



Final ADOT Planning to Programming Scoring Guidebook

Contract No. : ADOT17-171970
Title: MPD0011-19 P2P Implementation

Prepared by:



November 2018

Table of Contents

1.0	Introduction	3
2.0	Project Identification.....	4
3.0	Data Update Requirements.....	5
4.0	Technical Score Criteria.....	6
4.1	Technical Score – Scoring Process.....	6
4.1.1	Technical Group Submitted Projects.....	6
4.1.2	Planning Studies Recommended Projects.....	6
4.1.3	Expansion Projects.....	7
4.1.4	LOS and Speed AZTDM Calculations.....	7
4.1.5	Travel Time Reliability Calculations.....	8
5.0	Policy Score Criteria.....	9
5.1	Freight Flow Score.....	9
5.2	Corridor Significance / Functional Classification Score.....	9
5.3	External Funding Contribution Score.....	10
5.4	Policy Score – Scoring Process.....	10
5.4.1	New Project Scoring.....	10
5.4.2	Previously Recommended Project Scoring.....	10
6.0	Safety Score – Scoring Process.....	11
6.1	Step-by-Step Safety Score Application.....	11
7.0	District Score Criteria.....	12
7.1	District Score – Scoring Process.....	12
7.2	Preparation for District Workshop.....	13
8.0	Development of Final P2P List.....	14
9.0	Planning Level Scoping.....	14
10.0	Next Steps.....	15
11.0	Arizona Management System Integration.....	15

Appendices

- Appendix A – Planning to Programming Annual Schedule
- Appendix B – Technical Score Supplemental Materials
- Appendix C – Policy Score Supplemental Materials
- Appendix D – District Score Supplemental Materials
- Appendix E – P2P Communication List
- Appendix F – Guidance for Programming Expansion Projects in Greater Arizona

Acronyms

AADT	Annual Average Daily Traffic
AASHTO	American Association of State Highway and Transportation Officials
ADOT	Arizona Department of Transportation
AZTDM	Arizona Travel Demand Model
COG	Council of Governments
ECD	Enforcement & Compliance Division
E2C2	Estimated Engineering Construction Cost
FHWA	Federal Highway Administration
Five-Year Program	Five-Year Transportation Facilities Construction Program
FY	Fiscal Year
GIS	Geographic Information System
IDO	Infrastructure, Delivery, & Operations
LOS	Level of Service
LOSS	Level of Safety Service
LOTTR	Level of Travel Time Reliability
MPD	Multimodal Planning Division
MPO	Metropolitan Planning Organization
NHS	National Highway System
P2P	Planning to Programming
RAM	Responsibilities Assignment Matrix
TMC	Traffic Messaging Channel
TSMO	Transportation Systems Management and Operations
TTTR	Truck Travel Time Reliability

1.0 Introduction

This document provides the procedures for applying the Planning to Programming (P2P) scoring criteria which results in the Statewide Prioritized Project List. The P2P process is conducted annually by the Arizona Department of Transportation (ADOT) Multimodal Planning Division (MPD) to prioritize all prospective statewide facility improvements. The P2P process is a performance-based process resulting in the development of the Draft Five-Year Transportation Facilities Construction Program (Five-Year Program). The scoring criteria, weights, and process as identified in this P2P Guidebook (November 2018) were utilized to prioritize and recommend the top performing construction projects for consideration in ADOT's FY 2020 – 2024 Five-Year Program.

The P2P scoring process is separated into scoring sub-categories: technical, policy, safety and district:

- *Technical Score*: Based on prioritization provided directly from the respective ADOT Technical Groups, the project's originating study document or the MPD expansion project evaluation process.
- *Policy Score*: Derived from planning-level criteria including freight flow, corridor significance and local funding contributions.
- *Safety Score*: Based on the weighted Level of Safety Service (LOSS) values identified in the statewide database developed utilizing the American Association of State Highway and Transportation Officials (AASHTO) Safety Analyst tool.
- *District Score*: Derived from each ADOT District Engineer's prioritization of projects and supported by a scoring evaluation of each project.

The following sections outline the overall P2P process as well as step-by-step procedures for the completion of the P2P scoring process, including annual updates to scoring criteria, scoring newly recommended projects and revising scoring for previously recommended projects.

Authority for the P2P Guidebook is provided by ARS Title 28, Chapter 2, Article 7 and 23 USC Section 135(d)(2); 49 USC Section 5304(d)(2).

2.0 Project Identification

The P2P process begins with the identification of prospective projects. The identification is twofold, involving both the inclusion of previously recommended projects that were not selected in the Five-Year Program from the previous Fiscal Year (FY) and newly recommended projects. Projects that were accepted into the previous year's Five-Year Program are removed from consideration at this time.

In May, the P2P Manager requests any new planning study recommendations from ADOT Planning staff, COGs, and MPOs, as well as any District project nominations. All recommended projects from completed planning studies between the current and previous year's project identification process are collected. MPD's Geographic Information System (GIS) Attribute Table submitted with each completed MPD planning study is a resource to identify project information relevant to the P2P Scoring Process.

The following planning studies are referenced to identify projects:

- Bicycle and Pedestrian Safety Plans
- Corridor Profile Studies
- Statewide Planning Studies
- COG and MPO Studies
- State Freight Plan
- Other plans and studies, as applicable

The P2P Manager submits such study and District project nominations to the appropriate ADOT Technical Groups (see Table 1) for technical prioritization.

In July, the P2P Manager issues a Call for Projects to each Technical Group. Each Technical Group is required to submit a prioritized list of projects by July 31st and provide supporting backup data.

This identification process is structured to allow all project recommendations, including district originating recommendations, entering the P2P process to be competitive in the development of the Five-Year Program. In addition to newly developed recommended projects, all projects that were not accepted into the previous FY's Five-Year Program will be listed to be reprioritized with newly proposed project recommendations.¹

The following Technical Groups from ADOT's Infrastructure, Delivery, & Operations Division (IDO), Transportation Systems Management and Operations Division (TSMO) and Enforcement & Compliance Division (ECD) are recipients of the MPD call-for-projects:

Table 1: ADOT Technical Groups / Division

Technical Group	Division
Bridge	IDO
Geohazard Management	IDO
Environmental Planning (Stormwater & Erosion Control)	IDO
Pavement Management	TSMO
Rest Area	TSMO
Traffic Safety Section	TSMO
Port of Entry Liaison	ECD

¹ The call-for-projects may precede the final Five-Year Program completion, therefore the previously programmed projects determination may be based upon the Draft Five-Year Program

3.0 Data Update Requirements

The policy criteria and safety criteria of the P2P Scoring Process require annually updated information to accurately score proposed projects. **Table 2** notes the specific data sources and respective data fields required for updates as well as the frequency of data updates.

