



MMSD GREEN INFRASTRUCTURE PARTNERSHIP PROGRAM

Streamlined Green Infrastructure Inspection and
Maintenance Program.

Today's Presenter



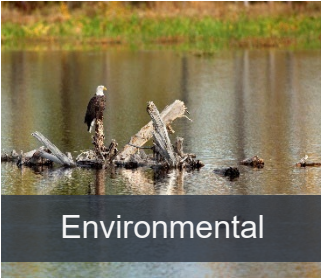
Kaley DuCoeur
Environmental Team Leader
Ruekert & Mielke, Inc.

About Ruekert & Mielke, Inc.

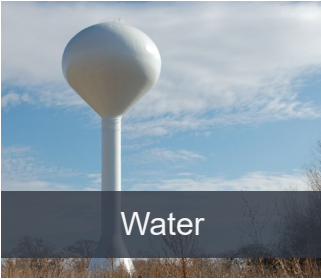
ENGINEERING SERVICES



Municipal



Environmental



Water

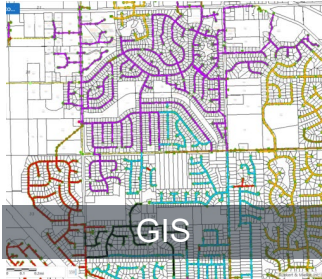


Wastewater

TECHNOLOGY



Asset Management



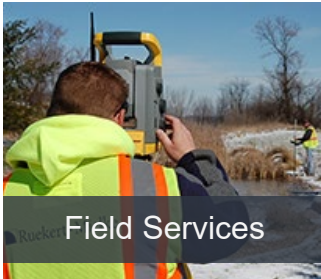
GIS



Water Resources



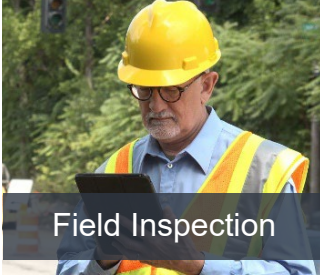
Green Infrastructure



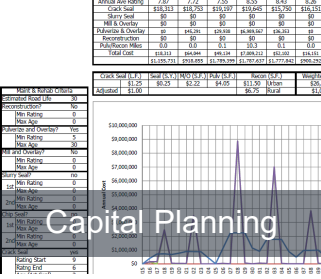
Field Services



Financial Services



Field Inspection



Capital Planning



Site Development



UAS/Drone Services



SCADA

Agenda



Purpose Today

- The Milwaukee Metropolitan Sewerage District's (MMSD) Green Infrastructure Partnership Program (GIPP) offers incentive funding to District landowners on a per-gallon-captured, reimbursement basis for green infrastructure strategies designed to capture and clean water where it falls.
- This presentation will highlight how R/M worked with the District and GIPP participants to make progress towards MMSD's goal to "implement 10 million gallons of green infrastructure annually" and achieve Total Maximum Daily Load (TMDL) compliance through an efficient, streamlined green infrastructure inspection and maintenance program.

Overview of Green Infrastructure Partnership Program

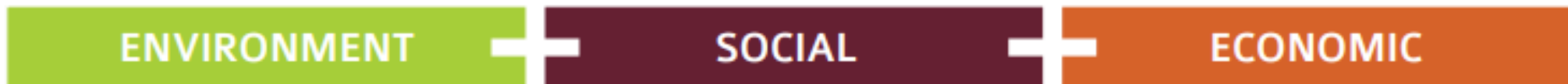
- MMSD Program to provide funding
- Creation of new green infrastructure (GI)



