# Table of Contents

**Introduction**  
Goal/Purpose ................................................................................................................................. 1  

**Inventory of Flooding Events and Roadway/ Bridge Closures**  
Methodology ..................................................................................................................................... 2  
PennDOT Extreme Weather Vulnerability Study ............................................................................. 2  
Historic Event Data .......................................................................................................................... 2  

**Combining the Database**  
Combining the Database .................................................................................................................. 3  

**Vulnerable Roadway Groups**  
Vulnerable Roadway Groups ........................................................................................................... 3  

**Municipal Meetings**  
Purpose ............................................................................................................................................. 6  

**Flood Proofing/Resiliency**  
Road Flood Proofing Table .............................................................................................................. 6  
Flood Resiliency .................................................................................................................................. 7  

**Policy Discussion**  
Hazard Mitigation .............................................................................................................................. 7  
Best Management Practices .............................................................................................................. 8  
Bridge Selection Criteria ..................................................................................................................... 9  

**Next Steps**  
Future Studies .................................................................................................................................... 9  
Public Involvement .......................................................................................................................... 10  
Update Cycle ..................................................................................................................................... 12  
Recommendations .............................................................................................................................. 12  

**Appendix**  
Historical Flooded Roadways Data Collection Table ......................................................................... Appendix I  
Road Flood Proofing Table .............................................................................................................. Appendix II  
Municipal Meeting Results .............................................................................................................. Appendix III  
Vulnerable Roadway Group Maps ..................................................................................................... Appendix IV  
Documentation of Public Solicitation and Comment ......................................................................... Appendix V  
Completed ID Group Studies ............................................................................................................. Appendix VI
**INTRODUCTION**

This study identifies roadways in York County that close due to flooding events, and of these roadways, which should be taken into consideration when rehabilitation or resurfacing projects become available in the surrounding area. The goal is for this study to act as an aid in identifying locations that should have additional goals of flood proofing or flood resiliency in the Purpose and Need statement when the project is funded on the Transportation Improvement Program (TIP).

To create an inventory of flooded roadways in York County, it is necessary to first establish criteria that must be met in order to classify a road as a flooded roadway. For the purpose of this study, the York County Planning Commission (YCPC) staff has defined a flooded roadway as *any roadway that is unable to be safely traveled by motorized/non-motorized vehicles or pedestrians due to waters from a nearby body of water cresting its banks and covering the roadway. This excludes roadway ponding due to clogged or undersized drainage facilities, or the lack of drainage due to a deteriorated roadway.*

*Flooding on Martin Rd, Jackson/North Codorus Township*

10/11/2013
INVENTORY OF FLOODING EVENTS AND ROADWAY/Bridge CLOSURES

Methodology

In order to create an accurate inventory of roadways and bridges that have closed due to past flooding events, the YCPC used four different sources of data: PennDOT’s Extreme Weather Vulnerability Study (PennDOT EWVS), York County 911 data, PennDOT’s Road Closure Reporting System (RCRS) and historical data provided by municipalities on past flooding events.

PennDOT Extreme Weather Vulnerability Study (2017)

The goals of the PennDOT EWVS are to “identify and compile historic impacts of extreme weather, identify the most critical assets [roadways and bridges], identify how climate change may affect future flooding locations, determine highest risk locations for flooding, and to assemble a toolbox of strategies and methods to address risks.” –PA Vulnerability Project Webinar

As a method of collecting data, PennDOT created a web-based survey tool that allowed users to identify transportation assets that were vulnerable to extreme weather, including flooding events. The majority of this information was provided by PennDOT district and Metropolitan Planning Organization staff.

The end result from the PennDOT EWVS is the risk assessment mapping, which ranks locations that are vulnerable to flooding throughout the state. The variables that formulate the Risk Assessment are listed in Figure 1.

<table>
<thead>
<tr>
<th>Figure 1: Risk Assessment Formula Variables</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exposure</td>
</tr>
<tr>
<td>Sensitivity</td>
</tr>
<tr>
<td>Consequence</td>
</tr>
</tbody>
</table>

The locations that are identified as vulnerable through the PennDOT EWVS are then ranked based on their level of vulnerability on a statewide scale, ranging from the top 5 percent of vulnerable segments, decreasing by 5 percent for each category to locations that rank below the top 25 percent of vulnerable segments. For the York County Flooded Roadway Study, all vulnerable locations are categorized under one symbol since the study is recording all locations that have a history of flooding.

Historic Event Data

Historic event data were collected by contacting the municipalities within York County and requesting that they complete a Historical Flooded Roadways Data Collection Table (Appendix I). The table includes the location of roadways identified by York County Emergency Management Agency (EMA) and
PennDOT’s RCRS that have historically flooded during flooding events. Municipalities were asked to provide information on the number of times that the listed roads have flooded in a one-year period and the average period of time that the roadway was closed due to the flooding event. The range of data collected is from 2009 to 2014, however, municipalities were encouraged to continue reporting flooded roadways for the first half of 2015.

**COMBINING THE DATABASE**

Once the historical data were gathered from PennDOT’s RCRS, York County EMA, and the municipalities, it was combined with the data provided by the PennDOT EWVS to create a comprehensive database of state and local roadways that are susceptible to flooding during flooding events (Map 1). The black squares on the maps in this study represent the vulnerable locations identified by this database.

**VULNERABLE ROADWAY GROUPS**

After the map of the combined database was created, groups of flood-prone roadways were identified using waterway geography, roadway system connections and connectivity, and roadway flooding and closure history (Map 2). In total, 14 Vulnerable Roadway Groups were identified:

- **Group A**: Fairview Township
- **Group B**: Fairview Township
- **Group C**: Carroll Township
- **Group D**: Dover Township, Paradise Township, Warrington Township, Washington Township
- **Group E**: East Manchester Township, Conewago Township, Newberry Township
- **Group F**: Dover Township, West Manchester Township, Conewago Township
- **Group G**: Spring Garden Township, Springettsbury Township
- **Group H**: Hellam Township, Hallam Borough
- **Group I**: Windsor Township, Lower Windsor Township
- **Group J**: West Manchester Township, Spring Garden Township, North Codorus Township, York Township, New Salem Borough
- **Group K**: Felton Borough, North Hopewell Township
- **Group L**: North Codorus Township, Seven Valleys Borough
- **Group M**: North Codorus Township, Codorus Township, Manheim Township
- **Group N**: Washington Township
**MUNICIPAL MEETINGS**

Individual meetings were held with each group of municipalities to compare the flooded roadway groups (shown on Map 2) with municipal experience of past flooding events, and to identify roads or bridges that should be improved to help mitigate closures in flood-prone areas. This included creating an inventory of all state and local roadways and bridges in the grouped area that are vulnerable to flooding, discussing completed or planned improvements to these assets, as well as identifying flooding events that have occurred in recent years and the effect they have had in each area. Municipalities were also asked to provide an estimate on how long the average road closure caused by flooding would last, and the possible detour for when that roadway was closed. Details of each municipal meeting can be found in Appendix III.

**FLOOD PROOFING/RESILIENCY**

Once the municipal meetings were completed, the information that was collected was added to the Historical Flooded Roadways Data Collection Table and to the “vulnerable locations” layer (represented by black squares on the maps in this document) in order to complete the inventory of flooded roadways in York County. Some of these groupings created certain effects on the surrounding area during flooding events (see below). The YCPC staff created the Road Flood Proofing Table (Appendix II), which lists roads and bridges at critical locations in the transportation system of York County that should have at least one road that does not flood, so as to allow for traffic to continue to flow through the area.

**Road Flood Proofing Table**

The Road Flood Proofing Table categorizes critical flood-prone locations in the transportation system of York County by the type of effect that occurs when these roads/bridges flood. The types of “Flooding Effects” that are given are:

- **Island Effect** - When flooding occurs in these areas, all roads/bridges flood; there is no possible exit from the area for automobiles until flood waters recede.

- **Disruption of Minor Arterial or Greater** - When flooding occurs in these areas, vehicle traffic on a roadway with a Functional Classification of “Minor Arterial” or greater is disrupted, forcing a high volume of vehicles to find an alternate route.

- **Barrier** - When flooding occurs in these areas, vehicle traffic is cut off over consecutive crossings, creating lengthy detours.

These locations might consist of a single road or bridge that causes these effects, or several. Each location includes the road/bridge that is affected during flooding events, as well as the relevant segment numbers. Any improvements that were suggested for these locations by the municipalities at the municipal meetings are included in the table. These improvements are suggestions, and any future improvements will require further study. Prevention of flooding effects may not apply to every road segment/bridge in the group. In this case, the road segments/bridges should be designed with flood resiliency in mind.

*Group N was formed due to information received during the meeting with Group D, hence there are no notes for Group N.*
Some of the Flooded Roadway Groups (B, E, I, and M) are not listed on the Road Flood Proofing Table. This is because there were no Islands or Barriers formed within the group due to flooding, and there were also no roads classified as Minor Arterials or greater that were disrupted by flooding.

**Flood Resiliency**

In an ideal world, roads and bridges would not flood, and the transportation network would not be disrupted during flooding events. However, improving every roadway and bridge in York County to be flood proof is not feasible. Therefore, any road listed in the Historical Flooded Roadways Data Collection Table, or any road/bridge that is not included in the solution for road flood proofing, should be designed with flood resiliency in mind the next time that improvements are proposed for that road/bridge. Some examples of flood resiliency measures for roads and bridges include:

- Increasing bridge heights
- Elevating roadways
- Changes in bridge design to tie decks more securely to substructures and strengthen foundations
- Installing riparian buffers
- Installing roadways with paved shoulders in flood zones
- Paving dirt and gravel roads to prevent erosion
- Installing rip-rap to protect the foundation footings and piers of bridges from bridge scour
- Dredging and bank stabilization
- Improving tapering along road shoulders to prevent erosion
- Natural stream restoration treatment

**POLICY DISCUSSION**

**Hazard Mitigation**

The *Disaster Mitigation Act of 2000 (DMA 2000)* requires State, local (county/municipal), and Indian Tribal governments to plan for hazard mitigation as a requirement for certain types of mitigation assistance. Hazard mitigation plans are required to be updated every five (5) years. The first York County Hazard Mitigation Plan (HMP) was adopted in 2008. The HMP is to be updated every five years, the most recent update being developed in 2018. The YCPC has secured Pre-Disaster Mitigation Grant funding through the Pennsylvania Emergency Management Agency (PEMA) to update the Plan. Staff of the YCPC update the HMP with guidance from a Local Planning Team and input from all 72 municipalities.

Input from a variety of stakeholders is important not only for updating the York County HMP, but also because most municipalities adopt the York County HMP as their local HMP to meet the requirements of *DMA 2000*. The main components of the Plan include hazard identification and profiling, a hazard capability assessment, and the formulation of goals, objectives, and actions to address hazards in York County. Many aspects of hazard mitigation planning are related to transportation. Perhaps the greatest opportunities are designing transportation systems and infrastructure to withstand effects of known
hazards so that they still function in the event of an emergency or disaster, and adopting policies that
direct growth away from known hazard areas.

Best Management Practices (BMPs)

Recognizing the need for a more integrated approach to water management in York County, the YCPC
staff prepared, and the County Commissioners adopted an Integrated Water Resources Plan (IWRP) in
2011 as a new component of the York County Comprehensive Plan. The IWRP provides a broad overview
of how water resources are managed in York County and includes goals and strategies for meeting future
challenges. The IWRP sets the stage for current cooperative efforts by stating that “intergovernmental
cooperation must be an integral part of water resource planning.”

Following the IWRP, the YCPC, in cooperation with the York County Coalition for Clean Waters, developed
the York County Watershed Implementation Plan (WIP) in 2013. The purpose of the WIP is to provide a
strategy for York County to achieve progress toward improving local waters and meeting draft pollutant
reduction targets established by the Pennsylvania Department of Environmental Protection (DEP) for each
county within the Chesapeake Bay watershed.

A key strategy from the WIP is compliance with the DEP Municipal Separate Storm Sewer System (MS4)
regulation that requires each municipality with a MS4 Permit, but no specific waste load allocation, to
implement a Chesapeake Bay Pollutant Reduction Plan (CBPRP). The YCPC staff reached out to all 72
municipalities in a regional effort to plan and construct water quality improvement practices in a
collaborative fashion. The effort resulted in the development of the York County Regional Chesapeake Bay
Pollutant Reduction Plan (Regional CBPRP) and involved 44 municipalities. Among the participants were
34 regulated municipalities including the County of York, six municipalities with MS4 waivers, and four
non-regulated municipalities. These municipalities, collectively known as the York County Stormwater
Consortium (YCSWC), entered into a five-year Intergovernmental Cooperation Agreement and pledged a
total of nearly one million dollars to implement the Regional CBPRP. The Regional CBPRP, approved by
DEP in August 2015, includes a list of best management practice (BMP) projects that reduce pollutants
and clean up York County waters. By participating in the approved Regional CBPRP, municipalities are able
to select projects that represent the most cost-effective use of limited resources.