Table 2: Data Update Schedule

Technical Criteria (Expansion)		
Data Source	Data Field	Update Frequency
Arizona Travel Demand Model (AZTDM)	Projected Level of Service (LOS)	Annual
	Projected Speeds	
INRIX Travel Time Reliability	Vehicle Travel Time Reliability	
	Truck Travel Time Reliability	
Policy Criteria		
Data Source	Data Field	Update Frequency
Annual Average Daily Traffic (AADT) Reports: Traffic Counts ²	T-Factor	Annual
ADOT Map Book / Corridor Significance GIS Shapefile	Functional Classification Map/Shapefile ³	Annual
	National Highway System (NHS) Map/Shapefile ³	MPD Discretion
Safety Criteria		
Data Source	Data Field	Update Frequency
AASHTO Safety Analyst	Level of Safety Service	Annual

The NHS remains relatively static on a year-to-year basis; therefore, it does not require an annual update to previously scored projects. However, in the event of known changes to the NHS system, these specific route(s) or route segments should be reassessed accordingly.

² The Annual AADT Report is accessible at <https://azdot.gov/planning/DataandAnalysis>

³ The annually updated ADOT Map Book, functional classification and NHS maps are accessible at <https://azdot.gov/maps>

4.0 Technical Score Criteria

4.1 Technical Score – Scoring Process

The first aspect of the P2P Scoring Process is the application of the *Technical Score* which makes up 35 percent of the overall P2P final score. A *Technical Score* is calculated for all projects identified during the initial MPD call-for-projects as well as all projects collected from completed planning studies. The project information and scores, as calculated below, should be stored in the *Call-for-Projects Template* spreadsheet.

4.1.1 Technical Group Submitted Projects

During the call-for-projects, each ADOT Technical Group is tasked with recommending and evaluating all new prospective projects pertaining to the group’s expertise. The Technical Group will provide their prioritized ranking or score for both newly recommended projects and existing projects from previous FY submissions with a single, contiguous ranking or scoring schema.

Upon the return of this information, MPD staff normalizes these scores into the P2P *Technical Score*. Given each Technical Group has differing internal processes that determine their ranking and/or scoring of projects, each group’s submission is sorted from highest priority (top ranking or highest scoring) to lowest priority (bottom ranking or lowest scoring). In order to normalize all of the scores to the 35-point scale allocated to the *Technical Score*, the top ranking project achieves the maximum 35-points, and each subsequently ranked project is scored at an evenly descending rate determined by the following formula:

$$\text{Technical Score} = ((1+n) - x) * y$$

x = rank order

y = weighted District Score percentage (0.35)

n = 100 (maximum number of projects considered)

This formula is applied to the top 100 ranked project recommendations for each ADOT Technical Group list independently. Therefore, the top ranking project from each group’s project recommendation list receives the maximum allocation of Technical Score points and each list descends on its own respective scale. All project lists are ranked independent of other submitted lists, including projects categorized in the Modernization or Expansion categories which have various project submission sources because of the broader scopes of work for the projects.

4.1.2 Planning Studies Recommended Projects

The same scoring methodology used for our Technical Groups is also applied to ADOT’s Statewide Studies. Each of the following studies are treated as a Technical Group as each developed its own statewide methodology to prioritize project recommendations: Corridor Profile Studies, State Freight Plan, Statewide Climbing and Passing Lane Study, and Statewide Shoulders Study.

In order to normalize all of the scores to the 35-point scale allocated to the *Technical Score*, the top ranking project achieves the maximum 35-points, and each subsequently ranked project is scored at an evenly descending rate determined by the following formula:

$$\text{Technical Score} = ((1+n) - x) * y$$

x = rank order

y = weighted District Score percentage (0.35)

n = 100 (maximum number of projects considered)

This formula is applied to the top 100 ranked project recommendations for each of the Statewide Studies.

All other project recommendations from any other study source are requested by the P2P Manager in May each year and submitted to each Technical Group for inclusion in their prioritization process. For example, if a study recommendation identified a safety improvement, it would be submitted to ADOT’s Traffic Safety Section within the TSMO Division for prioritization. If a study recommendation identified an

expansion project, it would be submitted to the P2P Manager to receive an Expansion Technical Score, as described in the following section, 4.1.3.

4.1.3 Expansion Projects

The expansion investment area is comprised of projects that do not originate from a consistent source; technical group, study recommendation or otherwise. Therefore, a separate technical score criteria is assigned specifically and exclusively to all projects categorized within the expansion investment area.

The expansion technical score includes criteria measuring the Projected Level of Service (LOS), Projected Average System Speeds, System Reliability and Freight System Reliability. The Projected LOS and Projected Average System Speeds are determined using the average of the AZTDM model 2023 and 2040 output values for LOS and percent relation between projected speeds and posted speeds. The automobile and freight system reliability calculations are derived from the outputs from the INRIX travel time data.

The individual scoring criteria is shown in **Table 3** and are further detailed in the following sections.

Table 3: *Expansion Technical Score

Expansion Technical Score Criteria	Score
Projected LOS	12
Projected Average System Speeds	5
System Reliability	8
Freight System Reliability	10

*Note: It is anticipated that in addition to the above four Expansion Technical Criteria, the below two Expansion Technical Criteria will be added to the P2P prioritization process for use in prioritizing the FY 2021 – 2025 Five-Year Program:

- Cost Effectiveness
- New Permanent Jobs Created

4.1.4 LOS and Speed AZTDM Calculations

Both the Projected LOS and Projected Average System Speed calculations use the resulting information from 2023 and 2040 outputs from the AZTDM statewide model. Given that project lengths and milepost limits often will not align directly with the model's segmentation, the output values are determined using a weighted average of all segments fully or partially within the project limits. All model segments that only partially intersect a project's milepost limits are truncated at the project limits to avoid over-representing partial segments.

