



ASSET MANAGEMENT: A FOUNDATIONAL AND ACCESSIBLE TOOL FOR ACHIEVING PLAN GOALS

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SPEAKERS



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WHO WE ARE

- Full-Service Civil Engineering Firm
- 60+ Years of Experience
- 11 Offices
- 350+ Employees
- 100% Employee-Owned (ESOP)
- Pennsylvania Firm of Choice

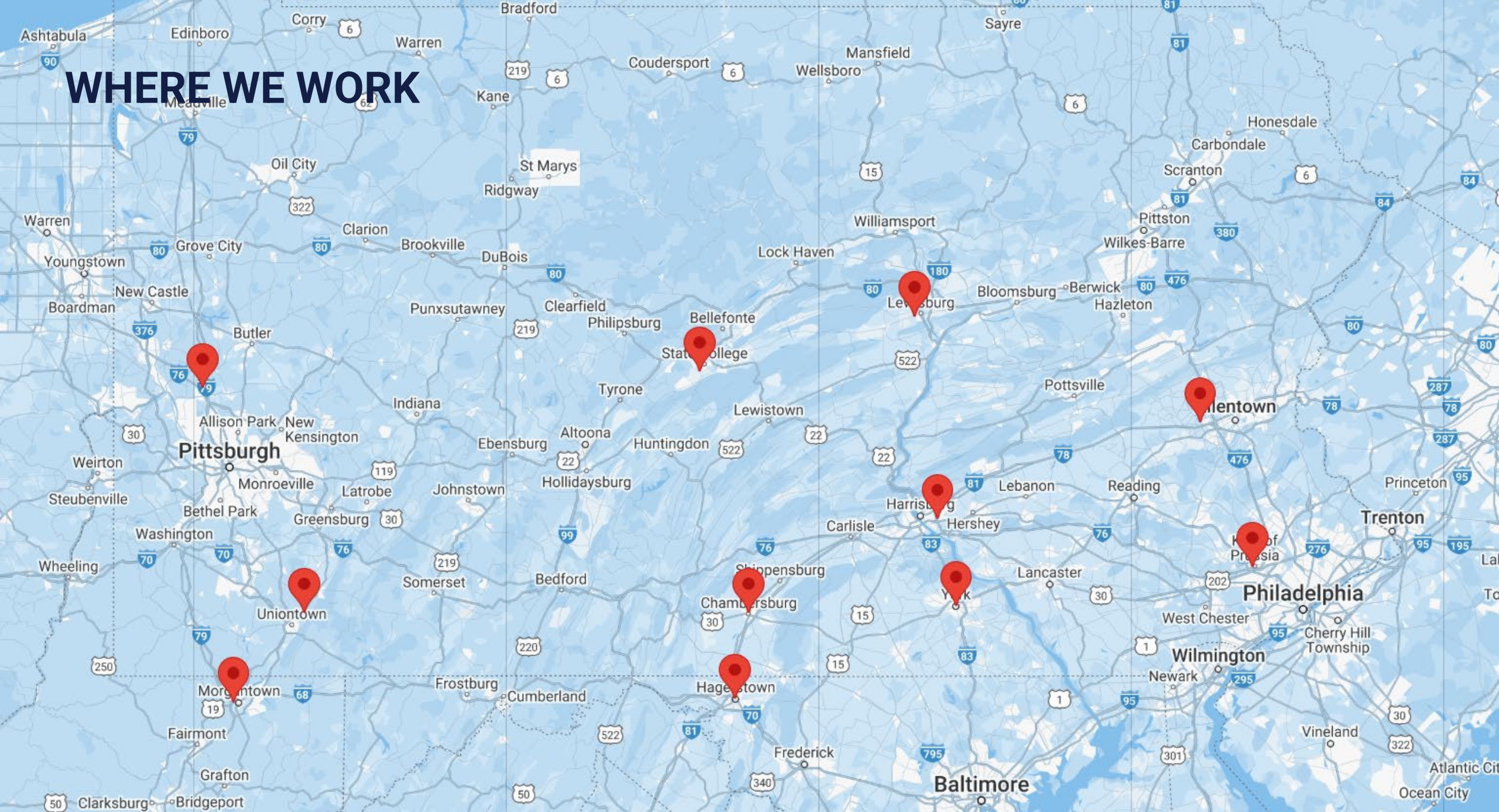
WHAT WE DO

- Water & Wastewater Engineering
- Municipal Engineering
- Municipal Administrative Support
- Capital Planning and Asset Management
- Stormwater
- Water Resource Management
- Electrical Engineering
- Environmental Compliance
- Construction Administration & Observation
- Surveying & GIS
- Planning
- Landscape Architecture
- Land Development & Site Design

WHO WE SERVE

- Utilities
- Wastewater Authorities
- Water Authorities
- Municipal Governments
- County Governments
- State Agencies
- Institutions
- Commercial & Residential Developers

WHERE WE WORK



WHY ASSET MANAGEMENT MATTERS NOW

- Aging Infrastructure (& Staff)
- Limited Budgets
- Maintaining Compliance
- Informing Data Driven Planning
- Transparency
- Funding Availability

WHY ASSET MANAGEMENT MATTERS NOW

WHAT WE'LL COVER TODAY

- What is Asset Management?
- GIS & Asset Management for Capital Planning
- Community Planning & Engagement
- Common Challenges & Strategies
- Real-world Examples
- Key Takeaways, Q&A

WHY ASSET MANAGEMENT MATTERS NOW



<https://forms.office.com/r/4cyYA3CLKw?origin=lprLink>

WHAT IS ASSET MANAGEMENT??

The systematic process of maintaining, upgrading, and operating physical assets in a cost-effective manner to maximize their value over lifecycle while meeting the needs of the community or group they serve.

WHAT IS ASSET MANAGEMENT??

KNOWING WHAT YOU HAVE

- Basic inventory of assets
 - Stormwater
 - Sanitary Sewer
 - Water
 - Other Utilities
 - Parks & Recreation
 - Municipal Properties
 - Transportation Infrastructure

WHAT IS ASSET MANAGEMENT??

KNOWING WHERE YOU HAVE IT

- Basic inventory of assets
 - How many assets
 - Age
 - Condition
 - Importance
 - Data Accuracy
 - Maintenance/Cost
 - Code Compliance

ASSET MANAGEMENT & PLANNING



ASSET MANAGEMENT & PLANNING

BOTH AN INPUT AND A GOAL

- Data gathered through asset management helps to inform the planning process.
- Asset Management can be a goal or objective that comes out of the planning process.
- Maintaining an Asset Management System can assist with the implementation process.

ASSET MANAGEMENT & PLANNING

GROWING COMMUNITIES

- Understanding what you have helps you understand what you want and what to ask for.

Stormwater Management & Environmental Issues

Theme Statement

The impacts of stormwater and environmental issues throughout the Borough and Township are minimized due to increased enforcement and regulatory measures taken and the completion of improvement projects to address flooding, promote preservation, conserve natural woodlands, and incorporate best management practices in stormwater and environmental management.