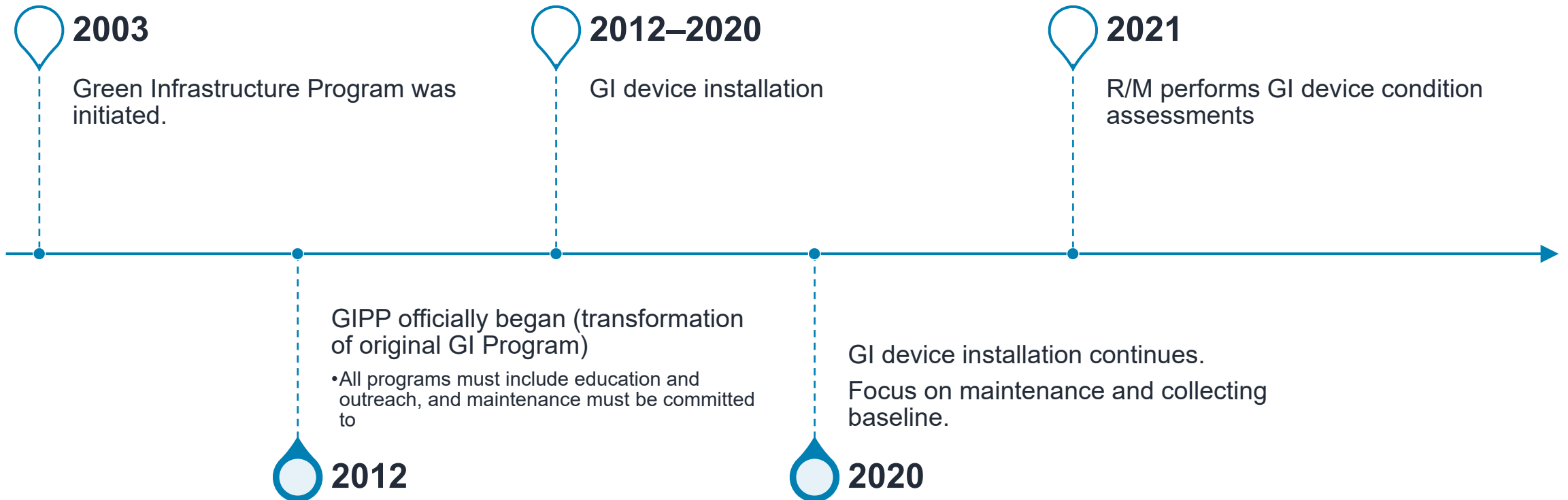
Overview of Green Infrastructure Partnership Program

- Program goal: Capture and clean water where it falls.
 - Measure: Capture the first 0.5 inch of rainfall
- Long-range goal: Eliminate sewer overflows, improve water quality, and incorporate an overall triple-bottom-line sustainable approach to operations.

TRIPLE BOTTOM LINE APPROACH

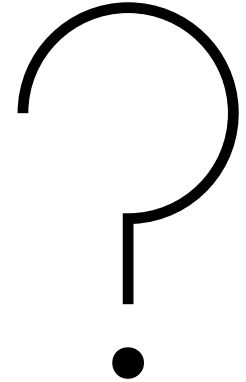


GI PP Program Overview



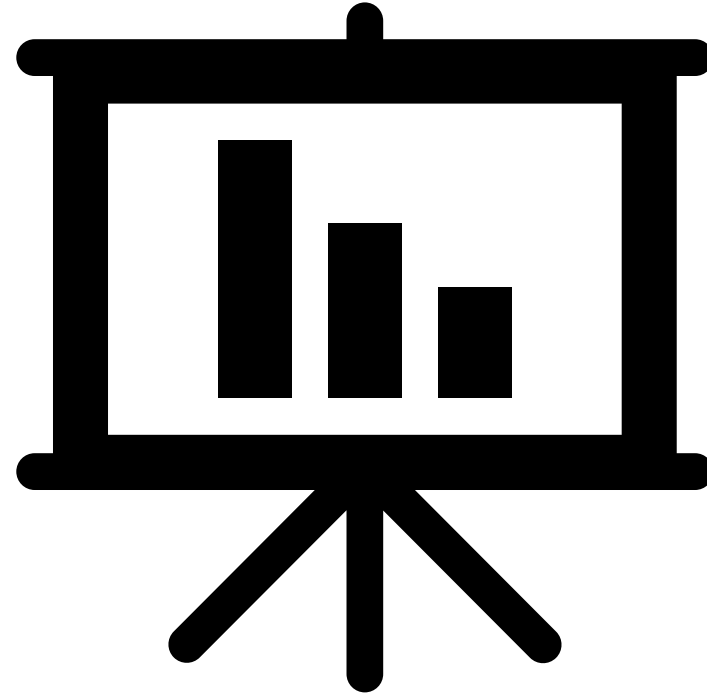
The Question: How do we ensure dollars are being spent effectively and with desired outcomes?