The average of the 2023 and 2040 projected LOS values was calculated for each project and related to a 0 – 1.0 scale prior to assessing the score. The range represents the continuum between LOS, with 0 representing free-flow traffic and subsequently a lower priority for expansion efforts, and 1.0 representing the highest degree of traffic congestion and a top priority for expansion efforts⁴. The following formula is used to determine this scoring component:

$$LOS\ Score = 2023/2040\ Average\ LOS / 1.0 * 12$$

The average of the 2023 and 2040 projected speeds are calculated for each project and related inversely to the existing weighted average posted speed limit within each project's limits. Therefore, project locations where projected average speeds are significantly lower than the existing posted speeds receive

⁴ Although LOS conditions of roadways exist between 0 – 1, the model may output a value exceeding 1.0 which would indicate projected traffic volumes in excess of the existing roadway capacity.

a higher score, whereas project locations where projected average speeds remain close to the posted speeds receive a lower score. The following formula is used to determine this scoring component:

$$\text{Speed Score} = 5 - (2023/2040 \text{ Average Speed} / \text{Weighted Average Posted Speed} * 5)$$

4.1.5 Travel Time Reliability Calculations

The Travel Time Reliability measures are determined by assessing a weighted average of the data ratio derived from the values collected along Traffic Messaging Channel (TMC) locations located throughout the statewide ADOT system. These TMC locations calculate speed values which are subsequently translated into reliability ratios given the variation of vehicular speeds.

The System Reliability Score is determined by identifying the Level of Travel Time Reliability (LOTTR) ratio which is calculated by measuring the 80th percentile speed of all vehicles which is represented as a ratio between 1.0 – 1.5. A ratio of 1.0 represents completely reliable conditions for the represented roadway segment, whereas a ratio of 1.5 represents unreliable conditions for the represented roadway segment. The following formula is used to determine this scoring component:

$$\text{System Reliability Score} = \text{LOTTR} / 1.5 * 8$$

The Freight System Reliability Score is determined by identifying the Truck Travel Time Reliability (TTTR) ratio which is calculated by measuring the 95th percentile speed of freight vehicles which is represented as a ratio between 1.0 – 1.5. A ratio of 1.0 represents completely reliable conditions for the represented roadway segment, whereas a ratio of 1.5 represents unreliable conditions for the represented roadway segment. The following formula is used to determine this scoring component:

$$\text{Freight System Reliability Score} = \text{TTTR} / 1.5 * 10$$

5.0 Policy Score Criteria

The second aspect of the P2P Scoring Process is the application of the *Policy Score* which makes up 10 percent of the overall P2P final score. A *Policy Score* is calculated for all the projects identified during the initial MPD call-for-projects, including all the projects collected from completed planning studies and all previously recommended projects submitted in a previous FY.

The *Policy Score* is comprised of three criteria: freight flow, corridor significance/functional classification and local funding contributions. The individual scoring criteria are further detailed in the following sections. Refer to **Table 6** for the full point distribution of the *Policy Score*.

5.1 Freight Flow Score

The Freight Flow Score is a measurement based on T-Factor values reported in the annual *AADT: Traffic Counts* report produced by MPD, as noted in **Section 3.0**. The T-Factor measures the percentage of the overall AADT volumes that freight vehicles represent. **Table 4** shows the specific point values assigned to each project based upon the project range's T-Factor value.

Table 4: Freight Flow Scoring

Freight Flow Range	Score
T-Factor > 25%	3
T-Factor 10% - 15%	2
T-Factor < 10%	1

Given project lengths and milepost limits often will not align directly with the T-Factor reporting segmentation, the T-Factor is determined using a weighted average of all segments fully or partially within the project limits. All T-Factor segments that only partially intersect a project's milepost limits are truncated at the project limits to avoid over-representing partial segments. For further details regarding the identification of the project's T-Factor value, including the calculation template, refer to **Appendix C**.

5.2 Corridor Significance / Functional Classification Score

The Corridor Significance / Functional Classification Score assigns specific point values to different roadway Functional Classifications and NHS designations as reported in the published ADOT Map Book (<https://azdot.gov/maps/geographic-and-functional-maps>) and expressed in the Roadway Features geodatabase. Roadways with a higher functional classification are awarded a higher point value. **Table 5** shows the specific point values assigned to each project based upon the project range's corresponding roadway functional classification.

Table 5: Functional Classification Scoring

Functional Classification	Score
Interstate	3
Non-Interstate NHS	2.5
Major Arterial	2
Minor Arterial	1.5
Major Collector	1
Minor Collector	0.5

The most recently published ADOT Map Book should be used as the preliminary reference for identifying the project's location when determining each project's Functional Classification Score. For more detailed differentiation between functional classifications, the Functional Classification feature class in the ADOT Features geodatabase can be overlaid with the ADOT Milepost feature class. In doing so, the changes between functional classifications as well as exact distinction between NHS and non-NHS route segments can be precisely determined to the milepost. In the event a project's milepost limits extend across two or more different functional classifications, the higher point value amongst the selections should be assigned.

Similarly, in the event that only a portion of a project’s milepost limits is located along a NHS route segment, the full point allocation is awarded.⁵

5.3 External Funding Contribution Score

Projects explicitly noted as partially or fully funded by local, regional or other secondary funding sources are awarded up to four (4) points for the External Funding Contribution Score. The percentage of funding contribution made towards the total project cost determines the proportion of the maximum available point value assigned to the project.

$$\text{External Funding Contribution Score} = (\% \text{ of funding contribution}) * 4$$

Most proposed projects submitted from an ADOT Technical Group will be funded through annually allocated state and/or federal funding sources and will not be awarded any points for External Funding Contributions. District Engineers, Technical Group personnel or MPD staff may propose projects with explicitly noted secondary funding sources.

5.4 Policy Score – Scoring Process

The application of the *Policy Score* includes accounting for each criterion, as noted in **Section 5.1**, **Section 5.2** and **Section 5.3**. The total *Policy Score* has a maximum of 10 points. **Table 6** shows the maximum point values for each scored component.