Priorities

- Focus on implementation of the identified Pollution Reduction Plan (PRP) projects that have been earmarked by the Borough and Township and their respective engineers.
- Coordinate with regional stormwater and flooding management efforts.
- Incorporate stormwater management best practices into park improvement projects and land development approvals in the Borough and Township.
- Identify flood prone and other problem areas and how to address them.

INFRASTRUCTURE NEEDS AND IMPROVEMENTS

Goal No.	Goal Description	Obj No.	Objective Description
1	Improve and enhance existing water and sanitary sewer service lines and infrastructure as needed and where appropriate.	1.1	Identify and track areas in need of water and sewer repairs and improvements.
		1.2	Work with Municipal Water Authority of Adams Township and Township residents to identify areas for water expansion.
2	Improve traffic flows and conditions along key roadways and at key intersections throughout the Township.	2.1	Improve conditions and traffic flows along the Route 8 Corridor.
		2.2	Complete a Traffic Impact Fee Study to determine focuses for improvement projects.
		2.3	Continue to improve intersections of Township-owned roads and Route 8 as needed.
		2.4	Improve traffic and safety concerns along key roadways and intersections as needed.

ASSET MANAGEMENT & PLANNING

BUILT OUT COMMUNITIES

- Maintaining high standards means maintaining what you have.

Goal
Update, enhance, and maintain the Township's existing parks as needed, including playground equipment, restrooms, picnic pavilions, fields, etc.
Improve, enhance, and modernize the Recreation Center.
Maintain the Township's existing recreational facilities so that they continue to serve as quality recreational assets to the community.

GOAL 1

Create a complete non-motorized transportation network within the Borough's limits that provides for all users and abilities.

OBJECTIVE 1

Complete the Borough's sidewalk and trail network.

OBJECTIVE 2

Develop appropriate bicycle infrastructure and connections within the Borough limits.

OBJECTIVE 3

Improve and maintain the existing non-motorized transportation network in order to provide better accessibility for all users.

Connectivity Goal Implementation Table

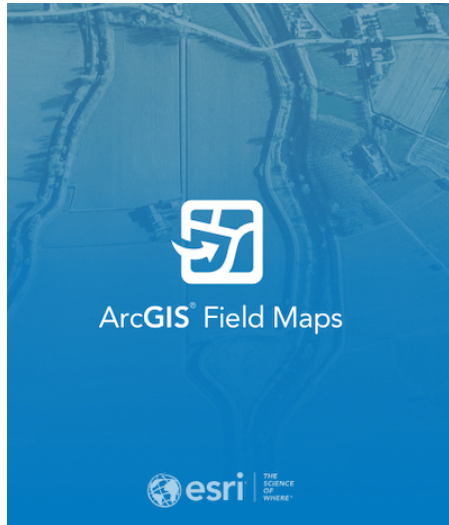
Objective	Strategy	Performance Measures (Metrics/Indicators)	Potential Partners	Opinion of Probable Cost	Timeframe for Implementation	Potential Funding Strategy
2.1 Create and maintain a safe, comfortable, and connected pedestrian network in the Borough.	2.1.1 Perform a complete inventory of the sidewalk network, identifying missing portions of sidewalk and areas of poor condition. This inventory should be updated at least every 3 to 5 years, but the process may consider the use of volunteers to help update data regularly.	Miles of sidewalk inventoried/assessed, annually. Regular update of sidewalk quality report.	Bellevue Borough, Bona Fide Bellevue, Third Party Consultant	\$/\$\$	Short-Term/Ongoing	Staff Time/General Fund*
	2.1.2 Develop a plan to fill or repair portions of sidewalk that are missing or in poor condition, and create a complete, comfortable sidewalk network that may be used and enjoyed by pedestrians of all ages and abilities. The network may also consider other appropriate pedestrian infrastructure, as discussed by this Plan.	Miles of sidewalk installed, annually. Miles of sidewalk replaced or repaired, annually. Number of curbs repaired or replaced, annually. Additional pedestrian improvement projects implemented, annually.	Bellevue Borough, Private Property Owners	\$\$\$\$\$	Short-Term/Ongoing	See Funding Table for Construction Funding, Borough Sidewalk Improvement Program

HOW TO DOCUMENT YOUR ASSETS

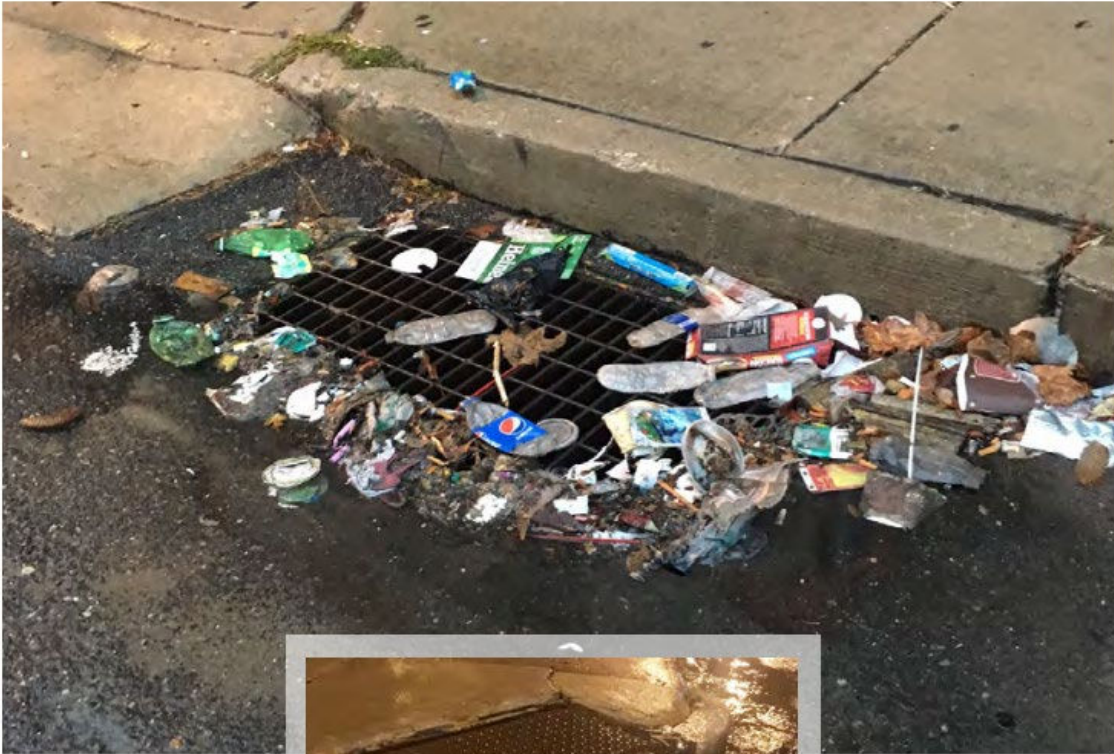
GIS! GIS! GIS!

