CALUMET STORMWATER COLLABORATIVE

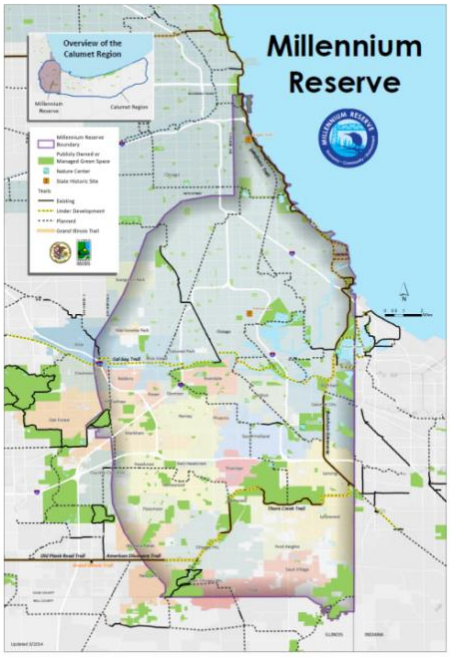
MEETING SUMMARY - October 3, 2014

South Suburban Mayors and Managers Association

1904 W. 174th St., East Hazel Crest

Attendees

Adam Jame, Baxter and Woodman
John Beckman, Catalyst Eco Consulting
Danielle Gallet, Center for Neighborhood Technology
Ryan Wilson, Center for Neighborhood Technology
Mason Throneberg, CH2MHILL
Michael Berkshire, Chicago Department of Planning and Development
Aaron Koch, Chicago Department of Water Management
Jason Navota, Chicago Metropolitan Agency for Planning
Zhanna Yermakov, Chicago Park District
Lauren Umek, Chicago Park District
Nancy Williamson, Chicago Wilderness
Thomas Burke, Christopher B. Burke Engineering, Ltd.
Dominic Tocci, Cook County Department of Planning and Development
Alex Simmons, Cook County Land Bank Authority
Eric Otto, Forest Preserve District of Cook County
Mark WIllobee, Geosyntec
Lisa Cotner, Illinois Department of Natural Resources
Amy Walkenbach, Illinois Environmental Protection Agency
Abby Crisostomo, Metropolitan Planning Council
Josh Ellis, Metropolitan Planning Council
Tim Oravec, Metropolitan Water Reclamation District
Brent Shraiberg, Metropolitan Water Reclamation District
John Watson, Metropolitan Water Reclamation District
Mollie Dowling, OIA Chicago Southland
Emy Brawley, Openlands
Andrew Szwak, Openlands
Katrin Phillips, Sierra Club
Reggie Greenwood, South Suburban Mayors and Managers Association
Dennis Latto, South Suburban Mayors and Managers Association
Sarah Brodzinksky, United States Army Corps of Engineers
Kevin Lovell, United States Army Corps of Engineers
Josh Schmidt, United States Army Corps of Engineers
Vanessa Villareal, United States Army Corps of Engineers
MaryPat Mattson, University of Illinois-Urbana-Champaign (plus several students)
Tom Slowinsla, V3
Sarah Coulter, Village of Park Forest
Sara Tamez, Wildlife Habitat Council
Daniel Goldfarb, Wildlife Habitat Council



Agenda Highlights

Introductions

Information Exchange

How the City of Chicago uses data and decision-support tools to form stormwater management priorities:

Aaron Koch, Department of Water Management (DWM), City of Chicago

4400 miles of sewer system in Chicago area - consider the investment made to create this and also maintain/improve it.

Our sewer network has a capacity that has served us for many years, but it has limitations.

- The amount of development over the past few years - When new developments or parking lots were built, people did not consider the impact to the sewer system. This created a misalignment between sewer capacity and the demand placed on the sewer system.
- Climate Change – bigger, more intense storms exceed the capacity of our sewer systems. Because of the history of how we built the city and how the environment is changing, we have challenges such as basement flooding and overbank flooding.

We need a way to make decisions beyond building or improving sewers based on complaint, such as 311 calls, because while that response may fix some problems, it allows others to go undiagnosed.

The sewer model was created to better inform sewer construction and repair. It is a computer program that takes the largest sewer pipes in the city to model how the system is going to perform. Allows the ability to "replace" pipes and foresee the impact and change in capacity across multiple scenarios.