Control measures have been identified to reduce pollutant loads to the Chesapeake Bay from the MS4
urbanized area covered by the Regional CBPRP. The current Regional CBPRP is for the years 2018-2023
and has 45 participants. All but two are MS4 communities. The implementation measures include a mix
of stream bank restoration, riparian forest buffer, bio-retention, bio-swale, stormwater basin retrofit, step
pool stormwater conveyance, and porous pavement BMP projects. However, many projects yield
secondary benefits, such as recreation, education and reduced flooding. These measures, which were
originally identified in the WIP, will assist the YCSWC in achieving the 10 percent sediment reduction
required by the 2018 MS4 Permit.

Municipal participant fees to implement the 2018-2023 Regional CBPRP were developed using a formula
based on lineal miles of impaired streams, 2010 population, and acres of impervious surface.
Approximately $12.3 million is being collected over the five-year life of the Plan or approximately $2.4
million per year. Participants are invoiced on an annual basis and have the option of paying the invoice in full or in two installments. The annual fee for a municipality that received an MS4 Waiver or is nonregulated is $1,591.00. However, the annual fee for municipalities with an MS4 Permit ranges from $4,296.00 to $224,138.00.

**Flooded Roadway Application and Coordination**

The goal of the Regional CBPRP is to improve impaired waterways in York County by reducing pollutants. The BMP projects may have a secondary benefit of reducing/mitigating flooding in these areas.

This important secondary benefit (from a transportation perspective) for these projects may call for greater coordination of project programming and implementation between the Regional CBPRP, municipal capital improvement programs, and the York County Flooded Roadway Study/York Area Metropolitan Planning Organization (YAMPO) TIP. Such coordination may be critical for projects proposed in proximity to each other and having a similar implementation schedule. For example, the replacement of the Baker Road Bridge over the Little Conewago Creek in Dover Township is programmed on the 2019-2022 YAMPO Transportation Improvement Program (2019-2022 TIP). The project is programmed for construction in FFY 2021 and is to be let for bid in June 2021. Concurrently, three BMP projects are proposed along the Little Conewago Creek to the southwest of this bridge. These projects are included in the 2018-2023 Regional CBPRP. During the Group F meeting, Dover Township Officials expressed concern about implementation of the BMP and a bridge project at the same time. Careful coordination of both sets of projects will ensure that one project will not negatively affect the other. Such BMP/TIP coordination should be a recommended action in the project initiation process for the PennDOT Connects Program.

Another possible benefit is that a BMP project proposed in proximity to a TIP project could reduce the programmed costs of either or both projects. Cost savings could provide an additional incentive to coordinate these projects closely.

**Bridge Selection Criteria**

Another purpose of this study is to incorporate the flooded roadway locations in York County into the criteria developed for selecting bridge projects in the YAMPO 2019-2045 Long Range Transportation Plan (2019-2045 LRTP). At this point, an Asset Management Committee has been formed to address the long-term transportation needs in York County, and this study can be used in the committee’s effort to formulate asset management criteria.

**NEXT STEPS**

**Future Studies**

Some locations listed in the Road Flood Proofing Table will require further study to determine what improvements will convert the highlighted segments/bridges into “flood proof” roadways. In order to conduct these studies in an efficient manner, the ID Groups (See Appendix II) have been separated into
Priorities based on assets programmed on the TIP. Locations in Priority 1 are locations that require further study and currently have an asset programmed on the 2017-2020 or 2019-2022 TIP that is currently not completed with the design phase. Priority 2 includes any locations that require further study and do not currently have an asset programmed on the 2017-2020 or 2019-2022 TIP.

The future studies for Priority 1 should be conducted as one study and programmed on the 2019-2022 TIP. The following assets meet the criteria for Priority 1 (see Appendix II for reference):

- ID Group 3: Harmony Grove Road Bridge .......... MPMS # 81070
- ID Group 3: Colonial Road Bridge ..................... MPMS # 78989
- ID Group 4: Roosevelt Avenue Bridge ............... MPMS # 87689
- ID Group 4: Baker Road Bridge ......................... MPMS # 21144
- ID Group 11: Seven Valleys Road Bridge .......... MPMS # 87698

Following the completion of the Priority 1 study, the locations for Priority 2 could either be completed as one study, or as individual studies in conjunction with the first asset in the location that is programmed on the next TIP. The following ID Groups meet the criteria for Priority 2:

- ID Group 1
- ID Group 2
- ID Group 5
- ID Group 6
- ID Group 7
- ID Group 8
- ID Group 9
- ID Group 10
- ID Group 12
- ID Group 13
- ID Group 14
- ID Group 15
- ID Group 16
- ID Group 17
- ID Group 18
- ID Group 19

These studies must take into consideration that improvements to prevent flooding cannot create flooding complications at other locations, or in the same area. Some of the locations have had or currently have projects planned on the TIP that may address the flooding issue. No studies should be completed at these locations until additional flood data shows that the issue remains.

Public Involvement

In accordance with applicable state and federal legislation, and YAMPO’s adopted Public Participation Plan (PPP), the YCPC staff recommended the following strategies and schedule for the public comment period of the York County Flooded Roadway Study Draft (YCFRSD). On April 26, 2018, the YAMPO Coordinating Committee adopted the strategies and schedule provided below. The documentation of the public involvement process addressed in this section is found in Appendix V.

YAMPO has accomplished the following public involvement tasks:

- A 30-day public comment about the YCFSD was opened on May 14, 2018 and closed the comment period on June 12, 2018
- A press release was submitted to the York Daily Record/Sunday News, the York Dispatch, the Hanover Evening Sun, and the Harrisburg Patriot News
Visualization techniques were employed in the form of maps and infographics that allowed the public to more easily understand the YCFRSD.

Additionally, the YAMPO PPP asks the YCPC staff to determine which step on a five-step scale of involvement we are trying to achieve for any given document. The five steps are ascending in involvement, and a higher step includes all steps below it.

The YCPC Staff conducted the public comment period of the YCFRSD in which the public should have some involvement. For that reason, The YCPC Staff employed Step 1, or Strategy to Inform as the level of public involvement for this study. The PPP defines informing as “providing the public with information to assist them in understanding the problem, alternatives and/or the solution”. The YAMPO Coordinating Committee approved this “Step” or level of public involvement in April 2018.

For each step, the YAMPO PPP list suggests outreach strategies. Given the categorization discussed above, the YCPC Staff undertook the following outreach efforts for the YCFRSD:

- Communicated the draft study and the opportunity for comment with the media via a press release;
- Communicate the draft Study and the opportunity for comment with the public via:
  - YCPC’s E-mail Alert (the Public Comment Form was available electronically)
  - YAMPO mailing list
  - A post on YCPC’s Facebook page (in conjunction with a “Flood and Water Pollution Solutions” Meeting held June 21, 2018)
  - A “Latest News” article on the YCPC/YAMPO website (the Public Comment Form was available electronically).
- Corresponded with each municipality for which flood-vulnerable roadways are identified in the study.
- Displayed the YCFRSD at the York County Planning Commission office. Paper copies of the Public Comment Forms were made available in the display area.
- Corresponded with fire and police chiefs in York County for further information regarding flood-vulnerable roadways.

The YCPC Staff received public comment on the YCFRSD via:

- E-mail to YCPC Transportation staff
- Telephone call to YCPC Transportation staff
- The YCFRS Public Comment Form.

The YCPC Staff followed schedule for the YCFRSD public comment and adoption provided below.

- May 14, 2018: public comment period commenced
- June 12, 2018: public comment period ended
• August 23, 2018: YCPC submitted both the YCRFS Documentation of Public Solicitation and Comment (i.e., Appendix V of the study) and the section of the study to the YAMPO Coordinating Committee for approval

August 23, 2018: YAMPO Coordinating Committee meeting approves the York County Flooded Roadway Study Draft as a final report.

**Update Cycle**

The goal for this study is to continue the process of gathering and compiling information regarding flooded roadways within York County. As the transportation assets and streams of our county continue to change, the YCPC will continue to track improvements that are made to roadways and bridges that are effected by flooding conditions, as well as actual flooding occurrences themselves. Therefore, the YCPC intends to formulate a new method of collecting data from municipalities, in order to catalog known flooding events, improvements that have been completed on these roads, and any future roadway or bridge improvements that are planned at these locations that could mitigate flooding.

An example of this future data collection would be to develop a form that could be sent to each municipality after a severe rainstorm event/heavy snow melt. Each municipality would then be able to record what roads (if any) flooded during that event, how long the road was closed, and any other comments that they might have about the flooding event. The municipalities would then return the form to the YCPC, where the data would be cataloged as a continuation of the Historical Flooded Roadways Data Collection Table.

Another aspect of the update cycle would be a post-construction evaluation of locations that have been improved, which will be used to evaluate the success of the improvements made, as well as to identify whether or not there are any new issues caused by the improvements.