- ESRI ArcGIS Online account
 - GIS is more accessible and easier to learn than in the past
 - Most basic (i.e. least expensive) is to use ArcGIS online and not desktop GIS
 - Cloud-based means sharing is easy and more dynamic than just static paper maps
- Willing Staff or Intern
 - Most individuals with GIS experience have used ESRI products (ArcGIS Pro, ArcGIS Online)
 - Must allow them time to *learn & train* (if you don't use it, you lose it)
- Simple hardware to get started

TOOLS OF THE TRADE



START WITH STORMWATER MANAGEMENT



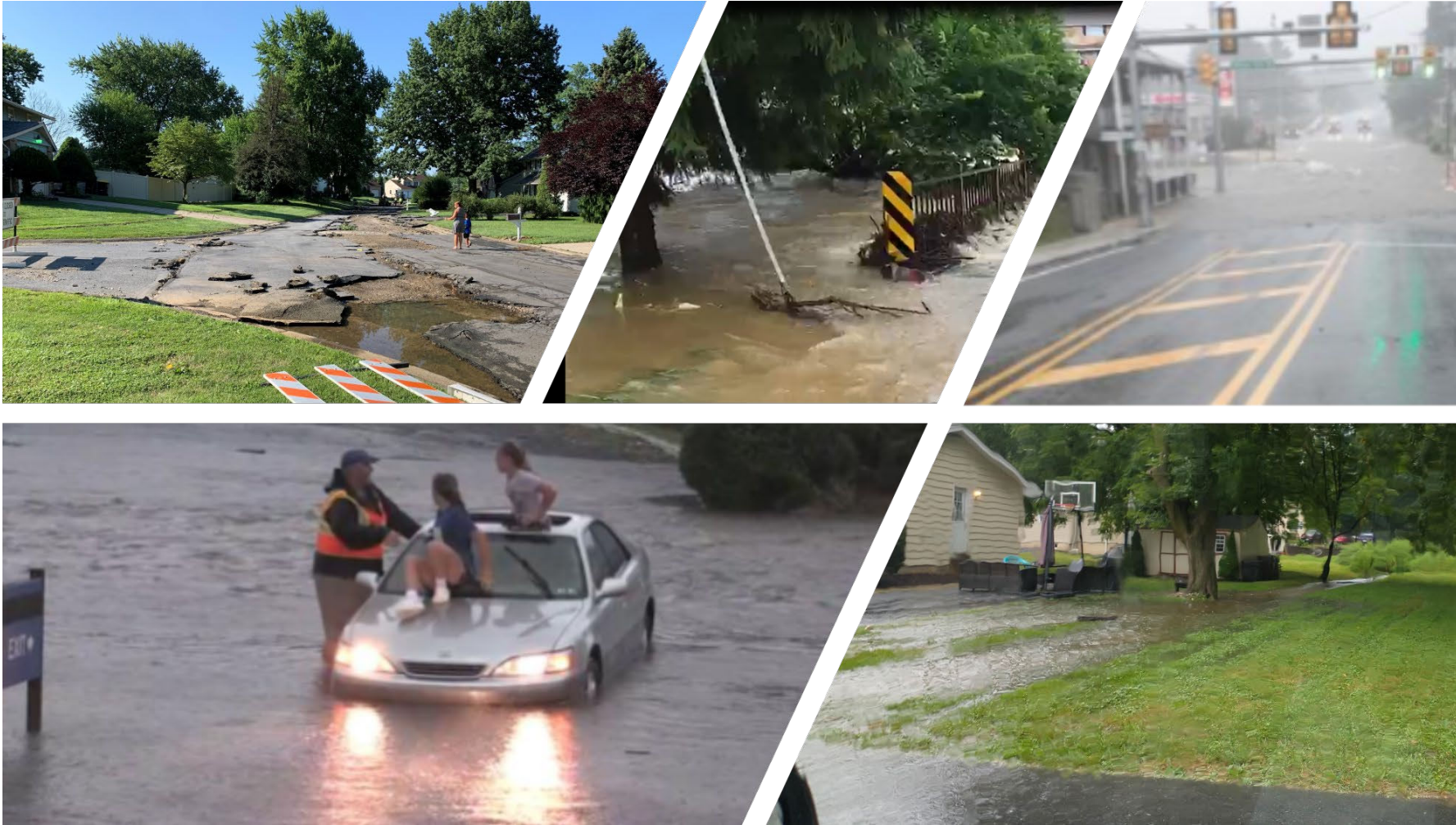
Pollution and trash also enter storm drains



“The National Weather Service estimates that, over the last 30 years, the United States lost an average of 82 lives and \$7.96 billion per year due to flooding.”

Source: PennFuture

FLOODING IN PA



- LACKING OR UNDERSIZED INFRASTRUCTURE
- FLOODWAY ENCROACHMENT
- CHANGING RAINFALL PATTERNS – MORE FREQUENT AND INTENSE RAINFALL EVENTS.

BETHLEHEM TOWNSHIP, NORTHAMPTON COUNTY

Lehigh Valley remains under flash flood watch as region avoids worst of storms, torrential rain

July 31, 2025

Storms bring flash flooding to Lehigh Valley ahead of July 4 holiday
PHOTOS



By **RICH ROLAN** | Special to The Morning Call
UPDATED: July 4, 2025 at 10:42 AM EDT

July 4, 2025

Some schools dismissing early, river projections reach flood stage as storm drenches the Lehigh Valley

LehighValleyNews.com | By **Stephanie Sigafoos**
Published December 18, 2023 at 11:50 AM EST

December 18, 2023

lehighvalleylive.com

LEHIGH COUNTY

Lehigh Valley weather: Flooding and power outages reported, flood advisories issued
(UPDATE)

Updated: Oct. 13, 2022, 8:34 p.m. | Published: Oct. 13, 2022, 6:20 p.m.

October 13, 2022

Multiple water rescues across Pennsylvania's Lehigh Valley after storms hit

Crews in Bethlehem Township confirm they had at least 11 water rescues there.



By **Annie McCormick** 
Thursday, September 2, 2021

September 2, 2021



STORMWATER INLETS – START HERE!



ONLINE DATA MANAGEMENT TOOLS

SwPipe

Table Edit Get directions Zoom to

Material	RCP
Notes	
SHAPE_Length	4.74
Survey By	HRG
Survey Date	
Up Elevation	
Upstream ID	



Last edited by ckriebelHRG on 9/18/2024, 1:07 PM.