[Aaron showed a map generated by the sewer model]

Aaron referenced the map and explained that throughout the Calumet region, there are many areas with challenged sewer capacity as determined by the release rate, which fluctuates between 0.1-1.2 cubic feet per acre. The prevalence of release rates below 0.5 cubic feet per acre suggests that investment is needed in most areas of the Calumet region.

Aaron noted the need to consider combined sewer systems versus separate sewer systems when determining where to make investments. If looking at making a stormwater investment, his department tends to avoid areas with a heavy presence of separate sewer systems, as there is less of an opportunity to reduce basement backups.

In reference to the map Aaron displayed, the question was raised of whether the best places to invest are those with the lowest rate of control. Aaron answered maybe; the team is still looking at how to invest and thinks that the 'lower the number, the higher the priority' could be a general rule. However, what *type* of investment is important to consider.

Aaron explained that the same model was used to generate a map showing where investments have been made and how the threat level was improved. He noted that while there is a good understanding of where investments could be made, it would be ideal if the model could be used to understand the choice to make certain sewer investments versus other investments, such as green infrastructure. With that he raised the following issues:

- What are the best stormwater investment decisions, for a particular problem, in a particular area? Problems could be caused by one pipe in one area or a network of pipes in another area.
- How do we maximize investments? "Cheaper is better" does not always stand, unless backed by data.

When asked for the average investment per gallon of water, Aaron responded that his team does not measure by gallon. Instead, they look at developments that are impacted by the investment and the size of the project. To this point, Aaron brought up water conveyance versus water storage. Chicago is trying to look at basement flooding, which is a problem of both conveyance and storage, though, storage effects conveyance. Finding a solution that can address both has been a challenge.

Aaron was also asked if DWM is compensating for climate change by constructing oversized pipes. Aaron replied that they are thinking longer term, including working with the State Water Survey to update rainfall data. They know climate will continue to change based on current projections and attempt to build sewers that will last a long time. Most pipes they are replacing now are over 100 years old. Combining the knowledge of the pipes they are replacing with the climate projections helps to inform what the future level of investment should be. Also, Aaron noted that the model changes every year as analyses are continually run, thereby adding new assumptions into the model and allowing the creating of new data layers.

MWRD has begun doing five pilot stormwater plans. Using the model and analysis, the City presented to MWRD an area that they want to study further in the Calumet region, just north of Lake Calumet. This work explores the biggest challenges for basement flooding and could present solutions for stormwater. Is there an investment or a series of investments that could solve basement flooding in this area?

In regards to the MWRD pilot projects, it was asked if there are any community engagement efforts within the projects. Aaron responded that MWRD would be better to answer that question, but that typically the efforts equate to reaching out to aldermen and/or conducting community meetings. He commented that community engagement for the city in this realm is not as grassroots as within the realms of housing or community development because there is often a lack of technical knowledge in the community.

Collaborative members noticed that parks were included on the maps being shown by Aaron and asked how this factors into investment. Aaron responded that there have to be discussions on the willingness of park districts to collaborate with investment efforts.

When asked why the pilot area shown was selected, Aaron answered that when looking at the entire city the team asked, where are the biggest challenges in terms of sewer capacity and basement flooding and concluded that while there are other challenged areas, the selected area is a large, contiguous area of need and sits within MWRD's Calumet Water Reclamation Plant's

sewershed, which means it will be affected by the timing of the Thornton Reservoir, expected to be completed in 2015. The City could use MWRD's understanding of how the deep tunnel and reservoir system will affect the neighborhood, as well as efforts by Chicago Park District around Lake Calumet. There is a convergence of need and there is the potential of infrastructure with more capacity here than in other parts of the city.

Finally, Aaron was asked what happens to water in noncontributing/separate sewer areas. He replied that the stormwater is discharged directly into waterways under an MS4 permit and that in areas without sewers the water will infiltrate, stay on site or runoff into an adjacent waterway.

Strengths: This is a very sophisticated, professional computer model that allows us to understand problems and it is dynamic enough to create solutions.

Limitations: There are many caveats for why this model's projections cannot be taken as gospel and there is additional engineering needed. Time and money has not be allotted yet to use the model to its full extent to analyze a broader range of stormwater investments.

