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## Cooperation, coordination, and connection: Evaluating the effectiveness of intersectoral collaboration through the lens of stormwater management

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# Cooperation, coordination, and connection: Evaluating the effectiveness of intersectoral collaboration through the lens of stormwater management

## Abstract

This paper describes an emerging organizational phenomenon called intersectoral collaboration as a means for delivering public services. Collaboration, and intersectoral collaboration specifically, present a new way to organize over traditional hierarchical organization. The conflict between structured and nonstructured organizations is one that has existed since people began organizing themselves (Olsen, 1965; Ahrhamasson, 1993). This paper is composed of three sections. The first provides a literature review on collaboration including discussion of the benefits and roadblocks to collaborative efforts. The second portion builds on this analysis of collaborative efforts in other functions with a case study of collaboration between the city of Ypsilanti and Eastern Michigan University in meeting Federal and state stormwater management mandates. The third and final section concludes with a review of lessons learned through viewing collaboration in the lens of stormwater management.

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COOPERATION, COORDINATION, AND CONNECTION:  
EVALUATING THE EFFECTIVENESS OF INTERSECTORAL COLLABORATION  
THROUGH THE LENS OF STORMWATER MANAGEMENT

By

Robin Miller

A Senior Thesis Submitted to the

Eastern Michigan University

Honors College

in Partial Fulfillment of the Requirements for Graduation

with Honors in Political Science

Approved at Ypsilanti, Michigan, on this date \_\_\_\_\_

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**Abstract**

This paper describes an emerging organizational phenomenon called intersectoral collaboration as a means for delivering public services. Collaboration, and intersectoral collaboration specifically, present a new way to organize over traditional hierarchical organization. The conflict between structured and nonstructured organizations is one that has existed since people began organizing themselves (Olsen, 1965; Ahrhamasson, 1993). This paper is composed of three sections. The first provides a literature review on collaboration including discussion of the benefits and roadblocks to collaborative efforts. The second portion builds on this analysis of collaborative efforts in other functions with a case study of collaboration between the city of Ypsilanti and Eastern Michigan University in meeting Federal and state stormwater management mandates. The third and final section concludes with a review of lessons learned through viewing collaboration in the lens of stormwater management.

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### **Emergence of Collaboration in Public Administration Theory**

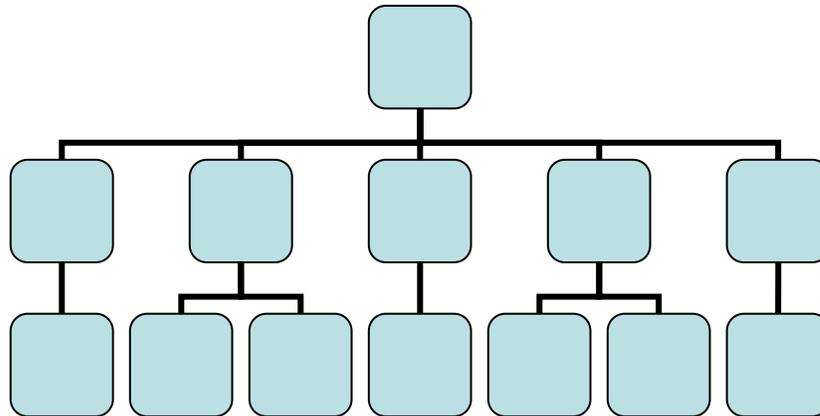
Traditional public administration theory began with a focus on the science of administration, or the “best way” to do things (Taylor, 1911). Taylor’s theories were originally developed for manufacturing engineers to pursue a science of management in a quest to achieve maximum efficiency and utility. This best way approach channeled itself into the development of hierarchical organizations or bureaucracies to solve routine problems and issues in the delivery of public services. If the public issue was crime, for example, a hierarchical agency would be created—the police system—with a strict chain of command from police chief to street officers in order to adequately deliver law enforcement and crime prevention services. Each link on the chain has a clear set of duties and a direct supervisor to oversee actions. In this approach, responsibilities and duties are managed so that they can be the most efficient and effective possible with the greatest degree of control (Abrahamsson, 1993). This best way approach led to the area in public administration literature that focused on incrementalism (Berry et al., 2008). Inherent in this view is that structures could be created that would result in effective, efficient administrative decision making. If inefficiencies arose, incremental structural changes would be the most appropriate solution. Why reinvent the wheel if all that needs to be changed is one part?