**Recommendations**

A copy of this study should be distributed to each municipality within York County for use in identifying roadways that have a recorded history of flooding. Also, incorporating this document into the asset management process (PennDOT’s Bridge Management System or Road Management System for example) would allow for efficient tracking of projects that include listed assets in their scope of work. This procedure ensures that the flooding concerns are taken into consideration during the preliminary planning phase of the project.
Appendix
<table>
<thead>
<tr>
<th>Municipality</th>
<th>Township</th>
<th>Road</th>
<th>Intersection</th>
<th>Date</th>
<th>Average</th>
<th>Length of Closure</th>
<th>Frequency</th>
<th>Last Flooded</th>
<th>Notes</th>
</tr>
</thead>
</table>
| Lower Glades Road | Highland Twp. | Lower Glades Rd | Highland Rd | 10/19/2018 | 1 | 1 day | 1 | 2009 | 2018 flood |}
| Lower Glades Road | Highland Twp. | Lower Glades Rd | Highland Rd | 10/19/2018 | 1 | 1 day | 1 | 2009 | 2018 flood |}
| Lower Glades Road | Highland Twp. | Lower Glades Rd | Highland Rd | 10/19/2018 | 1 | 1 day | 1 | 2009 | 2018 flood |}
<table>
<thead>
<tr>
<th>Township</th>
<th>Description</th>
<th>Date</th>
<th>Begin</th>
<th>End</th>
<th>Length of Closure</th>
<th>Number of Floods</th>
<th>Average Time of Closure</th>
<th>T-OR SR Number</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Newberry Township</td>
<td>Days Mill Road (SR3042)</td>
<td>2009</td>
<td>2 days</td>
<td>6 months</td>
<td>2 months</td>
<td>1</td>
<td>2 hours</td>
<td>(SR3041)</td>
<td>1</td>
</tr>
<tr>
<td>Newberry Township</td>
<td>Green Valley Road</td>
<td>2010</td>
<td>2 days</td>
<td>6 months</td>
<td>2 months</td>
<td>1</td>
<td>2 hours</td>
<td>(SR3041)</td>
<td>1</td>
</tr>
<tr>
<td>Newberry Township</td>
<td>Miller Road (SR2051)</td>
<td>2009</td>
<td>2 days</td>
<td>6 months</td>
<td>2 months</td>
<td>1</td>
<td>2 hours</td>
<td>(SR3041)</td>
<td>1</td>
</tr>
<tr>
<td>Newberry Township</td>
<td>Acres Road (SR0462)</td>
<td>2008</td>
<td>2 days</td>
<td>6 months</td>
<td>2 months</td>
<td>1</td>
<td>2 hours</td>
<td>(SR3041)</td>
<td>1</td>
</tr>
<tr>
<td>Newberry Township</td>
<td>Sinsheim Road (SR3041)</td>
<td>2009</td>
<td>2 days</td>
<td>6 months</td>
<td>2 months</td>
<td>1</td>
<td>2 hours</td>
<td>(SR3041)</td>
<td>1</td>
</tr>
<tr>
<td>Newberry Township</td>
<td>Stoverstown Road</td>
<td>2009</td>
<td>2 days</td>
<td>6 months</td>
<td>2 months</td>
<td>1</td>
<td>2 hours</td>
<td>(SR3041)</td>
<td>1</td>
</tr>
<tr>
<td>Newberry Township</td>
<td>Cold Springs Road</td>
<td>2009</td>
<td>2 days</td>
<td>6 months</td>
<td>2 months</td>
<td>1</td>
<td>2 hours</td>
<td>(SR3041)</td>
<td>1</td>
</tr>
<tr>
<td>Newberry Township</td>
<td>Frosty Hill Road (SR2040)</td>
<td>2008</td>
<td>2 days</td>
<td>6 months</td>
<td>2 months</td>
<td>1</td>
<td>2 hours</td>
<td>(SR3041)</td>
<td>1</td>
</tr>
<tr>
<td>Newberry Township</td>
<td>Lake Lea Drive</td>
<td>2009</td>
<td>2 days</td>
<td>6 months</td>
<td>2 months</td>
<td>1</td>
<td>2 hours</td>
<td>(SR3041)</td>
<td>1</td>
</tr>
<tr>
<td>Newberry Township</td>
<td>Valley Street</td>
<td>2009</td>
<td>2 days</td>
<td>6 months</td>
<td>2 months</td>
<td>1</td>
<td>2 hours</td>
<td>(SR3041)</td>
<td>1</td>
</tr>
<tr>
<td>Newberry Township</td>
<td>Nine Mile Road</td>
<td>2009</td>
<td>2 days</td>
<td>6 months</td>
<td>2 months</td>
<td>1</td>
<td>2 hours</td>
<td>(SR3041)</td>
<td>1</td>
</tr>
<tr>
<td>Newberry Township</td>
<td>Plymouth Road (SR0234)</td>
<td>2009</td>
<td>2 days</td>
<td>6 months</td>
<td>2 months</td>
<td>1</td>
<td>2 hours</td>
<td>(SR3041)</td>
<td>1</td>
</tr>
<tr>
<td>Newberry Township</td>
<td>Valley Road (SR0214)</td>
<td>2008</td>
<td>2 days</td>
<td>6 months</td>
<td>2 months</td>
<td>1</td>
<td>2 hours</td>
<td>(SR3041)</td>
<td>1</td>
</tr>
<tr>
<td>Newberry Township</td>
<td>Valley Road (SR0216)</td>
<td>2009</td>
<td>2 days</td>
<td>6 months</td>
<td>2 months</td>
<td>1</td>
<td>2 hours</td>
<td>(SR3041)</td>
<td>1</td>
</tr>
<tr>
<td>Newberry Township</td>
<td>Clear Springs Road</td>
<td>2009</td>
<td>2 days</td>
<td>6 months</td>
<td>2 months</td>
<td>1</td>
<td>2 hours</td>
<td>(SR3041)</td>
<td>1</td>
</tr>
<tr>
<td>Newberry Township</td>
<td>Stillmeadow Lane</td>
<td>2009</td>
<td>2 days</td>
<td>6 months</td>
<td>2 months</td>
<td>1</td>
<td>2 hours</td>
<td>(SR3041)</td>
<td>1</td>
</tr>
<tr>
<td>Newberry Township</td>
<td>Yorkana Road (SR2019)</td>
<td>2009</td>
<td>2 days</td>
<td>6 months</td>
<td>2 months</td>
<td>1</td>
<td>2 hours</td>
<td>(SR3041)</td>
<td>1</td>
</tr>
<tr>
<td>Newberry Township</td>
<td>Valley Road (SR0214)</td>
<td>2008</td>
<td>2 days</td>
<td>6 months</td>
<td>2 months</td>
<td>1</td>
<td>2 hours</td>
<td>(SR3041)</td>
<td>1</td>
</tr>
<tr>
<td>Newberry Township</td>
<td>Valley Road (SR0216)</td>
<td>2009</td>
<td>2 days</td>
<td>6 months</td>
<td>2 months</td>
<td>1</td>
<td>2 hours</td>
<td>(SR3041)</td>
<td>1</td>
</tr>
<tr>
<td>Newberry Township</td>
<td>Clear Springs Road</td>
<td>2009</td>
<td>2 days</td>
<td>6 months</td>
<td>2 months</td>
<td>1</td>
<td>2 hours</td>
<td>(SR3041)</td>
<td>1</td>
</tr>
<tr>
<td>Newberry Township</td>
<td>Stillmeadow Lane</td>
<td>2009</td>
<td>2 days</td>
<td>6 months</td>
<td>2 months</td>
<td>1</td>
<td>2 hours</td>
<td>(SR3041)</td>
<td>1</td>
</tr>
<tr>
<td>Newberry Township</td>
<td>Yorkana Road (SR2019)</td>
<td>2009</td>
<td>2 days</td>
<td>6 months</td>
<td>2 months</td>
<td>1</td>
<td>2 hours</td>
<td>(SR3041)</td>
<td>1</td>
</tr>
<tr>
<td>Newberry Township</td>
<td>Valley Road (SR0214)</td>
<td>2008</td>
<td>2 days</td>
<td>6 months</td>
<td>2 months</td>
<td>1</td>
<td>2 hours</td>
<td>(SR3041)</td>
<td>1</td>
</tr>
<tr>
<td>Newberry Township</td>
<td>Valley Road (SR0216)</td>
<td>2009</td>
<td>2 days</td>
<td>6 months</td>
<td>2 months</td>
<td>1</td>
<td>2 hours</td>
<td>(SR3041)</td>
<td>1</td>
</tr>
<tr>
<td>Newberry Township</td>
<td>Clear Springs Road</td>
<td>2009</td>
<td>2 days</td>
<td>6 months</td>
<td>2 months</td>
<td>1</td>
<td>2 hours</td>
<td>(SR3041)</td>
<td>1</td>
</tr>
<tr>
<td>Newberry Township</td>
<td>Stillmeadow Lane</td>
<td>2009</td>
<td>2 days</td>
<td>6 months</td>
<td>2 months</td>
<td>1</td>
<td>2 hours</td>
<td>(SR3041)</td>
<td>1</td>
</tr>
<tr>
<td>Newberry Township</td>
<td>Yorkana Road (SR2019)</td>
<td>2009</td>
<td>2 days</td>
<td>6 months</td>
<td>2 months</td>
<td>1</td>
<td>2 hours</td>
<td>(SR3041)</td>
<td>1</td>
</tr>
<tr>
<td>Newberry Township</td>
<td>Valley Road (SR0214)</td>
<td>2008</td>
<td>2 days</td>
<td>6 months</td>
<td>2 months</td>
<td>1</td>
<td>2 hours</td>
<td>(SR3041)</td>
<td>1</td>
</tr>
<tr>
<td>Newberry Township</td>
<td>Valley Road (SR0216)</td>
<td>2009</td>
<td>2 days</td>
<td>6 months</td>
<td>2 months</td>
<td>1</td>
<td>2 hours</td>
<td>(SR3041)</td>
<td>1</td>
</tr>
<tr>
<td>Newberry Township</td>
<td>Clear Springs Road</td>
<td>2009</td>
<td>2 days</td>
<td>6 months</td>
<td>2 months</td>
<td>1</td>
<td>2 hours</td>
<td>(SR3041)</td>
<td>1</td>
</tr>
<tr>
<td>Newberry Township</td>
<td>Stillmeadow Lane</td>
<td>2009</td>
<td>2 days</td>
<td>6 months</td>
<td>2 months</td>
<td>1</td>
<td>2 hours</td>
<td>(SR3041)</td>
<td>1</td>
</tr>
<tr>
<td>Newberry Township</td>
<td>Yorkana Road (SR2019)</td>
<td>2009</td>
<td>2 days</td>
<td>6 months</td>
<td>2 months</td>
<td>1</td>
<td>2 hours</td>
<td>(SR3041)</td>
<td>1</td>
</tr>
<tr>
<td>Newberry Township</td>
<td>Valley Road (SR0214)</td>
<td>2008</td>
<td>2 days</td>
<td>6 months</td>
<td>2 months</td>
<td>1</td>
<td>2 hours</td>
<td>(SR3041)</td>
<td>1</td>
</tr>
<tr>
<td>Newberry Township</td>
<td>Valley Road (SR0216)</td>
<td>2009</td>
<td>2 days</td>
<td>6 months</td>
<td>2 months</td>
<td>1</td>
<td>2 hours</td>
<td>(SR3041)</td>
<td>1</td>
</tr>
<tr>
<td>Newberry Township</td>
<td>Clear Springs Road</td>
<td>2009</td>
<td>2 days</td>
<td>6 months</td>
<td>2 months</td>
<td>1</td>
<td>2 hours</td>
<td>(SR3041)</td>
<td>1</td>
</tr>
<tr>
<td>Newberry Township</td>
<td>Stillmeadow Lane</td>
<td>2009</td>
<td>2 days</td>
<td>6 months</td>
<td>2 months</td>
<td>1</td>
<td>2 hours</td>
<td>(SR3041)</td>
<td>1</td>
</tr>
<tr>
<td>Newberry Township</td>
<td>Yorkana Road (SR2019)</td>
<td>2009</td>
<td>2 days</td>
<td>6 months</td>
<td>2 months</td>
<td>1</td>
<td>2 hours</td>
<td>(SR3041)</td>
<td>1</td>
</tr>
<tr>
<td>Newberry Township</td>
<td>Valley Road (SR0214)</td>
<td>2008</td>
<td>2 days</td>
<td>6 months</td>
<td>2 months</td>
<td>1</td>
<td>2 hours</td>
<td>(SR3041)</td>
<td>1</td>
</tr>
<tr>
<td>Newberry Township</td>
<td>Valley Road (SR0216)</td>
<td>2009</td>
<td>2 days</td>
<td>6 months</td>
<td>2 months</td>
<td>1</td>
<td>2 hours</td>
<td>(SR3041)</td>
<td>1</td>
</tr>
<tr>
<td>Newberry Township</td>
<td>Clear Springs Road</td>
<td>2009</td>
<td>2 days</td>
<td>6 months</td>
<td>2 months</td>
<td>1</td>
<td>2 hours</td>
<td>(SR3041)</td>
<td>1</td>
</tr>
<tr>
<td>Newberry Township</td>
<td>Stillmeadow Lane</td>
<td>2009</td>
<td>2 days</td>
<td>6 months</td>
<td>2 months</td>
<td>1</td>
<td>2 hours</td>
<td>(SR3041)</td>
<td>1</td>
</tr>
<tr>
<td>Newberry Township</td>
<td>Yorkana Road (SR2019)</td>
<td>2009</td>
<td>2 days</td>
<td>6 months</td>
<td>2 months</td>
<td>1</td>
<td>2 hours</td>
<td>(SR3041)</td>
<td>1</td>
</tr>
<tr>
<td>Newberry Township</td>
<td>Valley Road (SR0214)</td>
<td>2008</td>
<td>2 days</td>
<td>6 months</td>
<td>2 months</td>
<td>1</td>
<td>2 hours</td>
<td>(SR3041)</td>
<td>1</td>
</tr>
<tr>
<td>Newberry Township</td>
<td>Valley Road (SR0216)</td>
<td>2009</td>
<td>2 days</td>
<td>6 months</td>
<td>2 months</td>
<td>1</td>
<td>2 hours</td>
<td>(SR3041)</td>
<td>1</td>
</tr>
<tr>
<td>Newberry Township</td>
<td>Clear Springs Road</td>
<td>2009</td>
<td>2 days</td>
<td>6 months</td>
<td>2 months</td>
<td>1</td>
<td>2 hours</td>
<td>(SR3041)</td>
<td>1</td>
</tr>
<tr>
<td>Newberry Township</td>
<td>Stillmeadow Lane</td>
<td>2009</td>
<td>2 days</td>
<td>6 months</td>
<td>2 months</td>
<td>1</td>
<td>2 hours</td>
<td>(SR3041)</td>
<td>1</td>
</tr>
<tr>
<td>Newberry Township</td>
<td>Yorkana Road (SR2019)</td>
<td>2009</td>
<td>2 days</td>
<td>6 months</td>
<td>2 months</td>
<td>1</td>
<td>2 hours</td>
<td>(SR3041)</td>
<td>1</td>
</tr>
<tr>
<td>Newberry Township</td>
<td>Valley Road (SR0214)</td>
<td>2008</td>
<td>2 days</td>
<td>6 months</td>
<td>2 months</td>
<td>1</td>
<td>2 hours</td>
<td>(SR3041)</td>
<td>1</td>
</tr>
<tr>
<td>Newberry Township</td>
<td>Valley Road (SR0216)</td>
<td>2009</td>
<td>2 days</td>
<td>6 months</td>
<td>2 months</td>
<td>1</td>
<td>2 hours</td>
<td>(SR3041)</td>
<td>1</td>
</tr>
<tr>
<td>Newberry Township</td>
<td>Clear Springs Road</td>
<td>2009</td>
<td>2 days</td>
<td>6 months</td>
<td>2 months</td>
<td>1</td>
<td>2 hours</td>
<td>(SR3041)</td>
<td>1</td>
</tr>
<tr>
<td>Newberry Township</td>
<td>Stillmeadow Lane</td>
<td>2009</td>
<td>2 days</td>
<td>6 months</td>
<td>2 months</td>
<td>1</td>
<td>2 hours</td>
<td>(SR3041)</td>
<td>1</td>
</tr>
<tr>
<td>Newberry Township</td>
<td>Yorkana Road (SR2019)</td>
<td>2009</td>
<td>2 days</td>
<td>6 months</td>
<td>2 months</td>
<td>1</td>
<td>2 hours</td>
<td>(SR3041)</td>
<td>1</td>
</tr>
<tr>
<td>Township/Location</td>
<td>Speed Zone</td>
<td>Description of Roadway</td>
<td>Average Numbers of Times Flooded</td>
<td>Average Length of Closure (days)</td>
<td>Average Length of Closure (hours)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-------------------</td>
<td>------------</td>
<td>------------------------</td>
<td>---------------------------------</td>
<td>---------------------------------</td>
<td>----------------------------------</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>York Township</td>
<td>10 mph</td>
<td>Broad Street</td>
<td>2</td>
<td>3 days</td>
<td>3 hours</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>York Township</td>
<td>10 mph</td>
<td>Broadway</td>
<td>2</td>
<td>3 days</td>
<td>3 hours</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>York Township</td>
<td>10 mph</td>
<td>Broadway</td>
<td>2</td>
<td>3 days</td>
<td>3 hours</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>York Township</td>
<td>10 mph</td>
<td>Broadway</td>
<td>2</td>
<td>3 days</td>
<td>3 hours</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>York Township</td>
<td>10 mph</td>
<td>Broadway</td>
<td>2</td>
<td>3 days</td>
<td>3 hours</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Data obtained from Municipalities at municipal meetings, 2018**

