set the standards for performance? Or is it strictly lifecycle? Also, you also talked about risk assessment. When does that happen in the process and how does it influence the process? Is the level of maintenance part of that process?

Mark Gieseke, MnDOT

This is the first year we are trying risk assessment in the process, but it happens in a couple places. First, after we establish revenue and look at needs there are ten



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investment categories. Investment level zero is the minimum which could be tolerated. For each performance level there was an analysis of what you could get for each level and then there was a risk profile for that investment. When you go across the ten categories you try to balance the risk. Then, within each category there is a performance level for a certain level of investment. Secondly, each district will do a risk assessment for their district on a programming level. Once that is complete it will be compiled into a statewide risk assessment for programming.

Sandi Kohrs, CDOT

There are several mechanisms used to get public's input. Colorado has a Governor's blue ribbon panel statewide to gather input on priorities. Additionally, a customer survey was completed asking the public to define their priorities. There is also a group that meets monthly which represents planning regions to get feedback and provide recommendations to the commission regarding appropriate goals. The MPOs have their own conversations and context. There are lots of opportunities for influence.

Erik Havig, ODOT

There are a lot of complex performance measures and expectations that need to be met. Some key performance measures that were set years ago may need to change to match reality. The lack of investment years ago is beginning to catch up. ODOT is meeting with communities to reset expectations. Additionally, we are reassessing where the funding would come from and be available – whether it be local or federal funding. Included in this is the impact to economic development.

Bill Lawrence, UDOT

Utah has performance standards in different areas that are required to go through the Governor's office. It is a common understanding in Utah that good roads cost less. If we cannot maintain a good level of service on the entire system, we try to prioritize the roads that need more maintenance. With the asset management we try to identify the level we want to maintain at and what can be funded.

Question: You spoke of an illustrative list. Are those projects environmentally cleared with FHWA? How do you control the number of projects that are included on that list?

Sandi Kohrs, CDOT

Whether they have clearance or not depends on the size of the project. It is unlikely that an EIS project would make it on the list because they take too long to complete. The illustrative list tends to include smaller projects that may have already gone

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through the NEPA process. If there isn't enough money they often get pushed out year after year.

Question: To add to the questions, can you make observations on having a longer range program plan for those projects?

Sandi Kohrs, CDOT

There are pros and cons to that question. CDOT is looking at going to an 8-year timeline instead of 6. This helps include more projects to the list. Besides what the MPOs provide there is nothing beyond the STIP in the future. While it helps with longer range thinking and planning, creating an advanced list makes it much harder to change your mind if you need to. This was a challenge that CDOT faced and as a result a phased Record of Decision was developed which FHWA did not like. CDOT has since moved away from that method. So in order to complete the NEPA process money is needed in the long range plan and not the STIP.

Brian Gage, MnDOT

In 2003, MnDOT had a much larger list of projects. However, at this point we face both internal and external concerns. Internally, the majority of the projects for the next ten years will be pavement preservation. We don't want to publish that list of projects, because depending on the severity of the winters, that list can change each year. When we look at the 10-year program and beyond, the whole program could continue to be pavement. The other big capacity projects may not be included because a majority of the funds are going to maintain existing roadways.

Sandi Kohrs, CDOT

Just to add to that, CDOT's policy is that any new lanes added for capacity to relieve congestion will be tolled.

Mark Gieseke, MnDOT

Part of the question is how long is the illustrative list. At MnDOT, the plan is fiscally constrained. The first 10 years are mostly project specific and the next ten years are investment categories. Projects that are included in the illustrative list are those that would occur if more money was added.

Jerri Bohard, ODOT

ODOT does not have illustrative list. Instead, those projects are included in the development and construction portions of the STIP. The Commission, with the recommendation of the ODOT highway staff, sets aside a certain level of funding for preservation work and bridge projects. An amendment is made to the STIP



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depending on the project that is brought forward and the amount of new funding. The ACTs and regions maintain a needs list that is updated every few years.

Erik Havig, ODOT

The development portion of the STIP can become the wish list. If you want to add a project there needs to be enough back up showing that it is a high priority.

Bill Lawrence, UDOT

Anything included in the STIP, UDOT anticipates it will be completed in the year that it is programmed. There is also a wish list where everything is prioritized. If additional money becomes available then we move to the next highest prioritized project.

Question: Everyone talked about desire for multimodal. In Arizona we had a visioning document called "Building a Quality Arizona" or "bqAZ" and the multimodal options were very important to that vision. Have any of you taken funding for highway projects and moved towards other modes? If so, did it require changes to state legislation?

Jerri Bohard, ODOT

Yes. We flex as much as possible to accommodate multimodal projects. ODOT took STP funds and revisited the intent of the program to figure out how they could be used. Some gas tax was used to flex for bike, pedestrian, and transit projects. It did not require legislative changes. ODOT also has a special program from lottery funds multimodal projects which include rail, aviation, transit, and marine.

Question: In regard to STP funds, how much is flexed each year?

Jerri Bohard, ODOT

ODOT has \$100 million a year of which \$25 million goes to MPOs. So we flex approximately \$50 million.

Brian Gage, MnDOT

MnDOT has what is known as District C or the Central District. This pot is approximately \$30 million per year (\$15 million state and \$15 million federal) to fund odds and ends such as cable median barrier, historic bridges, etc. With MAP 21 MnDOT tried to work to balance budget and work with locals, but the transportation funding was a sensitive area. In MnDOT's case, we gave some money to the ATPs and allowed them to allocate as they wanted. Since bike and pedestrian projects were not going to score well within the districts, we then allowed for more money through District C to pay for programs such as the Safe Routes to Schools Program.



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Sandi Kohrs, CDOT

On the transit side legislation passed to fund bridges. Vehicle registration fees were applied towards transit. Some money stays within the state pot and some goes back to local levels. The amount distributed at a local level is a competitive grant process. CDOT does not do formal flexing. All projects will address bike and pedestrian needs which is now included in the larger projects. In the metro areas there is flexing for transit projects, but there with no formal amount of flexing toward multimodal.

Bill Lawrence, UDOT

UDOT had old enhancement funds and completed a lot of multimodal projects with those funds. We will be converting to STP funds and allow regions to make a determination whether or not they want to use the funds for multimodal projects.

Question: You use the term “corridors” in both programming and planning. Are all corridors considered equal?

Sandi Kohrs, CDOT

The advantage for CDOT is that it got us away from a project-based long-range plan. We look at things on a broader scale, more holistically now. We look at what needs to happen on a transportation corridor to make it multimodal and then set strategies to make it happen.

Mark Gieseke, MnDOT

With MnDOT this is more of a programming tool right now to help identify projects. It hasn't been included in the programming process yet. We currently prioritize by functional class. At this time, MnDOT doesn't have a corridor based plan.

Bill Lawrence, UDOT

UDOT does not have a corridor based plan.

Jerri Bohard, ODOT

Years ago ODOT had a corridor planning program, but the timing wasn't right to sustain that program. We now look at corridors from a maintenance viewpoint. There are some key corridors where we do maintenance based on functional class and target available funding towards those such as the interstate and east-west movements.

Question: In each of your processes, if you could change one thing to make it better link planning to programming, what would you change? Or is it perfect?



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Sandi Kohrs, CDOT

CDOT is changing a lot right now. The structure we have built in software that allows us to connect dollars to the strategies and goals that we have not been able to do in the past. We are not crazy about how the STIP is so tied to budget because it makes it a financial document and not a planning document because several amendments are required. The long-range plan should be as specific as possible regarding strategies and needs within corridors so there is agreement on transportation need and how to address those needs. We debate about how far to look ahead. CDOT is pulling back because we don't feel like we can predict the future well enough. There are changes in technology that we are unable to anticipate so we are taking it in shorter pieces.

Brian Gage, MnDOT

MnDOT is struggling with running models and achieving goals with available funding in some districts but not all. This is cultural difference that we have not been able to overcome. Some districts feel entitlement, but the debate is: should some districts feel entitlement or should the state feel entitlement? For us to get the state to be at that level, some districts will get more money while others get none. How do we change the culture on a statewide level so that each district does not have to meet the same targets?

Jerri Bohard, ODOT

The issues that are still relevant for ODOT is the local government system. There needs to be more clarity between the state system and the local system. Local governments currently rely a lot on the state system for local movement. This needs to change and the state needs to figure out how to connect these systems better. ODOT is also trying to figure out what economic development means. In Oregon, one in five jobs is freight related but there is also a lot of tourism. Several individuals talk about what having a thriving downtown means. So what is more important?

Erik Havig, ODOT

We discussed economic development, but when we start to look for strategic investments there are different values that the stakeholders are looking for in their transportation systems. How do you measure those strategic investment scenarios across measures that have not been evaluated before?

Bill Lawrence, UDOT

We shortchange ourselves not knowing the full benefit of building a road. Once we can capture the economic development element of transportation we can get



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funding. UDOT does a good job knowing where preservation is needed, but we have yet to tie together the cross-asset analysis to determine priorities.

David Rose once again thanked participants for their input. He stated that the session was very valuable.

Team Report of Concept Models

Steve Hogan gave a brief overview of the following activity and breakout sessions. He described each of the four concepts that were to be discussed during the breakout sessions. Each group was to answer the questions provided and rejoin as a group to give brief summary of each concept.

The following are the report outs from the breakout sessions.

Concept 1:

Dave Wessel, Flagstaff Metropolitan Planning Organization

For Concept one, the group discussed the similarities between this concept and the What Moves You Arizona investment categories. It covers all aspects of the system from preservation to expansion. It sets a policy basis for public expectation regarding the process. It's not an all or nothing process because it addresses the various points and looks at the entire system. One of the disadvantages it is just one more set of stove pipes atop other stove pipes, because it compounds existing problems. This is more about the outcomes and the public perception. There are different investment strategies and associated funding levels. It forces us to determine the best outcomes and shows the funding that should be achieved. It should be based on how the process is communicated and how projects are selected relative to outcomes as opposed to funding categories. Some of the challenges are that you get lost in the agency divisions. No one project fits perfectly into any one category. One size may seem to fit all. How do you adjust things over time? At this point there are no priorities among the categories, but minimum thresholds should be established within the categories. It seems that it is just one color of money that is being introduced, but doesn't set up opportunities to capitalize on future projects similar to the Hoover Dam Bypass. We need to ensure we are talking about project outcomes and reporting on a rolling average because there could be some projects that skew results. How do you analyze projects at a programmatic level for its outcomes? Viewpoints differ across the state as to what the investment strategies should be and as we feed projects through the MPO and COGs.

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Concept 2:

Aryan Lirange, FHWA

Concept 2 builds upon Concept 1 but with a more global arching initiative. We couldn't decide if it was a corridor initiative, a point project initiative (such as Hoover Dam Bypass project), or if it was communication tool. Ultimately it could be any of the three. From that perspective, part of this concept is that it could send a message statewide that projects should be in the best interest to the state as a whole. How does a strategic initiative get in there? How many are there? Is there one every year, is it the same one, is it a long-range project because it is a large effort? We are worried about the project being cut off the top. If it's a strategic initiative, is it supposed to fit one of the performance measures or categories? If it meets those then why isn't it measured based on those. The overall theme was it could be any of the three, a spot project, corridor initiative, or a communications theme. How is this translated to the locals who have a stake? If it's an initiative, does it apply to all people? We tried to decide if it should have funding from the top, similar to MnDOT District C. If your project is part of the initiative it helps it rise to the top. The project also needed to be clear to all stakeholders and it needed to be correctly communicated.

Concept 3:

Alvin Stump, ADOT Prescott District

Concept 3 is the regional investment plan where the planning and programming is decentralized to districts. There are some pros to this approach such as the viewpoint from the customers and stakeholders. They would have more local and direct input. Districts would have more opportunity to combine different funding sources to develop a complete project. Additionally, the districts have history and are more familiar with the needs of the area to better prioritize those needs and establish the program. It was interesting to hear from the other states who have this model and who are still looking for a balance. One challenge is the risk of planning and programming becoming too subjective. Some of the decision making could become more personality based. There are concerns with replicating the same process consistently throughout each district, weakening the asset management system, and accountability. Can we mitigate some of these concerns to improve the process? There are opportunities to find a happy medium and create a better system for everyone. This concept would take some work and communication among the districts. One way to differentiate from other states is that the design work would still occur on a more centralized level because there are more resources to efficiently complete design. This would be more of a hybrid concept.

Concept 4:

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Thor Anderson, ADOT MPD

Concept 4 proposes to evaluate all proposed projects regardless of type against the same set of performance criteria and prioritize and select without reference to an investment choice. Because it is such a big change from the way ADOT operates now there would need to be parameters. The first parameter is the color of money. Second is the flexibility under MAP 21. Lastly the approach must be a needs assessment. Because the criteria chosen will be the biggest deciding factor on which projects are selected, it will be essential that stakeholder input is considered when selecting the criteria. Additionally, careful consideration should be taken when weighting the criteria to ensure it falls in line with MAP 21. The pros are identified as follows:

1. Transparency
2. Implements policy well,
3. Needs-based
4. Identifies projects regardless of funding levels
5. Equitable across modes and projects
6. Allows for some projects that may get pushed out using other concepts.

The cons are as follows:

1. Careful writing policies and criteria are required
2. Complexity in developing criteria (not too many)
3. Complex transition from current process because it would go beyond a five-year timeline
4. Projects identified through the process may be unexpected and may not be accepted by the public
5. Lacks flexibility
6. Major projects that come to the top could eat up a lot of funds

There are some tradeoffs and compensations that would need to occur to include the political element. A two-phase process is necessary to help screen projects.



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Concept Model Team Debates

Steve Hogan then asked all debate captains from each concept group to approach the front of the room. He explained that each captain should try to answer the questions and defend the concept that they were assigned.

Question 1:

How will your concept result in a better performing transportation system in Arizona?

- Concept 1: We had the model that came out of the What Moves you Arizona process. It allocated priorities in modernization, preservation, non-highway, and expansion. Under this concept, ADOT would need to be more goal focused because the categories and percentage allocations are identified. There was a great deal of effort and coordination between COGs, MPOs, and stakeholders, as well as public acceptance that went into developing the current long-range plan. This is a good foundation where everyone agreed on the outcome which is a positive aspect of Concept 1.

- Concept 2: Concept 2 builds upon bqAZ to refine the process of identifying what transportation investments will support larger strategic initiatives. Not only from a transportation perspective but also from other statewide goals such as economic development, support policy changes related to energy and environmental issues, and identifying what investments from any funding categories can be made to support global strategic initiatives to benefit the state.

- Concept 3: Concept 3 is about giving the districts the authority to work with COGs and MPOS to identify needs and prioritize projects. Critical to success is the need for good performance measures and maintain consistency.

- Concept 4: The other three concepts don't match up to Concept 4. We will be able to deliver the best performing projects that are planned, programmed, and built.

Question 2:

How does your concept effectively advance projects from plans to programs?

- Concept 2: This would be a strategic initiatives category in addition to preservation, modernization, expansion, non-highway. This concept takes projects that are in the other four categories and moves them into one that is strategically



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significant to the entire state to advance goals such as economic development, job creation, or statewide policy initiative. This adds another level of prioritization when moving from planning to programming. If a project is identified as strategic, it is more likely to get political and stakeholder support to help move the project through the process. It also allows for projects to be competitive for funding.

Concept 3: Concept 3 works because everyone in the district area would be on the same page. There is also opportunity that the COGs and MPOs within districts can work together. The biggest advantage is that locally everyone agrees on the right projects. This method could eliminate disconnect.

Concept 4 – Unlike other concepts that perform decentralized “back scratching”, Concept 4 will transparently channelize a holistic view of the system goals.

Concept 1: This question goes back to question 1. Concept 1 has a solid and statewide understanding of the projects objectives and goals. This links into an acceptance of the types of projects that should be classified within the investment categories (modernization, preservation, expansion, and non-highway) that are performance and target based. This is more along the lines of public expectations.

Question 3:

How will consistency between statewide, MPO, modal, and corridor plans be achieved within your concept?

Concept 3: Consistency will depend on developing good performance measures to ensure consistency statewide. As far as consistency, the districts are the hub or key point of contact for all of these local stakeholders, COGs, MPOs and public.

Concept 4: Because of transparency in Concept 4, we will deliver the most level playing field and most equitable and defensible program, thus providing the most internally consistent plan.

Concept 1: Part of the What Moves you Arizona effort was bringing together COGs and MPOs, and it was their recommended investment choices that were included in the final product. Concept 1 has transparency because the locals provide it in their wants and needs and it will be contained within this model.

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Concept 2: A strategic plan and investment approach requires consistency. There needs to be support on what the strategic initiative is to move forward. Getting stakeholders to agree on initiatives can pose a challenge. It is not to discard the planning work already conducted, but it is to identify the components of the completed plans to benefit the state that are not necessarily transportation but also economic development, environmental, political initiatives, etc.