Table 6: Policy Scoring – Point Distribution

Policy Score Criteria	Score
External Funding Contribution	4
Freight Flow	3
Corridor Significance / Functional Classification	3

Use the *Master Project List* document within the *Policy Reference* to track each individual project’s *Policy Score* components and tabulate the normalized *Policy Score*.

The Policy Score category totals 10 points and represents 10% of the final P2P Project Score.

5.4.1 New Project Scoring

All newly proposed projects undergo the full scoring process for the Policy Scoring portion of the overall P2P Score.

5.4.2 Previously Recommended Project Scoring

Previously recommended projects will need to undergo a partial re-scoring of the Policy Scoring portion of the overall P2P Score. The necessity of updating individual project scoring will vary based upon the degree the scoring criteria components have been adjusted since the project was last scored. As referenced in **Section 3.0** the Freight Flow is required to be updated on an annual basis at a minimum.⁶

⁵ Note that under certain circumstances, only a portion of Arizona State Route may be included on the National Highway System.

⁶ Local Funding Contribution should be noted if changes have occurred between Fiscal Year scoring cycles and Corridor Significance / Functional Classification is only reassessed where known changes have been made to the statewide system’s classifications.

6.0 Safety Score – Scoring Process

The third aspect of the P2P scoring process is the application of the *Safety Score* which makes up 25 percent of the overall P2P final score. The *Safety Score* is determined by the Level of Safety Score (LOSS) score derived from the Safety Analyst tool. The LOSS score is a measurement of each individual project limit's safety performance relative to the capacity for further safety improvements dependent upon the roadway facility and environment type. Using this metric to measure safety allows the various roadway facilities and environments across the statewide transportation network to be normalized to a universal scale.

The LOSS output values from the Safety Analyst tool are displayed as LOSS 1 – 4, with a lower score indicating a safer facility (lower priority) relative to statistical norms of similar facility types and higher score indicating a less safe (higher priority) facility relative to statistical norms of similar facility types. Given the diverse variability in facility types and roadway environment conditions, these values are produced on segments with irregular-lengths.

The *Safety Score* category of the P2P Scoring Process is annually updated for all previously recommended projects. This is due to the annual updates made to the Safety Analyst Database based on reported statewide crashes, incident cataloging and potential updates or changes in roadway facility types. Therefore, MPD staff is responsible for requesting the statewide LOSS export from the TSMO Division on an annual basis as noted in **Section 3.0**.

6.1 Step-by-Step Safety Score Application

The LOSS score is calculated with a high-degree of accuracy through the use of GIS. The scoring process begins by georeferencing each prospective project. Each project is geographically referenced using the beginning and ending milepost limits precisely along the ADOT highway system. Once the projects have been georeferenced, the LOSS segmentation and associated segment scoring data (which is translated into a GIS compatible shapefile directly from Safety Analyst) is overlaid upon the newly created project location shapefile. The overlaid LOSS segmented values are then joined and attributed to the project location features by querying all intersecting LOSS segments. This process captures all LOSS segments partially or fully included within each project's respective milepost limits. Given project lengths and milepost limits often will not align directly with the LOSS reporting segmentation, the LOSS score is determined using a weighted average of all segments fully or partially within the project limits. All LOSS segments that only partially intersect a project's milepost limits are truncated at the project limits to avoid over-representing partial segments.

The following formula is used to determine this scoring component:

$$\text{Safety Score} = (x/4) * 25$$

$x = \text{LOSS Score (Average)}$

7.0 District Score Criteria

The fourth aspect of the overall P2P scoring process is the application of the *District Score* which makes up 30 percent of the overall P2P final score. Each District Engineer and district staff is given an opportunity to prioritize prospective projects within their district. This prioritization is requested in advance of each respective District Workshop.⁷ Following the discussion occurring at the District Workshop, each District Engineer provides confirmation of final adjustment to their *District Score* priorities. Any changes at this time will overwrite the preliminary district prioritization provided prior to the District Workshop.

7.1 District Score – Scoring Process

The district prioritization is given to each specific investment category (pavement preservation, bridge preservation, modernization and expansion) for all projects within each specific district boundary. Each district will have a singular project with a maximum applicable *District Score* for each investment area.

As noted in the determination of the *Technical Score*, each respective district prioritization submission is sorted from highest priority to lowest priority. In order to normalize all scores to the 30-point scale allocated to the *District Score*, the top ranking score achieves the maximum 30 points, and each subsequently ranked project is scored at an evenly descending rate determined by the following formula:

$$\text{District Score} = ((1+n) - x) * y$$

x = rank order

y = weighted *District Score* percentage (0.3)

n = 100 (maximum number of projects considered)

This formula is applied to each respective district projects list. Therefore, each top ranking project within each investment category from all ADOT Engineering Districts prospective project lists receive the maximum allocation of *District Score* points and each list descends on their own respective scales, independent of the other submitted lists.

In addition to providing a project ranking as outlined above, each ADOT Engineering District is asked to provide answers to a supplemental questionnaire for the projects that were ranked by the District. The eight-question questionnaire is included to provide further detail about project prioritization and serves as support data for ranking decisions. The survey questions included are as follows:

- Q1) Considering the existing facility condition, how would you rate the risk of not programming this project?
(1-6) 1 = lowest risk 6 = highest risk
- Q2) Considering the existing facility condition, how would you rate the benefits of this project to the region?
(1-6) 1 = lowest benefit 6 = highest benefit
- Q3) How would you rate the safety risk of this project location?
(1-6) 1 = lowest risk 6 = highest risk
- Q4) How would this project address a known safety issue?
(1-6) 1 = lowest benefit 6 = highest benefit
- Q5) Considering the existing congestion & reliability of the facility, how would you rate the risk of not programming this project?
(1-6) 1 = lowest risk 6 = highest risk
- Q6) Will completion of this project result in reduced congestion or increased reliability?
(1-6) 1 = lowest benefit 6 = highest benefit
- Q7) Executed IGA for Route Transfer?
(Yes/No)
- Q8) Executed IGA for External Funding Contribution?
(Yes/No)

⁷ Further detail is provided describing the District Workshop process in Section 7.2.

7.2 Preparation for District Workshop

Upon the completion of the first three scoring aspects of the overall P2P Scoring Process, District Spreadsheets are developed in preparation for the District Workshops held in October. Each ADOT Engineering District is scheduled for a workshop to discuss all prospective projects within the district's boundary.

