



CHALLENGE

ODOT NEEDED A COST-EFFECTIVE, EFFICIENT, AND SUCCESSFUL, ALTERNATIVE TO ITS POST-CONSTRUCTION, STORMWATER VOLUME REDUCING BEST MANAGEMENT PRACTICES.

SERVICES

- Construction Inspection
- Data Analysis and Research
- Green Infrastructure
- Highway Design
- Hydrology and Hydraulics
- Stormwater Flow Monitoring
- Survey
- Traffic Control

ODOT STORMWATER VOLUME REDUCTION RESEARCH

The Ohio Department of Transportation (ODOT) Location and Design Manual specifies several best management practices (BMPs) that have been approved by the Ohio EPA (OEPA) for use on publicly-funded transportation projects. These OEPA approved BMPs are currently the only practices ODOT can accept for post-construction water quality and water quantity treatment.

Designing post-construction stormwater BMPs is particularly difficult for transportation projects due to

their linear nature, restrictive construction limits, and limited right-of-way.

However, there are common features of roadway projects, such as grassed shoulders and medians, with modifications like soil amendments, may increase the infiltration capacity, promote evapotranspiration, and serve as a water quantity BMP.

IDENTIFYING ALTERNATIVES

To identify alternatives for stormwater volume BMPs, ODOT's Office of Hydraulic Engineering Research, in collaboration with ms consultants, the United States Geological Survey (USGS), and Stone Environmental is undergoing a research project for post-construction stormwater management.

The goal is to first determine the effectiveness of soil

amendment as a stormwater runoff volume reducing BMP.

If found to be cost-effective, this potential new BMP may provide a new and improved alternative for post-construction stormwater management for transportation construction projects.

ASSESSMENT OF EXISTING AND POTENTIAL VOLUME REDUCTION

This research project focuses on developing OEPA-approved BMPs that use common features on roadway projects (i.e. grassed shoulders with amended soil) that are within the right-of-way.

The intent of these BMPs is to reduce runoff by infiltration and evapotranspiration to meet water quantity requirements per the Ohio EPA Construction General Permit. This will better enable ODOT to provide additional post-construction stormwater management options to meet regulatory requirements.

The research team has identified twelve sites across the state of Ohio to perform flow monitoring. The sites are located within the grassed medians of ODOT-maintained right-of-ways. The geographic distribution of the sites allow for data representative of varying weather conditions throughout the state. Site-specific flow monitoring plans were developed and equipment was installed to capture and record the rate, volume,

and frequency of stormwater runoff generated from the roadway.

The soil amendment process consists of incorporating high-infiltrating soil materials into the top layer of existing soil along the sloped grass shoulder of the roadway. As the stormwater runoff sheet flows off the roadway, the amended soil is intended to decrease stormwater runoff volume by increasing infiltration, evapotranspiration, and initial abstraction of the grassed shoulder. Several soil amendment materials and amendment depths will be installed and analyzed to evaluate their performance.

After the soil amendment installations are completed, post-amendment flow monitoring will begin. The effectiveness of soil amendment as a stormwater volume reducing BMP will be evaluated by comparing the pre-amendment runoff volumes with post-amendment volumes.

THE PROJECT IN NUMBERS

- \$1.3 million research project
- 12 monitoring sites
- Across 5 Ohio counties
- 4 soil amendment alternatives
- 3 years of monitoring and data analysis