Joy Melita thanked the debaters for their efforts. Steve Hogan explained that Concept 1 was developed to be the closest to existing policy. Concept 2 is about big projects or programs that don't fit into established categories. Concept 3 brings the planning to programming process closer to the user, customer, and stakeholder. Finally, Concept 4 gets rid of existing stove pipes and puts everything on a level playing field.

Workshop Takeaways

Steve then asked participants to quickly go around the room to give a brief overview of their takeaways from the day.

Frank Medina: Too often we get tunnel vision. It is important to remember there are other options out there to support what goes on with the State Transportation Plan. Concept 2 can be embedded within each concept.

Charles Gutierrez: This is a difficult decision. ADOT is trying to be equitable across the board. Preparing a plan in the smaller region of Yuma is difficult enough, but I am excited to see how this will play out in the end for ADOT.

Sandi Kohrs: I am fascinated by how wide open the discussion has been here today. This could be a big change in the way ADOT does business. I got some conversation starters to take back to CDOT. Thank you.

Bill Lawrence: It is interesting to see the different processes that different states employ. I am appreciative of this opportunity to listen to the other states.

Jerri Bohard: I also am really appreciative. There is comfort in hearing that we are all facing the same problems even though we address them differently. All the energy that has been put into this discussion will show folks that more money needs to be allocated towards transportation.



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- Erik Havig: Its nice knowing there are others to discuss these challenges with. This will not be a perfect process. There is a lot of balancing that needs to be considered.
- Brian Gage: I don't want to do a STIP every year and it's nice to hear that there are options out there. MnDOT has tried many different versions of these concepts, but mainly relies on stakeholders to determine what projects move forward.
- Tom Deitering: The timing is right. We need to be more strategic with investments and resources. All the writing is on the wall. This will result in different ways of doing business. Some people will be unhappy because they don't like change.
- Aryan Lirange: There is a cross-asset challenge of comparing projects. The key is to know what you have now, how it will perform in the future, and the performance you can buy. It is an intensive process, but does it show us where we want to be?
- Barbara Bauer: "Smart is the new rich." We will not get more money. We need to make better decisions with what we have. The discussions today underscore having the right people at the table making decisions and the commitment we need to make to revisit goals and revise accordingly.
- Romare Truely: There is no one size fits all answer between planning and programming. There are regional and local needs that are equally important. It is a constant challenge, but the lines of communication need to remain open.
- Jodi Rooney: I appreciate hearing about friends in Minnesota and the backdoor leap frog politics. There is a political aspect that comes into plan.
- Ed Stillings: Our vision in Arizona is not where it needs to be. We have a STIP but we are lacking the middle phase. We are not visionary and populating what we need to be thinking about in all our programs. Sounds like all the peer states have that.
- Dianne Kressich: It is important to think about where we want to be to establish a set of criteria that should be applied to all projects.
- Chris Bridges: Ed Stillings is right. Having a land use planning background, it is difficult to see the lack of land use planning incorporated into long-range transportation



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planning. Transportation is reactive to land use. Secondly, we are on the threshold of a shift in how we do business and it is good to see the support.

- Jean Nehme: Whichever process we end up selecting needs to be flexible enough to not box us in. It needs to allow for tradeoffs.
- Thor Anderson: Selection of criteria is critical in developing projects and we need to think about efficiencies about projects within projects.
- Carlos Lopez: There were common themes between peer states, less funding and economic development and their impacts to the changes to the planning to programming process. The key part of the solution is communication between planning and programming, and also between the buy-in internally and externally with stakeholders.
- Bret Anderson: Comfort knowing someone else is still using a spreadsheet. We will know that there is no one size fits all in the process.
- Scott Driver: I'm impressed at how well this group worked together.
- Jason Kelly: The structure of the workshop was helpful in learning the process and procedures. We are in a unique place and the world is changing. This all goes back to how the other states adapted to cultural change.
- Chaun Hill: I honed in on the concept of system health. If only we could define the quality of the system by investing in the right projects. In the current economic times, we have limited funding. We need to provide for overall system health in Arizona.
- James Bramble: It will be nice to see a balance. It allows for everyone to do their job and get things done.
- Karla Petty: There is no one size fits all. I like the approach of having some stakeholders in the room as part of the discussion to make decisions. It is the start of the cultural change. It is also important to understand what is happening in neighbor states.
- Frank Medina: This confirms what I have known is that change is upon us. It is changing faster and faster. We are trying to be better prepared. We have to be nimble and be ready to change as stakeholders, politicians, and funding changes.



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- Jennifer Toth: We need to keep in mind a collaborative way to work with the districts. How do we identify more specifically what their needs are and incorporate those needs.
- Mark Griffin: Change is inevitable.
- Eric Anderson: We have to be firmly flexible. The Casa Grande Resolves was helpful in that it showed us that no one could figure out how the ADOT program was developed. ADOT has done long-range plans before and they sit on the shelf. We are headed in the right direction.
- Dave Wessel: To keep outcomes front and center. We don't want to be trapped in another stovepipe. Another key concept is corridors because they unite us. The corridors can show us what we have in common between regions and help create economic development.
- Steve Boschen: Purposely passionate about Concept 4 because a hybrid has to be a solution. Economic development needs to be evaluated regardless of whether or not the job is conducted. We also need to measure our return on investment somehow.
- Alvin Stump: It was great to hear from other states. It is about optimizing our limited resources.
- Mike Normand: Appreciated the format today and listening to other states. We are in a time of great change and have seen this over the last few years. It's a new paradigm. There isn't enough money to do all things that need to be done. We need to get the most value out of the limited resources we have.
- Annette Riley: Appreciate the complexity of the planning and programming process. I also appreciate the efforts that are going into today's work.

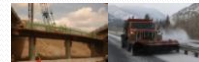
Once again Jim Zumpf thanked participants for their time and concluded the meeting.

Arizona DOT Peer Exchange

January 29, 2013

Sandi Kohrs

Multimodal Planning Branch Manager



Planning/Programming at CDOT

- Planning
 - Policy Directive 14
 - Performance Based Planning
 - Structure
 - Risk-Based Multi-Asset Management System
 - Resource Allocation
- Project Selection/Programming
 - Past/Future
 - Tiering
 - Cost/Benefit – Economic Analysis



Planning/Programming at CDOT

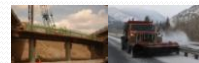
- Stakeholders
 - 5 MPO's - 3 are TMA's
 - 10 Rural Planning Regions
 - Statewide Transportation Advisory Committee (STAC)
- Transportation Commission



3

Statewide Planning

- Plan Status
 - In Plan Update mode
 - Target Year 2040
 - Focus on MAP-21 requirements
 - State Law requires fiscally constrained Statewide Plan
 - SW Long Range Plan is corridor based – not a list of projects
 - MPO's more project based



4

Planning

- PD 14
 - Sets Goals and Objectives – have been aspirational, looking at thresholds for MAP-21.
 - Goal areas: Safety, Infrastructure Condition, System Performance, Maintenance, Project Delivery – connect to National Goal areas.
 - No separate Freight or Environmental (State law–GHG)
 - “Balanced approach to optimize the system”
 - Sets framework for Program Allocations and for Performance Reporting



5

Planning

- Performance Based Planning
 - New categories – maintain, maximize, expand
 - Projections for achievement at various fund levels for infrastructure - Least life cycle cost
 - Transit – new goal - asset condition
 - Work on mobility/reliability measure on-going
 - New Operations Division – Operations Plan
 - Safety objectives but not separate category
 - Maintenance Level of Service objectives
 - Project Delivery – Chief Engineer Objectives



6

Structure

- Decentralized – allocation of funds to Regions from program area allocations based on formulas.
- Centralizing – more by asset management plan, corridor operations, Commission priorities for expansion.
- Senior Management Team –CDOT
- High Performance Transportation Enterprise (Tolling/P3)
- Bridge Enterprise (specific funds for bridge)



7

Asset Management

- Multi-asset management system – being developed to include pavement, bridge, maintenance, fleet, ITS assets, and property.
- Risk assessment – critical assets, threats, mitigation
- Least life cycle cost
- Condition target and treatment may vary by facility type
- Better data for link between maintenance practices and deterioration



8

Resource Allocation

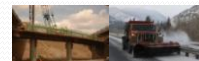
- By program – by fund category
- Fund to objectives in PD 14
- Past – fund to Regions – MOU's with 2 TMA's
- Future – fund to program – asset management - corridor operations – priority corridors – regional balance.
- Committees to discuss options – STAC members and DOT
- Sub-allocate to TMA's: as required by MAP-21 plus CMAQ. TAP to MPO's and Regions.



9

Project Selection/Programming

- Past:
 - 4P process – county meetings
 - Region selection but with pavement model, bridge needs, and maintenance goals.
 - Region plan identifies priorities for improvements
 - Strategic projects –major improvement list - fund source lost
- Future – asset management, more central for major improvements, compare statewide, less by formula.
- Project evaluation for those not driven by management system



10

Project Selection/Programming

- Tiering
 - For roadways – by volume, by classification
 - Different standards – Interstate, NHS, Other - “driveability” threshold
 - Have used Remaining Service Life score
 - National standard – IRI, Structural Health index
- Cost/Benefit – Economic Analysis
 - Working on improved project method



11

Planning Partners

- Work with MPO's
 - Agreement on fiscal constraint numbers for Plan/TIP
 - MPO's select projects for sub-allocated funds and local funds
 - CDOT submits projects for CDOT managed funds
 - Close coordination with Region staff on needs and priorities
 - Regular meetings with local jurisdictions
 - STAC members
 - Different CDOT representation at various MPO's



12

Planning Partners

- Rural Planning Regions
 - Some SPR for administration and meetings
 - CDOT provides staff for region plan development
 - Meet with Region regularly to discuss needs and priorities
 - Prioritize STIP list based on Region allocation
 - Future – more by asset management and project evaluation system
 - Have had Regional Priority Funds to apply to projects



13

Planning Partners

- STAC – one member for each of 15 Planning regions
 - Make recommendations to Commission
- Transportation Commission
 - Authority over CDOT budget
 - 11 members appointed by Governor from areas of State



14

STIP

- Has been 4 + 2 - Looking at 8 years
- 5 year strategic plan to legislature (SMART legislation)
- State fiscal year July 1- June 30
- Tied electronically to budget – nightly updates
- Have been conservative in projections – add funds mid year
- Has been budget based – moving to expenditure based
- Use “illustrative” to have flexibility in adding or deleting projects



15

Plan to Program to Reporting

- Corridor Vision and Strategies
- Projects match strategies for corridor
- STIP – will assign dollars to strategies for each project
- Strategies link back to PD 14 goals and national goal areas
- Compile report on funds from STIP applied to strategies
- Report on performance results annually



16

CDOT Contacts

- Asset Management – Scott Richrath
- Performance Measures – Scott Richrath
- Resource Allocation – Ben Stein, CFO or Laurie Freedle, Budget Director
- STIP – Pat Saffo
- Cost/Benefit – Economic Analysis– Scott Richrath
- MPO/Rural planning – Jeff Sudmeier
- Transit – Mark Imhoff
- Statewide Planning – Michelle Scheuerman





Minnesota DOT P2P Link

ADOT Best Practices Workshop
January 29, 2013

Mark Gieseke and Brian Gage
Minnesota Department of Transportation (MnDOT)
Office of Capital Programs and Performance Measures (OCPPM)

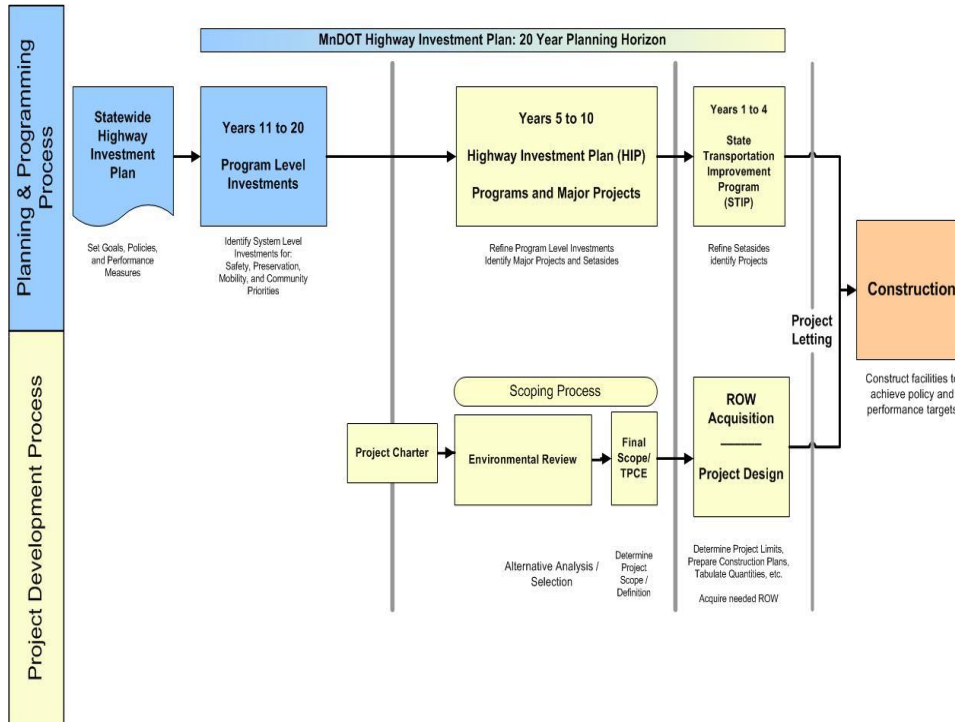
Your Destination...Our Priority



Overview of MnDOT Planning and Programming Process

- Program Length
 - 4-Year State Transportation Improvement Program (STIP) – Updated every year
 - Eight MPOs 4 or 5 year Transportation Improvement Plans (TIP) – Updated every year
 - 10-Year State Highway Investment Plan (MnSHIP) – Updated every year (usually)
 - 20-Year Investment Plan – updated every 4 years
 - 50-Year Vision (Minnesota GO) – first time



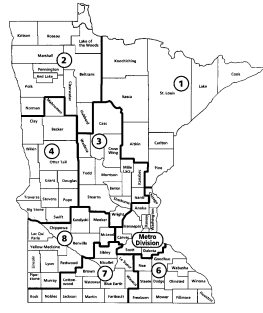


Overview of MnDOT Planning and Programming Process

- ▶ Program Structure
 - Decentralized
 - Eight Districts
- ▶ Current Approach
 - 2005 – 1st Performance Based – Linear
 - 2009 – 2nd Performance Based – Parallel
 - 2013 – 3rd Performance Based – Required



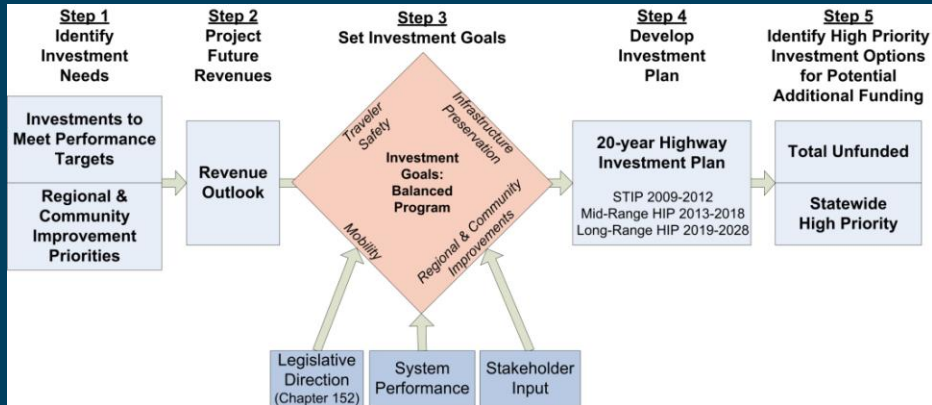
Decentralized Approach



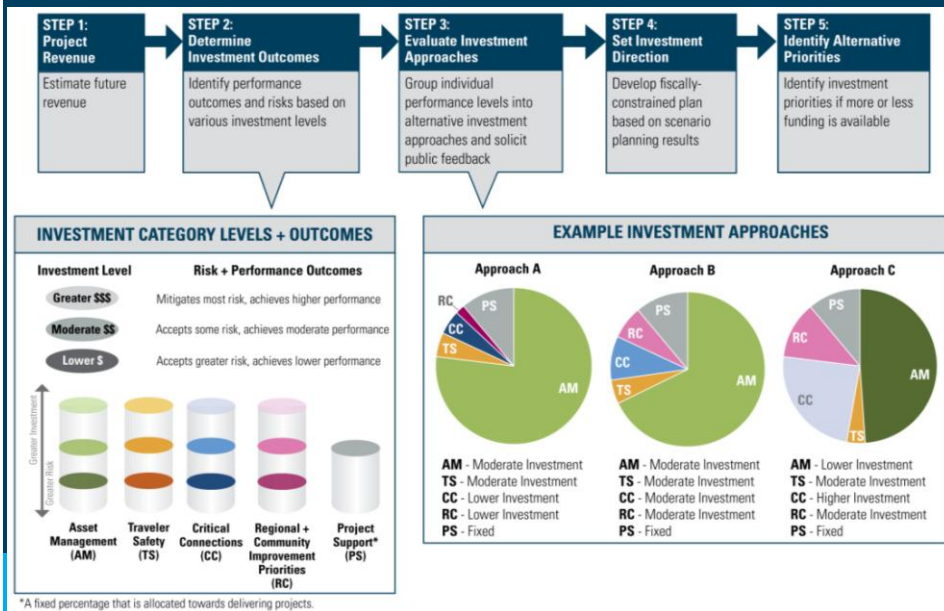
Dist/ATP	CITY	COUNTY	TWP	MODAL	RDC	MPO	MnDOT	OTHER*	TRIBAL	TOTAL
1	9	17	6	7	2	3	2	3	5	54
2	1	1		1	4	1	2		1	11
3	2	2		2	6	2	2		2	18
4	1	2		1	4	1	3		1	13
6	2	2		2		2	3		1	12
7	2	4		2	2		4			14
8	2	3		1	6		4			16
Metro	10	7		4	2	4	4	9		40
TOTAL	29	38	6	20	26	13	24	12	10	178



MnDOT's Previous Planning Process (2005 and 2009)



5-Step Plan Development Process



Challenges encountered while developing/implementing process

- ▶ **Decentralized Structure**
 - Project selection traditionally made by the District and the Area Transportation Partnership (ATP)
 - Each Region feels they are unique
 - District Risk Assessments identify top risks at a regional level and may not be the State's top risks
- ▶ **Political Pressure**
 - Corridor groups and others bypass MnDOT's planning/programming process and go directly to the Governor or Legislature



Challenges encountered while developing/implementing process

- ▶ Funding vs. Needs
 - In 2005, we had enough funding to meeting Preservation Needs and then some – Policy was “Preservation First”
 - In 2009, we did not have enough funding to meet Preservation Needs; Political pressure for other investments as well – Policy changed to “A Balanced Program”
 - In 2013, All Needs greatly exceed available funding; MAP-21 changes focus to NHS performance – Policy evolving to “NHS Performance/Preservation First”



Lessons Learned:

What would we do if we could start over?

