

NCHRP Project 25-60, “Watershed Approach to Mitigating Hydrologic Impacts of Transportation Projects”

Implementation of Research Findings and Products

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NCHRP Project 25-60, “Watershed Approach to Mitigating Hydrologic Impacts of Transportation Projects,” developed a decision framework, procedures, and tools for state departments of transportation (DOTs) to explore and analyze innovative mitigation techniques throughout a watershed to compensate for the stormwater quantity impacts of transportation projects. The project produced two primary deliverables:

- A final project report documenting the literature review, analysis, findings, and tools and methodologies from the project has been published as NCHRP Web-Only Document 333: Watershed Approach to Mitigating Hydrologic Impacts of Transportation Projects: Conduct of Research Report.
- A Practitioner’s Guide that provides guidelines and straightforward instructions on application of the watershed approach has been published as NCHRP Research Report 1011: Watershed Approach to Mitigating Hydrologic Impacts of Transportation Projects: Guide.

This memo describes how state DOTs can put the research results into practice, identifies institutions that may play a leadership role in implementation, identifies potential implementation issues and solutions, and suggests possible methods for identifying and measuring the success of implementation efforts.

Putting the Research Results into Practice

There are many opportunities for propagating the project findings and documents into practice including:

- NCHRP implementation support activities.
- Publications.
- Training/Workshops/Webinars.
- Updates to related manuals and guidebooks.
- Notices to state DOTs.

NCHRP Implementation Support Program (NCHRP Project 20-44)

NCHRP created a competitive program to fund implementation efforts relating to the products of NCHRP research. This program could be a funding vehicle for several implementation efforts including:

- Demonstration or pilot project illustrating the process in the Guide.
- A peer exchange of 3 to 5 interested states to review their experiences, successes, and barriers to the approach and tools described in the Guide. Peer exchanges could be conducted in a variety of locations around the country. These exchanges would be by invitation and include a training component as well as a feedback component from the participants.
- A flyer or video summarizing the watershed process to distribute nationally to state DOTs.

Publications

The results of this research can be disseminated through traditional information sharing vehicles, including articles and technical papers for publication in periodicals, journals, and newsletters. These can describe the benefits of the research and point to the research products for further information. Forums for this activity include:

- Periodicals including *Public Roads* and *TR News*.
- ASCE journals such as the *Journal of Water Resources Planning and Management*.
- AASHTO Technical Committee on Hydrology and Hydraulics newsletter *Hydrolink*.
- Trade journals such as *Stormwater* and *Stormwater Solutions*.

Training/Workshops/Webinars

Trainings and workshops can be an effective tool for putting the research results and products into practice. These are likely to be most effective in partnership with other agencies and organizations. Possible activities include:

- Creating web-based training (WBT) or web-conference training (WCT) through the Federal Highway Administration's (FHWA) National Highway Institute (NHI).
- Creating a workshop (approximately 2 hours that could be offered through and marketed by partner organizations such as AASHTO, TRB (e.g., at the Annual Meeting), and ASCE [e.g., through the American Academy of Water Resources Engineers (AAWRE) or the Environmental and Water Resources Institute (EWRI)].
- Presenting at conferences, including those organized by TRB, ASCE, the FHWA Hydraulic Engineers conference for state DOTs, ASFPM, StormCon, and others.
- Presenting live webinars that range from 1 to 2 hours in length offered multiple times and/or be available on demand.

Updates to Related Guidance

Several existing guidance documents provide information on mitigating stormwater quantity impacts of transportation projects into the planning and design of transportation infrastructure. Incorporating the tools and methods from this project into these documents will accelerate their application. Potential dissemination includes revisions to AASHTO guidelines or state DOT manuals.

Notices to State DOTs

Organizations such as AASHTO could provide notices to their member state DOTs about the availability of NCHRP Research Report 1011 through its newsletters, website, and other vehicles.

Additional Research and Development

Throughout the course of this research project, the consultant team and project panel identified areas where further research and/or example applications could result in identifying additional opportunities for the proper use of various techniques. Though this list is not intended to be exhaustive, additional investments in the following areas are recommended:

- Expanding the number and locations of analyzed sites to support making the hydrologic screening tool more robust.
- Expanding the number of analyses on the existing modeling sites to smaller project impact sites.
- Developing a spreadsheet application fully implementing the hydrologic screening tool.
- Conducting ex-post analyses at demonstration sites. This may involve identifying examples of landscape mitigation stormwater management projects that a state DOT has implemented and collecting pre- and post-project monitoring data and observed outcomes to determine how well the hydrologic and screening models perform.

Possible Institutions for Leadership Roles

Several organizations might share leadership for propagating the results from this research:

- AASHTO (including the technical committee on hydrology and hydraulics)
- FHWA
- TRB AKD50: Standing Committee on Hydrology, Hydraulics, and Stormwater
- ASCE Water, Wastewater & Stormwater Council, which includes the subcommittee Watershed Approach to Manage Stormwater Committee.

Issues Affecting Implementation and Possible Solutions

Two perennial issues affecting potential implementation of any new processes or technical resources are time and money. The training/workshops, guidance updates, publications, etc., all require effort and resources to implement and promote. In addition, the continuing evolution of mitigation techniques and modeling capabilities will require an attitude of flexibility going forward as new insights are realized. Finally, some states may experience push back against planning and designing using a watershed approach, thereby, slowing implementation.

In the short term, online resources to support implementation by state DOTs can be produced with minimal cost and effort. In the long term, one possible solution is to secure funding to support implementation activities from NCHRP.

With respect to encouraging all state DOTs to consider incorporating the research results into their standard workflow and approach, preparation of case studies and fact sheets that demonstrate the benefits are appropriate tools. Demonstrations related to the new approach could be implemented through that vehicle or other possible vehicles.

Identifying and Measuring the Impacts Associated with Implementation of the Findings and Products

Measuring progress is difficult because it relates to the evolution of work practices. The following are possible metrics for tracking progress:

- Tracking updates in guidance documents where the recommended tools from this project are incorporated in whole or part. Guidance documents from the following organizations could be tracked:
 - FHWA

- AASHTO
- State DOTs
- Compiling a bibliography of publications and presentations of case studies using the methodologies and tools from this research.
- Tracking the number of technology transfer events and the attendance at the events.
- Tracking video and webinar views and document downloads.
- Conducting a survey of state DOTs in 5 years to ascertain if the tool is being used; when it was used, whether the tools were helpful; and did the use of the tools result in a successful watershed approach.