SwInlet

Table Edit Get directions Zoom to



ONLINE DATA MANAGEMENT TOOLS

BTMA Storm Sewer Condition Assessment Hub

1 of 204

SP-190

Observation 1

Survey ID	SP-190
Material	CMP
Diameter	18
MH ID	3724
Observation 1	
Type of Structural Defect (Obs 1)	Lining Failure
Number of Structural Defects (Obs 1)	1
Severity of Structural Defect (Obs 1)	2
Comment Observation 1	Lining deteriorating, grout at mouth of pipe cracked

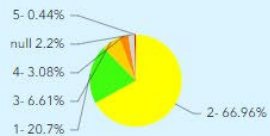
1 of 84

SP-191

Observation 2



Severity of Structural Defects For Pipes



Severity of Structural Defects For Pipes



Observation 1

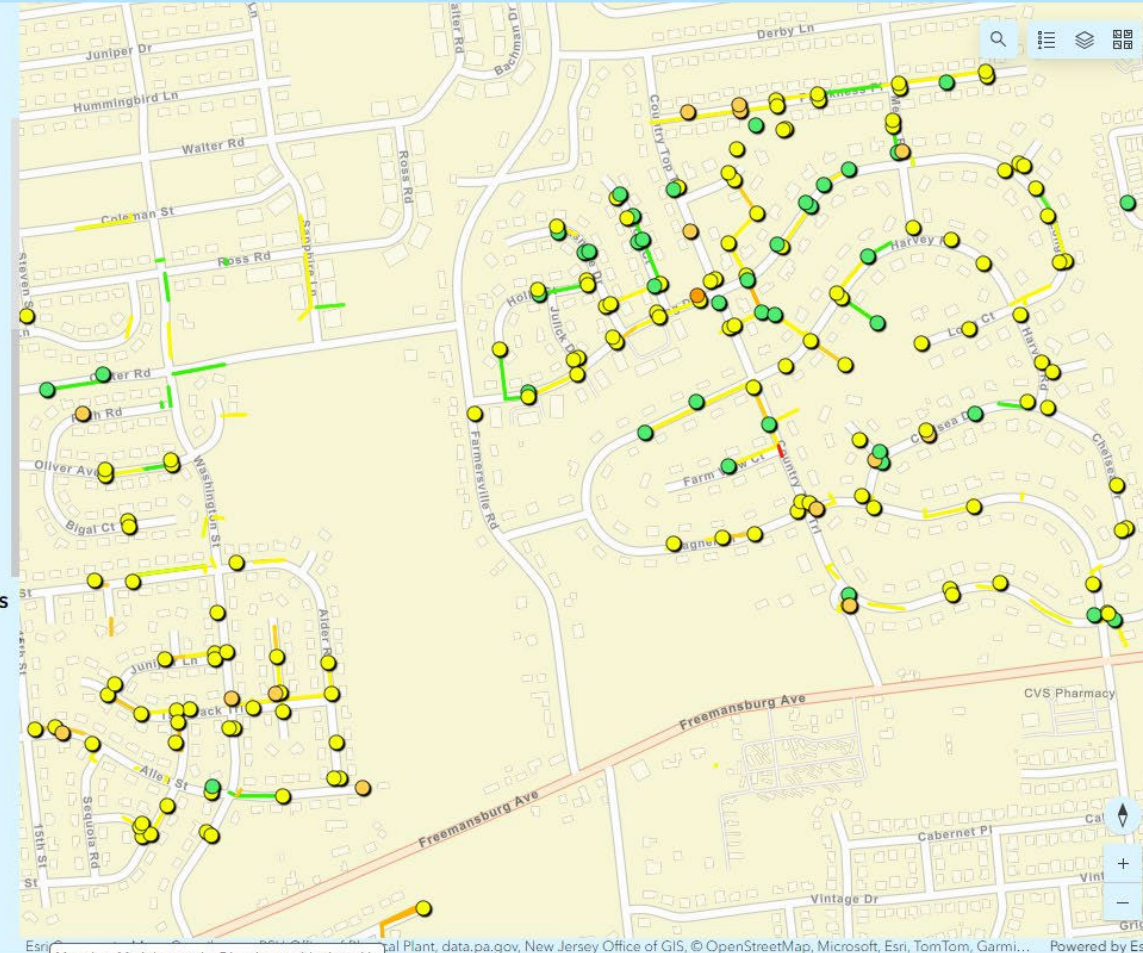
Observation 2

Total Scope Map

Severe Condition Verification

Structural Defects

Functional Defects



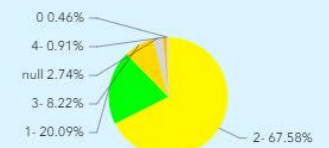
1 of 195

LR-IN-3005

LR-IN-3005

Survey ID	LR-IN-3005
Elevation	387.529999
Type of Structural Defect	Brickwork
Number of Structural Defects	1
Severity of Structure Defects	1
Material	Concrete
Inspected	Yes
Comment	Riser piece needs put back in place and regouted.

Severity of Structural Defects For Inlets



Maguire, Mark (mmaguire@hrg-inc.com) is signed in

Powered by Esri



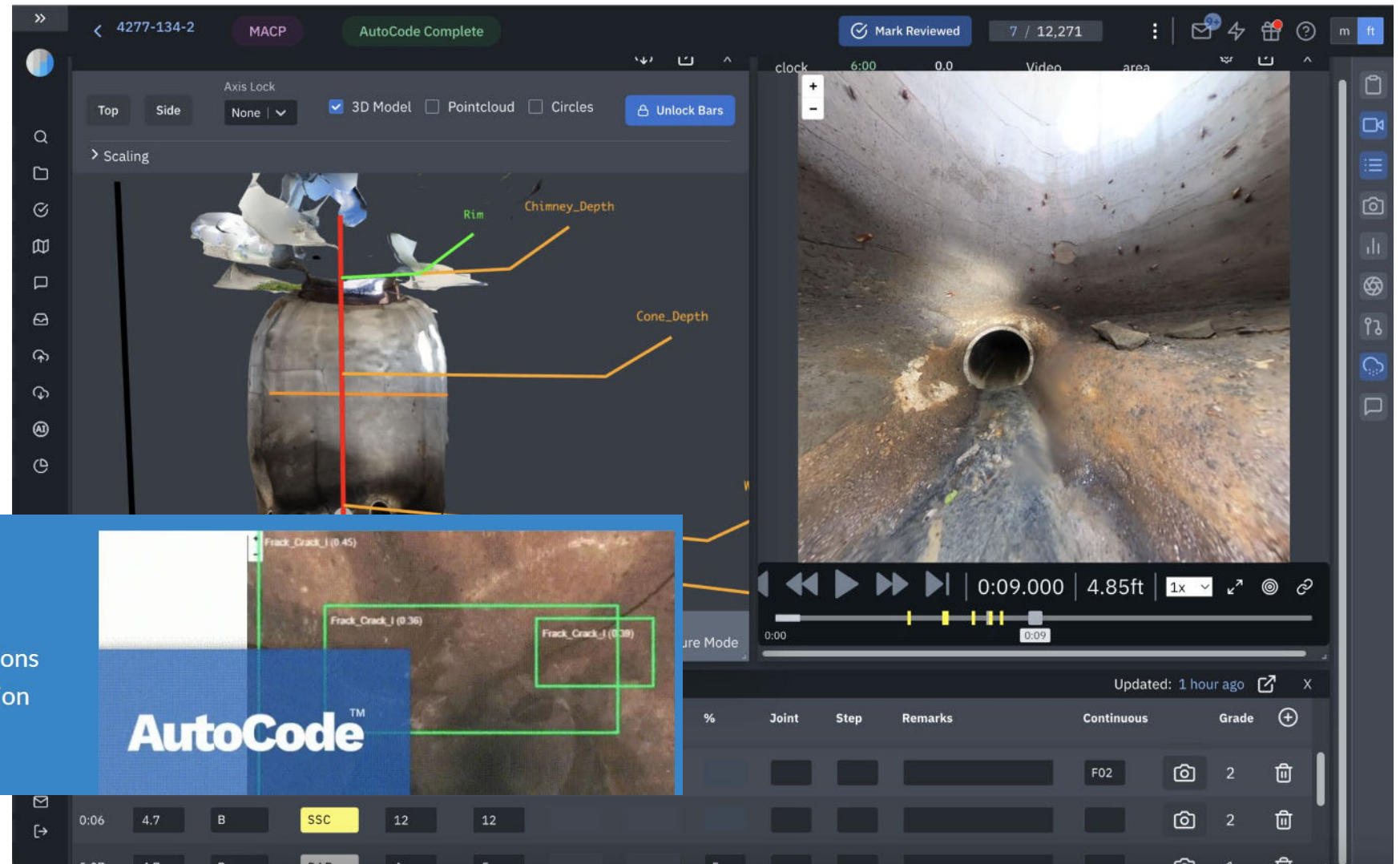
Using Insta360 Camera for Inlet Inspection