- ▶ Don't oversell the “If you can measure it, you can fund it” mentality
 - Economic Development, Bikes, Drainage, etc...
- ▶ Avoid the perception of awarding bad performance
 - How to address accountability in a public agency
- ▶ Backing into the program (political decisions)
 - How do you justify political leapfrogging of projects



Lessons Learned:

What would we do if we could start over?

- ▶ Tell a Consistent Story
 - Visions vs. Illustrative Lists vs. Plans vs. Programs

- ▶ Visions Die Hard
 - Plans change faster than peoples' memories
 - Once written down, hard to erase (11,200 ADT)



Possible Panel Questions

- ▶ MnDOT Answers to Questions



Stakeholder Involvement

- ▶ Minnesota GO (50-Year Vision)
 - Steering Committee, workshops, online input
 - 50-year vision and guiding principles (Nov. 2011)
- ▶ MnSHIP (20-Year Plan)
 - Public and agency input on investment scenarios
 - Updated priorities and programs to manage performance and risks (Summer 2013)
- ▶ STIP (4-Year Program)
 - Decentralized and centralized project selection
 - Annual updates for committed project list



Fund Distribution (2009–2016)

Approved Formula													
Performance-based Variables (Pavement and Bridge Needs, Fatal/A Injury Crashes and Congested VMT)													
		SYS	Units	Factors	Weight	ATP 1	ATP 2	ATP 3	ATP 4	ATP 6	ATP 7	ATP 8	METRO
100%	PRESERVATION	TH	\$	Average Bridge Needs	20%	\$7.5	\$2.6	\$4.4	\$1.3	\$7.4	\$2.7	\$1.1	\$42.0
				HCVMT	5%	\$1.4	\$0.7	\$2.6	\$1.6	\$1.7	\$1.1	\$2.7	\$5.4
		TH	\$	Average Pavement Needs	35%	\$19.8	\$13.4	\$14.3	\$13.6	\$20.2	\$13.1	\$11.1	\$15.2
	SAFETY	All	crashes	Fatal/A Injury Crashes (3 year average)	10%	\$2.5	\$1.3	\$4.9	\$2.1	\$4.0	\$1.9	\$2.0	\$15.8
				Congested VMT	15%	\$0.5	\$0.1	\$3.9	\$0.3	\$1.3	\$0.6	\$0.2	\$45.0
		FA	VMT	Congested VMT	15%	\$0.5	\$0.1	\$3.9	\$0.3	\$1.3	\$0.6	\$0.2	\$45.0
MOBILITY	All	buses	Transit	5%	\$1.3	\$0.3	\$1.0	\$0.6	\$0.8	\$0.7	\$0.2	\$12.3	
			Future VMT	10%	\$2.3	\$1.1	\$4.1	\$1.6	\$3.2	\$1.8	\$1.4	\$19.2	
	All	People	Future VMT	10%	\$2.3	\$1.1	\$4.1	\$1.6	\$3.2	\$1.8	\$1.4	\$19.2	
TOTAL BASE DISTRIBUTION					\$345	\$35.3	\$19.5	\$35.1	\$21.1	\$38.5	\$21.8	\$18.7	\$154.9
Addit. Federal Funds for Preservation Inflation (2009 to 2011)					\$47	\$6.6	\$3.8	\$4.8	\$3.8	\$6.7	\$3.9	\$3.4	\$14.3
Additional Federal Funds to hold ATP harmless					\$0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
TOTAL FEDERAL FUNDS DISTRIBUTED BY FORMULA					\$392	\$41.9	\$23.3	\$40.0	\$24.9	\$45.2	\$25.7	\$22.1	\$169.2
					100%	10.2%	5.7%	10.2%	6.1%	11.2%	6.3%	5.4%	44.9%
Definitions	Average Pavement Needs	2009 to 2020 Pavement Needs from the Pavement Model in January 2006.											
	Average Bridge Needs	2009 to 2030 Bridge Needs from the District Plans in June 2005											
	HCVMT	2005 Daily Heavy Commercial Vehicle Miles Traveled from TIS											
	Fatal/A Injury Crashes	3-Year Average of Statewide Fatal/A-Injury Crashes (2002-2004), Office of Traffic, Security and Operations											
	Congested VMT	2005 Congested Daily VMT for Trunk Highways and CSAHs using IRC definitions of congestion for moderate and above level of congestion as defined by facility type, December 2005 (Office of Investment Management)											
	Transit	2004 Minnesota Transit Report											
Future VMT	2010 Population, State Demographic Office, 2004												



Fund Distribution (2017)

Act	Federal and State Programs	ATP 1	ATP 2	ATP 3	ATP 4	ATP 6	ATP 7	ATP 8	Metro	State	District Total	State Total	Comparison	Eligible Projects
Current Distribution	Federal	\$41.9 M	\$23.3 M	\$40.0 M	\$24.9 M	\$45.2 M	\$25.7 M	\$22.1 M	\$169.2 M	\$132.7 M	\$392.3 M	\$525.0 M		
	Target Formula	10.7%	5.9%	10.2%	6.3%	11.3%	6.5%	5.6%	43.1%	15.0 M	100.0%	\$290.0 M	\$815.0 M	
	State	\$27.9 M	\$15.5 M	\$28.1 M	\$16.5 M	\$30.3 M	\$17.0 M	\$15.0 M	\$124.6 M	\$115.0 M	\$275.3 M	\$290.0 M		
	Target Formula	10.1%	6.6%	10.2%	6.6%	11.0%	6.2%	5.5%	45.3%	100.0%	100.0%	\$290.0 M	\$815.0 M	
ATP & District Total		\$69.8 M	\$38.8 M	\$68.1 M	\$41.4 M	\$75.5 M	\$42.7 M	\$37.1 M	\$293.8 M	\$147.7 M	\$667.3 M	\$815.0 M		
ATP Managed Allocation	ATP - Urban	\$0.0 M	\$0.0 M	\$0.0 M	\$0.0 M	\$0.0 M	\$0.0 M	\$0.0 M	\$37.3 M	\$37.3 M	\$37.3 M	\$37.3 M		Local Federal-Aid eligible roads and bridges, enhancements, and recreational trails
	ATP - Small Urban	\$2.1 M	\$0.6 M	\$2.9 M	\$1.2 M	\$4.1 M	\$1.7 M	\$0.8 M	\$1.2 M	\$14.7 M	\$14.7 M	\$14.7 M		
	ATP - Rural	\$2.9 M	\$1.7 M	\$4.6 M	\$2.3 M	\$2.9 M	\$2.3 M	\$2.2 M	\$2.3 M	\$22.6 M	\$22.6 M	\$22.6 M		
	TAP - Statewide	\$0.4 M	\$0.2 M	\$0.8 M	\$0.3 M	\$0.6 M	\$0.3 M	\$0.3 M	\$3.6 M	\$6.5 M	\$6.5 M	\$6.5 M		Local Transportation Alternation Program eligible projects selected through an ATP managed competitive grant process
	TAP - Urban	\$0.0 M	\$0.0 M	\$0.0 M	\$0.0 M	\$0.0 M	\$0.0 M	\$0.0 M	\$3.9 M	\$3.9 M	\$3.9 M	\$3.9 M		
	TAP - Small Urban	\$0.2 M	\$0.0 M	\$0.3 M	\$0.1 M	\$0.4 M	\$0.2 M	\$0.1 M	\$0.1 M	\$1.3 M	\$1.3 M	\$1.3 M		
	TAP - Rural	\$0.3 M	\$0.2 M	\$0.5 M	\$0.2 M	\$0.3 M	\$0.2 M	\$0.2 M	\$0.2 M	\$2.0 M	\$2.0 M	\$2.0 M		
	EMAQ	\$0.0 M	\$0.0 M	\$0.0 M	\$0.0 M	\$0.0 M	\$0.0 M	\$0.0 M	\$27.1 M	\$27.1 M	\$27.1 M	\$27.1 M		Metro area congestion mitigation and emission reduction projects
	HSP - ATP	\$1.3 M	\$0.8 M	\$2.6 M	\$1.1 M	\$2.2 M	\$1.4 M	\$1.1 M	\$8.3 M	\$18.9 M	\$18.9 M	\$18.9 M		Safety projects identified within County Safety Plans
	Sub-Total	\$7.2 M	\$3.6 M	\$13.3 M	\$5.1 M	\$10.4 M	\$6.1 M	\$4.7 M	\$83.3 M	\$133.6 M	\$133.6 M	\$133.6 M		Total Federal Funds to be distributed to ATPs
Statewide Investment Priority Program	ITP - Off-System Bridges								\$4.5 M	\$4.5 M	\$4.5 M	\$4.5 M		Off-System Bridge Program managed by State Aid
	TAP - International Trails								\$2.0 M	\$2.0 M	\$2.0 M	\$2.0 M		TAP funds transferred to DNR
	ITP/ISF - District C & D and Snow								\$45.0 M	\$45.0 M	\$45.0 M	\$45.0 M		ITP and ISF managed by TTC
	ISPAW/ISA Sanctions								\$18.1 M	\$18.1 M	\$18.1 M	\$18.1 M		
	HSP - Highway Full Grade Rigs								\$4.9 M	\$4.9 M	\$4.9 M	\$4.9 M		
	NHPP - NHIS (Chapter 152) Bridges	\$6.3 M	\$9.2 M	\$6.3 M	\$6.6 M	\$20.1 M	\$6.7 M	\$1.9 M	\$23.0 M	\$80.0 M	\$80.0 M	\$80.0 M		HSP Rail managed by ODFV-Rail Unit
	NHPP/IF - Interstate Pavement	\$2.6 M	\$0.0 M	\$2.0 M	\$2.6 M	\$3.2 M	\$8.1 M	\$0.0 M	\$19.3 M	\$40.0 M	\$40.0 M	\$40.0 M		Completion of the Chapter 152 Bridge program and NHIS Bridges Interstate Pavement projects
	NHPP/IF - NHIS Pavements	\$14.3 M	\$6.7 M	\$12.3 M	\$12.0 M	\$9.7 M	\$19.7 M	\$8.7 M	\$29.5 M	\$113.4 M	\$113.4 M	\$113.4 M		NHIS Pavement Projects
	NHPP - NHIS Performance	\$0.0 M	\$0.0 M	\$0.0 M	\$0.0 M	\$0.0 M	\$0.0 M	\$0.0 M	\$56.0 M	\$56.0 M	\$56.0 M	\$56.0 M		NHIS Performance (Wkts Reliability) projects
	IS - Other Statewide (CIMS, TED)								\$35.0 M	\$35.0 M	\$35.0 M	\$35.0 M		CIMS, TED, Major RCP Commitments
Sub-Total	\$23.2 M	\$15.9 M	\$20.6 M	\$21.7 M	\$39.0 M	\$34.5 M	\$10.6 M	\$127.8 M	\$122.6 M	\$287.2 M	\$399.8 M			
District Risk Management Program	HSP - MnDOT (Goal)	\$1.2 M	\$0.7 M	\$1.9 M	\$0.9 M	\$1.4 M	\$1.0 M	\$1.0 M	\$3.7 M	\$6.9 M	\$11.8 M	\$18.7 M		Safety projects identified within District Safety Plan on the trunk highway system (includes MnDOT share of ISA Sanction Funds)
	ITP - Statewide	\$16.2 M	\$6.1 M	\$9.9 M	\$7.1 M	\$9.3 M	\$9.8 M	\$6.0 M	\$28.5 M	\$92.9 M	\$92.9 M	\$92.9 M		NPA Pavements (\$140 M) & Bridge (\$57 M), Roadside Infrastructure, Other Twin Cities Mobility and Greater MN Mobility Projects, Non-HSP Safety Projects, and District RCPs
	State Funds (ST)	\$36.2 M	\$13.8 M	\$23.3 M	\$15.9 M	\$20.9 M	\$21.9 M	\$13.4 M	\$64.0 M	\$208.3 M	\$208.3 M	\$208.3 M		
	Sub-Total	\$53.6 M	\$20.6 M	\$34.1 M	\$23.8 M	\$31.6 M	\$32.7 M	\$20.3 M	\$96.2 M	\$69.9 M	\$313.0 M	\$313.9 M		
	Base Distribution Method	17.4%	6.6%	10.7%	7.6%	10.0%	10.5%	6.4%	30.7%	100.0%	100.0%	\$313.9 M	\$815.0 M	
ATP & District Total		\$84.0 M	\$40.9 M	\$88.0 M	\$65.7 M	\$106.9 M	\$73.5 M	\$58.6 M	\$387.5 M	\$119.5 M	\$706.0 M	\$815.0 M		

Base Distribution Method - NPA Pavement: 20%; NPA Bridge: 20%;/75 Lane Miles: 30%; WMT: 24%; HCMWT: 6%



Politics and the Planning/ Programming Process

- ▶ Regional & Community Improvement Priorities (RCIPs)
 - Statewide RCIPs
 - Regions RCIPs
- ▶ Corridor Investment Management Strategies (CIMS)
- ▶ Transportation Economic Development (TED) Program
- ▶ Safety and Mobility (SaM) Interchange Program



Transportation Boards and Commissions

- ▶ Minnesota does not have a Transportation Board or Commission
- ▶ Investment decisions are made within the DOT
 - Transportation Planning Investment Committee (TPIC) provides recommendations to the Commissioner



State Laws and Requirements

- ▶ State Plan
- ▶ State Program
- ▶ Major Projects Report
- ▶ Project Tracking



Funding Fluctuations

- ▶ Additional Funds
 - CAF, ARRA, etc
 - Split between MnDOT and Local
 - Directed towards specific project types
 - Distributed to Districts
 - ELLAs
- ▶ Less Funding
 - 30% Contingency identified every year for federal funds (projects not be let until February)
- ▶ Economic Forecasts
 - Economists on staff to provide forecasts and economic analyses (e.g., inflation, revenue)



Right-Sizing and Practical Designs into Project Scoping

- ▶ MnDOT Project Scoping Process
- ▶ Major Projects Committee
- ▶ District Budget Limitations



Incorporating Asset Management

- ▶ Expanded Initiative under MAP-21
- ▶ Previous plans relied varies surrogates
 - Pavement Model (predictive)
 - Bridge Model (not so predictive)
 - Safety “Model”
 - Other Roadside Infrastructure (life-cycle estimate)
 - Greater MN Mobility (travel time models)
 - Twin Cities Mobility Congestion plan
 - Everything else



Continuity in Decision-making Changes in Priorities over Time

- ▶ Resource Distribution Method (Target Formula)
- ▶ Investment Guidance/Direction
- ▶ HIP Meetings
- ▶ TPIC Meetings
 - Wiki Site



