Metro Stormwater Geodata Project (MSGP)

Steering Team Meeting 2 – Summary Meeting Notes & Next Steps
Tuesday, August 28, 2018: 9 a.m. – 12:00 p.m.
Carver County Water Management Organization – Carver County Government Center
Oak Lake Conference Room (Lower Level of the Courts Building)
604 East 4th Street, Chaska, MN 55318

Point Features Discussion – Point Team Findings:

The Point Team determined that a potentially useful approach would entail carrying two (2) feature classes, these being **Basins** and **Stormwater Structures:**

Basins:
Basins would be further categorized as either **natural** or **constructed** and would need to be coordinated with their corresponding polygon feature as appropriate and applicable.

Stormwater Structures:
The team identified fifty-one (51) potential device types and discussed the merits of expanding or contracting that list (e.g. is there a need more granular device types?) A critique from the asset management interests indicated that this would likely be too many device types in one feature class. The group will explore how this is handled in the ESRI Local Government Information Model, review of the new ESRI utility data structure may be helpful, even though it is unlike how this kind of work has been done in the past. Explore the potential for utilizing the 'subtype' approach for categorizing feature types. Within a given outlet structure, there are the possibility for numerous attributes depending if there are one or many points associated with the fixtures in place.

Points of Discussion:

Units of Measurement:
The question arose about how to manage and treat units of measurements in the transfer standard; should inches, feet, etc. be the baseline unit? Deeper examination of each case. There are some features where feet are always appropriate (even if the feature is less than one foot) and some where inches are always appropriate (even if it occasionally exceeds 12 inches).

***Task:** Each flash team to review on a case by case basis the elements and attributes in their portion of the standard and make an initial recommendation on which unit of measure is most appropriate (inches, feet, meters, etc.) for their various attributes based on use (and common sense)*

One example would potentially be pipe diameter would always appear in inches, while pipe length would always appear in feet.

Positional Accuracy:
Still discussing how to define position accuracy; how are people using the data? Routing? Using survey measurements vs aerial measurements? What equipment did you collect the measurements with? Could use low, med or high with a support document explaining what that means. Sometimes there is a pattern if the survey used a different datum when collecting. Could add a datum field to do conversions when needed.

Using point features for representing surface waters:
Surface water features, should they be represented as point, polygon or both?
Would it be appropriate to create a size cut-off for polygons (e.g. under a certain size, not represented as a polygon) or some rules on what get maintained in which feature type, such as detention ponds. The argument was made that it can be very time consuming to use polygons and that water features shape and extent can change with some frequency, so capturing their shape consistently can be challenging. Also, if representing water bodies as points, the accuracy of the point feature is important. Consideration of the challenge of routing using polygons and the need for centroids and artificial paths for routing applications remain key points of the discussion.

Definition of what a basin is.
The discussion turned to how a basin is defined (size threshold, intended functions, etc.) and it if was realistic for data users to expect cities to know how to create basin data effectively and how to maintain it effectively. The ESRI model may have some insight into how to manage and maintain these features.

Authoritative source.
The group agreed this is important for determining and maintaining who is the authoritative source for the data, regardless of who might own and/or maintain the real-world physical asset.

Comments field.
Useful for retaining unique, special or reference information, but can be mis-used as a 'catch all'. Potential to limit the number of characters of a comments field to keep from becoming unwieldy.

Sub-types/ESRI approach.
The merits of maintaining field(s) or using ESRI subtyping was discussed. Adhering to the ESRI model might leave out non-ESRI users and CAD interests. Is this eventual product to be a a geodatabase, maintained in a shapefile, in CAD? Variation in data sources will be a challenge and there will need to be robust ETL resources and workflows developed. Satisfying the core business needs will remain the main goal for the first version of the regional dataset, however, we need to button down on the details for some time yet.

Metadata.
All datasets that eventually result should have as complete a metadata record as possible. Additionally, another desirable long-term deliverable is for a 'best practices' guide or similar resource that documents what each attribute is, variations of its potential expression or form, what it contains, and so on. This resource would also potentially contain a glossary and supporting explanations.

Symbology:
Symbology does not always translate back and forth between GIS and Asset Management, we may wish to make some symbology recommendations as part of our work.

Key questions arising from the Point Team's work:

Unique ID. Discussed in full in the Line Team Section.

Inclusion categories to be applied. What kinds of inclusion categories (e.g. Mandatory, Conditional, Option) are appropriate to each feature? To be determined when we begin refining the first prototype of the data standard.

Need for shared nomenclature and terminology. Depending on usage and business need, terminology applied to the features can change (e.g. 'one person's inlet is another person's outlet') or potentially, direction of flow will be confusing depending on the structure. We will explore using descriptive elements such as “end of pipe” and “beginning of pipe” to provide clarity.

Line Team (Linear Features) Discussion – Line Team Findings:

The Line Team took on the task of which types of features best represented as lines.
Four categories of features emerged: pipes, channels, artificial paths and linear structures.

Some features, such as drain tiles, have the potential to appear in more than one of these categories and will need discussion and refinement.

Linear features.

Pipes
Drain tiles may fit other categories than just pipes. There is a potential need to add ground elevation (both upstream and downstream) to attribute. Also, some indication of ground cover over the structure would be helpful. Indicators such as if the feature has a natural bottom or could be used as a fish passage might be useful for some applications.

Channels
These could be either natural or constructed; drain tiles could potentially "straddle" both the pipe and channel categories. Width may change over the run of a channel
Slope could change as well over the length of the channel.
Having an indication of cover type or armoring would be helpful.

Artificial paths.
These were accommodated for in the original data standard (2010), simple lines with a few attributes, we would retain these as needed to facilitate routing to polygon centroids.