- What are the overall program(s) baseline?
- How is this being communicated?
- Who will perform the condition assessments?
- What will the baselines for the condition assessments be?



Ruekert & Mielke's Role

- In 2021 MMSD contracted with R/M to perform a baseline GI device condition assessment.

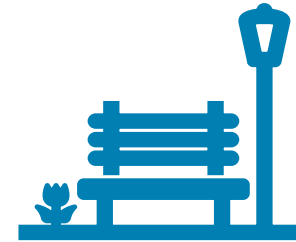


2021 GI Device Condition Assessment



Performed 347 GI Device Asset Condition Assessment in 2021

Survey123 provided by MMSD

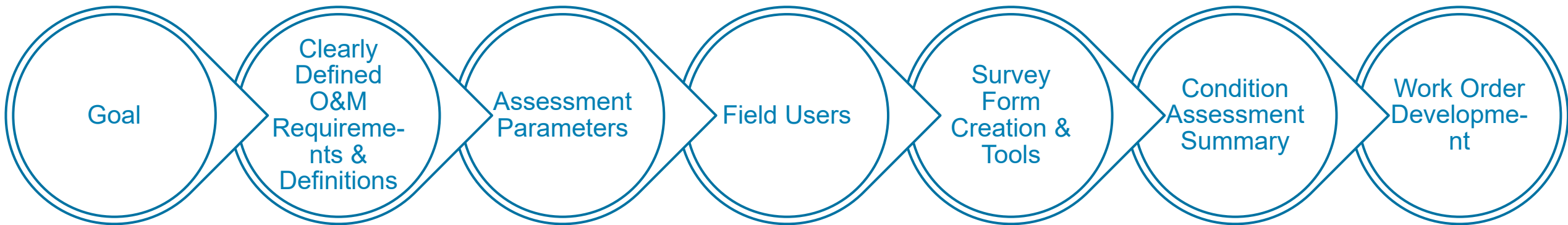


These devices included:

Green roofs,
Permeable pavement,
Bioswales,
Rain gardens,
Rainwater catchments,
Native landscaping, and
Constructed and Natural Wetlands

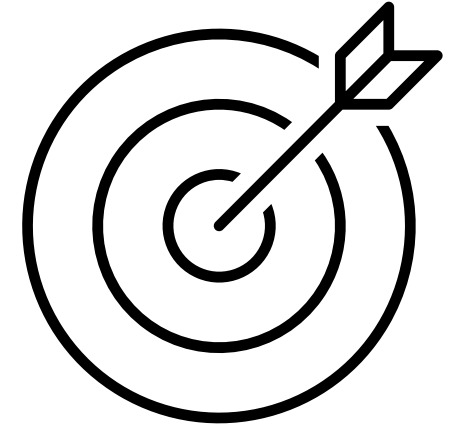
GI Device Condition Assessment Roadmap

1. 2. 3. 4. 5. 6. 7.



