MEMO

TO: Laura Nordan, MS4 Stormwater Program Coordinator, ADOT

FROM: Julia Manfredi, Vice President, Environmental Scientist, WSP

SUBJECT: ADOT Post-Construction Stormwater Retrofit Program Support

DATE: September 3, 2024

WSP is pleased to submit this Memorandum to the Arizona Department of Transportation (ADOT) Environmental Planning Water Resources group to provide support of program compliance with Section 4.10 of ADOT's 2021 Municipal Separate Storm Sewer System (MS4) Permit (AZS0000018-2021) (Permit) for Post-Construction Stormwater Controls. This memorandum describes the process under which projects are established and delivered at ADOT and the approach used to apply Permit requirements to assess ADOT retrofit projects within those processes.

In support of this effort, WSP performed the following tasks:

- Assessed and identified an inventory of retrofit projects for the 2023-2024 permit year using existing criteria set in the assessment for the 2022-2023 permit year (including that required by the MS4 Permit Section 4.10.A.2.and criteria that fit within current ADOT processes).
- Identified the status of projects outlined in stormwater-related planning studies
- Created a ranked list of projects based on identified criteria (including that required by the MS4 Permit Section 4.10.A.2.b and that fit ADOT processes) using existing prioritization criteria.

Background of ADOT Project Delivery Process

A goal of this retrofit assessment as part of the post-construction stormwater quality control program at ADOT is to incorporate it into the existing ADOT Project Delivery Process as much as possible. The process is split into four phases: Project Planning and Programming; Project Design; Project Construction; and Operation and Maintenance.

In the Project Planning and Programming Phase of ADOT's Project Delivery Process, proposed projects are pre-scoped and evaluated for funding and programmed into ADOT's 2025-2029 Five-Year Transportation Facilities Construction Program (ADOT's Five-Year Program)[1]. In the Project Design Phase, the programmed project goes through all the stages of design, environmental clearances, utility clearances, right of way clearances, and is advertised and awarded to the selected contractor(s). The project then moves into the Project Construction Phase where the project is constructed and completed. After construction is complete, the project moves into the Operation and Maintenance Phase at which time system operation and maintenance is primarily handled by ADOT Districts.

[1] Arizona Department of Transportation (ADOT). 2025-2029 Five Year Transportation Facilities Construction Program, 2024. https://azdot.gov/sites/default/files/2024-06/2025-29-FINAL-PROGRAM-ONLINE_3.pdf

During the Project Planning and Programming Phase, potential projects go through the Planning to Programming (P2P) Process in which projects are prioritized based on a scoring process that incorporates technical, policy, safety, and ADOT District considerations. This informs ADOT's Five-Year Program and identifies projects that are prioritized for funding, development, and construction. Within the program, projects are categorized as system preservation, expansion, modernization, or administration. Expansion and modernization projects are considered to be new development or redevelopment under the definition of the ADOT MS4 Permit.

Projects identified in the ADOT Five-Year Program must be evaluated early in the Project Delivery Process. Much of the prioritization criteria required by the Permit are included early through the P2P Process and development of ADOT's Five-Year Program. Within the P2P Process, ADOT has incorporated the use of a Statewide Stormwater & Erosion Control Study[2] that developed a prioritization model, project scoping elements, and planning costs for prioritized projects in each ADOT District. The study identified and prioritized statewide stormwater management and erosion control needs for initial planning purposes. This study delivered a data model that operates within a defined project prioritization framework. This prioritization model was developed to provide ADOT a quantitative, comprehensive, systematic, and replicable approach to augment stormwater management activities and provide a prioritized program of projects to incorporate into the annual P2P Process in support of ADOT's Five-Year Program.

Once the project moves into the Project Design Phase, additional criteria are incorporated into the design process to determine the specific details of the project. During this process, engineers and the Design Project Manager work to assess the specific location and type of permanent stormwater quality control.

After the design phase, the project moves into the Construction Phase, followed by Operations and Maintenance. These two phases incorporate tools for compliance with Section 4.10.B of the Permit and are not discussed in context of the retrofit assessment in this memorandum.