To maximize the efficiency of this workshop, MPD distributes district-specific spreadsheets to each ADOT Engineering District to review and return the *Preliminary District Score* by prioritizing the prospective projects by their respective investment categories. MPD Staff requests that each District provide a *Preliminary District Score* for up to the following number of projects within each respective investment category:

- Pavement Preservation – 20 projects
- Bridge Preservation – 10 projects
- Modernization – 10 projects
- Expansion – all projects

With all four scoring aspects provided, the draft final prioritization within each engineering district is presented at the respective District Workshops.

Each district spreadsheet should be organized based upon the following steps:

- Step 1: Create seven (7) district spreadsheets, based upon the template included in **Appendix D**.
- Step 2: Per district, populate district spreadsheet "All Projects" tab with both newly recommended projects as well as previously recommended projects.
- Step 3: Once all relevant projects are transferred to the district spreadsheet, begin sorting projects by location.
- Step 4: Copy projects from the "All Projects" tab and paste into the "Location" tab
- Step 5: With the filter/sort function activated, sort the route number column in ascending order and then sort the route column in ascending alphabetical order.
- Step 6: Add route row-headers between each different route per the template, assuring that each header is titled accurately.
- Step 7: All projects should therefore be sorted by route, beginning with Interstate, Arizona State Route (SR) and US Route (US) in descending numerical order of the route number.
- Step 8: Refer to "All Projects" tab and apply filter to the column labeled "Investment Category", selecting each respective investment category (Pavement Preservation, Bridge Preservation, Modernization and Expansion)
- Step 9: Copy each filtered selection and paste into respective tabs labeled "Pavement Preservation", "Bridge Preservation", "Modernization" and "Expansion".
- Step 10: In each "Pavement Preservation", "Bridge Preservation", "Modernization" and "Expansion" tab, refer to Step 5 – Step 7.
- Step 11: Repeat Step 2 – Step 10 for each remaining district.
- Step 12: Share district spreadsheet with the respective District Engineering staff, requesting the submission of the District's scores, rankings, and comments.
- Step 13: Upon receiving the preliminary district scores, rankings, and comments, complete the *District Score* scoring process as noted in **Section 7.1**.
- Step 14: Ensure all total scores are updated including the *District Score* component.
- Step 15: Print 11x17 copies of the "All Projects", "Pavement Preservation", "Bridge Preservation", "Modernization" and "Expansion" tabs, ensuring that the print settings are set to print all columns on a single page and the printing frame includes all listed projects.

8.0 Development of Final P2P List

After each District Workshops is conducted and the final district priorities are received, each component of the overall P2P Scoring Criteria is completed. Upon updating each individual district spreadsheet based on the final district priorities and subsequent *District Score*, each district's project lists must be compiled into one statewide prioritized list, resulting in the Draft Final P2P List.

The Draft Final P2P List should be separated into individual investment category lists in descending order of the total score. The sum of each component of the P2P Score equates to a maximum-possible project score of 100 points, and a minimum-possible score of 0 points. The full scoring breakdown is shown as follows in **Table 7**.

Table 7: Final Scoring Breakdown

Category	Percentage of Total
Technical Score	35%
Safety Score	25%
Policy Score	10%
District Score	30%

During the development of the Draft Final P2P List, the list is reviewed by the ADOT P2P Manager. Following this review, all comments and adjustments should be fully addressed. At this point, the Final P2P List is completed and resubmitted to the ADOT P2P Manager.

The P2P Manager then submits the Final P2P List to the ADOT STIP Manager, Major Projects Manager, Project Management Group Manager, and P2P Steering Committee for use in Programming and Planning Level Scoping. This step completes the performance-based planning prioritization process.

9.0 Planning Level Scoping

Upon the finalization of the P2P Statewide Prioritized Project List, the highest scoring projects within a combined ranking of both pavement and bridge preservation projects are selected as candidates for the Major Projects Group's Planning Level Scoping process. The number of projects selected varies depending on the number of preservation projects expected to enter the Five-Year Program each FY. Additionally, all Modernization projects are reviewed to identify overlapping project limits with the selected highest scoring preservation projects.

The highest scoring projects are submitted to the Major Projects Group to begin the Planning Level Scoping process. The Planning Level Scoping process is a ten-week effort that produces a Planning Level Scoping document. The Planning Level Scoping document includes a checklist, cost estimates and coordination meeting minutes. The checklist provides engineering justification for the cost estimate and scope of work refinements. The cost estimates completed in this process are fully itemized cost estimates adhering to ADOT's Estimated Engineering Construction Cost (E2C2) formatting. The final component of the Planning Level Scoping document is a collection of meeting minute records which document the coordination efforts engaged in with ADOT Technical Groups and ADOT Engineering District personnel. For additional detail regarding the Planning Level Scoping process, reference the Planning Level Scoping Guidelines produced by the Major Projects Group.

Upon completion, each Planning Level Scoping document is submitted to the ADOT P2P Manager and STIP Manager to update project scope of work and cost estimates in the Draft Five-Year Program. Additionally, the ADOT P2P Program Manager facilitates the update to the scope of work and cost estimates of projects not entering the current year's Five-Year Program for use in the next FY-cycle of the P2P process.

10.0 Next Steps

P2P Scoring is an annually completed process based upon the most recently updated data available. Upon the completion of each FY's P2P process, improvements to the scoring implementation procedures, scoring criteria, eligibility and weights can be identified.

This ADOT Planning to Programming Scoring Guidebook is developed based upon the scoring criteria, eligibility, weights and processes used during the development of the Draft FY 2020 – 2024 Five Year Program. In order to maintain consistency amongst scored projects, any future improvements or adjustments made to the scoring criteria will require adjustments to all previously proposed and newly proposed projects. Similarly, this document will require periodic updates based upon any implemented improvements or adjustments made to the scoring criteria, eligibility, weights, or processes.