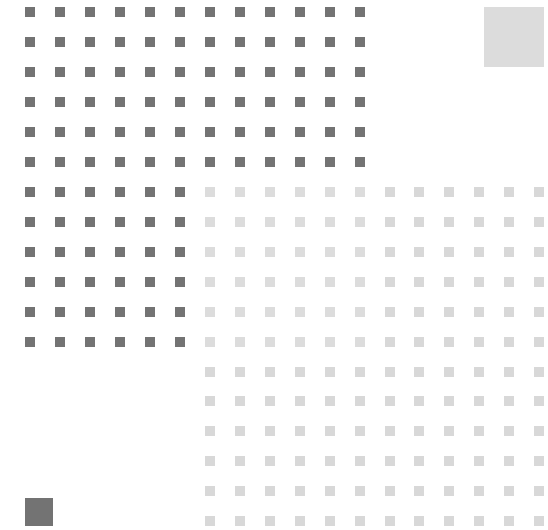
1.) Goal

- Clearly define the Goal of the condition assessment
 - Who: “Each GI device”
 - When / Frequency: “every 5 years”
 - Why: “determine maintenance needs”
 - What Standards: “WDNR BMP O&M standards”
- Ex. Each GI device will be inspected every 5 years to determine maintenance needs based on WDNR BMP O&M standards.



1.) Goal Continued

- When creating the goal
 - Range of Tolerance
 - Does Functionality = Designed Feature



2.) Clearly Defined O&M Requirements & Definitions

- Define GI devices
 - Annual/Seasonal/Degradational Maintenance Activities
 - Clearly define degradation
 - Ex. invasive species presence, rills, lack of vegetation, etc...
 - Clearly define “milestones” for ‘immediate’ maintenance needs
 - Ex. Green Roof vegetation must be maintained at 85% cover.
 - Create the threshold for maintenance requirements

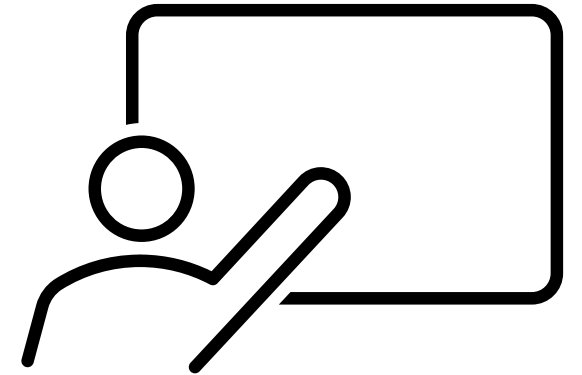


3.) Assessment Parameters

- Create Assessment Parameters for each GI Device
 - Group GI Devices Accordingly
 - Ex. Condition Assessments grouped bioswales – bioretention basins – wet ponds and others.
 - Standing Water Present was a parameter with a detrimental effect on the ranking of the device
 - Refer to the Condition Assessment Goal(s)
 - Refer to Program Goal(s)
 - Delineate Parameters of Degradation
- Ex. If a rain garden doesn't function with <85% cover, is that the question? Or is it beneficial to know a rain garden has 80% or 30% or no cover?

4.) Field Users

- Who will coordinate landowner access?
 - Note – Green Roof access coordination was time consuming
- Consider who is performing the condition assessments.
 - GI Device Training may be part of the program
- Within or along with the Survey Form Documents, provide examples of percent cover, definitions, clarifications of parameters, etc...
 - Build in Training Time at the beginning of every season



