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Sustain a Greener Ohio



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Stormwater Management: Improving Effectiveness and Efficiency through Collaborative GIS Services

Stark County, Ohio

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This case study describes the Stark County “Sustain a Greener Ohio” collaborative project with insights from leaders of this collaboration. The story is told with the help of the researchers at the Center for Public Administration and Public Policy at Kent State University. We hope that by sharing experiences and lessons learned through this collaboration, we will help others start successful collaborations. Robert Nau (Stark County Planning Commission), Sean Phillips (Stark County Planning Commission), and Tom Ault (City of Louisville) contributed insights and information that made this case study possible. The case study is written from in the first person plural (“we”) tense -- as though the writers were present and involved in the collaboration -- to enhance readability and ease comprehension for its readers.

Just the Facts:

In the field of public works, a number of unfunded mandates have come down from the state and federal level. Some of the more important ones related to stormwater regulations introduced by the United States Environmental Protection Agency (USEPA) in the 1990’s. Mandated stormwater system improvements were originally introduced in 1987 through the federal Clean Water Act. These mandates required municipalities and other entities which oversee stormwater systems to obtain permits and control the release of pollutants into waterways. The first of these mandates came into effect for large cities in Phase I in 1990, while the Phase II regulations that impact smaller cities came into effect in 1999. It is these Phase II regulations that have been applied to our communities here in Stark County.

Although these regulations did not require compliance by all cities in Stark County, the need for effective stormwater management emerged through issues with flooding and contamination. To complicate matters, while we were not required to completely overhaul our storm sewer system, we were required to map our storm sewer network. This would be an expensive undertaking in terms of manpower and equipment, and would be very difficult for many of the smaller townships and villages in our county. Many communities did not have the equipment necessary for mapping, or the personnel needed to operate the equipment if it were borrowed.

Thankfully, Stark County communities were fortunate enough to have a Regional Planning Commission (RPC), and leaders who were aware of the challenges presented by the stormwater mandates. Stark County RPC (SCRPC) members began to develop ideas for cooperative approaches to meeting this mandate. As discussions started, collaborative ideas expanded. The benefits of working together were clear: both equipment and personnel could be shared, while the cost of mapping could be spread across communities which could not easily afford the service independently. Collaborative service improvements, such as the use of common Geographic Information Systems (GIS) were also envisioned. As Robert Nau of the SCRPC observed, “We discussed the long term benefits of a countywide GIS map, not only in terms of meeting the EPA mandate, but also in terms of improving our emergency response capacity.”

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**Robert Nau, Director
Stark County Regional
Planning Commission**

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**Tom Ault, City Manager
City of Louisville**

We came across the Efficient Gov Now (EGN) grant program during this process. This was a local government grant program run by a regional philanthropic organization, the Fund for Our Economic Future (Fund). The program offered grant funding for projects that used local intergovernmental collaborations to improve the efficiency and effectiveness of government in Northeast Ohio. Viewing this program as a tremendous opportunity, we developed a proposal for our collaborative stormwater mapping and submitted it to the EGN grant program. In the end, however, we did not win the grant contest.

In spite of the setback of losing the grant, our project has moved quickly and has created benefits for the communities involved. By the fall of 2009, we were hiring personnel and we began mapping in November 2009. Projections stated that a full map would require completion of 615 total road miles throughout the participating communities. By June of 2010, we had already completed 12.5 percent of the road inventory system, and by December of 2011, 62% of the mapping had been completed.. The community partners are also saving money, about \$700,000 in total. The communities are also satisfied with the progress and results. Tom Ault, the City of Manager of Louisville, had this to say: “In retrospect would I do it again? Absolutely. We've clearly saved money and there is no sign as yet that we will be having any future problems with service.”

Sustain a Greener Ohio

The Problem

The issue of stormwater management is an important one. Effective storm-water management protects the environment and the public from toxic runoff from roadways and yards. Without appropriate stormwater systems, polluted water may enter waterways or traditional sewer systems that are not designed to process and treat pollutants washed from vehicle waste, yard pesticides, or other sources of urban runoff. Thus, if stormwater is not managed properly, it can deposit toxins in waterways and this can result in public health and ecological problems.