Organizational and Decision-making Structure

- ▶ TPIC
- ▶ Major Projects Committee
- ▶ Highway Investment Workshop



Crunch Time End of Fiscal Year(s)

- ▶ State Fiscal Year ends June 30
 - Biennial Budget
- ▶ Federal Fiscal Year ends September 30
 - Works off State Fiscal Year
 - Managing Forward
- ▶ Bond Expiration on December 31
- ▶ Goal to have a Balanced Letting Schedule
 - Begin tracking slippage in October
 - ELLAs and AC used to spend all the funds
 - Looking at IDIQ projects

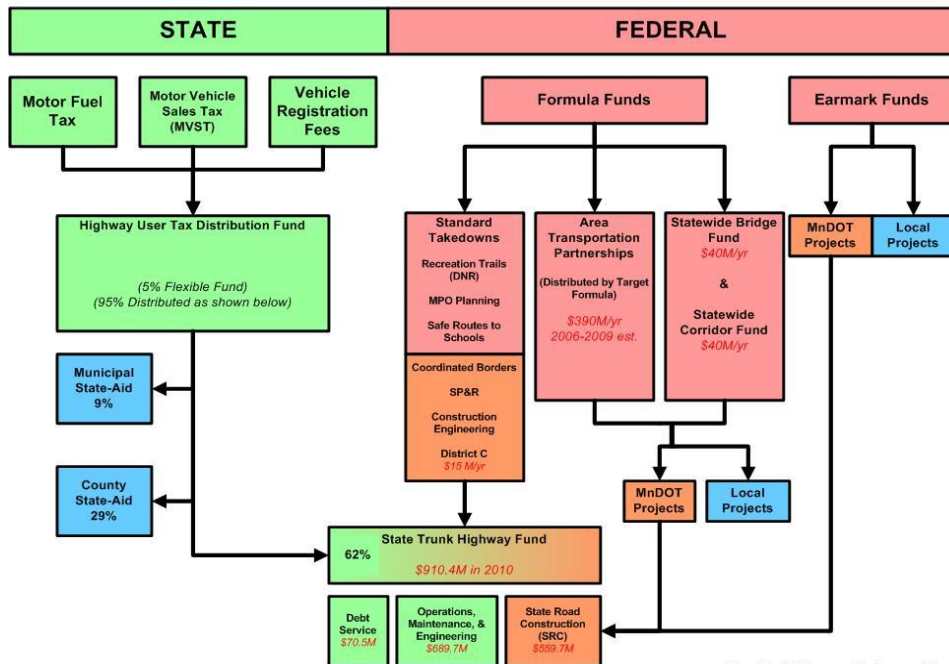


The Color of Money

- ▶ Before MAP-21
 - All funds treated as “Green”
 - Districts programmed their best projects,
 - Central Office managed the funds
- ▶ After MAP-21
 - Districts now have to develop projects consistent with STP geographic distribution
 - NHPP funds used for statewide program
 - TAP funds treated as “Green” still



Minnesota's Primary Transportation Funding Sources



Office of Capital Programs & Performance Measures
April 8, 2011

Life–Cycle Costs

- ▶ Changing with MAP–21 and Asset Management approach
- ▶ Before MAP–21
 - Pavement and Bridge needs developed by appropriate models
 - Other Infrastructure (Drainage, Signs, Noise Walls, etc) needs were based on complete replacement over the life of the structure
 - HSIP needs based on SHSP proactive improvements



Links

- ▶ MnDOT Strategic Vision
 - <http://www.dot.state.mn.us/strategicvision/vision.html>
- ▶ Minnesota GO – A collaborative vision for transportation
 - <http://www.dot.state.mn.us/minnesotago/index.html>
- ▶ Statewide Multimodal Transportation Plan
 - <http://www.dot.state.mn.us/minnesotago/SMTp.html>
- ▶ Highway Systems Operation Plan (2005 and 2012)
 - <http://www.dot.state.mn.us/planning/program/hsop.html>
 - <http://www.dot.state.mn.us/maintenance/hsop/>



Links

- ▶ Strategic Highway Safety Plan
 - <http://www.dot.state.mn.us/trafficeng/safety/shsp/index.html>
- ▶
- ▶ Minnesota State Highway Investment Plan: 2013–2023 (MnSHIP)
 - <http://www.dot.state.mn.us/planning/statehighwayinvestmentplan/index.html>
- ▶
- ▶ Minnesota Statewide Transportation Policy Plan: 2009–2028
- ▶ Minnesota Statewide 20–Year Highway Investment Plan: 2009–2028
 - <http://www.dot.state.mn.us/planning/stateplan/index.html>
- ▶
- ▶ Minnesota State Transportation Improvement Program
 - <http://www.dot.state.mn.us/planning/program/stip.html>
- ▶
- ▶ MnDOT Organization Structure
 - <http://www.dot.state.mn.us/information/orgchart.html>





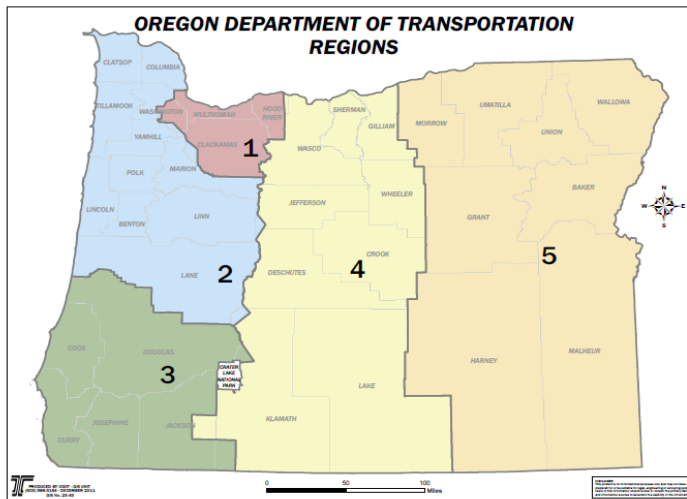
Oregon From Planning to Programming

ADOT Peer State Presentation
January 29, 2013

Jerri Bohard Division Administrator TDD
Erik Havig, PE Planning Section Manager

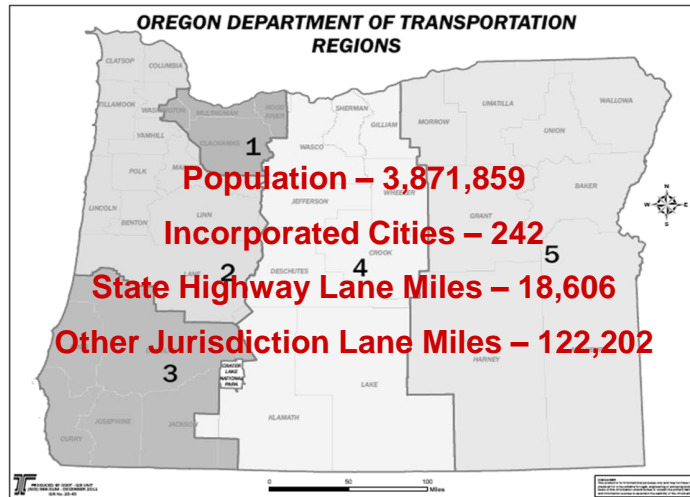


Oregon Map





Oregon Map



Planning In Oregon

- Federal Regulations
- State Laws
 - Statewide Planning Goals
 - Transportation one of the goals
 - Implementation requires cities and counties to prepare local transportation system plans
 - Requires by law all plans be consistent with state transportation plan



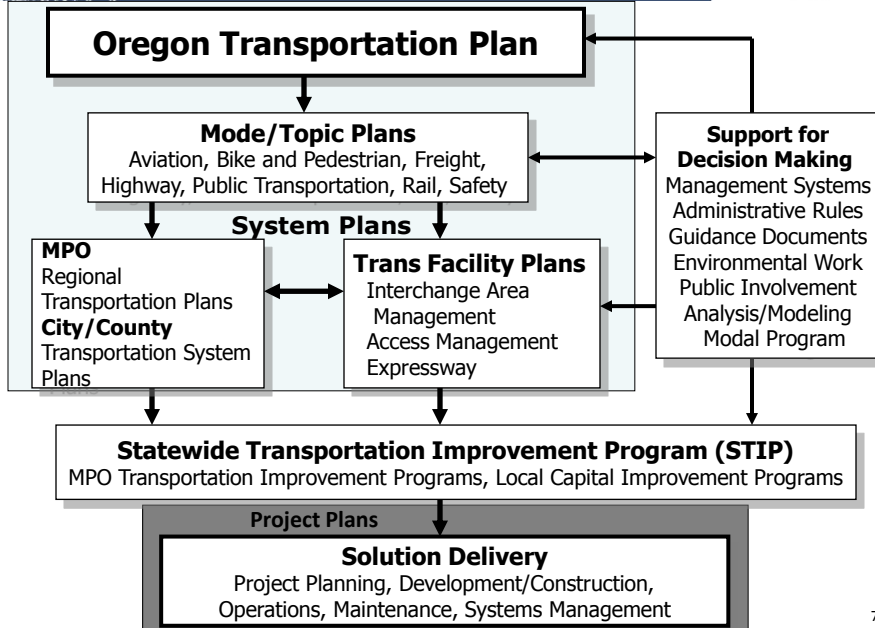
Planning In Oregon

- Oregon Transportation Plan
- Modal and Topic Plans
- Local Transportation System Plans
- Project Planning



Oregon Transportation Plan (OTP)

- Is the transportation policy planning document for ODOT
- 25-year statewide multimodal policy plan
- Establishes goals and policies for all system and project plans
- All regional and local transportation plans must be consistent with the OTP
- Does not include projects
- Updated in 2006



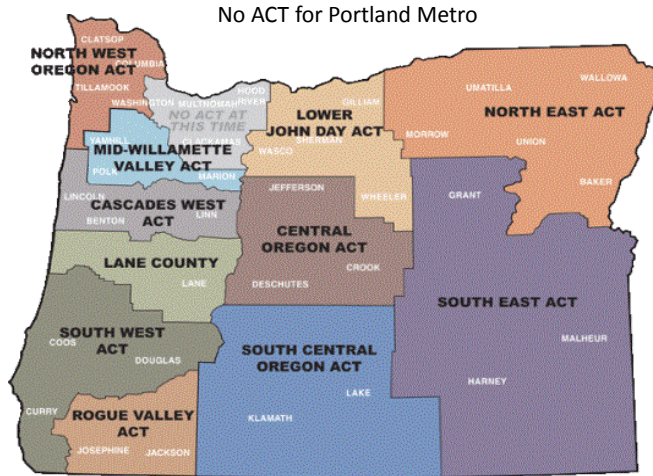
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Programming In Oregon

- Oregon created advisory committee's to inform Transportation Commission
- Area Commission on Transportation (ACT)
- Geographic areas of the state with similar characteristics
- ACTs inform statewide policy
- ACTs advise project programming decisions



Area Commissions on Transportation (ACTs)



9



Previous STIP Process

- The OTC set individual program funding allocations for 38 programs.
- Those 38 programs range from \$1.3M over 4 years for Public Transit TDM (Transportation Demand Management) and \$8.4M for Workzone Safety to \$216M for the State Bridge program and \$409M for Pavement Preservation.
- The project selection processes for those 38 programs vary and may include: state program decision making, asset management system data, statewide advisory committees, ACTs, MPOs, and/or regions.



Program Funding Levels

NON-CAPITAL PROGRAMS

	2010	2011	2012	2013	2014	2015
Maintenance	197.0	202.8	205.7	216.7	219.6	230.6
Bridge (OTIA III oversight)	20.7	17.1	13.3	11.6	5.9	5.2
Special Programs (Indirect)	81.0	81.2	82.2	83.8	85.4	87.0
Access Mgmt. remedies	2.5	2.5	2.5	2.6	2.6	2.6
Incident response	8.3	8.3	8.5	8.6	8.8	8.9
Central Services (Assessments and Other)	57.0	57.1	58.2	59.3	60.4	61.6
Capital Construction & Improvement	1.6	1.8	10.5	10.4	10.4	10.4
TOTAL NON-CAPITAL PROGRAMS	368.1	370.8	380.9	392.9	393.0	406.3

CAPITAL PROGRAMS -- CONSTRAINED STIP

	2010	2011	2012	2013	2014	2015
			OTC Targets		Projected	
Preservation	88.7	93.9	99.2	104.6	105.2	100.3
Bridge	53.3	56.1	51.0	55.9	56.2	53.7
Operations	17.5	20.2	16.2	16.9	17.1	16.2
Safety	27.6	29.2	29.1	29.1	29.2	28.3
Modernization	62.4	62.3	41.2	42.5	39.3	38.7
Special Programs						
Fish Passage	4.1	2.1	2.3	2.4	2.4	2.3
Stormwater Retrofit	0.0	2.1	2.1	2.1	2.1	2.1
Large Culvert Improvement	2.7	2.8	2.9	3.0	3.1	2.8
Bike/Ped	5.8	6.9	7.1	7.4	7.4	7.1
HazMat cleanup	0.3	0.3	0.3	0.3	0.3	0.3
Transportation Enhancement	8.6	9.0	9.4	9.7	9.7	9.7
TOTAL CONSTRAINED STIP	261.6	274.9	260.9	274.0	272.0	261.5
Economic Stimulus Package (ARRA)	111.9	0.0	0.0	0.0	0.0	0.0
Adjustments						
Rest Area Transfer to TIC	0.1	0.0	0.0	0.0	0.0	0.0
OJT Supportive Services State Option Key 16984	1.5	0.0	0.0	0.0	0.0	0.0
ARRA Statewide Cost Allocation Plan Assessment	0.1	0.0	0.0	0.0	0.0	0.0
JTA Projects Determined by OTC (CRC)	30.0	0.0	0.0	0.0	0.0	0.0
Federal Stimulus Reserve for PE Key 17036 (JMSA)	2.0	0.0	0.0	0.0	0.0	0.0
TOTAL CAPITAL PROGRAMS	407.2	274.9	260.9	274.0	272.0	261.5

PRODUCTIVITY INITIATIVES

	2010	2011	2012	2013	2014	2015
Quality Assurance/PE	0.0	0.5	0.0	0.8	0.0	0.8
Material Source Funding	0.0	0.8	0.0	0.9	0.0	0.9
Post Construction Monitoring (PCM)	0.2	1.5	1.2	1.3	1.2	1.1
Right of Way Document Management	0.5	0.5	0.0	0.0	0.0	0.0
Other	0.0	1.2	0.0	1.2	0.0	0.0
TOTAL PRODUCTIVITY INITIATIVES	0.7	4.5	1.2	4.2	1.2	2.8

TOTAL COMMITMENT

	2010	2011	2012	2013	2014	2015
TOTAL COMMITMENT	776.0	650.2	643.0	671.1	666.2	670.6

UNALLOCATED REVENUE

	2010	2011	2012	2013	2014	2015
UNALLOCATED REVENUE	88.1	41.7	42.9	22.4	18.2	14.2



What is Going On

- The process for developing the 2015-2018 State Transportation Improvement Program (STIP) is in the process of changing
- Moving from program-based selection to project value-based selection
- The overall objective is to take care of existing assets while make STIP decisions that will move us towards a more integrated multimodal transportation system



Programming Change in Oregon

- Project Selection For STIP
 - Combined most federal programs into two categories (Fix-It and Enhance)
 - Fix-It Program preserves and operates system
 - Enhance Program improves efficiency, travel options, and/or mobility of the system
 - Enhance Program includes all modes of travel eligible for FHWA funding
 - In Oregon, state gas tax for highways only



Goals of the Process Changes

- The new process shifts *from* setting funding levels for a multitude of programs
 - *to* selecting the best projects and then determining which types of funds can be used to deliver those projects.
- Flexing of funds to a greater extent in support of finding the best solution while still honoring legal and regulatory requirements
 - (e.g. 1% of ODOT's share of the State Highway Fund to Bike/Ped)



Goals of the Process Changes

- Increased local influence in project recommendations to the OTC
- More holistic, multi-modal view of the transportation system
- Single application process addressing what currently involves multiple program-specific application processes



What is Driving this Change?

- Limited/declining federal, state, and local transportation funding
- ODOT “right-sizing” and functional reorganization to better adapt to funding realities and business-related changes
- Need to balance maintenance with investments in high-value, multimodal transportation system enhancements
- Need to select most effective projects rather than those that fit into prescribed funding categories



What is Driving this Change?