11.0 Arizona Management System Integration

This Guidebook is being integrated into ADOT's Arizona Management System (AMS) process and products. Accordingly, the procedures and guidelines included in this Guidebook should be treated essentially as "Standard Work" for P2P. In addition, a Plan-Do-Check-Act (PDCA) effort was undertaken in 2017 for Pavement Preservation Project Delivery, resulting in Standard Work. Phase 0 of the Pavement Preservation Project Delivery Standard Work applies to P2P, and the procedures and guidelines included in this Guidebook need to be coordinated with the PDCA Standard Work. Both Standard Work documents are being adjusted to be uniform and consistent.

Appendix A – P2P Responsibilities Assignment Matrix (RAM)

Task #	Responsible Party	Responsibility	Start	Finish
1	MPD P2P Manager IDO District Staff Technical Groups MPD Regional Planners	Early Coordination Meeting(s) for P2P updates	May	June
2	COGs, MPOs, MPD Project Managers, District Engineers	Submit new Expansion project nominations to the P2P Manager by May 31 st	May 1 st	May 31 st
3	IDO District Engineers MPD Project Managers	Districts and MPD Project Managers to submit project nominations to *Technical Groups by July 1 st	Jun 1 st	Jul 1 st
4	MPD P2P Manager	Call for Projects Nominations	Jul 1 st	Jul 1 st
5	Technical Groups	Technical Groups to email list of prioritized project nominations to P2P Manager by July 31 st	Jul 1 st	Jul 31 st
6	MPD P2P Manager MPD Regional Planners	Initial Project Prioritization: Apply Technical Scores, Safety Scores, & Policy Scores	Aug 1 st	Aug 31 st
7	MPD P2P Manager	Submit list of prioritized project nominations to Districts for District Ranking	Aug 31 st	Aug 31 st
8	IDO District Staff	Districts to submit District Rankings to P2P Manager by September 30 th	Sep 1 st	Sep 30 th
9	MPD P2P Manager MPD Regional Planners	Convert District Ranking to District Score and prepare District Workshop spreadsheets	Oct 1 st	Oct 15 th
10	MPD P2P Manager MPD Regional Planners Technical Groups IDO District Staff	District Workshops: Confirm project details and rankings; combine projects (as appropriate)	Oct 15 th	Oct 31 st
11	MPD P2P Manager MPD Regional Planners	Apply final edits to the Draft Tentative Five Year Program	Nov 1 st	Nov 15 th
12	MPD P2P Manager	Submit Draft Tentative Five Year Program to STIP Manager and Major Projects Manager	Nov 15 th	Nov 15 th
13	MPD STIP Manager MPD, IDO, TSMO, & FMS Management	Management Review of Draft Tentative Five Year Program	Nov 15 th	Dec 31 st
14	MPD Major Projects Group Roadway Pre-Design	Planning Level Scoping (top ranking priority projects)	Nov 15 th	Feb 15 th

Task #	Responsible Party	Responsibility	Start	Finish
	Technical Groups			
15	MPD STIP Manager MPD, IDO, TSMO, & FMS Management Transportation Board	Draft Tentative Five Year Program Study Session	Jan 1 st	Jan 31 st
16	MPD STIP Manager Transportation Board	Draft Five Year Program Public Hearings	Mar 1 st	May 31 st
17	MPD STIP Manager	Revise Draft Five Year Program based on Public Comments	June	June
18	MPD STIP Manager Transportation Board	Transportation Board Approval of Draft Five Year Program	June	June
19	MPD STIP Manager Governor's Office	Governor's Office Approval of Final Five Year Program	June	June
20	MPD STIP Manager	Distribute Approved Five Year Program	July	July
21	Technical Groups	Field Inspections	Year-round	Year-round

Appendix B – Technical Score Supplemental Materials

Call-for-Projects Template Document

The *Call-for-Projects Template* Document should be used for the following:

- The template for the call-for-projects request to the technical group
- The call-for-projects response from the technical groups
- The scoring of each technical groups' provided rankings

Expansion Technical Scoring Template

The expansion technical score is comprised of four components from two separate data sources. The Projected LOS and Projected vehicular speeds are calculated from the outputs from the current year's AZTDM statewide traffic model. Additionally the Travel Time Reliability and Truck Travel Time Reliability values are calculated by outputs derived from the INRIX speed data. Each of these values are calculated for each project categorized in the expansion investment category using the Expansion Technical Score Calculation formatting as explained below:

1. Open the 'Scoring Worksheet' Excel file.
2. In the 'Expansion Technical Score' tab, enter the segment identification, route name and the milepost limits in the beige cells (Columns A – D) for all eligible projects.
3. Update the 'AZTDM Data' tab with the most recently available data. Coordinate with the MPD Data Group to access the appropriate data in excel format.
4. Open ArcMap and project and symbolize the 'AZ_2023_2040_VOC_VMT_VHT' shapefile. Additionally, project, symbolize, and label the 'a00m' ADOT route milepost shapefile and orient on top of the 'AZ_2023_2040_VOC_VMT_VHT' file for use as a special reference guide.
5. Save the current ArcMap working file as 'AZTDM_Reference.mxd' file to refer back to when needed.
6. Use the newly created 'AZTDM_Reference' file to identify which Location IDs ('ID') correspond to each project limits.
 - Within the 'AZTDM_Reference' file, use the selection tool and the milepost labels as a guide, select all applicable AZTDM segments within each respective project limits. Ensure that only mainline segments (excluding ramps, frontage roads, and intersecting and adjacent routes) are selected.
 - Enter (or copy/paste) the appropriate Location IDs applicable to each project's entire milepost limits into the beige cells in the 'Expansion Technical Score' tab (Column V). A Location ID applies to a segment if the Location ID's milepost limits fall partially or completely within the milepost limits for the project. Do not delete extra/unused rows.
 - In the event that rows need to be added to a segment to accommodate the number of Location ID's, insert additional cells only in columns R-AG within the middle of the existing cells, as opposed to the end, and select the "shift cells down" option in order to maintain proper calculation formatting.