Communities here in Stark County have known about this problem for some time. The Public Works departments in our cities followed the discussion surrounding stormwater laws and regulations passed at the federal level. The first of these laws passed in 1987. This law amended the federal Clean Water Act's (CWA) major regulatory program, the National Pollutant Discharge Elimination System (NPDES), to specifically address stormwater. Under the NPDES, federal and state governments are required to develop regulations and issue permits to local governments and private entities discharging pollutants to waters of the United States. In 1999, the second set of regulations under this new law were released by the USEPA, and it required many urban areas to apply for storm-water permit coverage and to implement six minimum control measures for stormwater systems:

1. Public Education and Outreach
2. Public Participation and Involvement
- 3. Illicit Discharge Detection and Elimination**
4. Construction Site Runoff Control
5. Post-Construction Runoff Control
6. Pollution Prevention and Good Housekeeping

Control measure '3' above requires communities to develop comprehensive maps of their stormwater systems to enable tracking of leaks and other weaknesses in the system. These types of leaks are called illicit discharges, and are described as "any discharge into a separate storm sewer system that is not composed entirely of storm water." Illicit discharges typically enter a stormwater system through direct connection or indirectly from cracked sanitary sewer systems, spills collected by storm drains, or from contaminants dumped into a storm drain. A detailed and comprehensive map of storm sewer systems is critical to tracking and controlling illicit discharges.

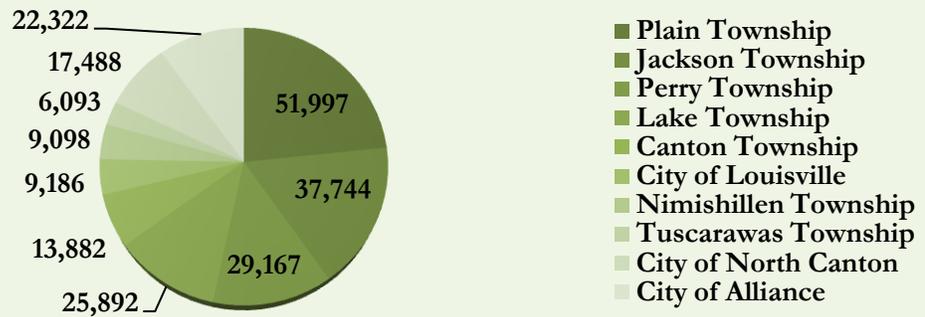
While these laws and regulations were important and necessary for preserving public health and the environment, all of the mandates described above were unfunded. This made implementation difficult, particularly for small communities. For the cities, villages, and townships in Stark County, meeting these mandates offered a twofold challenge: first, they required funds to carry out the mandates, and second, they required the materials and expertise needed to carry them out. Acquiring these things was not simple for communities in Stark County. Many of our communities were hard hit by the recession. Several large businesses closed in Canton, the County's largest city, and tax revenues decreased throughout the county. To complicate matters, many of the communities lacked the expertise and basic hardware to complete one of the first steps involved in improving stormwater management: developing the storm system map.

The Opportunity

While some of the required mapping had already taken place through the County Health Department which had mapped storm sewer outfalls in 2006, our communities needed a more comprehensive set of maps to meet the new EPA mandates. Stark County had already projected a cost of \$1.2 million for completing the needed maps, a healthy sum by any measure. Additional costs for updating and maintaining the maps are expected in the future. As concerns about meeting stormwater system map deadlines emerged within communities, word reached leaders in the Stark County Regional Planning Commission (SCRPC), an important presence in Stark County since 1957.

SCRPC recognized the importance of meeting these mandates, and also realized that the cost of completing the maps would be very difficult for some of the smaller communities to absorb. Using the partnerships formed between communities which participated in the Health Department outfall mapping project, leaders within SCRPC proposed collaborative purchasing of mapping equipment, personnel sharing, and joint mapping across the member communities listed on the following page in Figure 1.

Figure 1: Population of Partners (Total 378,098 in Stark)



A solution was needed. The cost of mapping all of the communities which needed to meet the mandate was large, about \$1.2 million. While we considered collaboration, we also began to seek out additional funding -- and that is when we came across the Efficient Gov Now (EGN) grant program.