AI TOOLS – CONDITION ASSESSMENT

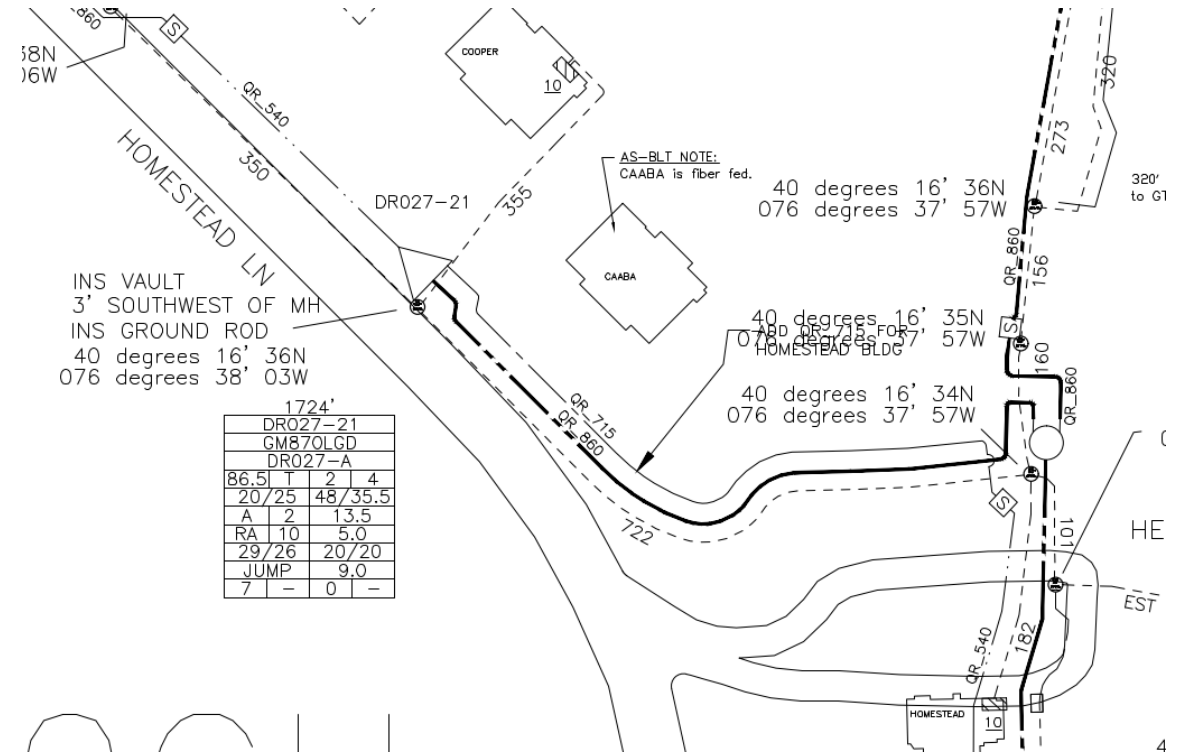
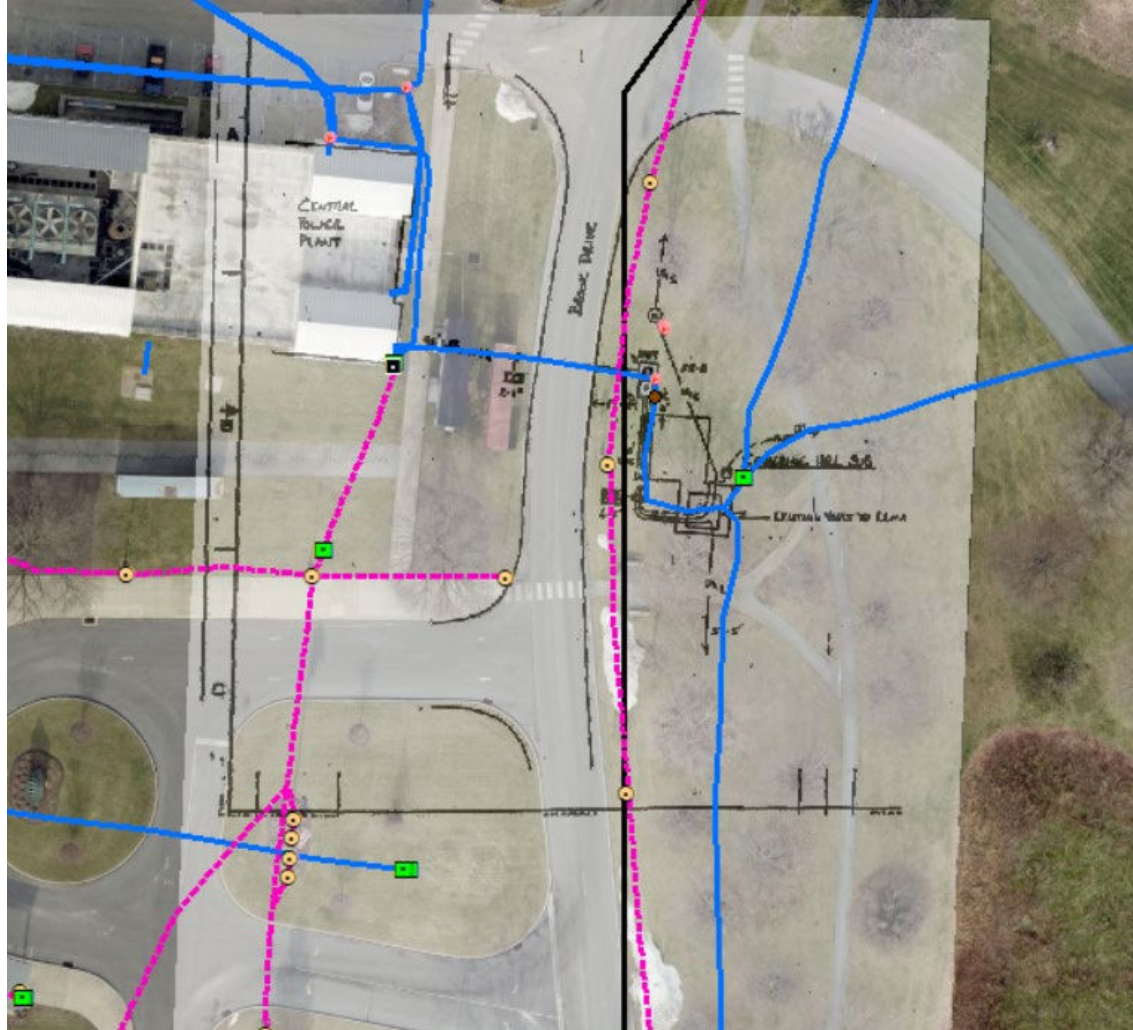