Michael Berkshire, Department of Planning and Development (DPD), City of Chicago

Michael explained that DPD is given the opportunity to work with both small and large scale developments, especially those working with TIF financing or purchasing properties from the city and planned development projects. Recently, DPD has started to use stormwater flow path data, which shows how stormwater flows over urban landscape. These layers are created using LIDAR data. Michael noted that the images reflect certain assumptions, such as that smaller inlets to a storm system are closed off, which makes these high level tools.

For DPD, data was first applied when doing land use planning in one of the priority areas of the Green Healthy Neighborhoods project in Englewood. The area has experienced a lot of disinvestment and depopulation resulting in many city-owned, vacant parcels (~11,000 properties, ~800 acres). Four years ago, it was decided to do a land use plan to look at ways to stabilize the neighborhood and maximize the use of vacant parcels. One topic area discussed was the opportunity to develop green infrastructure on these parcels.

Michael then referenced a map being shown and explained that the first layer applied was a result of the stormwater model, showing 5 year street and basement flooding event. The second layer shows the size of pipes, the third layer shows parcels, and so on. Layering this data revealed many options for low cost, simple strategies for managing stormwater in low-lying Washington Park. Now, a new park is being planned as part of the master plan of the development of affordable housing on 58th Street, several blocks into Washington Park as well as efforts to increase pedestrian and bicycle accessibility. After looking at flow path data for 58th street and analyzing the changes in topography, DPD recommended infrastructural improvements and a way to viably create a continuous stream of stormwater through the development to Washington Park.

After sharing this example, Michael explained that DPD is still learning how to apply data. The ability to illustrate flow path analysis was just completed this fall. When asked if the goal is to put all future developments through this type of screening process Michael said yes, though there are no requirements at this point.

How SSMMA's GIS Consortium support stormwater management decision making

Dennis Latto, South Suburban Mayors and Managers Association (SSMMA)

Dennis walked the group through a tutorial of the GIS Atlas tool built by SSMMA. He explained there are a few web viewers municipalities can use that act as a dulled down GIS. This tool can be used to inform many efforts such as emergency response time, economic development and infrastructure. For infrastructure, data is layered into GIS so public works officials can overlay the information layers to see capacity of pipes and new development. Currently, SSMMA is moving into creating more specialized viewers to simplify the use for communities to interact with the tool. They are adding and creating layers constantly.

Dennis was asked if there is data for all the south suburban communities? He replied that it is hit or miss. SSMMA requires communities to pay for membership in the GIS consortium, which give them access to information and expertise. Though, they have bits of information for all members of the consortium, it's inconsistent throughout the region.

Dennis was also asked if the viewers only see the information or download it? Dennis explained that the private viewer is password protected (has fire data, flooding hotspots, etc.). People are granted editing capabilities if people within the towns have GIS experience. Once data is edited, it is held in queue and must be approved by SSMMA before it is uploaded into the system. Other communities, without editing access, must call and request data or maps if manipulation beyond the public viewer is needed.

In regards to stormwater, SSMMA takes a macro level scaled approach because SSMMA cannot get into the engineering modeling of sewer systems unless towns take the initiative first. Though, SSMMA has worked on several projects to identify stormwater management opportunities. For example, the Midlothian flood plains; many of the FEMA-designated floodplains do not accurately represent the areas of the village that regularly flood, which have been mapped as "MWRD inundation areas." Also, Chicago Wilderness & IDNR, set up workshops with communities to develop identify opportunity areas for stormwater and green infrastructure projects. A grant was awarded based on these workshops to implement bio swales and permeable pavers.

SSMMA received a GLRI grant from USEPA to IDNR to SSMMA to work on 3 problem areas - creating naturalized rain gardens and put in bioswales. The project sites will be in Blue Island (expanding on the investments being done by MWRD in the northeast neighborhood), Robbins and Calumet Park. Plans are drawn up for other communities if money becomes available for implementation.

Collaborative members commented that having the information regarding where water is flowing from Blue Island into Chicago or Chicago into Blue Island would be helpful as well as trying to create a workforce program to install green infrastructure.

Limitations to the system: SSMMA is not a municipality, so doesn't have authority to initiate projects. Can help with isolating and locating certain events and help with GIS capacity for communities.

Work group in focus: Short-term information sharing and long-term research alignment

What other existing data or information should we share amongst each other?