- If a specific Location ID spans beyond the exact project milepost limits, as seen in the 'AZTDM_Reference' selection, manually adjust the length of the segment accordingly in Column W. The length can be calculated using the measurement tool within ArcMap and should be applied for either the beginning or ending limits where the milepost limits need to be truncated according to the projects BMP or EMP shown in columns T and U respectively. This process is requires manual entry where applicable.
 - The Locations IDs may not be consistent from year to year. Therefore, ensure that reoccurring project recommendations undergo the full scoring process including re-identifying the applicable 'Location ID' values.
7. Columns E – I indicates the weighted values for the V/C ratio (LOS) and the projected average speeds for both years, as well as the average posted speed limit for each project.
 8. Columns L & M show the calculated scores using the average of both year's V/C ratio values and using the average of both year's average speeds related to the average posted speeds.
 9. The processed INRIX speed data is and translated into travel time reliability for all vehicles as well as specifically for freight vehicles and should be updated in the INRIX' tab.
 10. In the 'Expansion Technical Score' tab, Columns N & O should indicate the LOTTR and TTTR scores, referencing the 'INRIX' tab data.
 11. Column P represents the total expansion score for each Expansion investment area project.

Appendix C – Policy Score Supplemental Materials

Freight Flow Score

The Freight Flow Score is a measure of the percentage of freight volume values for the associated MP ranges of the individual projects. This measure is expressed as the T-Factor value. The weighted average T-Factor value is calculated using the Policy Scoring T-Factor Calculation formatting as explained below:

1. Open the 'Scoring Worksheet' Excel file to compile T-Factor data from ADOT HPMS System.
2. In the 'T-Factor Calc' tab, enter the segment identification, route name and the milepost limits in the beige cells (Columns B – E) for all eligible projects.
3. Update the 'Statewide Data' tab with the most recently available data. Reference the AADT Reports: Traffic Counts developed by MPD and accessible on the Data and Analysis webpage (<https://azdot.gov/planning/DataandAnalysis/average-annual-daily-traffic>).
4. Use the 'Statewide Data' tab to identify which Location IDs ('CNTLOCID') correspond to each project limits.
 - Using the Excel filter, filter the "Route" column (column C) to show only the specific corridor and use column T to ensure you are using the most recently available data year.
 - Enter (or copy/paste) the appropriate Location IDs applicable to each project's entire milepost limits into the beige cells in the 'T-Factor Calc' tab (column M). A Location ID applies to a segment if the Location ID's milepost limits fall partially or completely within the milepost limits for the project. Do not delete extra/unused rows.
 - In the event that rows need to be added to a segment to accommodate the number of Location ID's, insert additional cells only in columns I-R within the middle of the existing cells, as opposed to the end, and select the "shift cells down" option in order to maintain proper calculation formatting.
 - If a specific Location ID spans beyond the exact project milepost limits for either the beginning or ending limits, the milepost limits will need to be truncated according to the projects BMP or EMP in columns N and P respectively. This process is requires manual entry where applicable.
 - The Locations IDs may not be consistent from year to year. Therefore, ensure that reoccurring project recommendations undergo the full scoring process including re-identifying the applicable 'Location ID' values.
5. Column R indicates the weighted T-Factor values.
6. Columns B – F show the T-Factor summary table, which represents the weighted average T-Factor values in a consolidated format, which is used as a reference for the 'Scoring' tab, which tabulates the full Policy Score.

Appendix D – District Score Extra Materials

District Workshop Template Document

The *District Workshop Template* Document should be used for the following:

- The template for each of the seven district workshop spreadsheets
- The returned preliminary district project ranking
- The development of the preliminary district project score
- The returned final district project ranking
- The development of the final district project score

Appendix E – P2P Communication List

Planning to Programming Communication List

*Contacts to include in Early Coordination and District Workshop meetings

FMS

	Lisa Danka
	Sandra Simmons
Federal Aid Administrator	Pat Stone

IDO

Bridge	Dave Eberhart	Pe-Shen Yang	David Benton
Railroad Coordination	Sayeed Hani		
Rock fall	Brent Conner		
Rest Area	Robert Wheeler	Giovanni Nabavi	
Stormwater/Erosion Control	Julia Manfredi	Eileen Dunn	Paul O'Brien
Winter Operations Support	Mark Trennepohl		
Northcentral District	Audra Merrick		
Northeast District	Matt Moul		
Central District	Randy Everett		
Northwest District	Alvin Stump		
Southeast District	Bill Harmon		
Southcentral District	Rod Lane		
Southwest District	Paul Patane		
PRO & LPA Section	Lisa Pounds	Seth Kaufman	Lee Mackler Mark Henige
Project Management	Steve O'Brien	Velvet Mathew	Madhav Mundle Rimpal Shah
Roadway	Mike DenBleyker	Reed Henry (Pre-Design)	Ghassan Aouad (Drainage)
Civil Rights	Lucy Schrader		
Communications	Timothy Tait		

ECD

	John Morales
Port of Entry	Vacant

MPD	
P2P Management	Clem Ligocki Dan Gabiou
Regional Planning	Mark Hoffman Jason Bottjen John Wennes
Freight	Heidi Yaqub
Bike/Ped	Donna Lewandowski
Tribal Planning	Ermalinda Gene Rosalinda Federico
Programming	Bret Anderson Myrna Bondoc Lynn Sugiyama
Transit	Jill Dusenberry
Aeronautics	Don Kriz
Major Projects/Planning-Level Scoping	Carlos Lopez
Asset/Performance Management	Thor Andreson
Transportation Analysis	Keith Killough

TSM&O	
Deputy State Engineer	Jim Windsor
Safety/Technology/TSMO	Susan Anderson Mona Aglan-Swick
Operational Traffic & Safety Group Manager	Scott Beck
Regional Traffic Engineer	Tony Abbo Central and SW Districts
Regional Traffic Engineer	James Gomes SC & SE Districts
Regional Traffic Engineer	Robert LaJeunesse NE, NC, and NW Districts
Pavement	Lonnie Hendrix Yongqui Li Mafiz Mian Kevin Robertson

Executive Management	
Director	John Halikowski
SEO	Dallas Hammit
CFO	Kristine Ward
MPD Director	Greg Byres
ECD Director	Tim Lane
Policy Director	Kevin Biesty
IDO Director	Steve Boschen
IDO Assist Dir (Delivery)	Todd Emery
TSM&O Director	Brent Cain
Ops	Scott Omer

PRB Manager	Barry Crockett
IDO Assist Dir (Districts)	Jesse Guitierrez
State Transportation Board	

Governor's Office

FHWA	
Senior Planner	Ed Stillings
Planner	Romare Truly
PEAR Manager	Alan Hanson
Division Director	Karla Petty