Linear structures.
These are devices that do not convey stormwater such as levies, embankments, weirs, debris barriers, etc. Project will examine inclusion of data of this type, our standard could have a landing place for this information and it could be optional if that is what the stakeholders desire.

Unique ID. How to create, deploy and maintain a unique identifier (ID) to be determined; this can be fleshed out in working with the other teams (line and polygon). There is potential to use the: **27 053 184411-045678901234** approach, where an agreed upon prefix is applied to whatever local code is in use. **State Code** + **County Code** + **Local (GNIS?) Code** + **Local Unique** ID to be potentially explored in pilot project. Ideal to have an ID that can be used to trace it back to location (where it is) and potentially who owns it. We will test Unique ID treatments in the pilot project when we have test data to work with.

***Task:** Group to determine fitness of the 'prefix' method for creating a unique feature ID in the development of the pilot data*

Public drainage features. Public drainage systems do exist in the metro, not in the urban (built up area)

***Task:** Conduct some base level research on the status of the state's public drainage data and data standard and any available data. Also, determination of where County, State and Judicial Ditches occur in the metro region.*

'Nice to have' elements.
The Line Team also identified a number of extra data elements terms as 'nice to have' but not central to the core needs as presently understood, these included condition ratings, rim elevations, slope indicator, data creation/acquisition methodology (with a domain), a means to link to inspection reports and frequency, links to plans and as-built drawings, percentage flow restriction, emergency overflow data, asset photos or videos, positional/locational accuracy,

linkage to maintenance agreements, link to maintenance needed reports, link to last maintenance activity, water quality data and flow volume data.

Discussion: Has there been any discussion on the role or inflow & infiltration difficulties that cities have? Could there be a flag on the pipes to indicate this?
Stormwater emergency overflow; how would this be handled, as a path or a channel? Is there any liability or concern if this data was public (e.g. a landowner finding out their property could flood due to emergency over flow). One potential would be to symbolize this with points (emergency topping points) that indicate generally where it could occur, but not the direction of the potential overflow.

Polygon Features Discussion – Polygon Team Findings:

As the 2010 data standard did not contain polygon features, the group debated the need for them, but also determined there were a number of business cases for which polygons should be maintained. The State of Washington DOT standard included them for similar uses, including visualization and mapping, buffering applications, integration with other systems, identifying flood prone areas, identifying cross-jurisdictional water features and so on.

Other useful potential polygon features beyond representing just the water features include the stormwater system areas (stormsheds, service areas) and drainage areas at the sub-watershed scale. Other features, such as wetlands can be challenging to capture and maintain, and flood zones come from other authoritative sources. Accuracy status could be captures in the attributes, but agencies may not want to have this out there in the public sphere.

Another question is determining who the audience for polygon data; engineers, the general public, etc. Potentially, the local government unit would want to (or not want to share this data). Need to identify a watershed scale? Or as they see fit? May be complicated to digest. Would have to be a regional scale.

The project could use a point data with some way of quantifying contributing flow areas;

Without polygons. IT would still be possible to do routing work without them, you can contain surface water volume data in a point feature. If you don't use real-world features, you can't perform buffering or use proximity analysis. The public and data consumer community have expanded expectations of the data they acquire and use; it would serve us well to think about what people will expect from the data model in the next 5-10 years; more flooding events will need better data. Web apps on mobile devices would have to search for a centroid in the middle of a lake, fitting the data to the use case will be key.

Polygons in a later phase of the project? Is Phase 2 to create the polygons? But hard to put lines around lakes and wetlands – these are an estimate only, determining spatial extent of water features will need rules, guidelines, and documentation of techniques employed. There will be extensive overlap between GIS and CAD worlds in this part of the effort. Also, to

consider, are drainage and utility easements which while important, gets into the regulatory side of things which is not our original purpose.

Should the standard satisfy what people want to see as polygons, or what features need to be polygons? Do elected officials need to decide? Expectations in the future – we will need to be able to satisfy these. Working this into shape with the pilot project will help us inform how we move forward.

Decision to include polygons.
Because this is new (not constricted by the 2010 standard), the group decided that we should use and include the polygons. Local data producers (cities and counites) can provide more accurate data than the state DNR. This may generate many questions now, but long term will be a good thing. Use of polygons will undoubtedly reveal how uncertain the shapes are. Wetlands especially are quite tricky, to determine where a wetland ends, you will need soil and plant people, wetland delineators involved, with detailed descriptions and metadata. The rising interest of the public in these issues and how they relate to climate change are also to be considered.

Attributes for polygons. The Polygon Team have started a list of attributes, but how much extra work would it be for cities and counties to maintain this data? Should this all just be optional or mandatory? If we are going to include polygons in the project we will need to more fully address, scale and threshold for inclusion (it is not feasible to build a boundary around every little puddle) and to document the list of assumptions and expectations about how they will be carried, how they integrate with the synonymous point data and what they can and can't be expected to do as features.

Next Actions:

- **Next full MSGP Steering Team Meeting is scheduled for November 14 in Blaine.**
- **Point, Line and Polygon Flash Teams can resume work if they wish and incorporate the intel form the discussion at the 8/28/18 Chaska meeting, develop initial prototype data standard elements (rough early draft for group review)**

- **Maas to draft 8/28/18 meeting summary notes and post presenter slides to the website;**

- **Maas applying for a small grant from the University of Minnesota Water Resources Center to help fund data transition of the MSGP pilot project. Grant submittal is due on September 10.**

- **Koutnik/Maas to set up a training demonstration session on the ESRI Utilities Network model (this fall, date TBD). Ideally this will occur prior to the November 14 meeting in Blaine.**