In addition to Taylor’s scientific management perspective, another prevailing theory in bureaucratic management is Max Weber’s “ideal type” bureaucracy (1947). Weber established a legacy of clear hierarchical order, concentration of power in senior officials, formal structures, strict roles and regulations, limited channels of communication, and confined openness to creativity, innovation, and change (Vigoda,

2002). The strict hierarchy of positions and duties and vertical flow of communication assures accountability within the chain of command. Figure 1 provides a template for a typical hierarchical organizational chart.

Figure 1. Hierarchical organization template.

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This strict chain of command is enforced by often harsh sanctions and restrictions imposed by supervisory individuals. This makes public administration naturally authoritarian (Vigoda, 2002). An authoritarian state can be good for many reasons. Power and control are maintained within a central point so any messages, communication or directives are clear and often quite effective. Efficiency of work is ensured through constant monitoring and management of worker behavior and output. This authoritarian state relies on the science of administration to meet its goals of service delivery. This controlling, authoritarian, scientific administration is thought to ensure that organizations serve the interest of the citizens, though this argument is debatable (Abrahamsson, 1993).

This authoritarian state often conflicts directly with the United States' establishment as a representative democracy. Values associated with democracy, including equality, participation, and individuality, clash with values of bureaucracy,

including hierarchy, specialization and impersonality. In bureaucratic agencies, the responsiveness—defined as the speed and accuracy of a service provider’s response to a request for action or information of agencies and institutions—can often be slow, which increases distrust and cynicism among citizens (Vigoda, 2002).

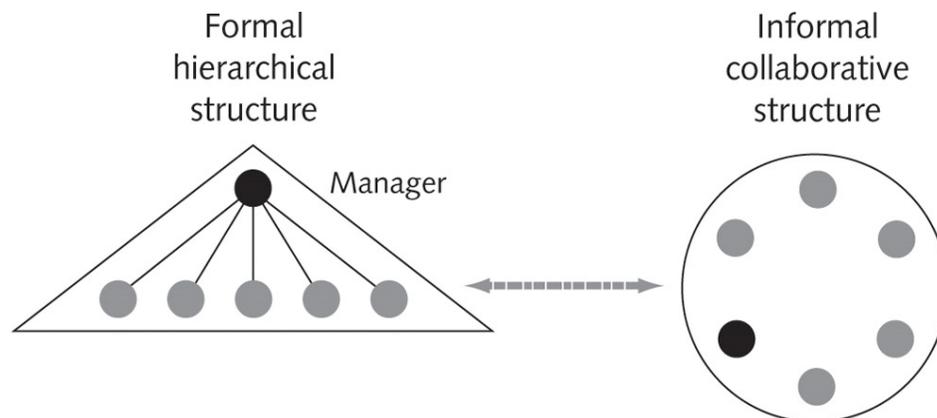
Because of this clash of traditional values in bureaucratic and democratic states as well as pressure from funding sources and resources, contemporary public administration literature has increasingly focused on alternative means of administrative management, specifically that of networked or intersectoral collaboration (Berry et al., 2008).

Public administration scholars and managers seek to stimulate collaboration between citizens and administrators in an effort to improve responsiveness, improve efficiency and effectiveness, and improve quality of life (Vigoda, 2002). This led to the development of *network theory*, the grouping of independent organizations coordinated by contracts rather than through formal hierarchy (Cropf, 2008). Also called *interorganizational or intersectoral theory*, this development started in the 1960s and 1970s when organizational theorists and urban sociologists began to acknowledge urban communities as networks of organizations charged with the delivery of social services (Hall, 2002). Services that were previously provided by hierarchical federal government organizations were beginning to be transferred to states, localities and community organizations. Most commonly, networked organizations address complex community issues in health and human services. The thought behind this was that interorganizational cooperation would lead to improved service delivery and lower costs. Groups practicing intersectoral collaboration work to redistribute power and control from a central authority to many vested individuals and groups. This sharing of power leads to cooperation and

partnership on a higher level than is possible in a typical bureaucratic system (Vigoda, 2002).

Networked structures differ from the traditional bureaucratic systems dictated by Weberian thought in that no single entity is in charge (Cropf, 2008). Networks are very inclusive of interorganizational relationships among a cluster of organizations. This intersectoral network meshes together to pursue collective and self-interest goals or resolve complex societal problems (Hall, 2002; Huxham and Vangen, 2000). Extensive collaboration is required among all involved parties to accomplish the goals and objectives of the network. Figure 2 provides a visual display of the difference between formal hierarchical structure and informal collaborative (interorganizational) structure.

Figure 2. Traditional hierarchical system compared with a networked system.



