Metro Stormwater Geodata Project – Line Team Presentation

Brian Jastram, Erik Madland, Chris Sanocki, Alex Blenkush
Line Data Business Needs – Geometry & Attributes

Ownership

Up and downstream invert elevations

Material

Link to plan sets

Emergency overflow

Level of accuracy

Maintenance districts

Data collection source

Data source

Flow volume

Maintenance agreements

Diameter

Maintenance districts

Water flow centerline

Connectivity between agencies
Line Data Business Needs – Additional Concepts

- Asset management
- Monitoring
- Cartography
- ms4 reporting
- Open data
- Modeling
- Expression of data quality
- Metadata standardization
- Data disclaimer
- BMP efficacy assessment
- System to accommodate changing data
- Emergency response
- Code enforcement
Which types of stormwater features are best represented as lines?

Pipes

Channels

Linear structures

Artificial paths

Enclosed conduits designed and constructed to convey stormwater flow.

Gravity Mains, Force Mains, Culverts, Drain Pipes, Underdrain Pipes, Catch Basin Leads, Drain Tiles(?)
Pipe attribute fields

Pipe ID
Type
Shape
Material
Diameter
Length
Upstream Invert Elevation
Downstream Invert Elevation
Owner Type
Owner Name
Maintenance Authority Type
Maintenance Authority Name
Installation Year
Active Flag
City/Township Name
City/Township Code
County Name
County Code
State Code
Last Edited Date
Data Source
Comments
Which types of stormwater features are best represented as lines?

- Pipes
- Channels
- Linear structures
- Artificial paths

Natural or constructed conduit that conveys stormwater

Ditches, Swales, Streams, Lined Channels, Drain Tiles(?)
### Channel attribute fields

<table>
<thead>
<tr>
<th>Channel ID</th>
<th>Installation Year</th>
</tr>
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<tbody>
<tr>
<td>Type</td>
<td>Active Flag</td>
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<tr>
<td>Assessment Unit ID</td>
<td>City/Township Name</td>
</tr>
<tr>
<td>Height</td>
<td>City/Township Code</td>
</tr>
<tr>
<td>Width</td>
<td>County Name</td>
</tr>
<tr>
<td>Length</td>
<td>County Code</td>
</tr>
<tr>
<td>Shape</td>
<td>State Code</td>
</tr>
<tr>
<td>Owner Type</td>
<td>Last Edited Date</td>
</tr>
<tr>
<td>Owner Name</td>
<td>Data Source</td>
</tr>
<tr>
<td>Maintenance Authority Type</td>
<td>Comments</td>
</tr>
<tr>
<td>Maintenance Authority Name</td>
<td></td>
</tr>
</tbody>
</table>
Which types of stormwater features are best represented as lines?

- Pipes
- Channels
- Linear structures
- Artificial paths

Stormwater management devices that are linear in nature, but do not convey stormwater

- Weirs, Debris Barriers, Others?
<table>
<thead>
<tr>
<th>Linear Structure attribute fields</th>
</tr>
</thead>
<tbody>
<tr>
<td>Structure ID</td>
</tr>
<tr>
<td>Type</td>
</tr>
<tr>
<td>Length</td>
</tr>
<tr>
<td>Owner Type</td>
</tr>
<tr>
<td>Owner Name</td>
</tr>
<tr>
<td>Maintenance Authority Type</td>
</tr>
<tr>
<td>Maintenance Authority Name</td>
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<tr>
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<tr>
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<tr>
<td>State Code</td>
</tr>
<tr>
<td>Last Edited Date</td>
</tr>
<tr>
<td>Data Source</td>
</tr>
<tr>
<td>Comments</td>
</tr>
</tbody>
</table>
Which types of stormwater features are best represented as lines?

- Pipes

  Provides a general conveyance connector for areas where an exact path isn’t known or doesn’t exist.

- Channels

  Lakes, Ponds, Wetlands

- Linear structures

- Artificial paths
Artificial Path attribute fields

- Artificial Path ID
- Length
- Active Flag
- City/Township Name
- City/Township Code
- County Name
- County Code
- State Code
- Last Edited Date
- Data Source
- Comments
Findings - General

- Existing materials (starter list, 2010 metro standard) cover many of the popular business needs

- Data are organized into 4 separate layers (pipes, channels, linear structures, artificial paths), but possibly could be combined – depending on field similarities
  - Implementation of data subtypes?

- “Linear structures” could be represented as points, depending on the need for cartographic representation or need for measuring structure length
Findings - Geometry

- Ideally, line features should be topologically connected with lines (junctions) and the other geometry types (points, polygons)

- If we are to include city/county ownership or location fields, lines will need to be split at jurisdictional boundaries

- Will need to find a way to resolve duplicate features/geometry
  - May be a challenge if data collection methodology and/or completeness is inconsistent amongst agencies
Findings - Attributes

- Unique ID will require some thought
  - Would be ideal to have logic built into ID (i.e. not random values)
  - How to best do this when features cross jurisdictional boundaries?
  - How do the IDs amongst other geometry types relate to each other?

Example ID: **State FIPS** + **County FIPS** + **CTU Code** + "-" + **Agency-produced ID**

2705318188-SP12345QWH

- Location-based ID requires integrity in geometry (i.e. split at boundaries)

- Have others discussed unique ID schemes?
<table>
<thead>
<tr>
<th>“Nice to Have” data elements</th>
<th>% flow restriction</th>
<th>Water quality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Condition ratings</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rim elevations</td>
<td>Emergency overflow</td>
<td>Flow volume</td>
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<tr>
<td>Slope</td>
<td>Asset photos/videos</td>
<td></td>
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<tr>
<td>Data creation/acquisition methodology</td>
<td>Locational accuracy</td>
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<tr>
<td>Inspection reports</td>
<td>Maintenance agreements</td>
<td></td>
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<tr>
<td>Inspection frequency</td>
<td>Maintenance needed</td>
<td></td>
</tr>
<tr>
<td>Link to plans/as-builts</td>
<td>Last maintenance activity</td>
<td></td>
</tr>
</tbody>
</table>
Thank you!