Definition of Retrofit

The definition of retrofit as it applies to ADOT's MS4 Program is as follows:

Stormwater Retrofit Controls incorporate stormwater permanent best management practice installation in the ADOT highway system where none previously existed, or improvement/upgrade of existing conditions to improve water quality in or adjacent to ADOT right-of-way. Stormwater retrofit projects are those that will be incorporated into ADOT expansion or modernization (redevelopment) projects as part of project planning and development.

It is unlikely that a stormwater project alone will drive a development project for retrofit, but rather that retrofit needs can be addressed through projects that are being planned as part of ADOT's mission. As such, ADOT's Five-Year Program serves as part of the foundation for the identification and prioritization of retrofit projects.

Assessment of Stormwater Retrofit Projects - Permit Section 4.10.A.2.a

Section 4.10.A.2.a of the Permit requires ADOT's assessment of retrofit projects to include an inventory of potential retrofit locations and/or projects.

[2] Arizona Department of Transportation (ADOT), Statewide Stormwater & Erosion Control Study, 2020. https://azdot.gov/statewide-stormwater-erosion-control-study

As part of this assessment, WSP evaluated and combined the criteria listed in Table 1 below along with the processes that ADOT already uses within their Project Delivery Process to evaluate project needs.

ADOT's criteria to identify projects is based initially on those projects identified in the current ADOT Five-Year Program. Additionally, WSP reviewed the 2020 Statewide Stormwater & Erosion Control Study to verify incorporation into the P2P Process and support retrofit assessment project identification.

Table 1 below lists criteria for identification of potential retrofit locations based on the ADOT MS4 Permit requirements in Section 4.10.A.2.a, and the location and information used to identify these locations based on the applicability to ADOT's MS4 Program and Project Delivery processes. Location assessments were conducted using Geographic Information Systems (GIS). The criteria below were spatially overlayed onto ADOT's Five-Year Program to assess location of projects already programmed in ADOT's Five-Year Program as well as their presence in ADOT's Statewide Stormwater & Erosion Control Study. WSP compared the GIS layer provided by ADOT with the final Five-Year Program document to ensure that all programmed projects were included in the GIS data layer. WSP then compared the projects identified as fitting any of these criteria to those listed as priority in the Statewide Stormwater & Erosion Control Study.

Table 1 – Assessment Criteria of Potential Retrofit Locations

ADOT MS4 Permit Section 4.10.A.2.a Criteria	Incorporation of Criteria through ADOT MS4 Program and Project Programming and Delivery Processes
Locations that contribute to highway transportation-related pollutants of concern to a local agency municipal separate storm sewer system	Discharges to an adjacent Municipal Separate Storm Sewer System; Discharges to ADOT Priority Outfall Locations
Locations that contribute to highway transportation-related pollutants of concern to an impaired or not-attaining waterbody or OAW, and	Discharges into an Impaired, Outstanding Arizona Waters (OAW), Not-Attaining waters. This criterion incorporates locations where the project limits drain within ¼ mile of these waters and a protected surface water or Water of the United States; Discharges to ADOT Priority Outfall Locations
Locations with significant erosion that contribute highway transportation-related pollutants of concern to protected surface waters.	Identified in the 2020 Statewide Stormwater & Erosion Control Study. This criterion is included to capture previous work conducted by ADOT's Multi-modal Planning Division for inclusion in ADOT's Planning to Programming (P2P) efforts which inform the Five-Year Program. This study captures locations of significant erosion in ADOT's highway system and includes consideration of known impacts to adjacent landowners.

A summary of the 161 projects meeting the assessed criteria is outlined in Table 2 below. The most current comprehensive inventory is included in the Microsoft Excel Attachment of this memorandum under the spreadsheet tab titled, “RetrofitAssessmentProjectList”.

Table 2 – Projects Meeting the Assessed Permit Section 4.10.A.2.a Criteria

Retrofit Assessment Criteria							
Priority Rank	Five-Year Program	ADEQ Protected Surface, OAW/Impaired	Discharges to Adjacent MS4	Priority Outfall	Erosion Control Study	Number of Criteria Met	Total Projects Meeting the Identified Criteria
1	X	X	X	X		4	1
2	X		X	X	X	3	9
3	X	X	X			3	6
4	X	X		X		3	2
5	X			X		2	1
6	X	X				2	10
7	X		X			2	46
8	X				X	2	6
9	X					1	80

Development of a Prioritized Ranking of Inventoried Locations to Prioritize Retrofit - Permit Section 4.10.A.2.b

This priority ranking happens at two stages in ADOT’s Project Delivery Process:

1. As part of MS4 program management, the assessment discussed above is completed annually, and projects are further identified and ranked based on project category, and
2. The criteria listed in Section 4.10.A.2.b of the Permit are evaluated during project design using the ADOT Post-Construction Best Management Practices Manual[3] and the use of other implementation tools currently being established.