Source: Straus, 2000, 75

Now that the stage has been set for the proliferation of collaboration in public administration literature, the paper addresses several questions about collaboration. What does collaboration mean? Who are the major players in a collaborative effort? What makes collaboration work? And finally, what are some of the roadblocks to collaborative

efforts? These questions are examined through the lens of a case study on local stormwater management issues at Eastern Michigan University. Finally, the paper concludes with lessons learned from the analysis.

### **Definition of Collaboration**

Merriam-Webster's online dictionary defines the term *collaboration* as an action "to work jointly with others or together especially in an intellectual endeavor" or "to cooperate with an agency or instrumentality with which one is not immediately connected." The term, which first appeared in the English dictionary in 1871, comes from the Late Latin *collaboratus*, past participle of *collaborare*, meaning "to labor together." This derivation comes from the breakdown of these syllables: *co/col/com*, meaning with or together, and *laborare*, meaning to labor. Inherent in the etymology of the word are two themes: togetherness and work.

These themes form the basis for academic definitions of the term. David Straus (2000, 10) defines collaboration as "...the process people employ when working together in a group, organization, or community to plan, create, solve problems, and make decisions." Another definition is one where groups and individuals "...think together, combining independent conceptual schemes to create original frameworks" (John-Steiner et al., 1998, 776).

Collaboration, however, requires more than just working together. There needs to be a "commitment to shared resources, power, and talent" with no single individual or organization's point of view dominating (John-Steiner et al., 1998, 776). Decision-making authority and task delegation reside in the group with the outcome of these

decisions and tasks reflecting the blending of participants' contributions (Keast et al., 2004).

Collaboration is the umbrella term for many types and forms of interorganizational action including contracting, public-private partnerships, multinational alliances, joint ventures, and trade associations (Wood and Gray, 1991; Abrahamsson, 1993). In this paper, the specific type of collaboration to be explored is intersectoral collaboration. This term refers to the loose coupling and linking of units across hierarchical boundaries and among public, private and nonprofit sectors to address complex public administration issues. Intersectoral collaboration is different from consolidation. Consolidation refers to the reorganization of administrative and governmental units into new hierarchies; the creation of the Department of Homeland Security, for example (Keast et al., 2004).

### **The Importance of Collaboration**

In a theoretical sense, collaboration “highlights a moral value of genuine cooperation and teamwork” among citizens and public administration organizations in which each party is neither servant nor master, but rather “a social player in the theater of state” (Vigoda, 2002, 527). Straus (2000) stresses that collaboration demonstrates a respect for human dignity. Additionally, collaboration provides another means for individuals to have a voice in their workplaces and societies.

In a practical sense, civic involvement—often the result of collaborative efforts—encouraged at a young age can lead to the development of adult citizens who are aware of their formal rights and duties (Vigoda, 2002). This awareness has the potential to create a

more participatory and satisfied democracy for years to come. Harland Cleveland (in Frederickson, 2005, 25) suggests that organizations “that get things done” in the future will not those hierarchical pyramids controlled from the top. They will be “systems—interlaced webs of tension” with loose control and diffused power.

Frederickson (2005) asserts the growing importance of collaboration reflects the inability of political borders to contain complex social problems. Issues of poverty, unemployment, homelessness, and environmental protection cut across policy and service delivery areas and resist solutions provided by a single agency or hierarchical approaches (Keast et al., 2004; Provan et al., 2005). This creates a need for highly developed forms of intersectoral cooperation, coordination and collaboration to develop and implement solutions to these problems.

