

Goal: Incorporate USGS Arizona Water Science real-time storm monitoring and data collection, post-storm event monitoring and data collection, and next generation StreamStats (v3) and surface water flow data collection capabilities. This effort would directly and meaningfully contribute to expediting and improving ADOT's efforts in planning and responding to incidents of flood, over-topping, system hotspots, hydraulic-related failure, and extreme weather events in connection with **1) NEPA jurisdictional and wetland delineation expediting and streamlining 2) Highway stormwater runoff management 3) Evaluating scour potential and countermeasure development at water crossings 4) Drainage structure siting, design and construction 5) Response to Federal extreme weather regulatory activities.**

Environmental Planning Benefits

- Provide ADOT with customized next generation StreamStats tool and 2-D flow data modeling
- Further respond to growing NEPA requirements for streamlining and quality control
- Cost savings of inhouse and consultant JD documentation
- Additional flow and groundwater data collection at predetermined, high risk areas could provide vital information when determining 404 permitting requirements relative to area of disturbance and dewatering activities. Supplementary information will aid in more accurate documentation and minimizing rework related to unforeseen circumstances.
- **23 CFR Part 771 - 771.105 (b)** Alternative courses of action should be evaluated and decisions be made in the best overall public interest based upon a balanced consideration of the need for safe and efficient transportation; of the social, economic, and environmental impacts of the proposed transportation improvement; and of national, State, and local environmental protection goals.
- **U.S. DOT 2015 Environmental Justice strategy for climate adaptation and resiliency – Update to the May 2012 EJ Order 5610.2(a)**

Bridge Hydraulic Group Benefits

- Continued improvement for LOS and traveling public - Plans of Action for Scour Critical Bridges -**2005 FHWA Regs 23CFR650.313e**
- Modeling discharge, depth, velocity, and stream bed stress of large flow events
- Monitoring of scour and deposition in stream channels (real time and post event modeling) to correlate calculated scour versus actual flood events
- The impact of channel change and scour design estimates on pier locating and depth – minimizing over design
- Monitoring of surface water discharge frequency, velocity, and stage, and monitoring of groundwater elevations; data to guide decisions related to longevity of structures and foreseeable issues
- **23 CFR Subpart A—Location and Hydraulic Design of Encroachments on Flood Plains § 650.115 Design standards** - (a) The design selected for an encroachment shall be supported by analyses of design alternatives with consideration given to capital costs and risks, and to other economic, engineering, social, and environmental concerns. (1) Consideration of capital costs and risks shall include, as appropriate, a risk analysis or assessment which includes: (i) The overtopping flood or the base flood, whichever is greater, or (ii) The greatest flood which must flow through the highway drainage structure(s), where overtopping is not practicable. The greatest flood used in the analysis is subject to state-of-the-art capability to estimate the exceedance probability.

Drainage Group Benefits & Sub-categories

Federal Flood, Extreme Weather, Drainage Asset Management

The President released the **Executive Order, Establishing a Federal Flood Risk Management Standard and a Process for Further Soliciting and Considering Stakeholder Input**, and the following **Standard** approach.

Federal agencies will be given the flexibility to select one of three approaches for establishing the flood elevation and hazard area information they use in siting, design, and construction:

- Utilizing best-available, actionable data and methods that integrate current and future changes in flooding based on science,
- Two or three feet of elevation, depending on the criticality of the building, above the 100-year, or 1%-annual-chance, flood elevation, or
- 500-year, or 0.2%-annual-chance, flood elevation.

FHWA Issues Climate Change and Extreme Weather Resilience Order - **FHWA Order 5520**, FHWA will integrate consideration of the risks of climate change and extreme weather event impacts and adaptation responses, into the delivery and stewardship of the Federal-aid and Federal Lands Highway programs.

23 U.S.C. 119(e)(1), MAP-21 § 1106

Each State is required to develop a risk-based asset management plan (TAMP) for the National Highway System (NHS) to improve or preserve the condition of the assets and the performance of the system. **23 U.S.C. 119(e)(3) (MAP-21 § 1106)** requires the Secretary to encourage States to include all infrastructure assets within the highway right-of-way in TAMP development. Activities related to this proposal are seen as contributing to current and future asset condition analysis, and the development of risk models disseminating asset failure versus reduced asset functionality. Both of these exercises would contribute to all eight (8) areas of a generic TAMP expected under Final Rule making.

Stormwater Management

Highway Runoff Management Act would require states to analyze the hydrological impact federal aid highways are having on water resources and develop approaches to reducing the destructive impact of heavy stormwater runoff volumes and flows. A bottom-up approach that puts states in control of developing the hydrological impact analysis of federal aid highways in their state, the bill aims to better manage stormwater flows and volumes to reduce the erosive force high runoff.

Highway Runoff Management Act - Proposed update to Chapter 3 of Title 23, United States Code - Introduced in Congress Feb 12, 2015

Bottom Line

Upgrade how and when ADOT utilizes best available science, engineering and technology

Contributes to the Director's innovation and streamlining goals

Responds directly to ADOT's Strategic Focus Areas

Federal funding tentatively approved pending MOU and deliverables

Conforms with ADOT and FHWA sustainability goals

A quality risk tool for LOS and safety for the traveling public

Since USGS is the main driver of the project deliverables at ADOT's direction, no extensive workload is encumbered

ADOT has to be willing to experiment with cost effective risk assessment approaches to continue upgrading how they report infrastructure health