**Data obtained from the York County EMA, 2014**
## Road Flood Proofing Table

<table>
<thead>
<tr>
<th>Vulnerable Roadway Group</th>
<th>ID Group</th>
<th>Flooding Effect</th>
<th>Description</th>
<th>SR and Segment Number</th>
<th>Bridge Structure Number</th>
<th>Road Name</th>
<th>Possible Improvements *</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>1</td>
<td>Island effect</td>
<td>Both SR 0114 and SR 1003 flood during flooding events. These roads have an Average Annual Daily Traffic (AADT) ranging from 6,052 to 10,363. At least one of these roads must stay open during flooding events to prevent an island effect from occurring. Improvements to some combination of the following road segments/bridges need to address this issue.</td>
<td>SR 0114, Seg 70-100</td>
<td>37474</td>
<td>Lewisberry RD</td>
<td>Elevate roadway</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>SR 0114, Seg 110-130</td>
<td>Lewisberry RD</td>
<td>Elevate roadway</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>37648</td>
<td>Bridge ST</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>2</td>
<td>Disruption of Minor Arterial or Greater</td>
<td>SR 0074 has an Average Annual Daily Traffic (AADT) of 8,484 at this location and needs to remain open during flooding events. Improvements to some combination of the following road segments/bridges need to address this issue.</td>
<td>SR 0074, Seg 1130</td>
<td>52583</td>
<td>York RD</td>
<td>Bridge replacement completed in 2015, monitor for further flooding</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>37403</td>
<td>York RD</td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>3</td>
<td>Barrier</td>
<td>The following roads/bridges have a history of flooding during severe weather events, creating a roughly 6-mile stretch of impassable roads. These roads have an Annual Average Daily Traffic (AADT) ranging from 93 to 7,720. At least one of these roads must remain open during flooding events. Improvements to some combination of the following road segments/bridges need to address this issue.</td>
<td>SR 0234, Seg 10, 60-70</td>
<td>37962</td>
<td>Admire RD</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>SR 4004, Seg 10</td>
<td>Admire RD</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>SR 4006, Seg 40</td>
<td>Bermudian Church RD</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>37965</td>
<td>Bermudian Church RD</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>T-809</td>
<td>Bermudian Church RD</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>38234</td>
<td>Bermudian Church RD</td>
<td>Bridge replacement completed April 24th 2018, monitor for further flooding</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>SR 4008, Seg 90-100</td>
<td>Davidburg RD</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>37967</td>
<td>Davidburg RD</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>SR 4014, Seg 70-80</td>
<td>Harmony Grove RD</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>37978</td>
<td>Harmony Grove RD</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>SR 4015, Seg 10-40</td>
<td>Colonial RD</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>37980</td>
<td>Colonial RD</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>SR 4051, Seg 40-110</td>
<td>Big Mount RD</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>38024</td>
<td>Big Mount RD</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>38025</td>
<td>Big Mount RD</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>45592</td>
<td>Big Mount RD</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>T-814</td>
<td>Big Mount RD</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>T-892</td>
<td>Clearview RD</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>38099</td>
<td>Clearview RD</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>bridge under 20'</td>
<td>Clearview RD</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>bridge under 20'</td>
<td>Clearview RD</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>T-803</td>
<td>Conewago RD</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>T-463</td>
<td>5 Creek RD</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>bridge under 20'</td>
<td>5 Creek RD</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>bridge under 20'</td>
<td>5 Creek RD</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>T-448</td>
<td>Dairy RD</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>38089</td>
<td>Dairy RD</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>T-803</td>
<td>Detters Mill RD</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>T-388</td>
<td>Eisenhart Mill RD</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>bridge under 20'</td>
<td>Eisenhart Mill RD</td>
<td></td>
</tr>
</tbody>
</table>

*Possible Improvements are improvements that were suggested by the municipalities at the municipal meetings. Any suggested improvement will require further study.*
## Road Flood Proofing Table (Cont.)

<table>
<thead>
<tr>
<th>Vulnerable Roadway Group</th>
<th>ID Group</th>
<th>Flooding Effect</th>
<th>Description</th>
<th>SR and Segment Number/T-Bridge Structure Number</th>
<th>Road Name</th>
<th>Possible Improvements *</th>
</tr>
</thead>
<tbody>
<tr>
<td>F</td>
<td>4</td>
<td>Barrier</td>
<td>The following roads/bridges have a history of flooding during severe weather events, creating a roughly 3.4-mile stretch of impassable roads. These roads have an Average Annual Daily Traffic (AADT) ranging from 3,108 to 21,735. At least one of these roads must remain open during flooding events. Improvements to some combination of the following road segments/bridges need to address this issue.</td>
<td>SR 0074, Seg 740-760</td>
<td>Carlisle RD</td>
<td>Replace current pipe with larger diameter pipe at tributary to Little Conewago Creek</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>37390 Carlisle RD</td>
<td>Carlisle RD</td>
<td>Under construction: completion date 11/30/18</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>SR 4001, Seg 210-220</td>
<td>Bull RD</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>54075 Bull RD</td>
<td>Bull RD</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>SR 4001, Seg 190-200</td>
<td>Roosevelt AV</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>37945 Roosevelt AV</td>
<td>Roosevelt AV</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>SR 4003, Seg 40-70</td>
<td>S Salem Church RD</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>37959 S Salem Church RD</td>
<td>S Salem Church RD</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>46076 S Salem Church RD</td>
<td>S Salem Church RD</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>T-500 Baker RD</td>
<td>Baker RD</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>38090 Baker RD</td>
<td>Baker RD</td>
<td></td>
</tr>
<tr>
<td>G</td>
<td>5</td>
<td>Disruption of Minor Arterial or Greater</td>
<td>Interstate I-83 has an Average Annual Daily Traffic (AADT) ranging from 33,120 to 33,750 at this location, and needs to remain open during flooding events. Improvements to some combination of the following road segments/bridges need to address this issue.</td>
<td>SR 0083, Seg 170/171 - 200/201</td>
<td>I-83</td>
<td>I-83 North York Widening Project Exits 19-22 (MPMS # 92924)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>45874 Eberts LN</td>
<td>Eberts LN</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>SR 8013, Seg 20, 500</td>
<td>Ramps Q &amp; F</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>SR 0462, Seg 110, 111</td>
<td>Market ST</td>
<td>Under construction: completion date 7/11/18</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>37592 Market ST</td>
<td>Market ST</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>SR 1033, Seg 20</td>
<td>Sherman ST</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>47519 Sherman ST</td>
<td>Sherman ST</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>SR 3029, Seg 30-40</td>
<td>Loucks Mill RD</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>37852 Loucks Mill RD</td>
<td>Loucks Mill RD</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>N/A</td>
<td>Eberts LN</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>42232 Eberts LN</td>
<td>Eberts LN</td>
<td></td>
</tr>
<tr>
<td>H</td>
<td>7</td>
<td>Barrier</td>
<td>The following roads/bridges have a history of flooding during severe weather events, creating a roughly 0.8-mile stretch of impassable roads. These roads have an Average Annual Daily Traffic (AADT) ranging from 957 to 10,001. At least one of these roads must stay open during flooding events to prevent a barrier effect from occurring. Improvements to some combination of the following road segments/bridges need to address this issue.</td>
<td>SR 2001, Seg 80-100</td>
<td>Freysville RD</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>37685 Freysville RD</td>
<td>Freysville RD</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>37686 Freysville RD</td>
<td>Freysville RD</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>SR 2019, Seg 70, 81, 91</td>
<td>Broad ST</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>37715 Broad ST</td>
<td>Broad ST</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>SR 2019, Seg 50-60</td>
<td>Yorkana RD</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>SR 2021, Seg 20-50</td>
<td>Ducktown RD</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>T-770 Hill View RD</td>
<td>Hill View RD</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>38131 Hill View RD</td>
<td>Hill View RD</td>
<td></td>
</tr>
</tbody>
</table>

*Possible Improvements are improvements that were suggested by the municipalities at the municipal meetings. Any suggested improvement will require further study.*
### Appendix II

#### Road Flood Proofing Table (Cont.)

<table>
<thead>
<tr>
<th>Vulnerable Roadway Group</th>
<th>ID Group</th>
<th>Flooding Effect</th>
<th>Description</th>
<th>SR and Segment Number/T-Bridge Structure Number</th>
<th>Road Name</th>
<th>Possible Improvements *</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>The following roads/bridges have a history of flooding during severe weather events, creating a roughly 6.9-mile stretch of impassable roads. These roads have an Average Annual Daily Traffic (AADT) ranging from 496 to 10,463 (There is no data available for the AADT of Heindel RD). At least one of these roads must remain open during flooding events. Improvements to some combination of the following road segments/bridges need to address this issue.</td>
<td>SR 0616, Seg 300-320 37614</td>
<td>Trinity RD</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>SR 0182, Seg 40 37508</td>
<td>Hokes Mill RD</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>SR 0182, Seg 50-100 37510</td>
<td>Indian Rock Dam RD</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>SR 3019, Seg 70-80 37844</td>
<td>Tunnel Hill RD</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>SR 3042, Seg 180-200 37875</td>
<td>Days Mill RD</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>SR 3042, Seg 210 37876</td>
<td>Croll School RD</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>SR 3044, Seg 30-50 37877</td>
<td>Indian Rock Dam RD</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>SR 3046, Seg 10-20 37880</td>
<td>West College AVE</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>SR 3052, Seg 10-20 37892</td>
<td>Indian Rock Dam RD</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>SR 3054, Seg 24-25 37897</td>
<td>Richland AVE</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>The following roads/bridges have a history of flooding during severe weather events, creating a roughly 4.2-mile long stretch of impassable roads. These roads have an Average Annual Daily Traffic (AADT) ranging from 2,568 to 6,000 (there is no data available for the AADT of Brush Valley RD, Strickhouser RD, Spangler RD, Panther Hill RD, or Junction RD). Improvements to some combination of the following road segments/bridges need to address this issue.</td>
<td>N/A</td>
<td>Church AV</td>
<td>Extend Church Avenue south to Crossroads Avenue</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>T-416 bridge under 20' 47742</td>
<td>Brush Valley RD</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>T-417 bridge under 20' 47742</td>
<td>Strickhouser RD</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>T-535 bridge under 20' 47742</td>
<td>Spangler RD</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>T-444 bridge under 20' 47742</td>
<td>Panther Hill RD</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>T-536 bridge under 20' 47742</td>
<td>Junction RD</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>SR 0214, Seg 20 47742</td>
<td>Main ST</td>
<td>Bridge replaced in 2012, monitor for further flooding</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>SR 0616, Seg 190-210 54709</td>
<td>Seven Valleys RD</td>
<td>Bridge rebuilt in 2017, monitor for further flooding</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>37613</td>
<td>Seven Valleys RD</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>37612</td>
<td>Seven Valleys RD</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>54709</td>
<td>Seven Valleys RD</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>37613</td>
<td>Seven Valleys RD</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>37612</td>
<td>Seven Valleys RD</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>37613</td>
<td>Seven Valleys RD</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>37612</td>
<td>Seven Valleys RD</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>37613</td>
<td>Seven Valleys RD</td>
<td></td>
</tr>
</tbody>
</table>

*Possible Improvements are improvements that were suggested by the municipalities at the municipal meetings. Any suggested improvement will require further study.*
### Road Flood Proofing Table (Cont.)