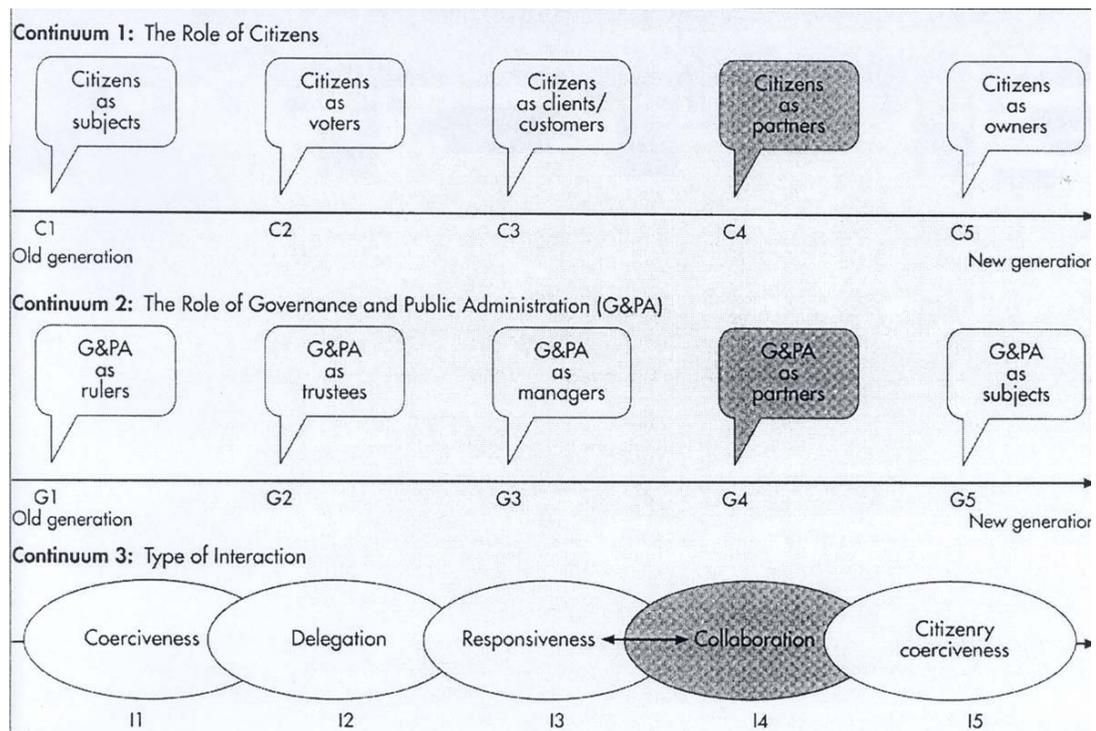
Additionally, collaborative efforts can help organizations cope with the turbulence and complexity of their environments (Gray and Wood, 1991; Hall, 2002). The problems that confront organizations today are complex and messy and require correspondingly complex skill sets—and thus people with varied backgrounds—to tackle the problems (Keast et al., 2004). For example, with prisoner re-entry initiatives, a broad range of services are needed including employment, health, substance abuse services among others. Traditional bureaucratic systems would reorganize those units into one hierarchy, but collaborative processes allow the linkage of key units and people together without reorganizing or building new bureaucracies.

### **The Major Players in Collaboration**

Collaborative efforts involve many groups and individuals. These “social players”, as Vigoda (2002, 527) referred to them, have varying levels of interest, skills, resource access and decision making power. The players, or participants, are broadly defined as anyone who may have skills, knowledge and ability to take the lead in some part of a collaborative effort (Huxham and Vangen, 2000). Participants (or members or representatives) may be individuals or organizations. Although there are many ways to divide the participants, one simple way is divide them into the following categories: citizens, stakeholders, governments, and interest groups. These categories are not mutually exclusive; for example, a stakeholder may also be a part of a government agency or interest group. The classifications, however, can be useful when determining who to include in a collaborative effort.

(i) *Citizens* form the foundation for any public administration activity. If it were not for the existence of citizens, there would be no need for service delivery or public administration. One of the driving forces of collaboration is the responsiveness of collaborative efforts in addressing the needs of the citizens. Vigoda (2002) developed a framework for analyzing general interactions between citizens and their public administration authorities. In Figure 3, Vigoda highlights the ideal conditions for collaboration where citizens and public administration authorities are partners in the decision-making process. This displays an important shift in the mindset of service delivery as citizens are equal partners in the process, not merely the subjects or clients of the service.

Figure 3. The Evolutionary Continuum of Public Administration-Citizen Interaction.



Source: Vigoda, 2002, 531

(ii) *Stakeholders* are simply those who have a stake in a given situation and can be further subdivided into four different groups: those with formal power, those with the power to block decisions, those affected by a decision, and those with relevant information or expertise (Straus, 2000).