AutoCode™

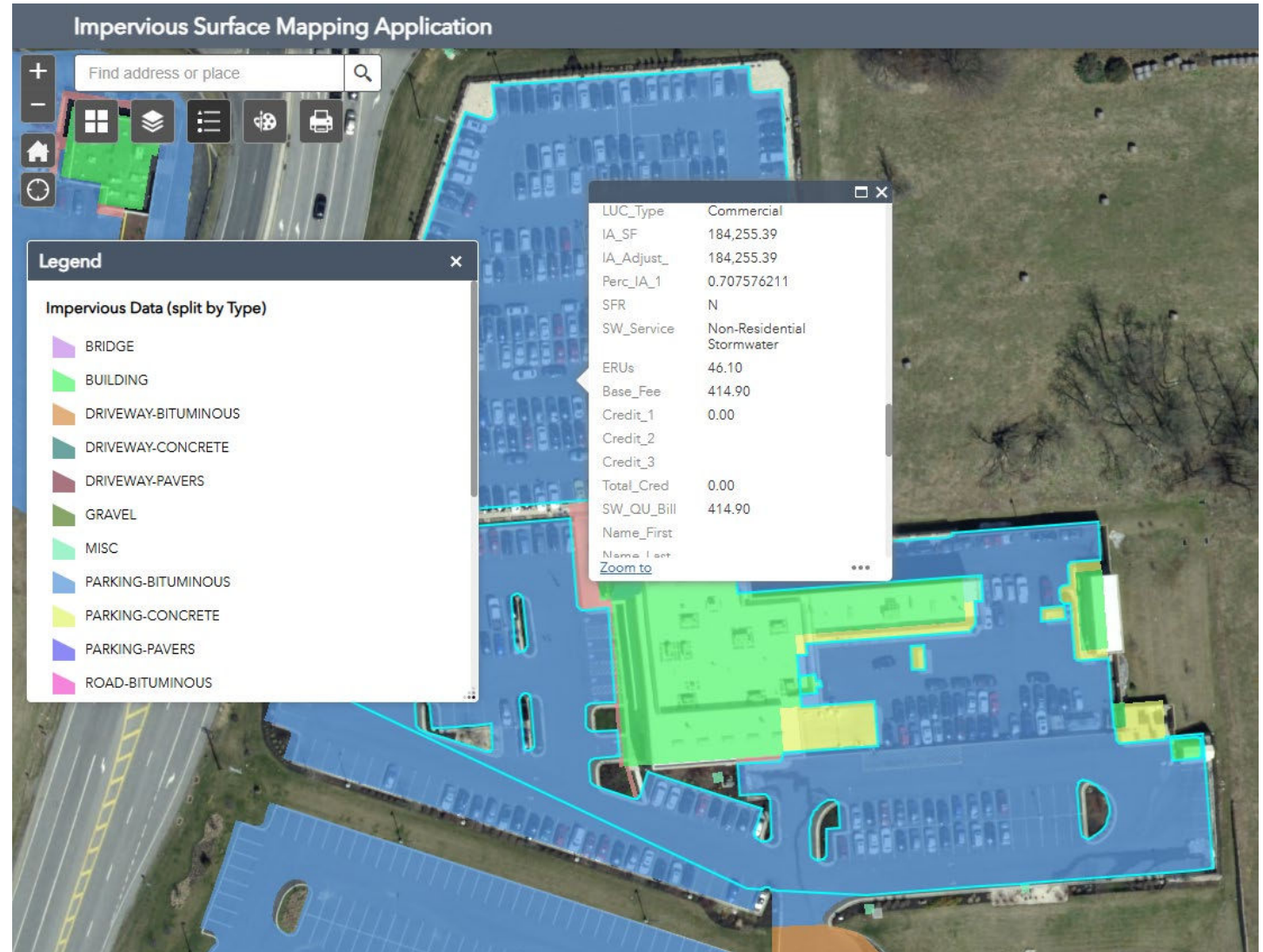
Computer vision AI automatically detects conditions based on 425,000+ NASSCO surveys and 40 million LF of data.



RECORD DRAWING INTEGRATION



IMPERVIOUS AREA FEES TO SUPPORT STORMWATER INFRASTRUCTURE



USING SURVEY123 FOR PUBLIC PARTICIPATION

[Lead and Copper Rule Pipe Material Survey](#)

[ArcGIS Solutions Gallery](#)

- Pre-built apps, layers, surveys, etc as templates you can add to your account and start adding data

ACTIVE TRANSPORTATION

- **DATA DRIVEN PLANNING REQUIRES DATA!**
- **ACTIVE TRANSPORTATION PLANNING REQUIRES AN UNDERSTANDING OF EXISTING INFRASTRUCTURE**
 - This is required to identify gaps in the network and make connectivity recommendations.
 - Ideally, a complete Asset Management System for these facilities would also capture condition and compliance.

Americans with Disabilities Act (ADA)

Adopted in 1990, ADA is a federal law that prohibits discrimination in employment, transportation, public accommodations, communications, access to government programs, and access to telecommunications on the basis of mental and/or physical disabilities. ADA Standards for Accessible Design establish accessibility requirements for buildings or facilities.

Public Right-of-Way Accessibility Guidelines (PROWAG)

PROWAG provides standards for accessibility within the public right-of-way. This set of guidelines establishes best practices for facilities like sidewalks; non-motorized crossings; curb ramps and detectable warnings; and much more. While PROWAG is not yet enforceable, these guidelines have been generally accepted as industry standard and provide much needed instruction for creating accessible public spaces.

Architectural Barriers Act (ABA)

Originally adopted in 1968, ABA requires that facilities designed, built, altered, or leased with federal funds be accessible to individuals with physical disabilities. It is codified in 42 U.S. Code § 4151 through 4157 and mandates that the Administrator of General Services set standards for accessibility in these buildings. ABA helps to ensure that users of all ages and abilities can safely access their final destination, even after leaving public sidewalks.

BOROUGH OF HUMMELSTOWN

ACTIVE TRANSPORTATION PLAN

- PROJECT KICKED OFF IN AUGUST OF 2023, SCOPED AS A CONVENTIONAL ACTIVE TRANSPORTATION PLAN.
- FIELDWORK REVEALED AN ALMOST COMPLETE SIDEWALK NETWORK.
 - Despite having few gaps, the sidewalk was in poor condition and lacked ADA compliance.
 - Adjacent property owners are responsible for the maintenance of their sidewalks.
 - Input indicated that many walkers chose to walk in the street.
 - Streets are generally low-volume and low-speed, limiting the need for dedicated bicycle infrastructure.