<table>
<thead>
<tr>
<th>Vulnerable Roadway Group</th>
<th>ID Group</th>
<th>Flooding Effect</th>
<th>Description</th>
<th>SR and Segment Number/T-Bridge Structure Number</th>
<th>Road Name</th>
<th>Possible Improvements *</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>12</td>
<td>Barrier</td>
<td>The following roads/bridges have a history of flooding during severe weather events, creating a roughly 3.2-mile long stretch of impassable roads. These Roads have an Average Annual Daily Traffic (AADT) ranging from 100 to 846. Improvements to some combination of the following road segments/bridges need to address this issue.</td>
<td>T-862</td>
<td>Barrens Church RD</td>
<td>bridge under 20’</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>38241</td>
<td>Barrens Church RD</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>38243</td>
<td>Barrens Church RD</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>38245</td>
<td>Barrens Church RD</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>T-853</td>
<td>Bentz Mill RD</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>4012, Seg 80-50</td>
<td>Creek RD</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>T-852</td>
<td>Milford Green RD</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>856</td>
<td>Milford Green RD</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>T-855</td>
<td>Nailor RD</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>T-849</td>
<td>Ridge RD</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>47404</td>
<td>Ridge RD</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Disruption of a Minor Arterial or Greater</td>
<td>Moulstown Road has an Average Annual Daily Traffic (AADT) of 7,968 at this location, and needs to remain open during flooding events. Improvements to some combination of the following road segments/bridges need to address this issue.</td>
<td>SR 3072, Seg 10-30</td>
<td>Moulstown RD</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>41977</td>
<td>Moulstown RD</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>41976</td>
<td>Moulstown RD</td>
<td></td>
</tr>
<tr>
<td></td>
<td>13</td>
<td>Disruption of a Minor Arterial or Greater</td>
<td>Frederick Street has an Average Annual Daily Traffic (AADT) of 8,969 at this location, and needs to remain open during flooding events. Improvements to some combination of the following road segments/bridges need to address this issue.</td>
<td>SR 0194, Seg 10</td>
<td>Frederick ST</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>37512</td>
<td>Frederick ST</td>
<td></td>
</tr>
<tr>
<td></td>
<td>14</td>
<td>Disruption of a Minor Arterial or Greater</td>
<td>Old York Road has an Average Annual Daily Traffic (AADT) of 9,343 at this location, and needs to remain open during flooding events. Improvements to some combination of the following road segments/bridges need to address this issue.</td>
<td>SR 0262, Seg 70</td>
<td>Old York RD</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>37485</td>
<td>Hanover RD</td>
<td></td>
</tr>
<tr>
<td></td>
<td>15</td>
<td>Disruption of a Minor Arterial or Greater</td>
<td>York Haven Road has an Average Annual Daily Traffic (AADT) of 4,721 at this location, and needs to remain open during flooding events. Improvements to some combination of the following road segments/bridges need to address this issue.</td>
<td>SR 0382, Seg 70-80</td>
<td>York Haven RD</td>
<td></td>
</tr>
<tr>
<td></td>
<td>16</td>
<td>Disruption of a Minor Arterial or Greater</td>
<td>Susquehanna Trail has an Average Annual Daily Traffic (AADT) ranging from 4,298 to 15,330 at this location, and needs to remain open during flooding events. Improvements to some combination of the following road segments/bridges need to address this issue.</td>
<td>SR 4005, Seg 30</td>
<td>Susquehanna TR</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>37936</td>
<td>Susquehanna TR</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>SR 0194, Seg 90-100</td>
<td>Susquehanna TR</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>38168</td>
<td>Susquehanna TR</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>bridge under 20’</td>
<td>Susquehanna TR</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>bridge under 20’</td>
<td>Susquehanna TR</td>
<td></td>
</tr>
<tr>
<td></td>
<td>17</td>
<td>Disruption of a Minor Arterial or Greater</td>
<td>Hanover Road has an Average Annual Daily Traffic (AADT) of 14,880 at this location, and needs to remain open during flooding events. Improvements to some combination of the following road segments/bridges need to address this issue.</td>
<td>SR 0116, Seg 320-330</td>
<td>Hanover RD</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>37485</td>
<td>Hanover RD</td>
<td></td>
</tr>
<tr>
<td></td>
<td>18</td>
<td>Disruption of a Minor Arterial or Greater</td>
<td>Memory Lane has an Average Annual Daily Traffic (AADT) of 16,403 at this location, and needs to remain open during flooding events. Improvements to some combination of the following road segments/bridges need to address this issue.</td>
<td>SR 2005, Seg 120</td>
<td>Memory LN</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>37696</td>
<td>Memory LN</td>
<td></td>
</tr>
</tbody>
</table>

*Possible Improvements are improvements that were suggested by the municipalities at the municipal meetings. Any suggested improvement will require further study.
Appendix III: Municipal Meetings

Group A: Fairview Township

The first map for Fairview Township is located at the intersection of Lewisberry Road (SR 0114) and Old York Road (SR 1003), just west of the Capital City Airport. The area that is most heavily impacted by flooding events is the bridge located on Lewisberry Road labeled “YB 1924/SR 76”. Road closure here due to flooding cuts off traffic access between the Defense Logistics Agency (DLA), the Airport, and the village of New Market from Interstate 83. The Township recommended that Lewisberry Road be raised, and the bridge labeled “YB 1924/SR 76” be replaced with a larger opening under the bridge deck to facilitate better water flow.

The other flooding priority in this group is located on Old York Road between Boeing Road and the DLA Depot access street. This stretch of roadway is bordered by very swampy terrain, and during rain events the southbound lane floods first, followed by the northbound lane. The Township recommended that this segment of Old York Road be raised to prevent or mitigate roadway flooding in this area.

Group B: Fairview Township

Group B is located just west of where Interstate 83 (SR 0083) and the Pennsylvania Turnpike (SR 0076) intersect. Flooding in this area tends to affect local roadways that do not have much impact on the transportation network in this area. One area that is considered to be vulnerable to flooding however is the bridge on Spanglers Mill Road (SR 4027) that crosses the Yellow Breeches Creek. Also, the bridge at the northern end of Green Lane Acres labeled “YB 1889/SR 16” has since been rehabilitated. There was no priority project identified for this area, and no regional detour issue exists since the roads/bridges that flood are typically local streets.

Group C: Carroll Township

The area of focus for Group C is the intersection of Camp Ground Road (SR 4045) and York Road (SR 0074). Carroll Township stated that since the bridge on SR 0074 labeled “YB 2015/SR 96.4” was replaced in 2015, they have had no recorded flooding. Also, Spring Lane Road, which intersects SR 0074, was raised approximately 12-15 inches in 2007, which has helped alleviate flooding on that stretch of roadway. Camp Ground Road is scheduled to be improved within the next 5 years, as is the replacement of the bridge on SR 0074 that is labeled “YB 1917/SR 64”.

During a flooding event, roads that flood tend to be closed for an average of 1-2 days. The township is responsible for posting Spring Lane Road as closed, while SR 0074 and Camp Ground Road are closed by PennDOT.
**Group D: Dover Township, Paradise Township, Warrington Township, and Washington Township**

Group D is located along the western edge of the county, and centered on the area between Davidsburg Road (SR 4008) and East Berlin Road (SR 0234), northeast of East Berlin. Several roads with a history of flooding were identified during the meeting: Creek Road, Milford Green Road, Bermudian Church Road, Ridge Road, Nailor Road, Eisenhart Mill Road, and North Creek Road. The bridge on Milford Green Road is currently closed, which creates a lengthy detour route for residents west of Bermudian Creek traveling east when Creek Road floods. There are no official detours set for when roadways flood in this area.

Detters Mill Road is another location impacted by flooding events. This roadway is an important connection to SR 0074, so when the roadway floods, it can create lengthy detours. Memory Lane, which branches off of Detters Mill Rd, serves a cul-de-sac that can become isolated by flood waters during flooding events. The bridge that serves this cul-de-sac is scheduled to be improved.

The municipalities mentioned a number of improvements in this group within the next 5 years, including the Home Road Bridge, Protectory Road Bridge, Shady Dell Road Bridge, and the North School Road Bridge.

**Group E: East Manchester Township, Conewago Township, and Newberry Township**

Group E centers on the intersection of Bowers Bridge Road (SR 1013) and Conewago Creek Road (SR 1004). The roadway at the intersection of Bowers Bridge Road and Cly Road tends to flood downstream of the bridge that crosses the Conewago Creek, which leaves that section of Bowers Bridge Road closed for 1 day on average. Rooster Lane, which branches off of Bowers Bridge Road, tends to flood during flash flood events between an unnamed farm lane and Conewago Creek Road. These flooding events typically last for a few hours on average. Rooster Lane is a dirt and gravel road, so when the roadway floods, it typically is damaged and needs to be repaired.

Conewago Creek Road is typically the first road to flood in East Manchester Township. The road has a tendency to flood west of Bowers Bridge Road for an average period of a few hours, and from the horseshoe bend at Bowers Bridge Road east along the Conewago Creek to the end of Creek Bottom Road on the other side of York Haven Road (SR 0181). Conewago Creek Road is typically closed for 1-2 days on average at this location. There is little that could be done for this road to reduce the impact of flooding events, due to the road’s close proximity to the Conewago Creek. The only possible improvement mentioned was to improve drainage along the roadway to reduce the amount of time that the road is flooded.

There are many areas outside of the current Group E boundary that have issues with flooding, specifically along SR 0392 and SR 0382, Old Quaker Road, Valley Road, and Pines Road in Newberry Township, and locations throughout East Manchester Township. Newberry Township stated that there are road closure detours for both Valley Road and Pines Road during flooding events.
A follow-up meeting with East Manchester Township was held to discuss the roads in their township that have been known to flood. Codorus Furnace Road in the east corner of the township where it crosses the Codorus Creek will flood during severe flooding events, and the bridge that crosses the Codorus Creek has become submerged in the past. This can lead to this section of the road being closed for approximately 1 week while the bridge is inspected.

Mundis Race Road along the Codorus Creek and North Sherman Street Extended (SR 0024) have also been known to flood during heavy storms. It was mentioned that a larger diameter pipe on North Sherman Street Extended and raising the roadway where it crosses a tributary to the Codorus Creek alongside the Springettsbury Wastewater Treatment Facility might mitigate roadway flooding in this area.

Another road in the township that floods is Jerusalem School Road, just north of Horseshoe Bend Road. The road crosses a tributary to the Codorus Creek at this location, and floodwaters will overwhelm the pipe that crosses under the roadway. The Township mentioned that replacing the pipe with a bridge would allow for a greater volume of water to pass under the roadway, reducing or potentially eliminating flooding at this location.

The last locations that were discussed in East Manchester Township were Wago Road, Gut Road, and Riverview Road, which run along the west bank of the Susquehanna River. Sections of these roads will flood when the river rises, forcing them to close. There are road closure gates installed on Gut Road which can be closed by the police, road master, or fire department.

**Group F: Dover Township, West Manchester Township, and Conewago Township**

The location of group F centers on Carlisle Road (SR 0074) where it crosses the Little Conewago Creek. The bridge on SR 0074 labeled “YB 1949/SR 49.8” is scheduled for replacement in 2018-2019, and should address some of the issues with flooding at this location. The local bridge on Emig Mill Road between Village Square Drive and Tracys Way is scheduled to be improved within the next 5 years, and Emig Mill Road is scheduled to be paved from Mayfield Drive to SR 0074 in 2018. Dover Township mentioned that the diameter of the pipe that runs under SR 0074 at the intersection of SR 0074 and Emig Mill Road should be increased in order to alleviate roadway flooding at this location. Another suggestion for improvement was the Fox Run Road Bridge that crosses Fox Run just north of Palomino Road.

Some other roads that were identified as having issues with flooding were Sedgewick Avenue (under severe flooding conditions) and Hilton Avenue along the Little Conewago Creek. Also, the Cardinal Lane Bridge over Fox Run floods due to a build-up of debris during flooding events.

There were no established detours for road closures due to flooding events that were mentioned for this group.

**Group G: Spring Garden Township and Springettsbury Township**

The area of study for Group G focused on the segment of Interstate 83 between the Market Street (SR 0462) Exit and Loucks Mill Road (SR 3029). Interstate 83 has an Average Annual Daily Traffic (AADT) of
33,120 northbound and 33,750 southbound at this location, so it is a major disruption to the transportation network of York County when this section of I-83 floods. Exit 19 at Market Street also has a history of flooding, with flood waters inundating both Market Street and the Southbound and Northbound entrance ramps.

The other roads within Group G that have had a history of flooding are Eberts Lane, North Sherman Street (SR 1033), and Loucks Mill Road (SR 3029). These locations all have a history of flooding along Mill Creek, creating lengthy detours.

There are planned improvements within Group G, most notably the North York Widening Project for I-83 from exits 19 to 22.

Group H: Hellam Township and Hallam Borough

Group H focuses on the area around the intersection of West Market Street (SR 0462) and Kreutz Creek just south of Route 30. The location that was identified as the most prone to flooding is on Freysville Road (SR 2001) at the two bridges labeled “YB 1988/SR 81.7” and “YB 1988/SR 80.7”. Other locations that were listed as prone to flooding were the bridge on South Broad Street (SR 2019) labeled “YB 1939/SR 92.3”, just south of the intersection with South Prospect Road, and Ducktown Road (SR 2021). Both of these roads flooded during Tropical Storm Lee in 2011. The Ducktown Road Bridge was damaged during Tropical Storm Lee, and has since been replaced.

Group I: Windsor Township and Lower Windsor Township

The map for group I centers on the intersection of Witmer Road (SR 2013) and East Prospect Road (SR 0124). According to the municipalities, Riddle Road and East Prospect Road typically flood at the same time, but only during extreme flooding events. When Riddle Road floods, the flood waters average up to 12”. Flooding on Riddle Road is fairly short-lived, typically lasting less than 1 hour. There is no established detour route when these roads flood.