The EGN grant program is a contest which a Northeast Ohio philanthropic organization, the Fund for Our Economic Future (Fund), ran in 2009 and 2010. Created to encourage local government efficiency and effectiveness through collaboration, EGN invited local governments to write and submit proposals for projects that involve two or more local governments working together to improve or expand government programs and services. The Fund invited citizens from across Northeast Ohio to vote on their favorite project to select the three winners. It was an appealing contest for a lot of reasons: it encouraged collaboration, rewarded good ideas and involved citizens in government choices. Some governments heard of the contest, and immediately set about creating an idea that involved collaboration. Since we were facing problems which demanded a collaborative solution, we saw the contest as an opportunity to bring potential partners to the table. The EGN program presented an excellent opportunity for us to seek additional savings through a grant as we collaborated.

The Plan

SCRPC's involvement immediately presented an opportunity for cost savings for member communities, as the commission already possessed a Geographic Information System (GIS), GIS staff, and an administrative structure capable of completing the mapping. The SCRPC also served as a pre-established connection between all of the communities involved.

Given these capacities, the communities used the SCRPC to develop a plan to enable each of the member municipalities to use the SCRPC GIS system and personnel to develop a county-wide map rather than individual community maps. This approach offered tremendous potential for cost savings over time through equipment sharing, personnel sharing, and software sharing. It also offered service advantages because it involved one single mapping format for communities throughout Stark County, which was much more useful than a large number of maps in different formats that might have been produced if each community had sought to meet the EPA mandate on its own.

The Proposal

The number of communities participating in the project has varied over time since we started discussion through SCRPC in 2008. In the early stages, 13 cities, villages and townships considered participating in the project. When we applied to EGN in 2009, 11 project partners were in place. Currently, 10 of the partners remain, with the 11th, Perry Township, pursuing work with a private organization. Of the current 10 partners, 7 share a joint contract with the SCRPC for storm-water mapping services, while the City of North Canton and the City of Alliance use separate contracts which call for an expanded range of mapping services. The last partner, Stark County, sought assistance with mapping for county roads.

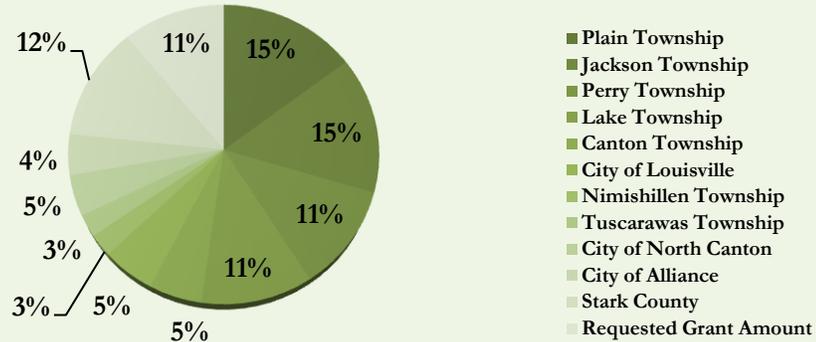
As we developed the proposal, the SCRPC took the lead in developing administrative arrangements. Early on, communities interested in participating sent letters of interest to the SCRPC GIS Coordinator, Sean Phillips. After the list of participants was finalized, a Consortium was formed, and Memoranda of Understanding (MOUs) were signed by the partners. The MOUs described how the GIS unit would complete the mapping, as well as the distribution of responsibility. These MOUs also provided the SCRPC GIS unit with necessary financial and technical support for completing the mapping. Once the MOUs were in place, the participating communities entered into contract with the SCRPC. The timeline for the proposed EGN project is outlined on the following page in Figure 2.

Figure 2: Timeline for Implementation



At the time of writing the grant proposal, the projected cost of the joint stormwater mapping program was projected at around \$730,000, well below the original \$1.2 million estimate of the cost of individual communities building maps individually. The proportional contributions of each community, as well as the EGN grant, are described in Figure 3.