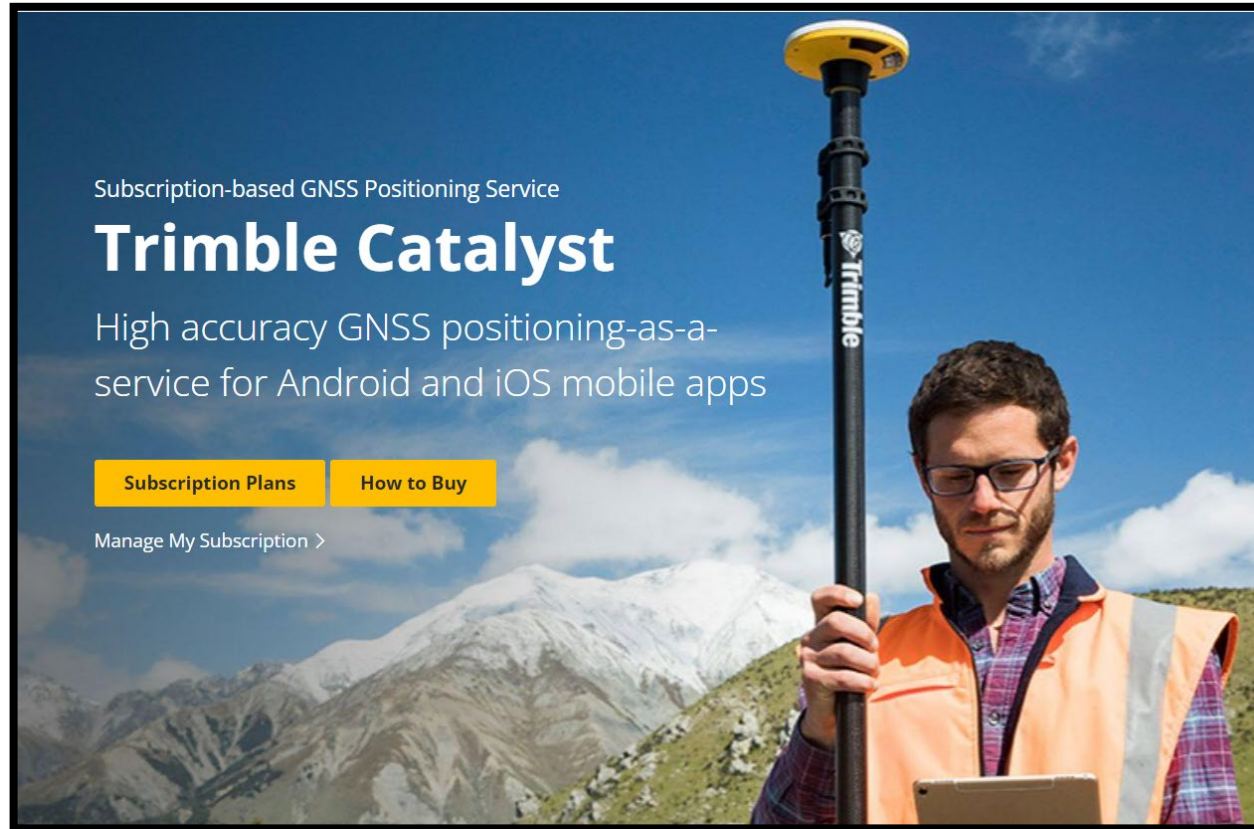
5.) Survey Form Creation & Tools



- Software:
 - Condition Assessment Form Creation: Survey123
 - Inspections: Field Maps (Collector) Application
 - Data Sharing, Progress, and Location: ArcGIS Online
 - Efficient and resourceful for data collection
 - Creates easily manipulated data
 - Post condition assessment data collection analyses can be built-in and automated

5.) Survey Form Creation & Tools

- Hardware: Tablet or Phone
 - Wifi connection is only required to prep for condition assessments and upload data collected
 - If accuracy is a concern, additional survey collection tools can be used



Subscription-based GNSS Positioning Service

Trimble Catalyst

High accuracy GNSS positioning-as-a-service for Android and iOS mobile apps

[Subscription Plans](#) [How to Buy](#)