Some improvements to make note of in the area are the replacement of the bridge on East Prospect Road that was built in 1923, which is currently under way. Also, some of the pipes underneath Meadow Road were replaced in 2017, before it was resurfaced and raised approximately 2”. There are no planned improvements scheduled in this location within the next 5 years.

Group J: West Manchester Township, Spring Garden Township, North Codorus Township, York Township, and New Salem Borough (Appendix 3)

Group J is located southwest of York City, centered on Indian Rock Dam and the surrounding area. This area is severely impacted by major flooding events, as Trinity Road (SR 0616), West College Avenue (SR 3046), Indian Rock Dam Road (SR 3044 & 0182), and Days Mill Road (SR 3042) will all close during flooding events, sometimes for several days. This is due to Indian Rock Dam closing during flooding conditions, which causes extensive flooding upstream from the dam. Other roads throughout the area also flood, including Graybill Road, Woodberry Road, Glatfelter Station Road (SR 3020), Hokes Mill Road (SR 0182),
Lemon Street, Camp Betty Washington Road (SR 2005), and Tri Hill Road. When all of these roads close during a flooding event, it can create very lengthy detours for commuters.

The two roads that remain open during flooding events are Stoverstown Road (SR 3061), and Markle Road, which crosses over Indian Rock Dam. Trinity Road, West College Avenue, Indian Rock Dam Road, and Woodberry Road all have permanent flood gates installed that can be closed when the dam closes, but there is currently no defined detour for the area when flooding occurs. Besides Intelligent Transportation System (ITS) signing, there are currently no improvements planned in the next 5 years within the area.

**Group K: Felton Borough and North Hopewell Township**

Group K centered on the intersection of Red Lion Avenue (SR 2079) and Main Street (SR 2054) in Felton Borough. Main Street in Felton Borough reportedly floods during flooding events, just east of the intersection with Red Lion Avenue, and the bridge that crosses the North Branch of Muddy Creek on Herbst Road (SR 2058) can be forced to close due to swiftly moving flood waters. Other roads that have minimal flooding within this group are Seitz Road, Rippling Run Road, and Maul Avenue.

Church Avenue in Felton Borough is a dead-end street that serves several residences. The bridge labeled “YB 1991/SR 93.6” floods frequently during flooding events, leaving the residences south of the bridge stranded. A possible solution would be to extend Church Avenue south to Crossroads Avenue in North Hopewell Township. This road improvement effort would have to be coordinated between the Borough and the Township, and could be funded under the “municipal dirt and gravel” program.

Other possible improvements within Group K involve raising the road grade of Water Street at the bridge crossing of the North Branch of Muddy Creek, which could help reduce the frequency of flooding on this roadway. Also, both the Borough and Township completed stream restoration projects for the full length of Muddy Creek within the Borough between 2009 and 2010. Additional stream embankment stabilization could be completed for the extension of Pine Run, which would lessen the impact of flooding in the area.

One road outside of the group boundary was mentioned after the meeting was held - Potosi Road at the bridge over the East Branch of the Codorus Creek. This bridge has a history of flooding due to it being undersized, as well as poor stream geometry. North Hopewell Township is planning to replace and upgrade this bridge within the next 5 years, which should address this issue.

It is recommended that both the Borough and Township adopt guidelines for closing roads during flooding events, as this will help with determining when a roadway or bridge should be closed.

**Group L: North Codorus Township and Seven Valleys Borough**

The area of study for group L ranges from Jefferson Borough to Seven Valleys Borough. This area has many bridges, both local and state-owned. These roadways and bridges have a tendency to flood, starting at Brush Valley Road and moving east towards the bridge on Main Street (SR 0214) in Seven Valleys Borough, which has flooded in the past (since the bridge was replaced in 2012, there has been no recorded flooding at this location). Maple Street in Seven Valleys Borough also has a tendency to flood, and in extreme
flooding events, Green Valley Road (SR 3041) has flooded at the bridge near Jefferson Borough labeled “YB 1923/SR 81”.

Detours for when this area floods are Green Valley Road or Zeiglers Church Road (SR 3076) to the north, and Shaffers Church Road to the south. Some of the roads in this area are scheduled to be paved in 2018, which could potentially make these roads more flood resilient. These improvements include the north side of Panther Hill Road (currently tar & chip), Spangler Road (currently dirt & gravel), Hoff Road (currently tar & chip), and Stauffer Road. The pipe underneath the Junction Road Bridge is also planned to be improved within the next 5 years.

**Group M: North Codorus Township, Codorus Township, and Manheim Township**

Group M is located at the intersection of Sinsheim Road (SR 3041) and Park Road (SR 3051). The only location identified as being flood-prone was Sinsheim Road at the bridge that crosses the Codorus Creek. Since the reconstruction of this bridge, which included expanding the span of the bridge, Sinsheim Road floods infrequently. When it does flood, the waters are typically 4-6” deep. Detours for when this roadway floods are Pentland Road to the east, or Park Road to the west.

**Miscellaneous Correspondence**

After the municipal meetings were conducted, a location was identified as flood-prone by Manchester Township on Emig Road between George Street and Church Road. Emig Road flooded in this location in 2011 during Tropical Storm Lee, which prompted PennDOT to clean the swale located along the west side of the railroad right-of-way. There has been no recorded flooding at this location since the swale has been cleaned.
APPENDIX IV:
VULNERABLE ROADWAY GROUP MAPS
APPENDIX V

YORK COUNTY FLOODED ROADWAY STUDY

30-DAY COMMENT PERIOD

MAY 14, 2018 – JUNE 12, 2018

DOCUMENTATION OF PUBLIC SOLICITATION AND COMMENT

Prepared by the York County Planning Commission

June 15, 2018
STRATEGIES AND SCHEDULE FOR PUBLIC INVOLVEMENT
Comments: In accordance with applicable state and federal legislation, and YAMPO’s adopted Public Participation Plan (PPP), the YCPC staff recommends the following strategies and schedule for the public comment period of the York County Flooded Roadway Study Draft. At their April meeting, the YAMPO Coordinating Committee adopted the strategies and this schedule provided below.

YAMPO will:

- Allow for at least 30 days of public comment about the York County Flooded Roadway Study prior to its adoption by the YAMPO Coordinating Committee;
- Publish a press release in the York Daily Record/Sunday News, the York Dispatch, the Hanover Evening Sun, and the Harrisburg Patriot News. The release must include the dates of the public comment period and the methods by which the public should communicate their comments to YAMPO; and,
- Employ visualization techniques including maps and infographics that allow the public to more easily understand the York County Flooded Roadway Study.

Additionally, the PPP asks staff to determine which step on a five-step scale of involvement we are trying to achieve for any given document. The five steps are ascending in involvement, and a higher step includes all steps below it.

The YCPC Staff considers the public comment period of the York County Flooded Roadway Study during which the public should have some involvement. For that reason, The YCPC Staff recommends the York County Flooded Roadway Study as a Step 1, or strategy to Inform, document. The PPP defines informing as “providing the public with information to assist them in understanding the problem, alternatives and/or the solution.”

For each step, the PPP lists suggested outreach strategies. Given the categorization discussed above, the YCPC Staff recommends YAMPO undertake the following outreach efforts for the York County Flooded Roadway Study Draft:

- Communicate the draft study and the opportunity for comment with the media via a press release;
- Communicate the draft Study and the opportunity for comment with the public via:
  - YCPC e-mail alert,
Correspond with each municipality for which flood-vulnerable roadways are identified in the study; and,

- The YCPC Staff recommends the York County Flooded Roadway Study Draft be made available, at a minimum, at:
  - York County Planning Commission office.

Staff recommends that the public be able to comment on the York County Flooded Roadway Study Draft via:

- Letter to York County Planning Commission offices,
- E-mail to YCPC Transportation staff,
- Telephone call to YCPC Transportation staff, and
- A comment form at the above listed location, to be collected by the staff of the location and returned to YCPC staff prior to the end of the public comment period.

Staff recommends the following schedule for the York County Flooded Roadway Study Draft public comment and adoption:

- No later than May 22, 2018: Beginning of public comment period;
- No later than June 20, 2018: End of public comment period;
- June 21, 2018: YAMPO Coordinating Committee agenda packet mailing, including a summary of all public comments received and YCPC staff response where applicable; and,
- June 28, 2018: YAMPO Coordinating Committee meeting with approval of the York County Flooded Roadway Study Draft on the agenda.
PUBLIC SOLICITATION
Media Outlets/Contacts and Outreach Efforts

1. York Dispatch: News Article (York Daily Record and Harrisburg Patriot News were also contacted)

2. YCPC Website: Main Webpage (a) and News Release (b)

3. YCPC E-Alert

4. YCPC Facebook

5. YCFRS Electronic Mailings
   - Municipalities (a)
   - YAMPO Committees/Adjoining MPO’s
   - YCRFS Steering Committee/York County 911/YCPC HAZMIT Planner (b)
   - YCPC Chiefs
   - Public Comment Form (c) (for Website, E-Alert and YCPC Office Display)

6. York County Transportation Coalition – Quarterly Meeting – April 19, 2018

7. Flood and Water Pollution Solutions – A public meeting hosted by the York County Planning Commission – June 21, 2018

8. Additional Electronic Mailings
   - YCFRS mailing to local Fire Chiefs – July 7, 2018
   - YCFRS mailing to local Police Chiefs – July 7, 2018
York County officials ask residents to identify flooding locations

Lindsay C. VanAsdalan, 717-505-5450/@lcvanasdalan Published 2:29 p.m. ET May 16, 2018 | Updated 4:18 p.m. ET May 20, 2018

Lake Clarke Marina's parking lot is under water as the Susquehanna River starts to overflow its banks in the Long Level area. River ice continues to back up against the Safe Harbor Dam in Chanceford Township, Monday January 15, 2018. John A. Pavoncello photo (Photo: The York Dispatch)

County officials are looking for input from residents on a flooding study to identify any vulnerable locations or flood events the study might have missed.

The York County Planning Commission, on behalf of the York Area Metropolitan Planning Organization, is opening the study draft to comment and review online through June 12.

Residents can provide information on flood-vulnerable locations, flooding and road closures in the county.
More: VIDEO: July 17 flooding on Industrial Highway in Springettsbury Twp.

The York County Flooded Roadway Study, publicly available online at ycpc.org, was done to identify which roadways or bridges might need flood protection.

Rehabilitation or resurfacing projects can get flood proofing or flood resiliency when funded through the YAMPO Transportation Improvement Program.

Flood proofing is for critical locations in which one road has to stay open during flooding events, and flood resiliency is for other areas that need protection but are not considered for proofing.

The focus of the study is on road closures caused by heavy rain and high water levels — not inadequate or clogged storm sewer systems and road-surface ponding.

Information on flooding closures was collected from the Pennsylvania Department of Transportation, York County Emergency Management Agency (York County 911) and municipalities.

More: Power outages, flooding linger following powerful nor’easter

Comments on the study should be directed to Jephrey L. Rebert, senior transportation planner, at jrebert@ycpc.org, mailed to 28 E. Market St., Room 301, York 17401, or given by phone at 717-771-9870.

The study also is available for review at the York County Planning Commission, in the county administration center, 28 E. Market St., Room 301.

YAMPO is scheduled to take action based on the study at its regular meeting at 9 a.m. Monday, June 28, in the administration center.
2a. YCPC Website Main Page, “Latest News”
2b. YCPC Website YCFRS New Release

Public Comment Opportunity for Flooded Roadway Study

York County Flooded Roadway Study, Addressing and Planning for Roadways Affected by Flooding Events within York County

The York County Planning Commission (YCPC) on behalf of the York Area Metropolitan Planning Organization (YAMPO) announces the start of the public review and comment for the draft of the York County Flooded Roadway Study. You are invited to comment on the study draft during this time. We are looking for flood-vulnerable locations not identified in the study, as well as additional information about flooding events and road closures in the County. The comment period will open May 14, 2018, and extend 30 days until June 12, 2018. Please submit all comments to Jophrey L. Rebert, Senior Transportation Planner at jrebert@ycpc.org. Comments will also be accepted through regular USPS mail at the following address: 28 East Market Street, Room 301, York, PA 17401-1480 and by telephone call, (717) 757-9400 x 1726. You may use this comment form to make and submit your comments.

The purpose of the study is twofold: it identifies roadways and bridges within York County that are vulnerable to flooding events; and it identifies which of these roadways/bridges should be taken into consideration the next time rehabilitation or resurfacing projects are proposed in the surrounding area. The goal of the study is to serve as an aid identifying locations within York County that require flood proofing or flood resistance when a project is funded through the YAMPO Transportation Improvement Program (TIP).

The study focuses on flooding events where a roadway crosses its banks due to an intense rain event, closing a road and/or bridge. Widespread flooding and subsequent road closures caused Tropical Storm Lee in 2011 is an obvious example. The study does not address the inundation of this infrastructure by inadequately designed storm sewer systems and road surface ponding.
To keep you updated on activities and current events, the York County Planning Commission has created E-Alerts. These E-Alerts are just another way to keep you connected with what is taking place in and around your community. Please explore the articles below or visit the links to the left for other helpful information.