- Direction from the Oregon Transportation Commission (OTC) and the Oregon Transportation Plan (OTP)
 - Maintain and preserve existing transportation system assets
 - Develop a sustainable multi-modal transportation system
 - Provide for effective movement of people and goods
 - Support state and community economic vitality
 - Advance transportation system safety and security
 - Collaborate across all levels of government and with the general public to implement the most effective solutions with the available funding

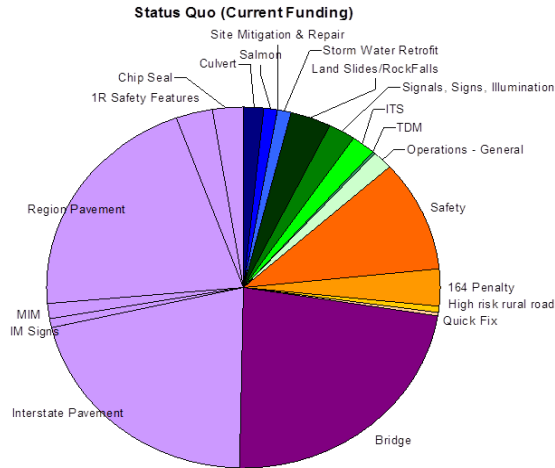


Fix-it/Enhance

Transportation System		Agency	
Capital Program Funds STIP, Transit, Rail Federal Funds (and State Funds when sufficient)		Budget Non-Capital Programs State and Federal Funds	Budget State and Federal Funds
"Enhance" Expanding or Improving the System	"Fix-It" Fixing or Preserving the System	Maintaining and Operating the System	ODOT Regulatory, Financial and Administrative Functions



Fix-It Current Spending



Geo-Env	Operations	Safety	Preservation
---------	------------	--------	--------------



The New Allocation Process

- The Fix-it Guiding Principles are:
 - Balance
 - Leverage
 - Maintenance
 - Safety
 - Regulatory Compliance
 - Economy
 - Cost Effectiveness
 - System Continuity
- Fix-it project lists will ultimately be shared with ACTs and MPOs to optimize opportunities to leverage funding with Enhance projects and to better coordinate project timing and outcomes

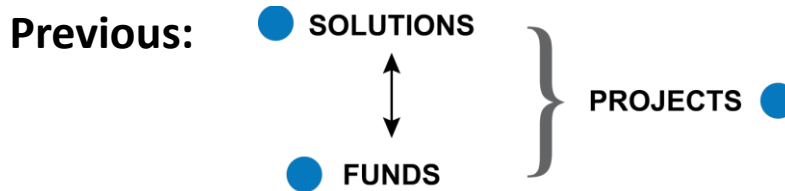


The New Allocation Process

- Eligible Enhance project types will include:
 - Bike and Pedestrian Funds
 - Flexible Funds
 - Modernization
 - Developmental STIP
 - Protective ROW
 - Construction
 - Safe Routes to Schools - infrastructure
 - Scenic Byways - infrastructure
 - Transportation Enhancement
 - Transportation Demand Management
 - Transit Capital Projects



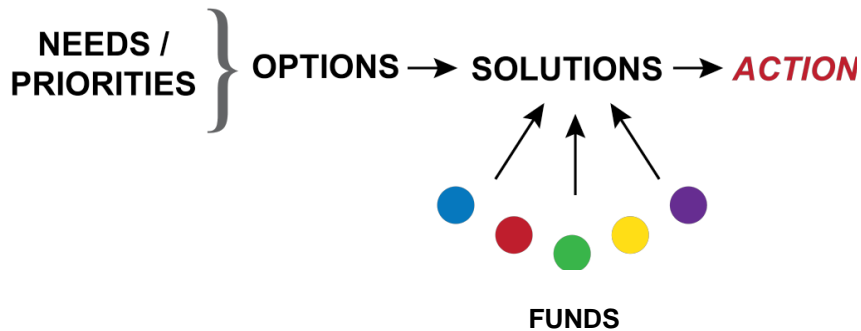
Fix-it/Enhance





Fix-it/Enhance

Our Future:



Fix-it/Enhance: Project Selection

- Project selection and prioritization for recommendation to the OTC for the Enhance funding will be conducted by the ACTs.
- Project selection for recommendation to the OTC for the Fix-It funding will be done via ODOT management systems and staff in alignment with the Guiding Principles developed for that purpose. A subsequent report will be developed showing results of the project selection and impacts on system condition and service delivery.



The New Application/Selection Process

- A single application will be used for all Enhance projects
- Projects must be ready to obligate in the year requested
- A government/public agency must be the applicant
- Review and selection/prioritization process will be a qualitative values-based exercise by ACTs – not quantitatively scored
- ACTs and MPOs make project recommendations to the OTC for selection



Programming Funds

- Enhance Program
 - Recommended projects in Draft STIP assigned financial resources
 - Color of money only assigned after projects selected
 - Maximizes strategic investment overall, not for specific funding pot
 - Financial funds managed centrally



Planning and Programming In Oregon

- Questions?
- Key Links:

<http://www.oregon.gov/ODOT/TD/TP/Pages/index.aspx>

http://www.oregon.gov/ODOT/TD/TP/pages/stip_guide.aspx



Planning and Programming In Oregon

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erik.m.havig@odot.state.or.us
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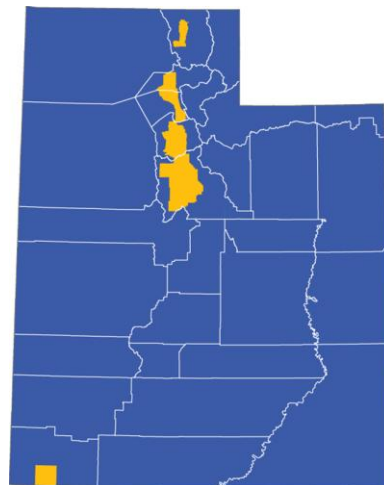
Planning and Programming Process

Utah Department of Transportation
Arizona Best Practice Workshop– 2013



Planning

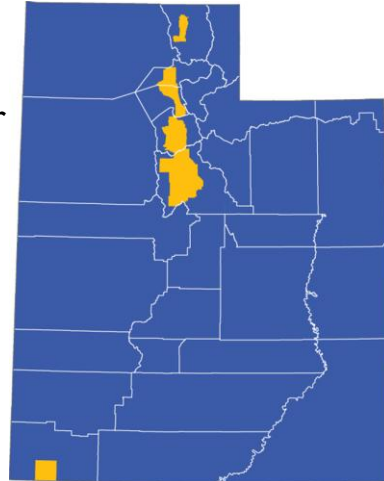
- ❖ Metropolitan Planning Organizations develop Long Range Plans for Urban Areas (RTPs)
- ❖ UDOT is responsible for the remaining Rural Area of the State (LRP)



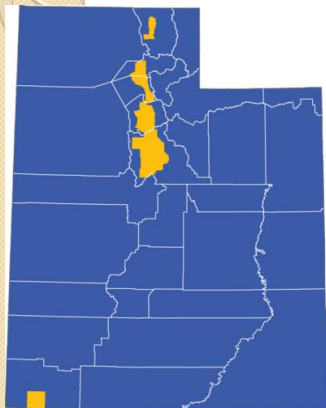


Planning

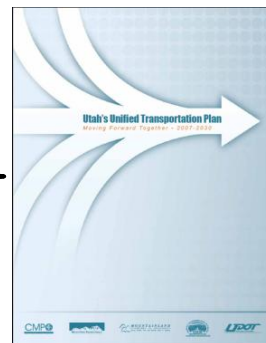
- ❖ UDOT and Metropolitan Planning Organizations update the LRP every four years and coordinate several elements:
 - ❖ Schedule of Updates
 - ❖ Plan Phasing
 - ❖ Air Quality Conformity
 - ❖ Financial Assumptions



Planning



- UDOT Long Range Transportation Plan 2011-2040**
- Cache MPO Regional Transportation Plan 2011 -2035**
- Dixie MPO Regional Transportation Plan 2011-2040**
- MAG Regional Transportation Plan 2011-2040**
- WFRC Regional Transportation Plan 2011-2040**



Utah's Unified Transportation Plan

Utah Legislative Requirement



Utah Code Section 72-1-304

(Enacted by Senate Bill 25, 2005 General Session)

- Directs the Commission, in consultation with the Department and the Metropolitan Planning Organizations in the State, to issue rules that establish a prioritization process for new transportation projects that meet the Department's strategic goals.

Rule R940-6. Prioritization of New Transportation Capacity Projects

- Written to fulfill the directive given by State Code 72-1-304.

Administrative Rule



Rule R907-68 States,

The Department will use the Strategic Goals to:

- First seek to preserve & optimize mobility of the current infrastructure.
- Improve the mobility of the existing system through technology like intelligent transportation systems (ITS), as well as using other tools such as access management, transportation demand management, etc...
- Address safety through projects in preservation and mobility, as well as target specific highway locations for safety improvements.
- Add new capacity projects.

All recommendations to be forwarded to the Transportation Commission for its review/action.



The Department's Strategic Goals:

- Preserve Infrastructure
- Optimize Mobility
- Zero Fatalities
- Strengthen Economy

Project Selection & Prioritization



Remember...

The Ranking Process is designed to support the **decision-making process**, rather than render a decision.

The process is a means to help the Utah Transportation Commission generally prioritize and rank projects in order of their importance.



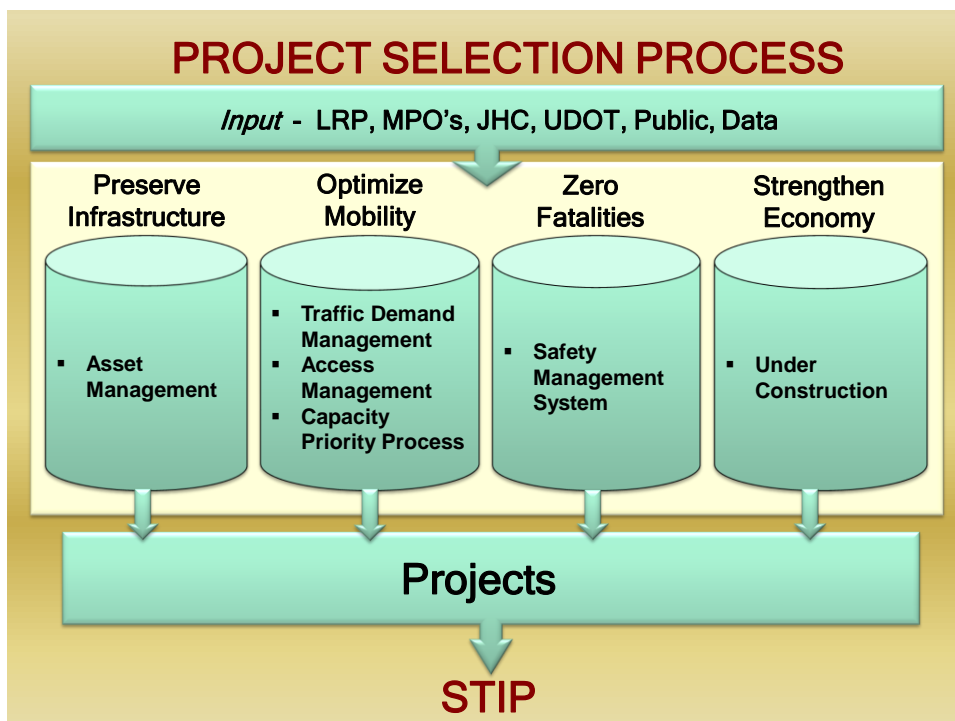
Planning → Programed STIP

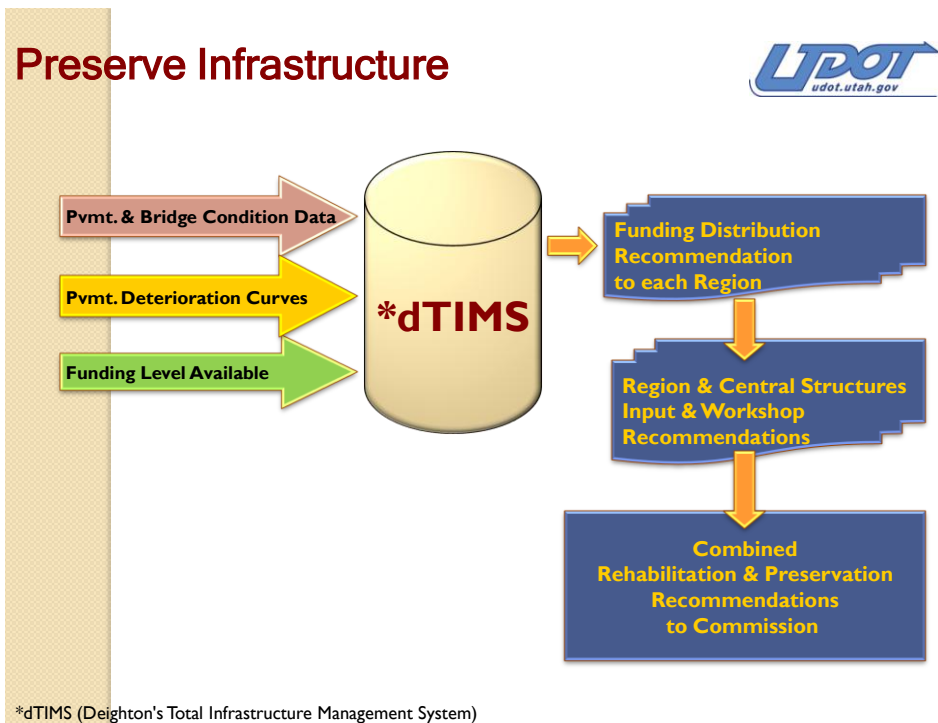
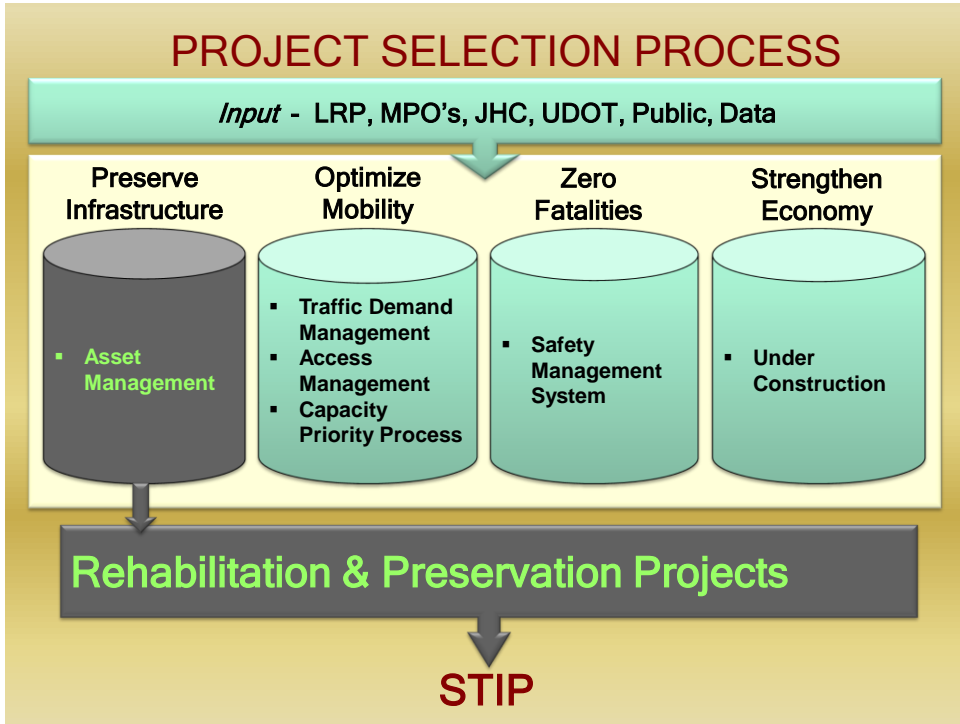
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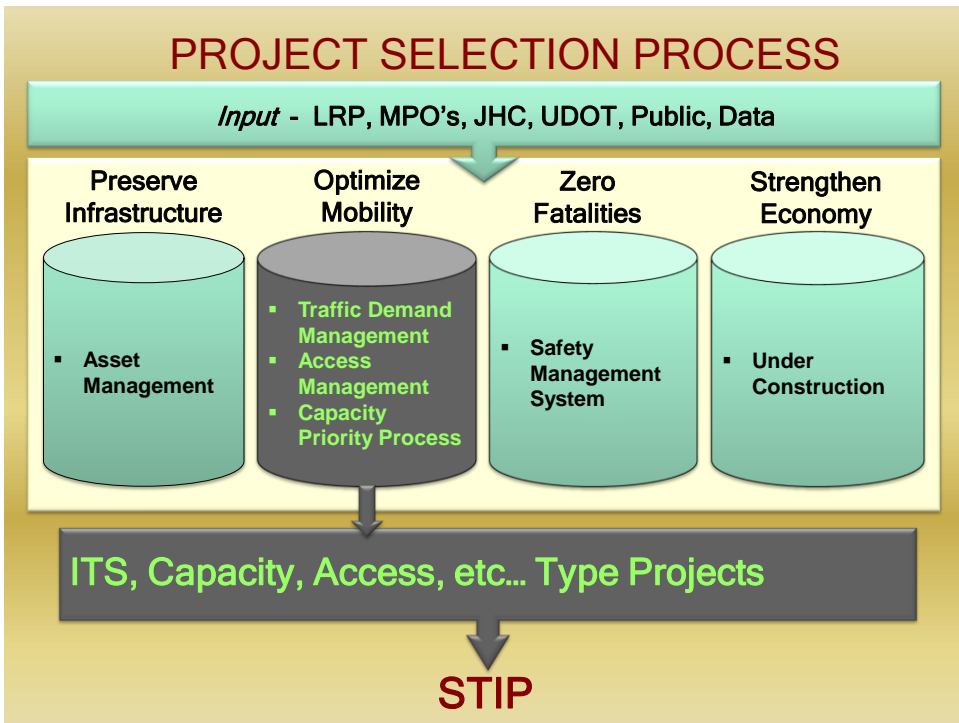
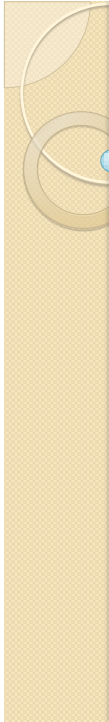
- Asset Management Division (Pavement/Bridge)
- Structures Division
- UDOT's Region Workshop
- Traffic and Safety
- Traffic Operation Center
- Capacity Projects Come from LRP First Phase
- MPO's
- JHC