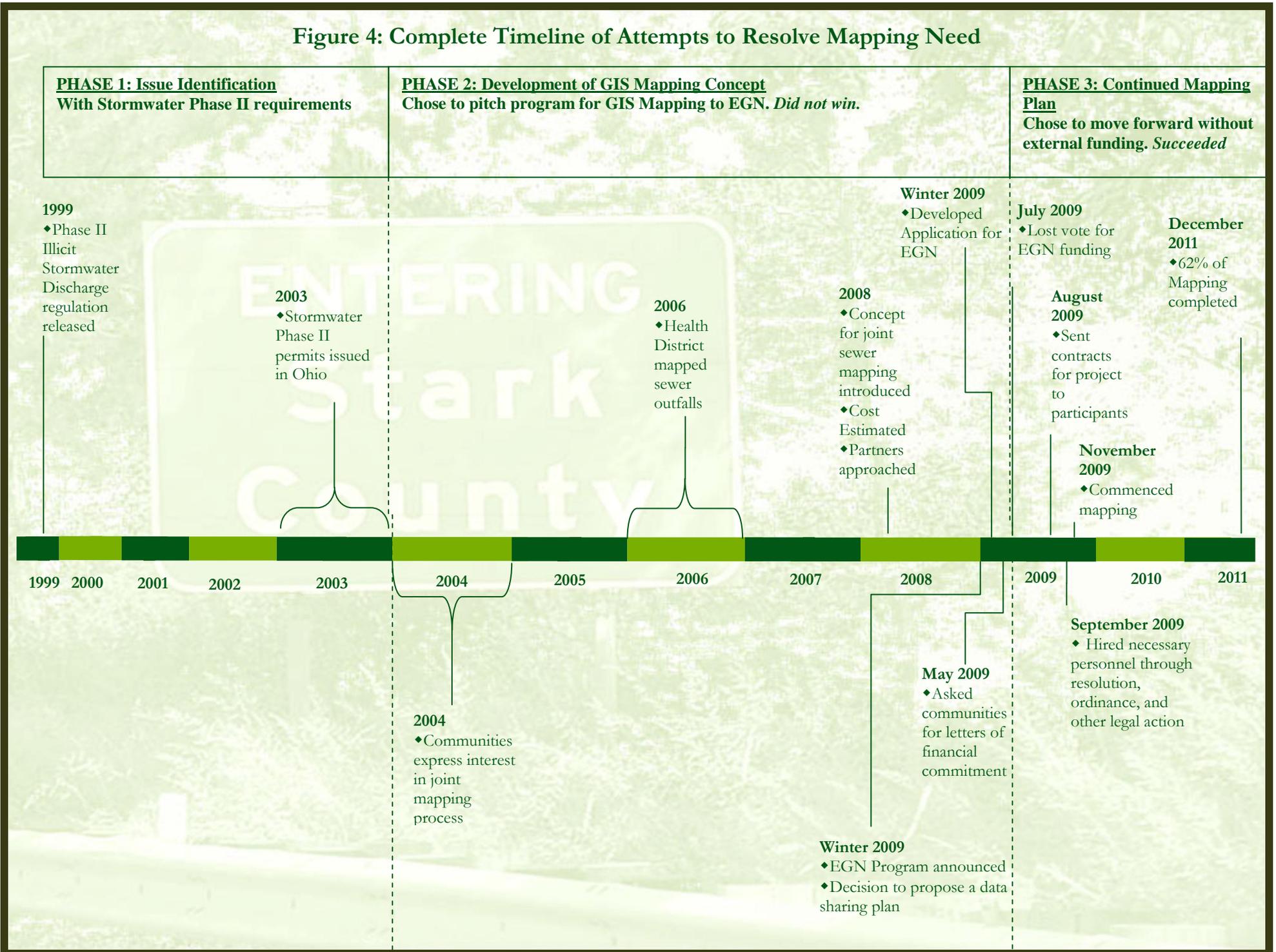
Figure 3: Contributions of Original Partners



The Reality

Once the contracts were in place, we submitted the proposal to the EGN contest. Voting commenced, and we waited, hoping for the best. In the end, we did not receive financial support from the EGN program. While this news was difficult and disappointing, it only served as a setback, not an insurmountable barrier. In spite of the setback, we carried on with implementation and our progress as described in Figure 4 and on the following pages.