---

**York County Parks Story Map**

YCPC has volunteered to develop a story map to commemorate the York County Parks 50th anniversary. This interactive story map is a timeline of the establishment and growth of the York County Parks. It includes old and new images, links for more information, and maps. This project took a lot of collaboration between YCPC and York County Parks. It is just another example that demonstrates our strong and effective partnership over the years. The YCPC is proud to share this interactive timeline with you, the Parks, and with the citizens of York County. Click [here](#) to preview the story map.

If you have questions about the story map, please contact Tanya Wall, Anne Walko, or Heather Bitner.

If you have questions about the Parks 50th anniversary, please contact Tammy Klunk.
The York County Planning Commission (YCPC) on behalf of the York Area Metropolitan Planning Organization (YAMPO)* announces the start of the public review and comment for the draft of the York County Flooded Roadway Study. You are invited to comment on the study draft during this time. We are looking for flood-vulnerable locations not identified in the study, as well as additional information about flooding events and road closures in the County. The comment period will open May 14, 2018, and extend 30 days until June 12, 2018. Please submit all comments to Jephrey L. Rebert, Senior Transportation Planner at jrebert@ycpc.org. Comments will also be accepted through regular (USPS) mail at the following address: 28 East Market Street, Room 301, York, PA 17401-1580 and by telephone call, (717) 771-9870x1726. You may use this comment form to make and submit your comments.

The purpose of the study is twofold: it identifies roadways and bridges within York County that close due to flooding events; and it identifies which of these roadways/bridges should be taken into consideration the next time rehabilitation or resurfacing projects are proposed in the surrounding area. The goal of the study is to serve as an aid identifying locations that require flood proofing or flood resiliency when a project is funded through the YAMPO Transportation Improvement Program (TIP).

The study focuses on flooding events where a waterway crests its banks due to an intense rain event, closing a road and/or bridge. Widespread flooding and subsequent road closures caused Tropical Storm Lee in 2011 is an obvious example. The study does not address the inundation of this infrastructure by inadequate or clogged storm sewer systems and road surface ponding.

The YCPC Transportation staff collected flood event/road closure data from the following sources: PennDOT, York County Emergency Management Agency (a.k.a., “York County 911”) and York County municipalities. The flood-vulnerable locations identified in York County from all these data sources are shown on the enclosed map. A more detailed version of these locations are provided by clicking here.

The flood-vulnerability locations in the transportation system are placed into two groups, flood proofing and flood resiliency. Flood proofing identifies road and bridges at critical locations in the transportation system of York County where one road should remain open during flooding events. Flood resiliency identifies roads and bridges with the transportation system that are not considered for flood proofing, but they should be designed to be resilient to flooding events the next time improvements are considered here.

The Draft Study is also available for review at the York County Planning Commission, 28 East Market Street, Room 301, York, PA 17401-1580, in addition to the YCPC website.

The York Area Metropolitan Planning Organization (YAMPO) is scheduled to act on this study at their regularly scheduled meeting at 9:00 A.M. on June 28, 2018. The meeting will be held in the York County Administration Center, 28 East Market Street, York, PA 17401-1580.

* The York Area Metropolitan Planning Organization (YAMPO) is a local decision-making body for Federal and state transportation funding for York County.

The YAMPO fully complies with Title VI of the Civil Rights Act of 1964, the Civil Rights Restoration Act of 1987, Executive Order 12898 on Environmental Justice, and related nondiscrimination statues and regulations in all programs and activities. YAMPO's website, www.yampo.org, may be translated into multiple languages. Publications and other public documents can be made available in alternative languages and formats, if requested. YAMPO public meetings are always held in ADA-accessible facilities and in transit-accessible locations when possible. Auxiliary services can be provided to individuals who submit a request. These requests will be accommodated to the greatest extent possible. Any persons who believes they
have been aggrieved by an unlawful discriminatory practice by YAMPO under Title VI has a right to file a formal complaint. Any such complaint may be made in writing and filed with YAMPO's Title VI Compliance Manager and/or the appropriate state or federal agency within 180 days of the alleged discriminatory occurrence. For more information on YAMPO's Title VI program, or to obtain a Title VI Complaint form, please contact Will Clark, Chief of Transportation Planning at (717) 771-9870 or wclark@ycpc.org.

York County Planning Commission | (717) 771-9870 | wgobrecht@ycpc.org | 28 East Market Street York, PA 17401-1580

Missed an E-Alert?
If you missed one of our E-Alerts or are just interested in looking back through past E-Alerts, please visit the [YCPC E-Alert Archives](#) page.
4. YCPC Facebook

**Event Details**

**Event Name:** Flood & Water Pollution Solutions Public Meeting

**Location:** York Learning Center (Old Central High School), 300 East 7th Ave, York, PA 17404

**Date and Time:**
- Thursday, June 21 at 7:00 PM - 8:30 PM EDT
- Next Week

**Description:**
The York County Planning Commission invites county residents, municipal officials, and businesses to join us for a public information session to discuss the scale of flooding and water pollution in the County, along with potential solutions.

Doors will open at 6:30 pm. Come to the public meeting to learn more, ask questions, and share your thoughts with us. Your input will help shape this important effort.

Approximately 1,100 miles of streams that don’t meet mandated environmental standards have been identified in the County, and there are still many miles of streams to evaluate. In addition, the Commission has identified 215 locations on roads in the county that experience frequent flooding problems.

Among the solutions that will be discussed at this public meeting will be creation of a countywide stormwater authority. If approved by the York County Commissioners, this new local agency would address flooding and pollution problems by investing in stream restoration, erosion control, and reforestation projects along county waterways.

Please share this notice with any other interested parties, and also mark your calendars for additional public meetings on September 25th and November 8th!
Dear Municipal Official:

Below, you will find a news release of the 30–day review and comment period being held for the York County Flooded Roadway Study. We request that you provide us with additional flood vulnerable locations within your municipality we did not address in this study. PLEASE DISREGARD THE E-MAIL SENT YOU PREVIOUSLY; IT DID NOT TRANSMIT PROPERLY.

“York County Flooded Roadway Study, Addressing and Planning for Roadways Affected by Flooding Events within York County”

The York County Planning Commission (YCPC) on behalf of the York Area Metropolitan Planning Organization (YAMPO)* announces the start of the public review and comment for the draft of the York County Flooded Roadway Study. You are invited to comment on the study draft (posted on www.ycpc.org) during that time. We are looking for flood–vulnerable locations not identified in the study, as well as additional information about flooding events and road closures in the County. The comment period will open May 14, 2018 and extend 30 days until June 12, 2018. Please submit all comments to Jephrey L. Rebert, Senior Transportation Planner at jrebert@ycpc.org. Comments will also be accepted through regular (USPS) mail at the following address: 28 East Market Street, Room 301, York, PA 17401-1580 and by telephone call, (717) 771-9870x1726.

The purpose of the study is twofold: it identifies roadways and bridges within York County that close due to flooding events; and it identifies which of these roadways/bridges should be taken into consideration the next time rehabilitation...
or resurfacing projects are proposed in the surrounding area. The goal of the study is to serve as an aid identifying locations that require flood proofing or flood resiliency when a project is funded through the YAMPO Transportation Improvement Program (TIP).

The study focuses on flooding events where a waterway crests its banks due to an intense rain event, closing a road and/or bridge. Widespread flooding and subsequent road closures caused Tropical Storm Lee in 2011 is an obvious example. The study does not address the inundation of this infrastructure by inadequate or clogged storm sewer systems and road surface ponding.

The YCPC Transportation staff collected flood event/road closure data from the following sources: PennDOT, York County Emergency Management Agency (a.k.a., “York County 911”) and York County municipalities. The flood-vulnerable locations identified in York County from all these data sources are shown on the enclosed map. A more detailed version of these locations are provided using this GIS viewer link:

http://yorkcountypa.maps.arcgis.com/home/item.html?id=ae3822ca47424baba77eb3595ded450c#overview.

The flood-vulnerability locations in the transportation system are placed into two groups, flood proofing and flood resiliency. Flood proofing identifies road and bridges at critical locations in the transportation system of York County where one road should remain open during flooding events. Flood resiliency identifies roads and bridges with the transportation system that are not considered for flood proofing, but they should be designed to be resilient to flooding events the next time improvements are considered here.

The study recommends that the YCPC staff develop a form to send to each municipality after each major rainstorm event or rapid snow melt to record what, if any, roads have flooded during that time. The data returned to our office would provide more accurate accounts on the number of events, number of flooded roads and bridges and the length of road closures for each municipality in the County.

The Draft Study is available for review at the York County Planning Commission, 28 East Market Street, Room 301, York, PA 17401-1580. This document is also available on the YCPC website, www.ycpc.org.

The York Area Metropolitan Planning Organization (YAMPO) is scheduled to act on this study at their regularly scheduled meeting at 9:00 A.M. on June 28, 2018. The meeting will be held in the York County Administration Center, 28 East Market Street, York, PA 17401-1580.

* The York Area Metropolitan Planning Organization (YAMPO) is a local decision-making body for Federal and state transportation funding for York County.

I thank you and your staff for your help in this endeavor.

Sincerely,

Jephrey L. Rebert  
Senior Planner

---

*The York Area Metropolitan Planning Organization (YAMPO) is a local decision-making body for Federal and state transportation funding for York County.*
To York County Flooded Road Study Committee Members,

The YAMPO Coordinating Committee has opened a public comment period for the York County Flooded Roadway Study. In addition to receiving input from the public, the Committee members have an opportunity to review and comment on this document. We will extend the comment period for the Committee members between June 5, 2018 and June 20, 2018. An electronic copy of the report is available for review online at www.ycpc.org. In addition, a physical copy of the report will be displayed at the Reception Desk of the York County Planning Commission, 28 East Market Street, Room 301, York, PA 17401.

Meanwhile, should you have any questions or comments concerning this or any other matters related to the development of this Study, please contact me.

I thank you for your participation in the development of the York County Flooded Roadway Study.

Sincerely,

Jephrey L. Rebert
Senior Planner
5c YCFRS Public Comment Form
Dear Local Fire Chief or Captain,

The Transportation Department of the York County Planning Commission is conducting a study to identify road/bridge flooding in York County. The study attempts to identify roadways in the County that close during flooding events, and of these roadways/bridges, which should be taken into consideration when rehabilitation or resurfacing projects are planned or programmed for implementation in the surrounding area. The goal of this effort is for the study to act as an aid in identifying locations that should have flood issues identified in the Purpose and Needs Statements when road and bridge projects are funded on the York Area Metropolitan Planning Organization (YAMPO) Transportation Improvement Program (TIP). The YCPC Staff defines a flooded roadway as any roadway that is unable to be safely traveled by motorized/non-motorized vehicles or pedestrians due to waters from a nearby body of water cresting its banks and covering the roadway. This excludes roadway ponding due to clogged or undersized drainage facilities, or the lack of drainage due to a deteriorated roadway.

The critical element in developing this type of study is to obtain an accurate and detailed history about flooding events that have occurred throughout the County. These data are crucial to identify target flooding areas for evaluation and further study and or improvement. Hence, our staff is providing you copies of the Flooded Roadway Location Map (Map 1 of the study) and the Historical Flooded Roadways Data Collection Table (taken from the Study Appendix) attached to this E-Mail message. The data provided in the Historic Flooded Roadway Table (and plotted on the attached Map) were collected from PennDOT, York County Emergency Management Agency (aka, York 911) and York County municipalities (i.e., managers/administrators, public works directors, EMA staff, road crew foremen and/or zoning officers).

Our goal with this effort is to ensure that the flooded roads/bridges list is complete by contacting all agencies involved in coordinating emergency services for such events. Hence, we request that your department review the roadway listing and inform us if you have information on the flooding locations listed in the attached table. Also, please provide us with additional locations not identified in this table. Also, if you can identify additional flooding event locations, please provide us information you may have about flood events which have occurred in your jurisdiction over the past five years. We need to know how many events have occurred per year and the average length of time that the roads and/or bridges were flooded during each year. If detour routes have been designated for some or all of these affected roadways and bridges, please provide a map or a listing of roads which comprise the detour routing. The methods (e.g., signing or barricading) to close traffic to these areas should also be provided with this list.

PLEASE RESPOND TO THIS INFORMATION REQUEST BY AUGUST 15, 2018.

Meanwhile, should you have any questions or comments about our request, please contact me either by telephone or E-Mail.