COG & MPO			
*District Workshops only			
CAG	Travis Ashbaugh		
CYMPO	Chris Bridges	Daniel Harmonick	
FMPO	Dave Wessel	Martin Ince	
LHMPO	Vinny Gallegos		
MAG	Eric Anderson	Tim Strow	Roger Herzog
NACOG	Chris Fetzer	Vacant	Jason James
PAG	Farhad Moghimi	Paul Casertano	Vacant
SCMPO	Irene Higgs	Jason Hafner	
SEAGO	Randy Heiss	Chris Vertrees	
SVMPO	Andrea Castanon	Vacant	
WACOG	Brian Babiars	Justin Hembree	
YMPO	Paul Ward	Charles Gutierrez	

Appendix F – Guidance for Programming Expansion Projects in Greater Arizona

Guidance for Programming Expansion Projects in Greater Arizona

1.01 PURPOSE

To present the Arizona Department of Transportation (ADOT) guidance for recommending expansion projects to the State Transportation Board for programming consideration in ADOT's Five-Year Construction Program and Six-Ten Year Development Program for Greater Arizona.

1.02 SCOPE

This guidance is intended for all ADOT staff involved in developing and recommending adoption of ADOT's Five-Year Construction Program, or any subsequent State Transportation Improvement Program (STIP) Amendments.

1.03 AUTHORITY

Authority for the P2P Guidebook is provided by ARS Title 28, Chapter 2, Article 7 and 23 USC Section 135(d)(2); 49 USC Section 5304(d)(2).

1.04 BACKGROUND

ADOT's 2016-2040 Long-Range Transportation Plan (LRTP), *What Moves You Arizona 2040*, identifies the following policy statement, which applies to ADOT's ability to fund expansion projects in Greater Arizona:

"[ADOT], subject to State Transportation Board approval, may identify up to 5% of [Recommended Investment Choice (RIC)] funding in a given Five-Year Program year to provide 'seed money' to consider future highway expansion projects under one or more of the following scenarios:

- A federal grant is made;
- A third party provides a funding contribution; and/or
- A public-private partnership is arranged.

Consideration of such funding will be contingent on the associated project(s) scoring high enough in ADOT's Planning to Programming (P2P) Link process to be eligible for funding. Additional funding from legislative appropriations or other sources may also enable ADOT to consider new system expansion projects."

1.05 DEFINITIONS

Cost Effectiveness Ratio	The Cost Effectiveness Ratio is a Technical Evaluation Criteria for expansion projects within ADOT's P2P process, calculated as: $(\text{Annualized Life-Cycle Capital Cost} + \text{Annual Operating \& Maintenance Cost} - \text{Annualized External Contributions}) / (\text{Annual Travel Time Savings})$.
Expansion	Projects which add capacity through the addition of new facilities and/or services.
Performance Targets	Moving Ahead for Progress in the 21 st Century Act (MAP-21) of 2012 established six national transportation goal areas: Safety, Infrastructure Conditions, Congestion Reduction, System Reliability, Freight Movement & Economic Vitality and Environmental Sustainability. The Fixing America's Surface Transportation Act of 2015 (FAST Act) further requires State Departments of Transportation to establish targets for up to 17 performance measures associated with these goal areas.
Greater Arizona	All State Highway Systems that are not included within the Maricopa Association of Governments (MAG) and Pima Association of Governments (PAG) boundaries.
Modernization	Projects that upgrade efficiency, functionality, and safety without adding capacity.
Preservation	Projects that preserve infrastructure by sustaining asset condition or extending asset service life.
Recommended Investment Choice	The percentage of funds identified within ADOT's LRTP to be applied to each investment category: preservation, modernization, and expansion.
Third Party	An agency or entity external from ADOT.

1.06 PROGRAMMING GUIDANCE

A. Eligibility

In order for ADOT to recommend to the State Transportation Board inclusion of a new expansion project in Greater Arizona via the Draft Five-Year Construction Program or Six-to-Ten-Year Development Program, the project must meet the following parameters:

1. The project must be on the State Highway System within Greater Arizona.
2. The project must meet the eligibility requirements of its funding source(s). For Surface Transportation Block Grant Program (STBG) funds, refer to the list of eligible activities, as identified by the Federal Highway Administration (FHWA): <https://www.fhwa.dot.gov/specialfunding/stp/160307.cfm>.
3. An Intergovernmental Agreement (IGA) or contract between ADOT and the external entity (or entities) must be executed (signed by all authorized parties).
4. External funding contribution must include a minimum non-ADOT contribution (including federally allocated funds to ADOT) of 25% of the expansion project's total cost.
5. The expansion project nomination must be submitted to ADOT's P2P Manager no later than May 31st, for consideration in the subsequent year's Draft Five-Year Construction Program.
6. An expansion project nomination, at minimum, must include the following data:
 - a. Route Name (Ex: I-10)
 - b. Project Begin and End Limits (Ex: milepost (MP) 1.00 to MP 2.00, or First Street to Second Street)
 - c. Proposed Project Name (Ex: I-10 Widening, MP 1.00 to MP 2.00)

- d. Scope of Work, detailing the specific improvements of the project (number of additional lanes, lane widths, and direction of travel)
 - e. Total Project Cost (as estimated by a Professional Engineer, Civil)
7. The total funds contributed by ADOT to the expansion project must not exceed 5% of ADOT's Five-Year Construction Program STBG budget for Greater Arizona.

B. RESPONSIBILITIES

1. ADOT's Multimodal Planning Division (ADOT MPD) must complete the P2P process on an annual basis, according to the P2P schedule as outlined in the P2P Responsibilities Assignment Matrix (RAM) Chart.
2. Both internal and external Greater Arizona expansion project nominations must be submitted to ADOT's P2P Manager by May 31st of each year to be considered in the following year's P2P process. External expansion project nominations must be submitted by a recognized Metropolitan Planning Organization (MPO), Council of Government (COG), or Tribal Government to be considered.
3. The reallocation of funding from ADOT's Greater Arizona preservation and/or modernization investment categories to fund the expansion project may not hinder ADOT's ability to meet its minimum performance targets as required by the FAST Act. ADOT MPD would be responsible for analyzing the performance impacts of programming an expansion project.