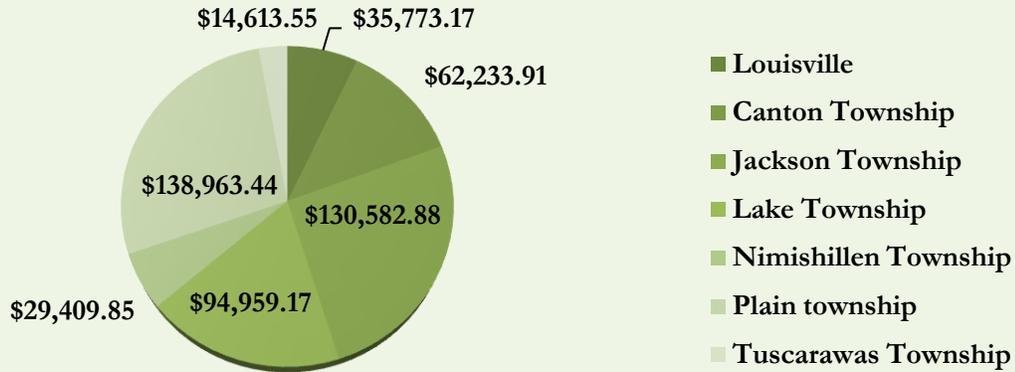
Figure 4: Complete Timeline of Attempts to Resolve Mapping Need



The Progress

While funding presented challenges, our member communities came together to support the project, offering the contributions described below in Figure 5. It is noteworthy that these costs are lower than the originally projected costs that were included in our EGN application.

Figure 5: Final Partner Contributions (\$506,535.97)



Throughout the process, SCRPC's GIS team has refined its mapping approaches. Originally, maps were distributed to the consortium in a hard copy paper format. We were aware of a software program called Accuglobe, but came to realize that this software was not capable of carrying the amount of data that we needed. In response to this concern, the SCRPC GIS team partnered with the Stark County Auditor's office to utilize Pictometry Online. The Auditor's office had an existing partnership with this online map hosting site that houses Pictometry's images and some county data such as roads and parcel lines. To use this software, the SCRPC GIS team members submit data to the Auditor's office, who subsequently upload the maps to Pictometry online where all consortium members can access the information.

While progress has been steady, issues have arisen during the course of implementation. Communication and cooperation with the Stark County Auditor's office has enabled us to improve our strategy for sharing information with project members.

Our success in improving communications regarding the mapping and its progress has led to concerns about maintenance and long term availability of information that must be addressed as we progress. The concern that we see on the horizon is the maintenance of the maps. Current contributions from partner communities only cover the completion of the first versions of the maps. In the future, however, these maps will need to be updated if they are to remain viable and useful, and the servers which house them must be maintained. In the coming years, our communities must choose how to fund these activities.

The Outcomes

Since the mapping process began in November of 2009, progress has been steady and encouraging. By June of 2010, we had already completed 12.5 percent of the road inventory system, and various levels of inventory were finished in the partners' communities. Currently, as of December 2011, 62% of the mapping is completed, with each community experiencing an equal level of completion. We are now on track to complete mapping by December 2013, two months before the USEPA compliance deadline.

This project has resulted in a number of significant outcomes. First, the project will save our member communities a total of about \$700,000. This is a critical cost savings to our communities given the tough economic times. Second, this project will enable the communities involved to meet EPA mandates. This will protect our communities from potentially costly fines.

Third, this project will allow us to track and resolve future contamination problems, preserving the safety of our water resources and the security of our environment, while also protecting public and community health. Fourth, this project will enable us to respond to emergencies real-time, a feat which would not be possible without the help of the County Auditor's office Pictometry online software. As Stark County Regional Planning Commission GIS Coordinator Sean Phillips observed, "With the help of the County Auditor's Office, we are establishing a system which allows emergency responders access to maps in the field, improving their ability to respond to real-time to floods and toxic spills."

The Lessons

Throughout the process, we have learned several important lessons. First, we found that collaboration requires effective coordination across all parties involved. Planning should take place with all of the critical parties at the table, and decisions should be reached after discussion.

Second, we found that leadership is important to collaborative success. In this case, the SCRPC served as a leading entity, and effectively balanced the important tasks of bringing partners to the table and continuing dialogue.

Third, we found that equality among partners makes collaboration much easier. Early on in the process, we chose to map equal portions of each community simultaneously. This meant that nobody felt left behind by the project, and assured partners that they were receiving the service they deserved for the price they paid.

Fourth, we found that past partnerships were important when building new ones. In this project, the partnerships developed through the initial Health District outfall mapping led the way to the partnership between the SCRPC and the seven member communities. Without this history of cooperation, it would have been difficult to bring together all of the organizations involved and complete the project.

“ With the help of the County Auditor’s Office, we are establishing a system which allows emergency responders access to maps in the field, improving their ability to respond to real-time to floods and toxic spills.”

**Sean Phillips
Stark County Regional Planning Commission**

For More Information...

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