I thank you for your assistance in this endeavor.
Sincerely,

Jesse King
Planner
To:    jpollock@ellamtownship.com; PoliceInfo@lowerwindsor.com; police@newberrypd.org; info@nerregionalpd.us; info@pennpolice.com; info@srpd.us; police@wmtwp.com; police@westmanheimpd.com; ASCHAUM@WRIGHTSVILLEBOROUGH.COM
Cc:    Will Clark; Jeph Rebert
Subject:  York County Flooded Roadway Study Draft, 2018 - Local Police Chiefs and Captains
Attachments:  FRDCT.pdf; Flooded_roads_County_Map_8x10.pdf

Dear Local Police Chief or Captain,

The Transportation Department of the York County Planning Commission is conducting a study to identify road/bridge flooding in York County. The study attempts to identify roadways in the County that close during flooding events, and of these roadways/bridges, which should be taken into consideration when rehabilitation or resurfacing projects are planned or programmed for implementation in the surrounding area. The goal of this effort is for the study to act as an aid in identifying locations that should have flood issues identified in the Purpose and Needs Statements when road and bridge projects are funded on the York Area Metropolitan Planning Organization (YAMPO) Transportation Improvement Program (TIP). The YCPC Staff defines a flooded roadway as *any roadway that is unable to be safely traveled by motorized/non-motorized vehicles or pedestrians due to waters from a nearby body of water cresting its banks and covering the roadway. This excludes roadway ponding due to clogged or undersized drainage facilities, or the lack of drainage due to a deteriorated roadway.*

The critical element in developing this type of study is to obtain an accurate and detailed history about flooding events that have occurred throughout the County. These data are crucial to identify target flooding areas for evaluation and further study and or improvement. Hence, our staff is providing you copies of the *Flooded Roadway Location Map (Map 1 of the study)* and the *Historical Flooded Roadways Data Collection Table (taken from the Study Appendix)* attached to this E-Mail message. The data provided in the Historic Flooded Roadway Table (and plotted on the attached Map) were collected from PennDOT, York County Emergency Management Agency (aka, York 911) and York County municipalities (i.e., managers/administrators, public works directors, EMA staff, road crew foremen and/or zoning officers).

Our goal with this effort is to ensure that the flooded roads/bridges list is complete by contacting all agencies involved in coordinating emergency services for such events. Hence, we request that your department review the roadway listing and inform us if you have information on the flooding locations listed in the attached table. Also, please provide us with additional locations not identified in this table. Also, if you can identify additional flooding event locations, please provide us information you may have about flood events which have occurred in your jurisdiction over the past five years. We need to know how many events have occurred per year and the average length of time that the roads and/or bridges were flooded during each year. If detour routes have been designated for some or all of these affected roadways and bridges, please provide a map or a listing of roads which comprise the detour routing. The methods (e.g., signing or barricading) to close traffic to these areas should also be provided with this list.

**PLEASE RESPOND TO THIS INFORMATION REQUEST BY AUGUST 15, 2018.**

Meanwhile, should you have any questions or comments about our request, please contact me either by telephone or E-Mail.

I thank you for your assistance in this endeavor.

Sincerely,
Sincerely,

Jesse King  
Planner
PUBLIC COMMENT
Comments Received:

1. Mark Hodgkinson, DPW&W, Springettsbury Twp. – Comment
2. Jason Snyder, P.E., Engineer, North Hopewell Twp. – Comment
3. North Hopewell Township – YCPC Response
4. Thomas Shelley, Citizen – Comment
5. Thomas Shelley – YCPC Response
6. Thomas Shelley – 2nd Response
7. Eric Bortner, P.E. Engineer, Penn Twp. – Comment
8. Joy Flinchbaugh, Zoning Officer, Felton Borough – Comment
9. Dan Schmidt, Citizen, Heidelberg Township – Comment
10. Dan Schmidt - YCPC Response
11. Howard Daniels, NE Regional Police Department – Comment
12. Howard Daniels – YCPC Response
13. Guy Hettinger, Penn Township Police Department – Comment
14. Guy Hettinger – YCPC Response
15. Guy Hettinger – 2nd Response
Jephrey,

We reviewed the draft list of roadways in Springettsbury Township that are susceptible to flooding as a result of a body of water surcharging its banks.

The following are not listed in your original draft.

- Industrial Highway – to the east of Rockburn Street
- Stonewood Road – culvert on Stonewood between Eastern Blvd and Boxwood Lane
- Eleventh Ave – at York Nissan/Whiteford Road

- East Market Street at the railroad tracks just east of Locust Grove Road floods a few times a year. The water follows the tracks from the County Prison/911 Center direction and floods Market Street. It is not clear if the stream that flows through the area surcharges its bank or if the flooding waters are coming from sheet flow from the surrounding area.

Please consider adding the above to the overall map.

Contact me with any questions.

Thanks,

Mark

*Mark Hodgkinson*
Director of Public Works & Wastewater
Springettsbury Township
1501 Mt. Zion Road, York, PA 17402
717-757-3521 ext. 433
Fax: 717-840-0680
mark.hodgkinson@springettsbury.com
2.
Jeph
The Board of Supervisors of North Hopewell Township reviewed the Flooded Roadway Study and discussed it at the 6/5/18 board of Supervisors meeting. The Board thanks you for your efforts and has asked both the Fire Chiefs of Station 43 (Felton) and 45 (North Hopewell/Winterstown) to prepare a flooded roadway policy. The Police Chief will provide support to both Fire Companies in developing the policy. In addition to the policy the Township will be purchasing additional signage and equipment to aid both the fire departments and police in properly securing any potentially flooded roadways. 
Sincerely
Jason A. Snyder, PE
North Hopewell Township Engineer

3.
Hi Jason,

Our staff appreciates the North Hopewell Township Board of Supervisors for its support of this study. In addition, we heartily support the flooded roadway actions to be taken by the Township and area fire companies. I will present this E-Mail to the YAMPO Coordinating Committee Board when they meet to approve the study at the end of this month. I know they will also appreciate the Township's response to the study.

Also, I want thank you personally for informing me of the Township's response to this project and for your support for this project over the past several years.

Sincerely,

Jephrey L. Rebert
Senior Planner

4.
I am very distressed by the omission of several local roads in Springfield Township which are routinely flooded by the South Branch of the Codorus: Maple St./Shaffers Church Road at the Springfield/Seven Valleys/North Codorus line; and Seitzville Rd at the Springfield/Codorus line.

In addition, I believe that there should be an "island" designation for York New Salem Borough, for when the flood gates of Indian Rock Dam have been closed the only access to that community is Markel Rd across the dam spillway.

In my opinion, the Army Corps has been too quick of late to close the gate after 3-4 inch rains. While there is a little "protection" for downtown York, it comes at great inconvenience to the growing suburbs to York's west and south.
In particular—and germaine to this study—the flooding of SR 616 creates a huge traffic impact. That route is a heavily traveled shortcut to I-83 south from points west of the City. Do a traffic count on Yellow Church Rd (SR 3018) and PA 216 between Centerville and Yellow Church. The rush hour traffic volume is significant. My suggestion is that SR 616 become an elevated causeway from Wilmer Miller's Garage to the YorkRail crossing at Graybill so that dam closures would have no effect on this artery.

J. Thomas Shelley
PO Box 463
Loganville PA

Springfield Township resident since 1991 York County resident since 1960

5.

Tom,

Good Afternoon!

I thank you for your input for the York County Flooded Roadway Study.

First, our staff will add your recommendations for flooded local roads in Springfield Township to our Flooded Roadway Study database.

Secondly, New Salem Borough access seems to qualify more as a "barrier" since Markel Road remains open across the dam during these events (as you mentioned). Moreover, Stoverstown Road also remains open during flooding events, particularly Tropical Storm Lee in 2011 (I can personally attest to this road opening at that time). Hence, Borough residents have at least two points of access that remain open to traffic during flooding events.

Thirdly, the York Area Metropolitan Planning Organization (YAMPO) has officially requested the United States Army Corps of Engineers (USACOE) to update its 1987 Flood Emergency Plan for the Indian Rock Dam Facility. To date, the Corps has not responded to our request.

Finally, the elevated causeway you propose for PA Route 616 was explored by our staff and the YAMPO; however, the cost to construct such a structure is prohibitive.

Should you have any further questions or comments about these and other matters relating to this study, please feel free to contact me.

I thank you again for your interest in the York County Flooded Roadway Study.

Jephrey L. Rebert
6.

Thanks for your reply.

Re: York New Salem barrier vs island: I can recall hearing the WSBA announcers in June of 1972 after TS Agnes saying "York New Salem is an island". The backwater from Indian Rock Dam had closed Stoverstown Rd and Salem Rd; the south branch of the Codorus had cut off access from the south via Seven Valleys; and Markel Rd was not even an option because there was flooding on Hoke's Mill Rd.

Agnes obviously much more serious than TS Lee throughout the county.

Re: Springfield Twp Roads--thank you for the addition.

Have a safe weekend!

Tom Shelley

7.

Jeph,

I went through the study again. Everything appears correct to me.

Have a great day!

Eric Bortner
Penn Township

8.

Maul Avenue is listed on the map as Maw Ave.

Thanks,
Joy Flinchbaugh
Felton Borough
9.

Hi Jephrey,

Here's a 20 second video (link to the video below) of the flooding along our section of Rt 116 (York Rd) with each heavy rain. I don't know if this qualifies as "flooding" but I thought I'd make you aware as we have no real drainage I can see. This is in front of my house that I bought last year at 6581 York Rd; Spring Grove, PA 17362.

Thanks,
Dan Schmidt

10.

Hi Dan,

I thank you for the video you sent me earlier this week. I apologize for not getting back to you sooner, but I've been in and out of the office all week.

I shared this video with the Flooded Roadway Study team members. We all agree with you that this event was caused by lack of drainage here and not by a nearby stream cresting its bank. But, we will keep this video on file for use in future storm water management and related projects.

I thank you for sharing this video with our staff and for your interest in the York County Flooded Roadway Study.

Sincerely,

Jephrey L. Rebert  
Senior Planner

11.

SR 1004, Conewago Creek Rd from Bowers Bridge Rd to Park St. is where we normally experience flooding. Cassel Rd is in Newberry Twp and doesn't intersect Conewago Creek Rd. The other listings for East Manchester Twp are correct.

Howard Daniels  
Lieutenant
12.

Good morning Howard,

Thank you for your quick response. We will make sure that the correction you noted for Conewago Creek Rd is changed to be within the correct limits.

Thank you for your assistance,

**Jesse King**
*Planner*

13.

Jesse

Over the last 5 years Penn Township has not had much roadway flooding that required the roadway to be closed. However, the severe rain/storms of July 25th did require a number of roadways to be closed (using road flares and barricades) for about an hour and a half. Please see the attached list for the road closures on that date. No detours were established as there was not enough time to do so.

The areas that occasionally experience flooding when rain volume is EXTREMELY heavy are:

Moulstown Road (SR 3072) in the 400 block of Penn Township
Frederick Street (SR 194) in the 700 block (just east of the Adams County line)

These roadways may require a short closure (under 30 minutes) to allow the high water to recede. This only happens about once a year or so.

**Guy W. Hettinger**
*Acting Chief of Police*
Penn Township Police Department
Main Narrative

SGT. JEDADIAH SHEarer (18)

07/25/2018 21:04:28 - 18 SGT. JEDADIAH SHEarer

On above date beginning at approx 1745 hrs the Penn Township area received extremely heavy rain due to a severe storm. Numerous roads were completely closed due to severe flooding. Chief Hettinger was contacted by phone and notified of the situation. I contacted Kevin Mahan and his crew to assist with barricades and road clean up due to debris from the severe flooding. YCC also received multiple calls for service to include flooded basements and sewage backups throughout Penn Township. Bill Mahone was contacted by YCC for the sewer complaints and the Fire Department was notified for the miscellaneous calls for service.

The following roadways were completely closed due to severe flooding from approx 1800 hrs until 1930 hrs:

600 Blk of Boundary Ave
400 Blk of Moulstown Rd
Park Heights Blvd at Dougherty Dr
York St at Mumma Ave
Frederick St at Orchard Ln
W Granger at Park Heights
Westminster at Little Bridge
Ridge Ave at Old Ridge
Baer Ave at Charles Ave
Baer Ave at Wirt Ave
Baugher Dr
Earl St
Scott St
Sherman St

Pd assisted with road closures and traffic control for above roadways.
14.

Good afternoon Guy,

Thank you for the information, we will be adding the roads that you provided to our Historical Flooded Roadways Data Collection Table. We continue to improve our inventory of flooded roadways in York County, and this type of information is exactly what we are looking for.

I viewed each location via google maps to familiarize myself with the streets and where they experienced flooding, and I just wanted to verify with you that some of the locations were flooding strictly from a body of water crested its banks and flooding the roadway, and not from excessive runoff or a lack of sufficient stormwater infrastructure. For the following locations, I was not able to locate where the source of the flood waters was coming from:

W Granger St at Park Heights Blvd
Baer Ave at Charles Ave
Baer Ave at Wirt Ave

If you could provide me with the source/cause of the flooding for these locations, I would truly appreciate it.

Thank you again for all of your help,

Jesse King
Planner

15.

Jesse

The three (3) areas below were flooded due to poor drainage of excess runoff.

Guy W. Hettinger
Acting Chief of Police
Penn Township Police Department
Appendix VI

Completed ID Group Studies

* Once they are completed, the detailed studies for Priority 1 and 2 will be added to this document as appendices.*