Each of these stages are described further in the section below.

Stage 1

As part of the first stage, WSP assessed and identified a list of projects from ADOT’s Five-Year Program that meet the criteria in Section 4.10.A.2.a of the Permit. These projects are identified by ADOT as projects administered for other local public agencies, as system preservation projects, as system modernization projects, or as system expansion projects. For the priority ranking under Section 4.10.A.2.b of the Permit, WSP further refined the list of assessed projects to include only those that are listed as system modernization or system expansion projects (meeting the definition of new development or redevelopment under the Permit) plus bridge projects. Bridge projects are listed in the Five-Year Program as preservation projects but may include bridge replacement making them potential candidates for stormwater retrofit, and thus were included in the inventory. Projects administered for local public agencies were removed because they are not within the ADOT MS4. Non-bridge projects for system preservation were removed because

[3] Arizona Department of Transportation (ADOT), Post-Construction Best Management Practices Manual for Water Quality, 2016. https://azdot.gov/sites/default/files/2019/06/post-construction-best-management-practices-%28bmp%29-manual.pdf

they do not meet the definition of new development or redevelopment and the scope and funding of the projects do not allow for retrofits to be included.

As a next step to create the ranking inventory and further prioritize system modernization, expansion, and bridge projects, WSP re-applied the assessment criteria used in compliance with Section 4.10.A.2.a of the MS4 Permit. WSP identified the projects meeting at least two of these criteria and developed a ranking system, as shown in Table 3 below. Projects meeting the most (four) criteria were identified as highest priority (Rank 1). Projects meeting three criteria were identified as moderate priority (Rank 2-4), and projects meeting two criteria were ranked lowest (Rank 5-8). 81 total projects were included in this ranking. The summary of the results of this assessment are shown in Table 3. The full listing is included as an attachment to this memo (Excel tab titled, "RankedProjectsList").

Table 3 – Retrofit Priority Ranking of Modernization, Expansion, and Bridge Preservation Projects in ADOT's 2025-2029 Five-Year Program (prior to evaluation during Design)

Priority Rank	Retrofit Assessment Criteria					Number of Criteria Met	Total Projects Per Rank
	Five-Year program	ADEQ Protected Surface, OAW/Impaired	Discharges to Adjacent MS4	Priority Outfall	Erosion Control Study		
1	X	X	X	X		4	1
2	X		X	X	X	3	9
3	X	X	X			3	6
4	X	X		X		3	2
5	X			X		2	1
6	X	X				2	10
7	X		X			2	46
8	X				X	2	6

Stage 2

In the second stage of prioritization, the specific evaluation criteria listed in Section 4.10.A.2.b. of the Permit and the ADOT Post-Construction Best Management Practices Manual are evaluated as part of Project Design. This includes an evaluation of:

1. Stormwater pollutant control measures
2. Feasibility
3. Right-of-Way availability
4. Cost effectiveness
5. Roadway area potentially treated
6. Maintenance requirements

These criteria are incorporated into an evaluation process conducted by the project design team (using tools specifically developed to document this evaluation), to be completed by the 60% design stage. Upon completion of each project evaluation to meet the design criteria, ADOT Water Resources is notified of its status and can track the project status through construction completion. These projects are identified as the evaluation is completed on a project-by-project basis.

In conclusion, the assessment described above supports and demonstrates the implementation of a post-construction (permanent) retrofit program for stormwater quality control measures, which will lead to improved tracking of water quality control measures, maintenance, and compliance management.

ATTACHMENT

As one MS Excel File :
Retrofit Assessment Project List (Permit Section 4.10.A.2.a.)
Ranked Projects List (Permit Section 4.10.A.2.b)