Roadway Flooding Elimination

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Roadway Flooding Definition

A condition in which the amount of water on the roadway constitutes a hazard to the traveling public

- Hazard is determined by engineering judgment

- Hazard considerations
  - Depth/Extent of Water
  - Speed of Vehicle
  - Icing potential
  - Time of Day (Night Visibility)
Roadway Flooding Definition

- Water may lead to pavement deterioration
  - Pothole may be a hazard

- If not a hazard is considered to be ponding

- Two situations
  - Impounded Water with no outlet
  - Transitory flooding that drains over time

- Impounded water may be a hazard when freezes
Roadway Flooding Mitigation

Who Remediates?

City of Columbus

Department of Public Service

Department of Public Utilities

Infrastructure Management

Design & Construction

Sewerage & Drainage
Mitigation

Division of Infrastructure Management

- Roadway Flooding Elimination Program
  - Identification/Observation
  - Assessment/Required Mitigation
  - Mitigation Initiation – Who/How

- Pavement Resurfacing Program
  - Identify drainage issues prior to Resurfacing

- Street Maintenance
  - Roadside Grading/Clearing Inlet Grates
  - Asphalt Patching
Mitigation

Division of Design & Construction
- Design Section
  - Resurfacing Design/Mitigation Design

Department of Public Utilities
- Division of Sewerage & Drainage
  - Storm System Design & Construction
  - Stormwater Maintenance

Other Agencies within City Limits
- ODOT
- Counties
Causes of Roadway Flooding

 No Stormwater System
 Inadequate Stormwater System
 Lack of Maintenance of Stormwater System
  ▪ Inlets
  ▪ Pipes
  ▪ Ditches
 Lack of Roadside Grading so water cannot flow to ditch (vegetation, soil)
Causes of Roadway Flooding

- Pavement Resurfacing
  - May create elevation changes interrupting water flow

- Poor Design of Roadway or other projects
  - Site Development- Driveways, Site Drainage
  - U/G Utility Projects affecting ground Elevation

- Dandy Bags
Lack of Storm System

McKinley Ave. at Harrison Ave.
Lack of Storm System

McKinley Ave. at Harrison Ave.
Lack of Storm System
Inadequate Storm System

Central Ave. (US-62) N/ Mound St.
Inadequate Storm System

Central Ave. (US-62) N/ Mound St.
Inadequate Storm System
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Inadequate Storm System
Lack of Stormwater System Maintenance
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Lack of Roadside Grading

Water cannot flow to ditch
Lack of Roadside Grading
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Lack of Roadside Grading
Pavement Resurfacing Issues

Water flow interrupted by elevation changes
Pavement Resurfacing Issues
Pavement Resurfacing Issues
Poor Roadway Design
Other Issues
Other Issues
Dandy Bags
Dandy Bags
Dandy Bags
Pavement Deterioration
Pavement Deterioration
Pavement Deterioration
Pavement Deterioration
Summary

- New focus on Roadway Drainage
  - Many of the Flooding Locations existed for decades without being addressed
  - Most all of locations have now been resolved
  - New awareness on the part of DPS and DPU
  - Multi-Party roles from design to maintenance
  - Training conducted to improve performance
  - New understanding of causes and solutions
  - Improvement in processes
  - Awareness of cost of pavement deterioration
Takeaway Lessons

- Simple fixes such as roadside grading can provide huge return in pavement costs
- Engineers need to spend time in the field to observe infrastructure conditions
- Staff needs to be aware of the issue and understand their role and the importance of taking action.
- Research on Pavement Deterioration?