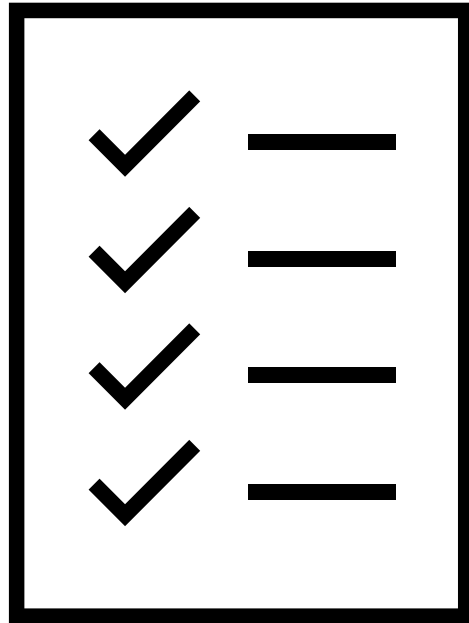
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The advertisement features a man in an orange safety vest and glasses holding a black surveying pole with a yellow Trimble GNSS receiver on top. He is looking at a tablet. The background shows a mountain range under a blue sky with clouds.

6.) Condition Assessment Summary

- Based on Assessment Parameters, the Condition Assessment Summary should include:
 - Specific summary of each GI Device
 - Detailed information to provide Program Goal(s) progress

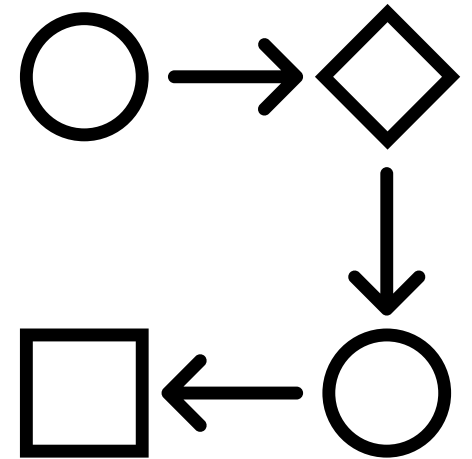
7.) Work Order Development



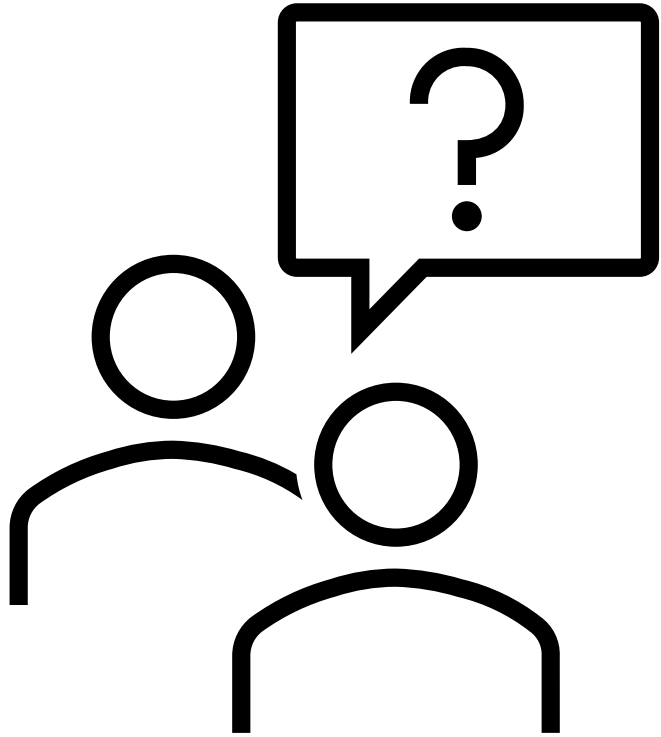
- For all GI Devices identified as requiring maintenance:
 - Clearly defined parameters for maintenance needs
 - Checklist of requirements based on O&M plan can be beneficial

The Question: How do we ensure dollars are being spent effectively, and with desired outcomes?

- What are the overall program(s) baseline?
 - Detail all program goals
 - Collect the first 0.5-inches – Assess for biodiversity rankings
- How is this being communicated?
 - Internally – Condition Assessment Report
 - Externally – Maintenance Work Orders
- Who will perform the condition assessments?
 - Interns, GI Device Task Force, Consultant?
- What will the baselines for the condition assessments be?
 - Addressed during creation of Assessment Parameters



Questions?



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