**Statewide
Transportation
Improvement
Program**

Approved by Transportation
Commission







Optimize Mobility



Capacity - New Facility

Objective	Factor	Max. Score
Transportation Efficiency	Projected ADT on New Facilities in 2015	25
	Projected Truck ADT on New Facilities in 2015	15
	V/C on Existing System if Corridor is not Built	30
	% V/C Improvement on System if Corridor is Built	30
	Total Possible Points	100

Optimize Mobility



Capacity - New Facility

Volume/Capacity (V/C)	
Minimum	Score
0	0
0.6	1.5
0.65	3
0.7	4.5
0.75	6
0.8	7.5
0.85	9
0.9	12
0.95	15
1	18
1.05	21
1.1	24
1.15	27
1.2	30

TRUCK AADT	
Minimum	Score
0	1.5
1,600	3
2,400	4.5
3,200	6
4,000	7.5
4,800	9
5,600	10.5
6,400	12
7,200	13.5
8,000	15

AADT	
Minimum	Score
0	2.5
16,000	5
24,000	7.5
32,000	10
40,000	12.5
48,000	15
56,000	17.5
64,000	20
72,000	22.5
80,000	25

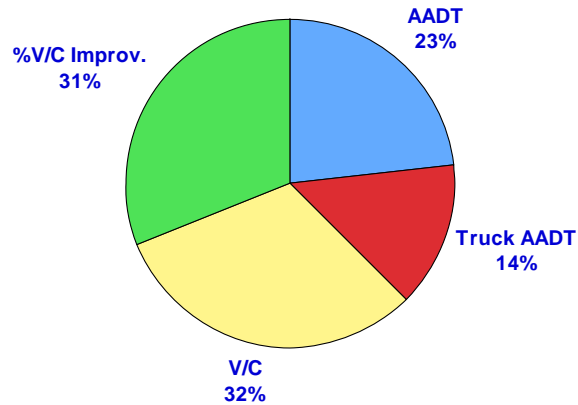
Percent V/C Improvement

MIN %	Score
0	0
5	3
10	6
15	12
20	21
25	30

Optimize Mobility



Ranking Factors Percent Weight (New Facilities)



Optimize Mobility - Others



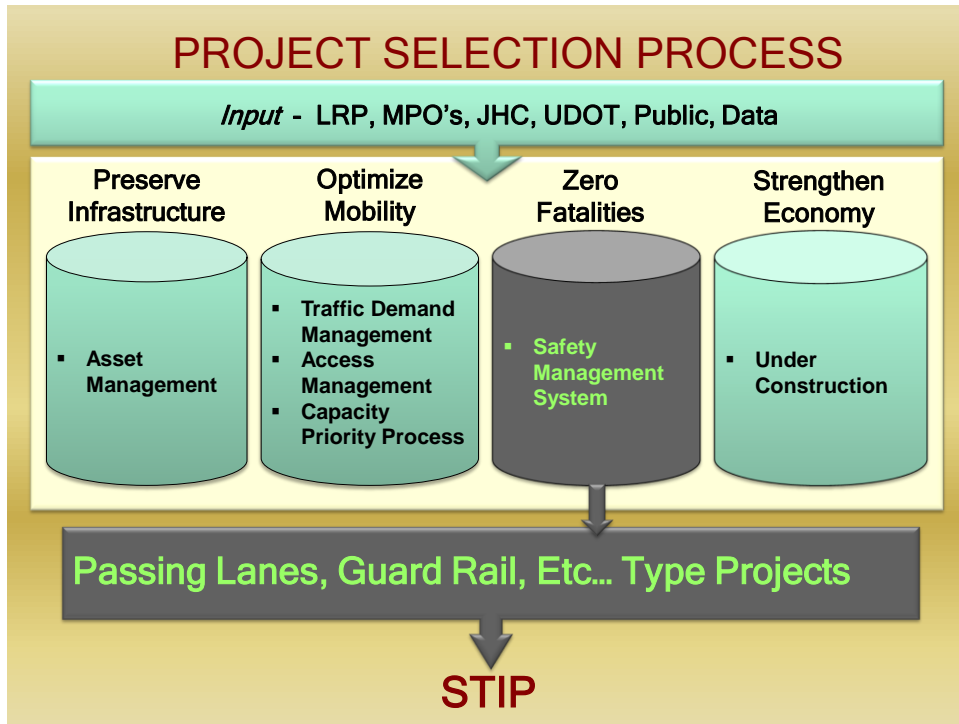
Widen Existing Facilities

Choke Point Projects

Passing Lanes

Interchanges

1. Existing Signals to be Upgraded to Interchanges
2. New Interchanges on Existing Freeways
3. New Interchanges to be Considered as part of a Major Corridor Reconstruction
4. Re-Construction of Existing Interchanges

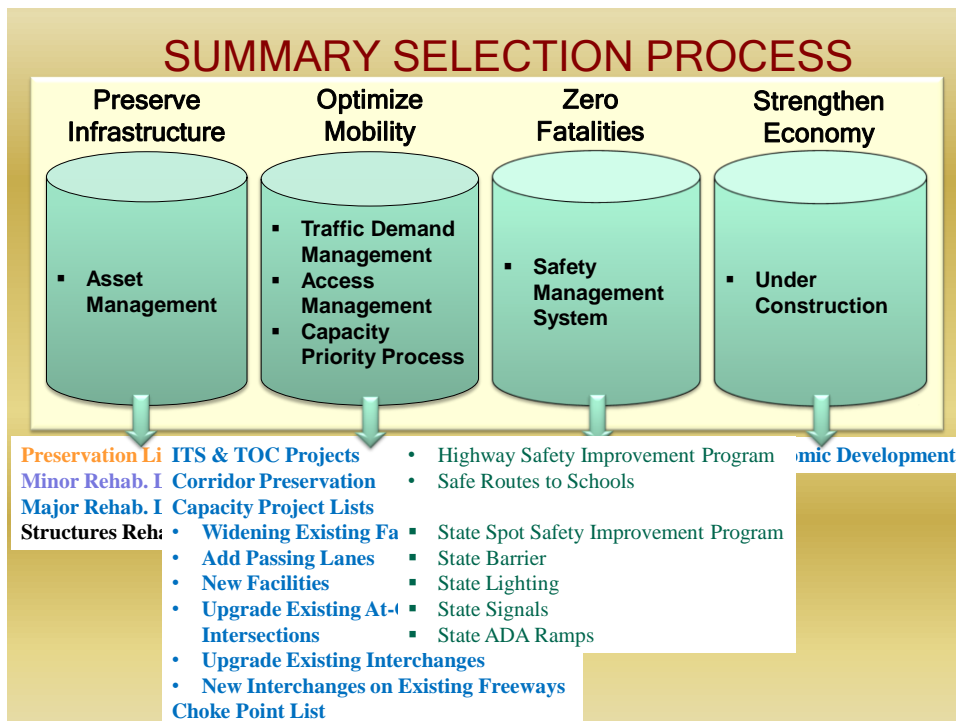
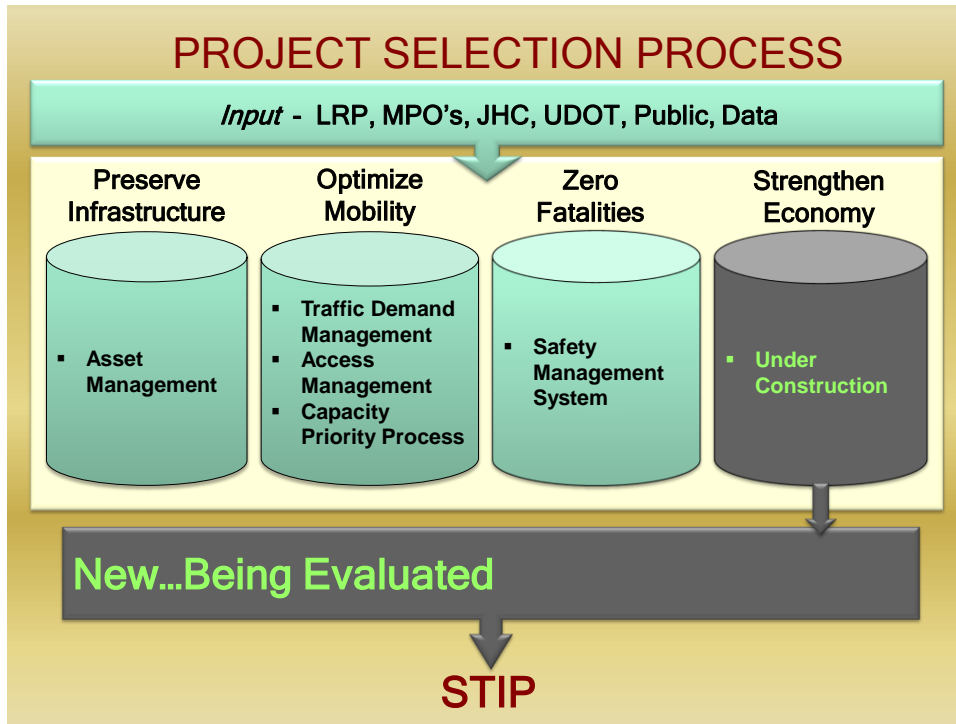


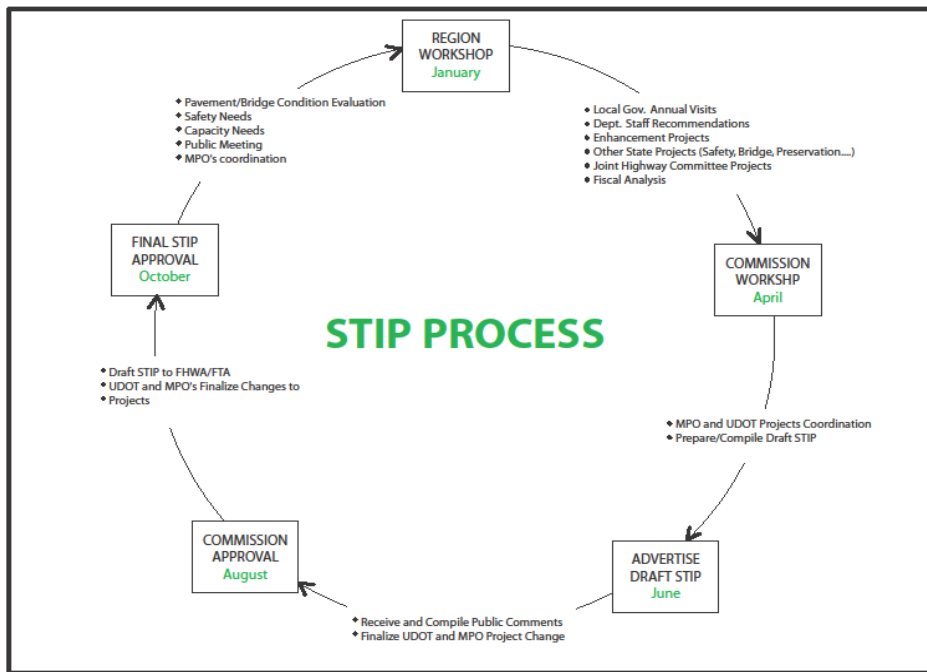
Improve Safety



Project Prioritization Factors

- Greatest Benefit to Reduce Fatal and Serious Injury Crashes
- Benefit-To-Cost Ratio
- Timeline to Completion
- Coordination with Other Projects



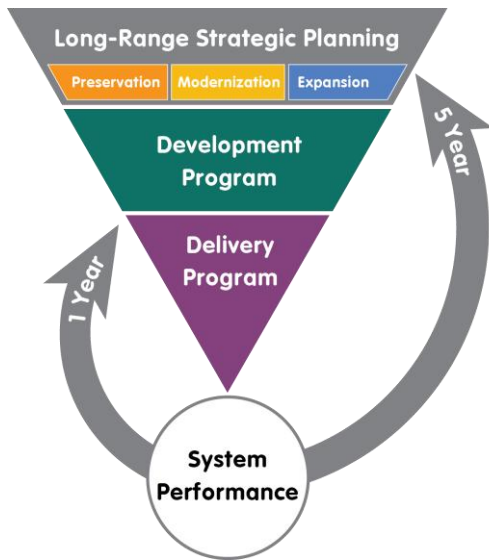




Linking the Long-Range Plan and Construction Program

Appendix C

Prototyping Data



Guidance for Applying Criteria and Implementation Roadmap

The body of this report provides an overview of the P2P project ranking and prioritization process as well as a brief discussion surrounding the evaluation criteria. This appendix provides user guidance for the implementation of the proposed evaluation criteria for the three investment categories: preservation (pavement and bridge), modernization, and expansion.

The purpose of this prototyping process is to examine the suitability of the evaluation criteria and perform initial project rankings. It is anticipated that over time the evaluation criteria, their respective scoring scales, and the data sources are likely to evolve and improve. This Appendix discusses lessons learned from this initial prototyping and provides guidance for implementation of the P2P project ranking and prioritization approach.

Evaluation Criteria Weights

There are many potential combinations of evaluation criteria weights that can be used for each investment category. This initial prototyping involved the use of equal criteria weights for each investment category along with weighting the technical evaluation criteria more heavily to produce multiple scenarios. Based on feedback from ADOT staff, certain investment categories, such as bridge preservation, may also contain additional weighting scenarios.

Testing two weighting scenarios is a limited analysis of the impact of weights on the rankings or outputs. The weights should be set based on the Department's policy priorities. Nonetheless, a more thorough sensitivity analysis that considers a variety of potential weights can better inform the impact of weights on rankings. The P2P project prioritization and ranking approach is a decision-support tool and any resulting rankings are intended to assist in the project ranking process.

As discussed in the body of this report, the evaluation criteria weightings must sum to one so that the weights assigned to the evaluation criteria reflect the relative importance of each criterion. The rankings used for this initial prototyping are shown for each investment category following in Tables 1 – 4.

Table 1 – Preservation Bridge Evaluation Criteria Equal Weights

Evaluation Criteria	Weight
NBI Sufficiency Rating	0.200
Composite Health Index	0.200
Scour Criticality	0.200
Fracture Criticality	0.200
Traffic Volume	0.050
Freight Flow	0.050
Detour Length	0.050
Strategic Corridor	0.050

Table 2 – Preservation Pavement Criteria Equal Weights

Evaluation Criteria	Weight
Pavement Ride Quality	0.400
Pavement Structural Integrity	0.400
Traffic Volume	0.068
Freight Flow	0.066
Strategic Investment	0.066

Table 3 – Modernization Criteria Equal Weights

Evaluation Criteria	Weight
Estimated Daily V/C	0.240
Traffic Flow Improvement	0.120
Freight Flow Improvement	0.120
Expected Crash Reduction	0.320
Strategic Investment	0.080
Supports Statewide Plans	0.060
Multimodal Enhancement	0.060

Table 4 – Expansion Criteria Equal Weights

Evaluation Criteria	Weight
Travel Time Savings	0.420
Future Traffic Volume	0.175
Future Freight Flow	0.105
Strategic Investment Project	0.120
Supports Statewide Plans	0.075
Multimodal Enhancement	0.105

The following sections will discuss lessons learned in each investment category as well as data sources and challenges for each criterion.

Preservation

The preservation investment category allowed for relatively easy access to existing data sources. The majority of the evaluation criteria are sourced from National Bridge Inventory (NBI) data, State Highway System (SHS) Traffic Log data, and pavement condition survey and IRI report data. Additional data for the pavement structural integrity criterion is sourced from the annual pavement condition survey and IRI report.