The following were provided:

1. Sharing of existing GIS layers; for example, sewer mains of shared concerns.
2. Inventory of existing green stormwater management projects.
3. Topographic and flow path data.
4. Recent rain and climate data from ISWS and MWRD gages.
5. Existing climate change projections.
6. Data on MWRD operations and capacity.

The following were additions suggested by members of the Collaborative:

7. USGS - gauges for climate data and stream gauge data.
8. Have CNT present some of the findings of recent urban flooding study.
9. FEMA floodplains (GIS layer)
10. Non-point source and Green Infrastructure Grant projects from IEPA. What constitutes green infrastructure? Even stream restoration is a green stormwater infrastructure project.

What new data or information should we gather through new research?

The following were provided:

1. Soil Mapping
    a. Understanding the soil condition, considering the difference between clay and sand, is important
2. Impervious surface mapping
    a. Does the rest of the Calumet region have this data? Is it refined enough? Think about how to put it into maps and models to make this data stronger.
3. Expanded flow path analysis and digital elevation models
4. Rain frequency and climate change projections
    a. Update rain data tables so that we are developing for the future
5. Green stormwater infrastructure cost and performance data
    a. We have done many pilots and projections, but there is not real data set to tell what you might expect when you install green infrastructure. How much might it cost? We do not have great numbers on cost or performance for green infrastructure, especially compared to grey infrastructure.
    b. We only have assumptions for cost and benefits.

The following were additions suggested by members of the Collaborative:

6. Groundwater table levels
7. Maintenance cost of green infrastructure projects
    a. Could be included in cost and performance - which should consider a lifecycle analysis. SSMMA going through this problem now with developments, experiencing many legal issues and having to draft MOUs.
    b. MWRD Watershed Management Ordinance, potential conservancy areas - can larger scale developments use that as regional stormwater management?

    c. Ex. NeighborSpace Program: discussing ownership and maintenance of stormwater parks.
8. Capture the energy uses and associated emissions - document climate adaption.
9. Monitor the impact on homeowners of different flooding events and to different extents. Monitor how impactful investments are. (percentage of flood impacts and reduced impacts) Who has this information and at what level is it shared?

Collaboration Now!

Zhanna shared that two weeks ago, two contracts were issued to do work on Van Vlissingen Marsh and Big Marsh. Both sites have issues with slag, contamination, high pH, etc. Zhanna asked the Collaborative if there is a possibility to plan, design and manage these sites so that they can alleviate stormwater issues in the surrounding area. She explained that there is grant funding to move forward, but if there are ideas to incorporate stormwater issues, there could be additional funding and they would be able to solve several issues at the same time. The Chicago Park District would like to work with others, but are unsure how to approach that and how to get funding.

Some of the responses were:

- The sites seem contiguous to the sites Aaron Koch showed that are in the MWRD pilot area, experiencing sewer capacity problems and near separate sewer areas. Including them in the pilot study with MWRD could be an option with possible funding.
- The flow path model is done in this area, so it would make sense to see where water was coming from or going to within this area.
- The Chicago Park District might want to talk to the land bank to acquire adjacent parcels to manage water quality before it reaches the property.
- If the property was previous industrial, check to see who that user was.
- Check for funding from government agency or local government.
- Get the surface level flooding water to the area and provide a place for it to infiltrate there. Slag can be helpful for that as long as it is not contaminated.

Member Updates

Mason reported on the Data Sharing and Modeling Work Group. He said the group convened for a third meeting and are in the process of defining what to do moving forward. Some ideas they have proposed are to take an inventory of what models and metadata are being used and are conceptualizing what kinds of questions such tools can answer. Also, the group is coming up with performance metrics for model output to better explain how these outputs are useful to a variety of end users.

Abby reported on the Installation, Troubleshooting & Maintenance Group. The group has made progress on their logic model in terms of figuring out what kinds of questions to ask and invited those who have questions and proposals related to long-term maintenance to join the group. Also, Abby proposed that the Collaborative find a way to share information from different work groups so that people who cannot attend meetings can stay up-to-date. This brought up the issue of creating a better website for the Collaborative.

Josh reports on the Land Bank Group. They are working on questionnaires to determine stormwater and open space variables that the land bank can use to vet the suitability of acquiring properties.

Next Meeting

Friday, November 7, 9:00am – 11:00pm

MWRD Calumet Water Reclamation Plant, 400 E. St., Chicago
(Optional facility tour to follow)