BOROUGH OF HUMMELSTOWN

ACTIVE TRANSPORTATION PLAN



BOROUGH OF HUMMELSTOWN

ACTIVE TRANSPORTATION PLAN

- BUT HOW DO YOU UNDERTAKE NETWORK WIDE DATA COLLECTION WHEN IT WASN'T IN THE SCOPE?!?
 - An initial desktop review was performed using aerial imagery.
 - Very dedicated members of the Steering Committee volunteered to ground truth the data and gather information about sidewalk condition.
 - A guide was created to develop a simple inventory of sidewalks and their current condition based on the current requirements of the zoning ordinance:
 - Surface Condition
 - Joint Condition
 - Obstructions
 - Heaving or Vertical Faults

BOROUGH OF HUMMELSTOWN

ACTIVE TRANSPORTATION PLAN

B. Sidewalk Condition Assessment

GOAL: The goal of this section is to document relevant condition characteristics of the sidewalk, associated with each property/ street address. This data collection process is intended to document significant sidewalk condition issues that should be prioritized to improve the overall network. It is not expected that reviewers will capture specific details about the sidewalks at every property, but instead highlight the more standout problems. The characteristics assessed will include surface condition, joint condition, heaving, and obstructions. These characteristics and standards for their condition are explained below.

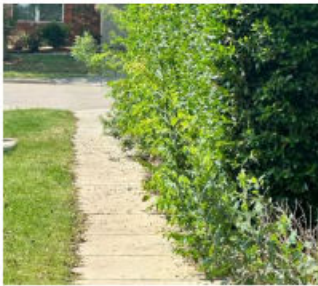
- **Surface condition** refers to the general condition of the sidewalk panels. Poor condition includes cracked panels (without movement or heaving); surface cracking; spalling or scaling, meaning breaking, chipping or pitting associated with the deterioration of the sidewalk slab; or dirt or debris that is clearly from long-term lack of maintenance. Additional pictures of these characteristics are provided below for reference. All of these conditions combined make up the overall surface condition of the sidewalk, and do not need to be called out separately, but additional notes may be included in the comments if deemed necessary.

		
Moderate Cracking	Moderate Spalling/Scaling	Moderate Dirt/Maintenance
		
Major Cracking	Major Spalling/ Scaling	Major Dirt/Maintenance

- **Joint condition** refers to the condition of the slab edges at the adjoining slab or roadway. Poor condition would include joint seal failure, meaning the space between sidewalk slabs has spread to create a significant gap; or joint spalling, referring to breaking or chipping at the slab joints. Joint gaps that have already been repaired should not be noted unless they still impact the safety of the sidewalk.

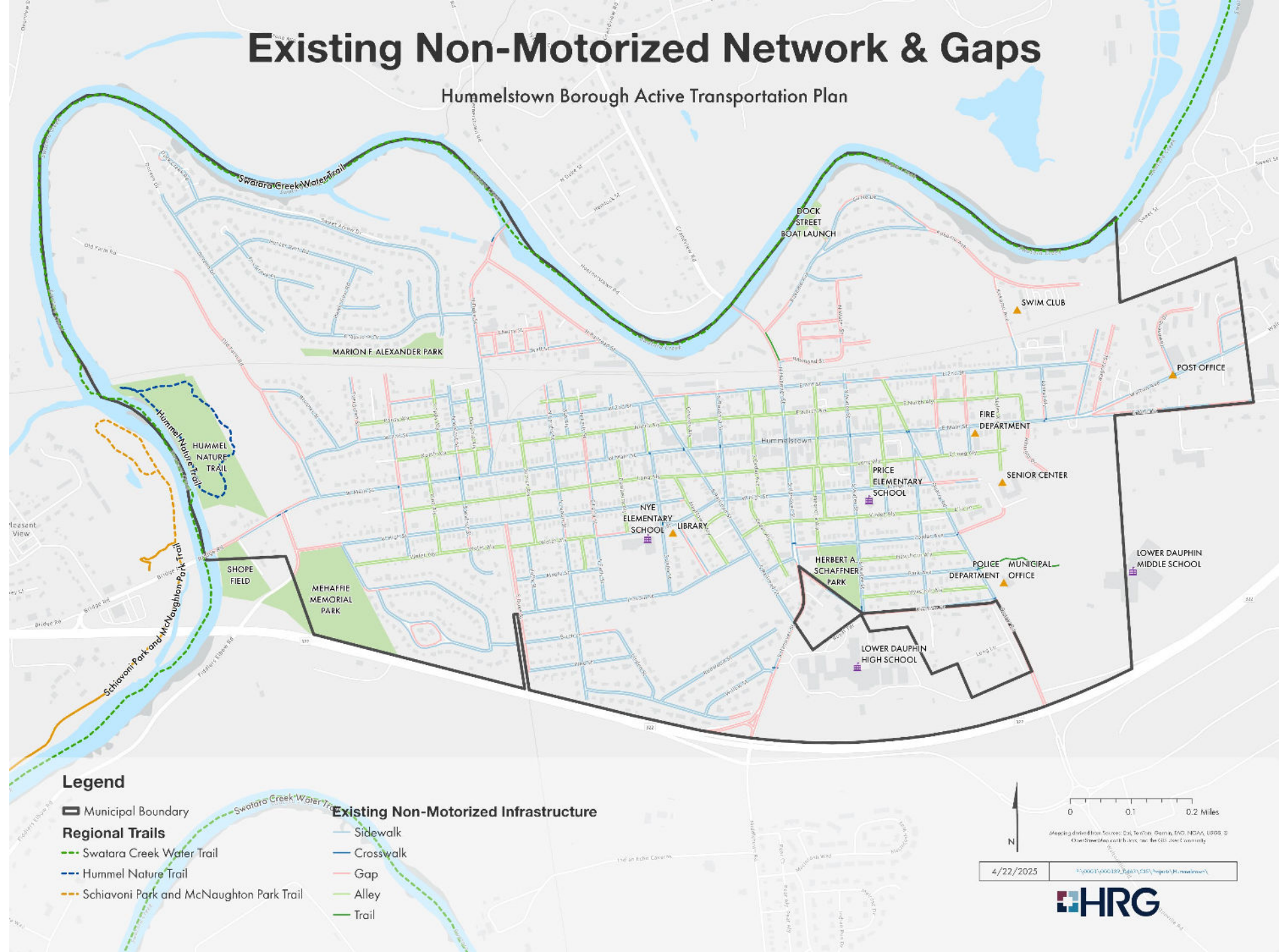
	
Moderate joint seal failure and spalling	Major joint seal failure and spalling

- **Obstructions** refer to any significant blockage impacting the ability to pass on the pavement. This may refer to an obstacle for an able-bodied person or someone using a wheelchair. This should only include permanent obstacles like trees, overgrown bushes, fire hydrants, utilities, signs, etc., and not objects that may be easily removed.