Given that the majority of the bridge and pavement data can be easily obtained from existing sources, a basic comparative analysis is required to establish scoring thresholds (i.e., to assign points) for certain criteria including: traffic volume, freight flow, detour length (for bridges), and pavement structural integrity. An examination of the descriptive statistics (mean, median, mode, minimum, maximum) and distribution of data informed the determination of thresholds for these criteria.

The thresholds for certain criteria were established based on recommendation from ADOT staff as well as engineering judgment. In particular, instead of using FHWA recommended thresholds for good, fair, and poor IRI, the Department opted to establish different thresholds for interstate and non-interstate roadways that exceed anticipated federal performance requirements related to MAP-21. ADOT Materials staff recommended the use of cracking and rutting to develop the pavement structural integrity criterion. As described above, an examination of the descriptive statistics and distribution of data for the cracking and rutting components of the structural integrity criterion was used to establish the initial scoring thresholds.

Although the use of cracking and rutting to establish a pavement structural integrity criterion is not an ideal metric for pavement structural integrity, it captures two important physical properties of pavement that contribute to structural integrity. This was done in the absence of some sort of pavement condition index. It should be noted that the Department intends to procure Pavement Management System (PMS) software in the near future. It is likely that any PMS software the Department procures will produce a pavement condition index, in which case this criterion can be modified in the future to accommodate this improvement.

Recommended Actions for Preservation:

1. Ensure collaboration between MPD staff and Materials staff to ensure that P2P and Pavement Management approaches to prioritizing projects are complimentary and not redundant.
2. Update P2P project evaluation criteria to utilize the PMS pavement condition index once it is established.
3. Perform a sensitivity analysis to determine the influence of various criteria weights and scoring scales on project rankings.

Based upon results of the initial prototyping, the project ranking and prioritization approach was well-received by ADOT Bridge staff. ADOT Bridge staff also provided feedback in the form of revised evaluation criteria weights beyond the initial definition of evaluation criteria weights. Nearly all the data required to prototype the bridge projects were easily obtained from the NBI.

Similar to bridge preservation projects, obtaining the required data to prototype the pavement projects from ADOT pavement engineering staff proved relatively easy. However, due to the nature of pavement projects occurring over multiple miles, or segments, of the highway network, additional data processing is required for many of the evaluation criteria since data is recorded by milepost in segments of one mile in length. In particular this requires users to manually calculate averages for segments of roadways corresponding to projects for the pavement ride quality and pavement structural integrity criteria.

When the initial prototyping results were shared with the ADOT Materials staff, some concern was expressed about the P2P project ranking and prioritization process. ADOT's current pavement management approach provides a prioritized list of projects that includes consideration of non-technical criteria like corridor significance. This approach may appear to overlap with the P2P prioritization process. However, the P2P prioritization process is undertaken by MPD at the policy-level and is not intended to replace existing pavement management prioritization approaches, but rather use the outputs of existing pavement management prioritization to inform the P2P project ranking and prioritization approach.

The following sections describe the data sources used for each criterion along with criterion-specific challenges encountered during the prototyping process.

Bridge

- Sufficiency Rating
 - Data Source: NBI Item No. SR
 - Deck, Superstructure, and Substructure Condition Ratings
 - Data Source: NBI Item Nos. 58 (Deck), 59 (Superstructure), 60 (Substructure)
 - Scour Criticality
 - Data Source: NBI Item No. 113
 - Fracture Criticality
 - Data Source: NBI Item No. 92
 - Traffic Volume
 - Data Source: NBI Item No. 29
 - Freight Flow
 - Data Source: NBI Item No. 109
 - Detour Length
 - Data Source: NBI Item No. 19
 - Corridor Significance
-

- Data Source: Key Commerce Corridor Designation (Infrastructure Investments), NHS Designation (not including MAP-21 principal arterials)
 - Key Commerce Corridors (KCC) include:
 - All of I-17 and I-10
 - I-8 between MP 115 and 179
 - I-40 between MP 48 and 72
 - SR 85 between MP 120 and 155

Pavement

- IRI
 - Data Source: Pave Condition Survey and IRI Report
 - Requires that user manually average IRI across project segment since it is reported by mile
- Pavement Structural Integrity – requires further development
 - Cracking (%)
 - Data Source: Pave Condition Survey and IRI Report
 - Similar to above – requires user to manually calculate average over length of project segment
 - Rutting (inches)
 - Data Source: Pave Condition Survey and IRI Report
 - Also requires user to manually calculate average over project length
- Traffic Volume
 - Data Source: State Highway System Traffic Log (AADT)
- Freight Flow
 - Data Source: State Highway System Traffic Log (Truck Percentage)
- Corridor Significance
 - Data Source: Key Commerce Corridor Designation (Infrastructure Investments), NHS Designation (not including MAP-21 principal arterials)
 - Key Commerce Corridors (KCC) include:
 - All of I-17 and I-10
 - I-8 between MP 115 and 179
 - I-40 between MP 48 and 72
 - SR 85 between MP 120 and 155

Modernization

The modernization investment category presented the greatest challenge in terms of developing evaluation criteria using existing data and processes. Initially, the project team identified delay reduction and traffic flow improvement as potential evaluation to criteria. These criteria could identify the potential impact of a project on transportation network performance. However, in order to use these criteria, rough approximations would need to be calculated using Highway Capacity Manual 2010 (HCM 2010) based industry accepted methodologies. Performing these sorts of rough calculations is not part of the existing project scoping process and thus these criteria cannot be used within the context of existing processes. Therefore, the project team recommends that over time ADOT formulate a new process that allows for the development of delay reduction and traffic flow improvement criteria.

Recommended Actions for Modernization:

1. Define improved delay reduction criterion and traffic flow improvement criterion based on industry-accepted standards, i.e., consistent with the Highway Capacity Manual (HCM) 2010
2. Where necessary modify business processes, particularly the project nomination process for modernization projects, to ensure that delay reduction and traffic flow improvement can be calculated.
3. Validate improved delay reduction and traffic flow improvement criteria.

In the absence of the capability to produce delay reduction and traffic flow improvement criteria that are based on engineering calculations and industry best practice, a scoring table was developed to assign points for traffic flow improvement based on project type. Without performing a delay reduction calculation, an accurate estimate of the potential delay reduction from a project cannot be produced. As discussed earlier, this type of delay reduction would reflect the potential improvement in traffic flow performance related to a specific project.

For the purposes of prototyping, rough estimates of volume to capacity (v/c) ratios were estimated for each project. To calculate these rough estimates of v/c ratios the project team used annual average daily traffic volumes as a proxy for congestion and estimated capacity by facility type using satellite imagery of project locations. It should be noted that this does not accurately capture congestion during peak periods and is not in line with industry best practice to calculate v/c ratios. This criterion requires further development.

The approach used to calculate v/c ratios roughly approximates existing conditions in terms of congestion in project areas and assumes that a particular project in a congested area will have a positive impact in terms of reducing congestion. This may not be a reasonable assumption in all cases since some modernization projects are not designed to improve traffic flow as much as achieve other objectives (e.g., safety). For this reason, this criterion needs to be examined further as the Department gains experience with the rating process.

To assess the potential safety improvement associated with a project, the expected crash reduction associated is estimated. Determining the expected crash reduction requires two input criteria: the number of collisions at a project location over the past five years, and a Crash Modification Factor (CMF). The expected reduction in crashes over five years is estimated as the product of one minus the CMF (1-CMF is also known as the Crash Reduction Factor or CRF) and the total number of crashes over the past five years.

The primary policy goals modernization projects are to improve productivity, reduce safety risk, and/or reduce travel time. Given that the primary goal of the majority of modernization projects is delay reduction, this prioritization and ranking process is used for roadway projects. The modernization investment category also contains a number of non-roadway projects. Alternative prioritization and ranking approaches can be used to assess projects related to other highway asset types. These other highway assets are a significant component of the roadway system and can be addressed in the asset management plan(s) specific to these asset types.

The cost effectiveness of modernization projects can be estimated using several approaches. Since the primary goal of the majority of modernization projects is delay reduction, cost effectiveness can be calculated in terms of dollars per reduction in delay (seconds). Given the limitations in prototyping in terms of calculating delay reduction, this approach would require further development. Another approach would be to assess project cost effectiveness as dollars per point. Whatever approach is used, projects of similar magnitude, i.e., low, mid, and high cost, should be evaluated using distinct scoring scales to facilitate comparison of cost effectiveness for projects of similar scope.

The data sources used for each criterion along with criterion-specific challenges encountered during the prototyping process are shown below.

- Existing Congestion Estimate – V/C ratio
 - Volume (AADT) – proxy for congestion
 - Data Source: State Highway System Traffic Log
 - Capacity
 - Data Source: Estimated daily capacity by facility type
- Traffic Flow Improvement
 - Data Source: Points assigned based on project type (see Table):

Table 5 – Traffic Flow Improvement Criterion Scoring Scale

Project Type	Points
Traffic Interchanges (TI)	100
Passing Lanes (PL)	90
Roundabouts	80
Intersection Improvements (II)	70

Superelevation Improvements (SI)	60
Shoulder Widening (SW)	50
Others (O)	10

- Freight Flow Improvement
 - Data Source: State Highway System Traffic Log (Truck Percentage)
- Expected Crash Reduction = $(1 - \text{CMF}) * \text{Total Collisions}$
 - Total Collisions for Past Five Years
 - Data Source: ADOT Safety Mart
 - CMF
 - Data Source: HSIP-funded project calculations or CMF Clearinghouse
- Corridor Significance
 - Data Source: Key Commerce Corridor Designation (Infrastructure Investments), NHS Designation (not including MAP-21 principal arterials)
 - Key Commerce Corridors (KCC) include:
 - All of I-17 and I-10
 - I-8 between MP 115 and 179
 - I-40 between MP 48 and 72
 - SR 85 between MP 120 and 155
- Supports Statewide Plans
 - Data Sources: Infrastructure Investments (underway), Asset Management Plan (underway), Strategic Highway Safety Plan (underway), Topical Statewide Plans (Port of Entry, Rest Area, Passing Lanes, etc.), Corridor Profile Studies (underway), and DCRs or Feasibility Studies.
 - Points are assigned based upon the recommendations made by the Statewide Plans.
 - Top Tier Priority = 100 points
 - Completes Implementation of a Corridor = 100 points
 - Middle Tier Priority = 50 points
 - Bottom Tier Priority = 10 points
- Multimodal Enhancement
 - Data Sources: Locations of transportation facilities (e.g., airports, rail yards, train or bus stations) and project scope (includes rail line, reconfiguration of existing lanes to add a bike lane, HOV/HOT lane, BRT lane or freight truck lane).
 - Points are assigned based upon the project's contribution to improving or expanding multimodal travel.
 - Significantly increases person-carrying capacity = 100 points
 - Expands multimodal options = 75 points
 - Directly serves a transportation terminal = 50 points

Expansion

The list of projects used to evaluate the expansion investment category consists of 14 unfunded projects from the 2014–2018 Five-Year Transportation Facilities Construction Program. Life-cycle cost analysis capabilities are particularly important for expansion projects since these projects typically occur over many years and require multiple important steps including environmental

documentation, design, right-of-way acquisition, utility relocation and construction. Accounting for life-cycle costs also allows for more accurate analyses of cost effectiveness of expansion projects.

Similar to modernization projects, a consideration specific to expansion projects is prioritizing and ranking non-roadway projects, i.e., port of entry and rest area projects. These other highway asset types, while significant components of the roadway system, can be addressed in the asset management plan(s) specific to these asset types. This prioritization and ranking approach is used for roadway projects since these projects are intended to significantly increase capacity which is aligned with the primary policy goal of expansion projects.

The key evaluation criterion for the ranking and prioritization process for expansion projects is travel time savings. Typically expansion projects are larger-scale and thus travel time savings can be estimated for project segments using the statewide travel demand model, which estimates the potential savings in vehicle hours traveled.

Much like modernization projects, cost effectiveness of expansion projects can be estimated using multiple approaches. Since the primary goal of expansion projects is providing sufficient capacity and thus reducing travel time, cost effectiveness can be calculated in terms of dollars per travel time savings. Another approach would be to assess project cost effectiveness as dollars per point. Whatever approach is used, projects of similar magnitude, i.e., low, mid, and high cost, should be evaluated using distinct scoring scales to facilitate comparison of cost effectiveness for projects of similar scope.

The data sources and any criterion-specific challenges are discussed below.

- Travel Time Savings
 - Data Source: project segments in statewide travel demand model
- Future Traffic Volumes
 - Data Source: ADOT 2030 AADT Projections
- Future Freight Flow
 - Data Source: State Highway System Traffic Log
- Strategic Investment

Recommended Actions for Expansion:

1. Perform sensitivity analysis on evaluation criteria weights to validate and adjust weights as required.
2. Identify approach to prioritize and rank projects for other highway asset types, particularly ports of entry and rest area projects.

- Data Source: Key Commerce Corridor Designation (Infrastructure Investments), NHS Designation (not including MAP-21 principal arterials)
 - Key Commerce Corridors (KCC) include:
 - All of I-17 and I-10
 - I-8 between MP 115 and 179
 - I-40 between MP 48 and 72
 - SR 85 between MP 120 and 155
- Supports Statewide Plans
 - Data Sources: Infrastructure Investments (underway), Asset Management Plan (underway), Strategic Highway Safety Plan (underway), Topical Statewide Plans (Port of Entry, Rest Area, Passing Lanes, etc.), Corridor Profile Studies (underway), and DCRs or Feasibility Studies.
 - Points are assigned based upon the recommendations made by the Statewide Plans.
 - Top Tier Priority = 100 points
 - Completes Implementation of a Corridor = 100 points
 - Middle Tier Priority = 50 points
 - Bottom Tier Priority = 10 points
- Multimodal Enhancement
 - Data Sources: Locations of transportation facilities (e.g., airports, rail yards, train or bus stations) and project scope (includes rail line, reconfiguration of existing lanes to add a bike lane, HOV/HOT lane, BRT lane or freight truck lane).
 - Points are assigned based upon the project's contribution to improving or expanding multimodal travel.
 - Significantly increases person-carrying capacity = 100 points
 - Expands multimodal options = 75 points
 - Directly serves a transportation terminal = 50 points

Calculations and Weightings

The calculations for the prototyping of the prioritization and ranking approach were performed in Microsoft Excel®. Users are required to input evaluation criteria weightings, which must sum to one (if not, an error message is displayed), on the home worksheet. The raw data required for each evaluation criterion is also an input in the form of a worksheet; projects correspond to rows in the worksheet and evaluation criteria correspond to columns.

A calculations worksheet utilizes custom functions to assign points to each criterion based on investment category. The custom functions used to calculate scores for the evaluation criteria were created using Visual Basic and can be easily modified to account for changes in computation methodologies or scoring scales. For every project, points are assigned for each criterion based on the computation methodology and scoring scales defined for each investment category (see Table , Table ,

Table , and Table). Scores for each project are calculated based on the user-defined evaluation criteria weights from the home worksheet.

Sensitivity Analysis

This prototyping exercise was a proof of concept to ensure that the evaluation criteria could be used in practice and also served to identify where data gaps exist for certain criteria. Given that only two or fewer weighting scenarios were produced for each investment category, it is important for ADOT to conduct a sensitivity analysis. Sensitivity analyses determine the influence of certain variables on outputs or results. In this case, multiple scenarios using different weights and potentially different scoring scales can help determine the impact of various weights and scoring scales on results. While an understanding of different weights on outcomes is important, it is also important to be mindful that evaluation criteria weights reflect their relative importance and should be closely linked to ADOT's policy goals.

Visual Display of Results of P2P Prioritization Process

MPD staff at ADOT produced a geospatially-referenced version of the investment program used to prototype this approach. Along with geospatially-referenced project data, the scores resulting from the P2P process can be visually displayed using maps similar to those in FIGURES for preservation projects. This can be a powerful tool to convey both the magnitude of scores and the spatial distribution of projects. MPD staff at ADOT geospatially referenced the program so it can be displayed visually.

Table 6 – Preservation Pavement Evaluation Criteria Descriptions, Computation Methodologies, and Scoring Scales

Candidate Evaluation Criteria	Description of Criterion	Computation Methodology	Scoring Scale	Max No. of Points	Weight*
Pavement Ride Quality	IRI - International Roughness Index (IRI) rating	Different thresholds and scales used for Interstates and non-Interstates	Interstate >104 = 100 points >75 and <=104 = 75 points <=75 = 50 points	100	1
			Non- Interstate >142 = 100 Points >93 and <=142 = 75 points <=93 = 50 points	100	
Pavement Structural Integrity	Composite condition index	Composite index calculated based on structural/thermo cracking, rutting, and faulting	Scale shown below	100	1
Traffic Volume	Average Annual Daily Traffic (AADT), to determine relatively high or low volume	Average annual daily traffic of vehicles	>=20,000 = 100 points >=5,000 and <20,000 = 75 points <5,000 = 50 points	100	1
Freight Flow	Truck volume as percent of AADT	% of Average annual daily traffic attributed to trucks – proxy for freight volumes	>=25% = 100 points >=10% and <25% = 75 points <10% = 50 points	100	1
Corridor Significance	Is the project located in a corridor of statewide significance?	Yes/No	Key Commerce Corridors = 100 points Statewide/Regionally Significant = 75 points Other NHS = 50 points	100	1
TOTAL POINTS					

NOTE:

See Table 2 and spread sheets for initial weightings. Multiple scenarios with different weights should be considered prior to finalizing for the program update.