	
Moderate Obstruction	Major Obstruction

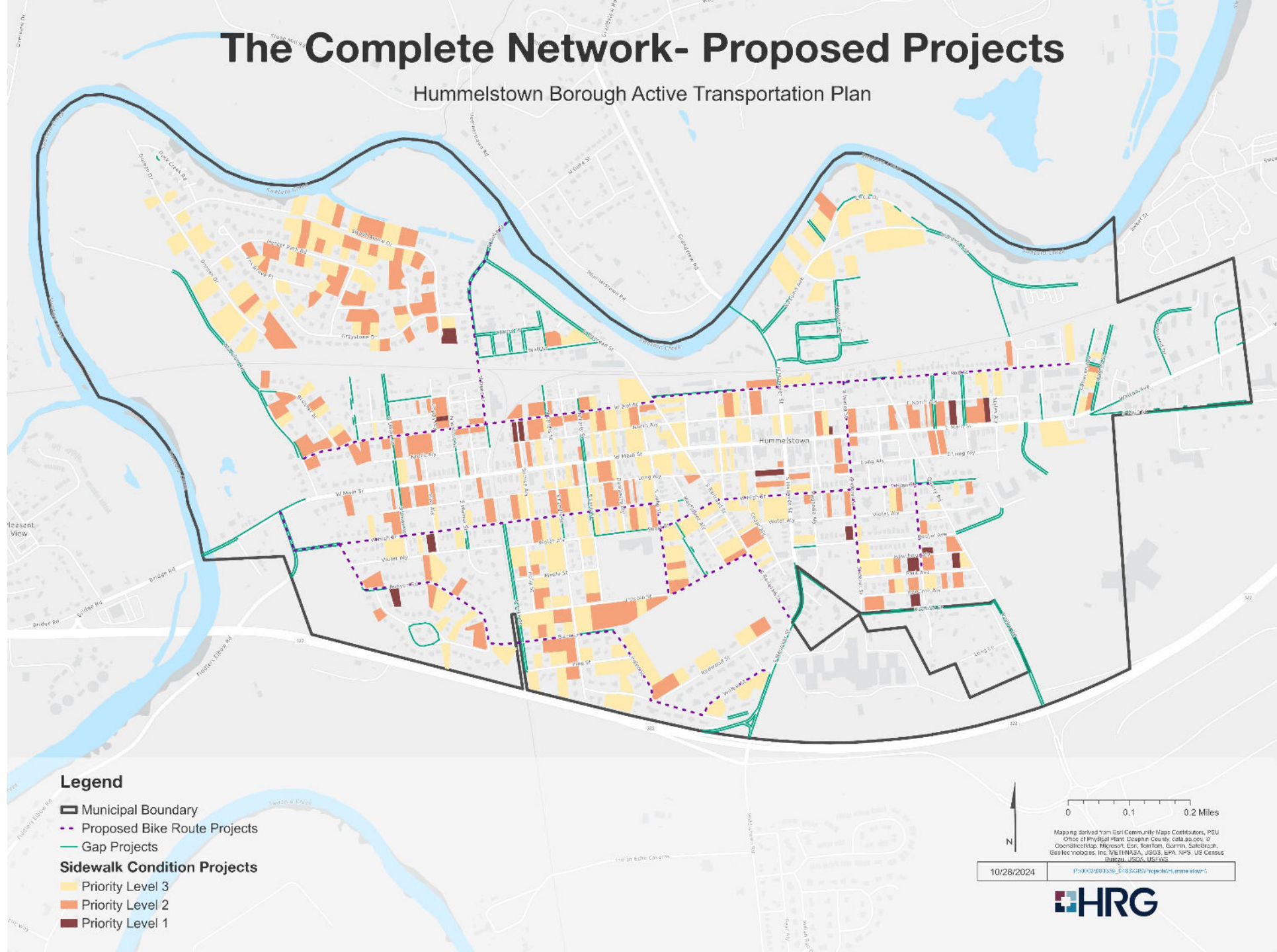
Existing Non-Motorized Network & Gaps

Hummelstown Borough Active Transportation Plan



The Complete Network- Proposed Projects

Hummelstown Borough Active Transportation Plan



BOROUGH OF HUMMELSTOWN

ACTIVE TRANSPORTATION PLAN

- THIS DATA FORMS THE BASIS FOR FUTURE IMPLEMENTATION
 - Gap projects and priority areas for improvement were identified.
 - This information was uploaded into the Borough's existing code enforcement software and can be used to issue notices of violation.
 - This information would assist with the implementation of a Sidewalk Improvement Program, helping to reduce the financial burden on property owners.

HOW TO GET STARTED WITH ASSET MANAGEMENT

1. DEFINE YOUR ASSETS

- The best way to get started is to understand what you're trying to accomplish.
- Start small. Pick one asset to inventory.
- Consider how you can establish consistency with planning efforts.

HOW TO GET STARTED WITH ASSET MANAGEMENT

2. IDENTIFY THE NECESSARY TOOLS AND SUPPORT

- Do you need a GIS or other software license?
- What hardware do you need?
- Do you need to hire a consultant?

HOW TO GET STARTED WITH ASSET MANAGEMENT

3. CREATE YOUR IMPLEMENTATION PLAN

- Whether you're working with a consultant or creating your own system, establish a system that works for you. Consider your existing resources, staff, existing software systems, and established processes for coordination.
- Identify a member of your staff as a lead.
- Remember software fees are annual, not a one-time fee.

HOW TO GET STARTED WITH ASSET MANAGEMENT

4. CONSIDER MAINTENANCE OF YOUR SYSTEM

- Consider establishing a digital asset management system that can be managed by your staff.
 - If you're working with a consultant, ask how the system can be set up to allow your staff to take over its management.
 - Staff do not need to be proficient in desktop GIS, but willing to learn the basics of managing and creating data.
 - GIS support can be a time and materials service provided by the consultant.
- What will fund the ongoing maintenance of your system?

PROJECT FUNDING

FUNDING PROJECTS

- Having an asset inventory is a prerequisite to apply for most funding sources.
- Knowing the condition of your assets helps to prioritize projects.
- HRG has a Capital Solutions team who assists municipalities and authorities to fund their projects with grants, loans, and establishing stormwater utility fees.

FROM ASSET MANAGEMENT INVENTORY TO PROBLEM IDENTIFICATION TO PROVIDING SOLUTIONS

Feds award \$3M for Easton Avenue flood mitigation in Bethlehem area

Updated: Sep. 05, 2023, 7:10 a.m. | Published: Sep. 05, 2023, 7:00 a.m.



Heavy rain on July 30, 2016, causes Santee Road to flood at the intersection with Easton Avenue in Bethlehem Township. Mike Nester file photo | lehighvalleylive.com contributor

Flood reduction projects progress in Bethlehem Twp., at millions under budget

LehighValleyNews.com | By [Will Oliver](#)

Published December 5, 2023 at 10:00 AM EST

Bethlehem Township pursues \$2.71 million loan to help reduce flooding

LehighValleyNews.com | By [Brian Myszkowski](#)

Published September 4, 2024 at 8:00 AM EDT



THANK YOU!

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