PAVEMENT CONDITION INDEX CRITERION

Candidate Evaluation Criterion	Computation Methodology	Components of Criterion	Scoring Scale	Max No. of Points	Weight
Pavement Structural Integrity	Pavement condition index calculated based on cracking, rutting, and friction properties	Cracking (%)	>5 = 100 points >2.5 and <=5 = 75 points <=2.5 = 50 points		0.5
		Rutting (inches)	>0.015 = 100 points >0.005 and <=0.015 = 75 points <=0.005 = 50 points		0.5

Table 7 – Preservation Bridge Evaluation Criteria Descriptions, Computation Methodologies, and Scoring Scales

Candidate Evaluation Criteria	Description of Criterion	Computation Methodology	Scoring Scale	Max No. of Points	Weight
NBI Sufficiency Rating	Bridge sufficiency rating	Four status types: <ul style="list-style-type: none"> Structurally deficient: Significant load-carrying elements are found to be in poor condition Functionally obsolete: Function of geometrics of bridge in relation to geometrics required by current design standards Not deficient: Not structurally deficient or functionally obsolete Not applicable: Non-highways bridge 	Structurally deficient: 100 Not deficient: 0	100	0.15
NBI Condition Ratings	Superstructure condition rating Substructure condition rating Deck condition rating	Based on whether superstructure, substructure, or deck NBI condition rating values are above or below certain thresholds as shown in the scoring scale. The lowest condition rating value is used.	If either deck, substructure, or superstructure condition rating <=5 then = 100 points 6 or 7 = 75 points 8 or 9 = 50 points	100	0.15
Scour Criticality	Scour Critical bridge conditions	Bridge coding as scour critical in the NBI	Scour Critical = 100 points Not Scour Critical = 0 points	100	0.15
Fracture Criticality	Fracture Critical bridge conditions	Bridge coding as fracture critical in the NBI	Fracture Critical = 100 points Not Scour Critical = 0 points	100	0.15
Traffic Volume	Average Annual Daily Traffic (AADT), to determine relatively high or low volume relative to the geographical area.	Average annual daily traffic of vehicles, forecast using historical data	>=10,000 = 100 points 5,000<=AADT<10,000 = 75 points <5,000 = 50 points	100	0.1
Freight Flow	Truck volume as % of AADT	% of Average annual daily traffic attributed to trucks – proxy for freight volumes	>40% = 100 points 20 – 40% = 75 points <20% = 50 points	100	0.1
Detour Length	Length of bypass required if bridge is out-of-service	Bypass Length (miles)	>50 miles = 100 points 20 to 50 miles = 75 points 0 to 20 miles = 50 points	100	0.1
Strategic Investment	Is the project located in a strategic corridor?	Yes/No	Key Commerce Corridors = 100 points NHS – Interstate = 75 points NHS – Non-Interstate = 50 points	100	0.1
TOTAL POINTS					

NOTE:

See Table 1 and spread sheets for initial weightings. Multiple scenarios with different weights should be considered prior to finalizing for the program update.

Table 8 – Modernization Evaluation Criteria Descriptions, Computation Methodologies, and Scoring Scales

Candidate Evaluation Criteria	Description of Criterion	Computation Methodology	Scoring Scale	Max No. of Points	Weight
Delay Reduction	Approximation of level of congestion in project area	Calculate rough V/C ratios for projects using AADT and estimated daily capacity by facility type	v/c > 0.9 = 100 points v/c > 0.75 = 75 points v/c > 0.5 = 50 points	100	1
Traffic Flow Improvement	Approximation of impact of project type on traffic flow	Projects assessed based on type: traffic interchange improvements, passing lanes, roundabouts, intersection improvements, superelevation improvements, shoulder widening, other	TI = 100 points PL = 90 points RD = 80 points II = 70 points SI = 60 points SW = 50 points Others = 10 points		
Freight Flow Improvement	Truck volume as % of AADT – captures impact on goods movement	% of AADT attributed to trucks – proxy for freight volumes	>=20% = 100 points >= 10% = 75 points < 10% = 50 points	100	1
Expected Crash Reduction	Expected reduction in crashes as a result of the project	Use Crash Modification Factors (CMF) to determine Crash Reduction Factor (CRF) which = 1 – CMF. Then estimate reduction in crashes over five years as the product of total crashes over five years and the CRF.	Expected crash reduction > 100 = 100 points Expected crash reduction > 75 = 75 points Expected crash reduction > 25 = 50 points	100	1
Strategic Corridor	Is the project located in a strategic corridor? Which tier of roadway?	Yes/No	Key Commerce Corridors = 100 Points Statewide/Regionally Significant = 75 Points Other NHS = 50 Points	100	1
Supports Statewide Plans	Has this project been identified in the following plans with specific recommendations for improvement? (<i>Infrastructure Investments, Asset Management Plan, Strategic Highway Safety Plan, Topical Statewide Plans (Port of Entry, Rest Area, Passing Lanes, etc.), Corridor Profile Studies, and DCRs or Feasibility Studies</i>)	Yes/No	Top Tier Priority = 100 points Completes Implementation of a Corridor = 100 point Middle Tier Priority = 50 points Bottom Tier Priority = 10 points	100	1
Multimodal Enhancement	Does the project improve multimodal connectivity?	Yes/No	Significantly increases person-carrying capacity = 100 points Expands multimodal options = 75 points Directly serves a transportation terminal = 50 points	100	1
Subtotal					0.7
Cost Effectiveness (\$/delay reduction) 3 Project Categories – Low, Medium, High Cost				TBD – relative to project category	TBD
Local Input				TBD	TBD
Total Points					

NOTE:

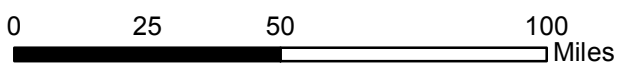
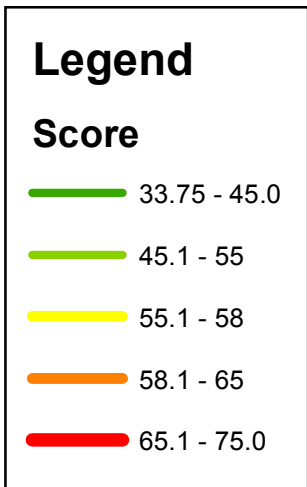
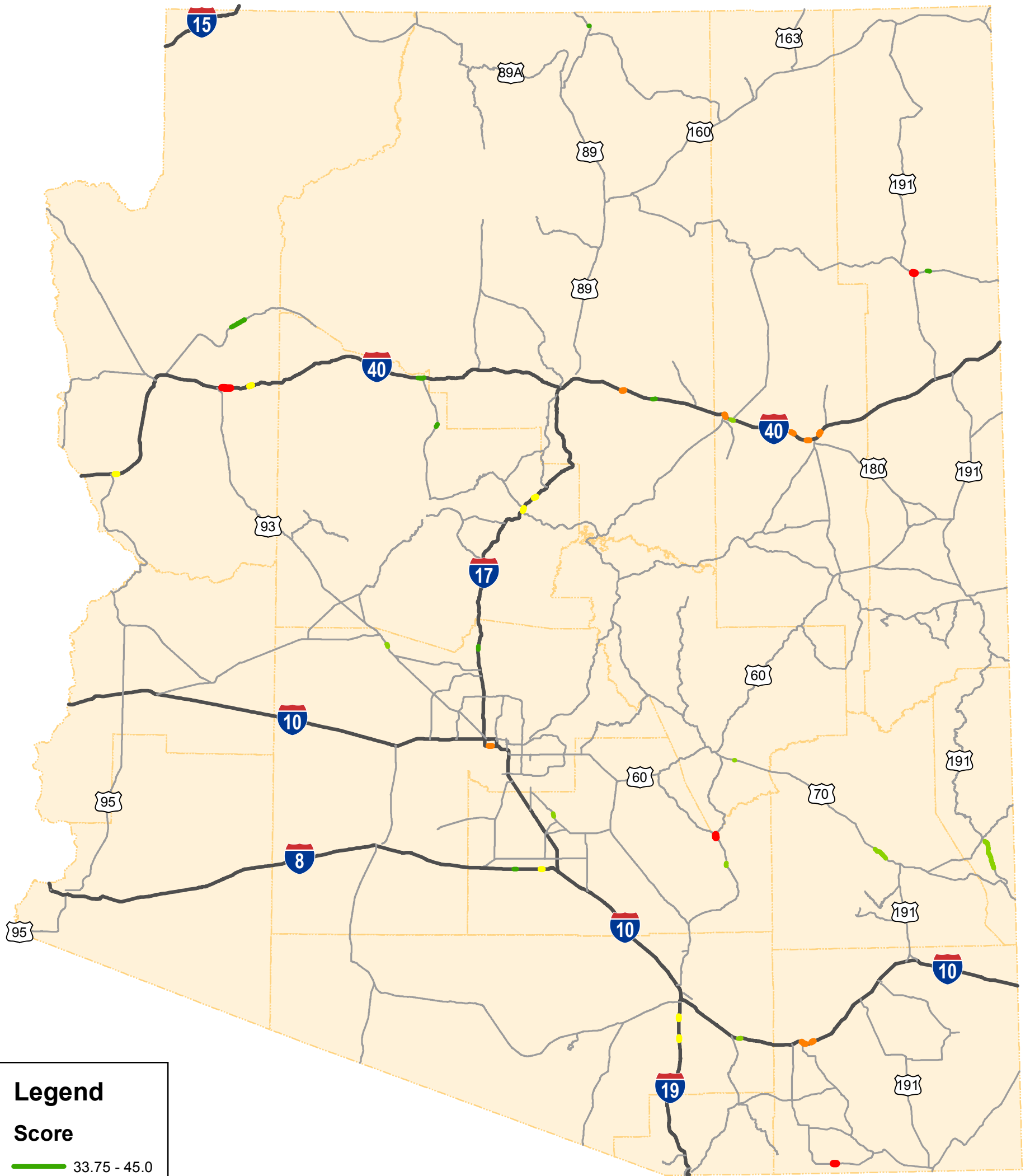
See Table 3 and spread sheets for initial weightings. Multiple scenarios with different weights should be considered prior to finalizing for the program update.

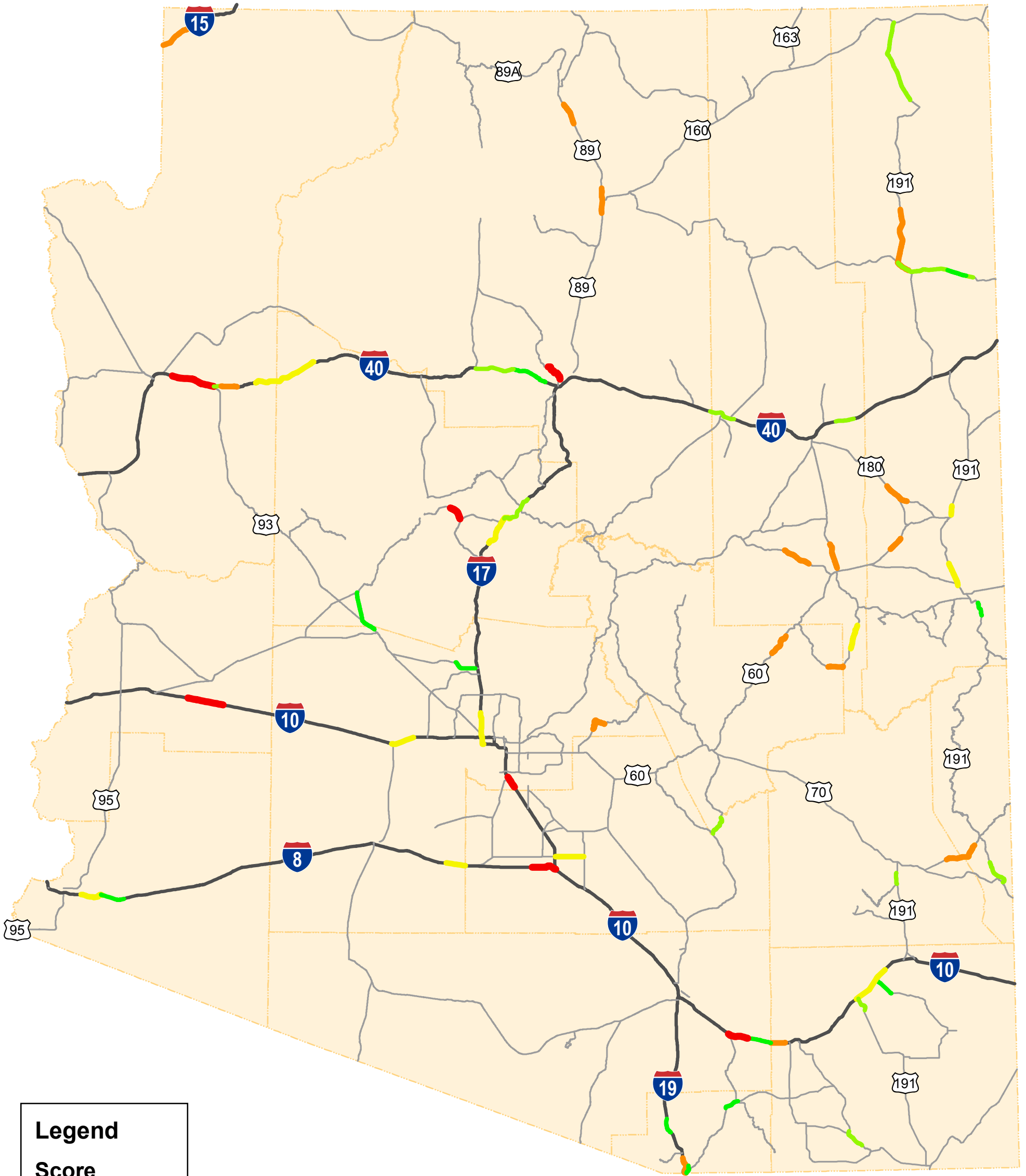
Table 9 – Expansion Evaluation Criteria, Computation Methodologies, and Scoring Scales

Candidate Evaluation Criteria	Description of Criterion	Computation Methodology	Scoring Scale	Max No. of Points	Weight
Travel Time Savings	Simulation-based/network-level analysis	Use simulation analyses to estimate travel time savings associated with implementation of expansion project links. Calculate as seconds per vehicle per day.	>5 sec/veh/day = 100 points >2.5 sec/veh/day = 75 points >0 sec/veh/day = 50 points	100	1
Future Traffic Volume	Projected traffic volumes	Use ADOT traffic projection data (at time of publication 2030 AADT Projections)	>= 25,000 = 100 points >= 10,000 = 75 points < 10,000 = 50 points	100	1
Future Freight Flow	Projected truck volume as % of AADT – captures impact on goods movement	% of AADT attributed to trucks – proxy for freight volumes	>= 20% = 100 points >= 10% = 75 points < 10% = 50 points	100	1
Corridor Significance	Is the project located in a corridor of statewide significance?	Yes/No	Key Commerce Corridors = 100 points Statewide/Regionally Significant = 75 points Other NHS = 50 points	100	1
Supports Statewide Plans	Has this project been identified in the following plans with specific recommendations for improvement? (<i>Infrastructure Investments, Asset Management Plan, Strategic Highway Safety Plan, Topical Statewide Plans (Port of Entry, Rest Area, Passing Lanes, etc.), Corridor Profile Studies, and DCRs or Feasibility Studies</i>)	Yes/No	Top Tier Priority = 100 points Completes Implementation of a Corridor = 100 point Middle Tier Priority = 50 points Bottom Tier Priority = 10 points	100	1
Multimodal Enhancement	Does the project directly serve a transportation terminal (e.g. airport, train or bus station, rail yard)? Does the project expand multimodal options (e.g., rail line, reconfiguration of existing lanes to add a bike lane, HOV/HOT lane, BRT lane or freight truck lane)?	Yes/No	Significantly increases person-carrying capacity = 100 points Expands multimodal options = 75 points Directly serves a transportation terminal = 50 points	100	1
Subtotal					0.7
Cost Effectiveness (\$/travel time savings) 3 Project Categories – Low, Medium, High Cost				TBD – relative to project category	TBD
Local Input				TBD	TBD
Total Points					

NOTE:

See Table 4 and spread sheets for initial weightings. Multiple scenarios with different weights should be considered prior to finalizing for the program update.





Legend

Score

- 47.5 - 55.0
- 55.1 - 65.0
- 65.1 - 70.0
- 70.1 - 77.5
- 77.6 - 90.0