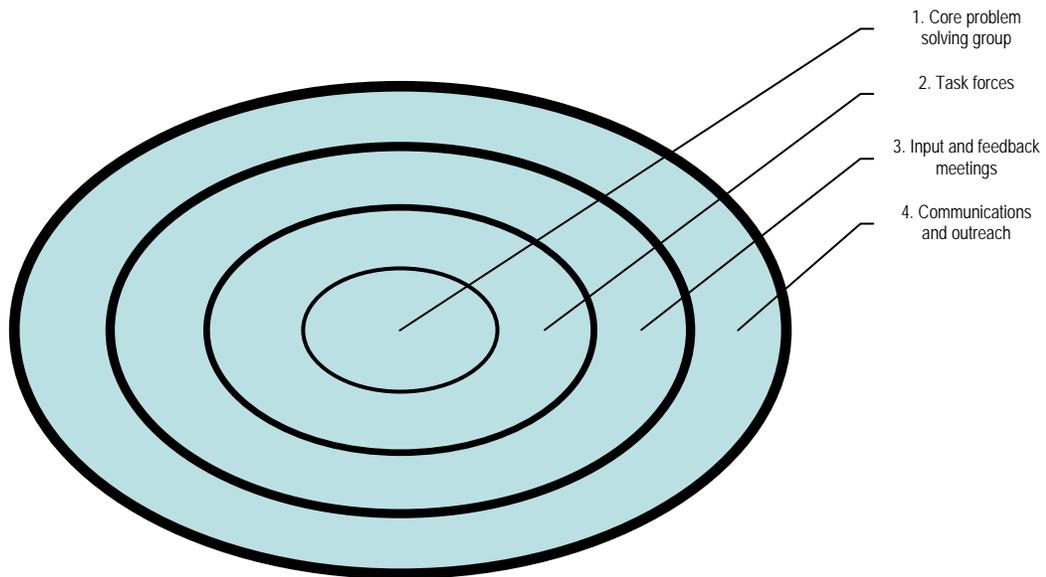
(iii) The role of the *governments* in collaborative processes can take many forms. Many collaborative efforts are developed and implemented at the local level, so local officials are often found in collaborative work groups (Huxham and Vangen, 2000). Since governmental authorities have policy and decision making power, authorities and agencies play a definitive role in the collaborative process. Gray and Wood (1991) question many of these issues when exploring the interplay between collaborative alliances in their institutional environments. Specifically, they question whether the

alliances are shaped by institutions or whether alliances in turn influence their institutional environments.

(iv) Finally, the role of *interest groups* can impact both the collaborative effort and the institutions that may (or may not as Gray and Wood question) direct it. Interest groups press certain agendas on policies that affect how collaborative efforts function.

Now that the players have been discussed, it is helpful to know how these players interact with one another. Straus (2000) provides a framework called the *rings of involvement* (Figure 4) where each larger ring involves more participants in the collaborative process, but with a decreased intensity of involvement. Not every collaborative process needs to include all of these rings. The rings include the *core problem solving group*, typically responsible for managing the collaborative process but without formal decision-making power; the various *task forces* or subcommittees who handle subsets of the larger issue; people who attend *input and feedback meetings* including focus groups, hearings and brainstorming sessions; and broad-based *communications and outreach* efforts which include those receiving information through newsletters, email, or mass media and don't usually participate in face-to-face meetings. Although the boundaries between these rings are distinct, they should be flexible as collaborative players may shift positions throughout the process.

Figure 4. Rings of Involvement.



Source: Straus, 2000, 49

Additional research has shown that action taking groups and subgroups like the core problem solving group and the task forces tend to be smaller than non-action taking groups and subgroups—those involved in input and feedback meetings and communications and outreach (Olsen, 1965). Historically, small groups have tended to be more effective at providing a sustainable production of goods (Homans, 1950). Large, formal organizations seeking to address entire problems often fall to pieces while smaller groups find themselves able to cohere and withstand life's many challenges.

### **What Makes Collaboration Work?**

In a comparative analysis of theories, Gray and Wood (1991) declared that no single theory presented a comprehensive model of collaboration. This makes sense because of the wide variety of collaborative applications to almost any issue or sector or sectors in society. The questions within this topic of what makes collaboration work address the following: what do we mean by ‘work’, how do we assess the success of collaborative efforts, and does collaboration work better in some areas or functions than in others?

*What do we mean by ‘work’?*

Work in a collaborative activity can take many forms (also called transactions) including meetings, committees, workshops, seminars, telephone calls, faxes, email use and many other types of communication (Huxham and Vangen, 2000). The purpose of this work is to provide space for participants to develop relationships in order to further the common mission of the entire collaboration (Keast et al., 2004). These relationships often vary in the degree of standardization, importance, and reciprocity. These work and relationship dynamics transfer to the interorganizational factors of the frequency transactions, the amount of cooperation or conflict, and the balance of power among participants (Hall, 2002). Huxham and Vangen (2000, 1162) identified several general characteristics of successful collaborative efforts as “common aims, communication, commitment and determination, compromise, appropriate working processes, accountability, democracy and equality, resources, trust and power.”

*Assessing the success of collaborative efforts*

Measuring the outcomes and successes of collaborative efforts can be complex and difficult. With one of the main benefits of collaboration being improved service delivery, this benefit can be challenging to isolate and measure (Hall, 2002). Effectiveness is in the eye of the beholder and can be measured from many different vantage points: the participants, the organization as a whole, the clients served (or not served), the community in which the collaboration takes place, or even the policy makers who have jurisdiction over the area in which the collaboration operates. Regardless of how collaboration is measured, there exists a need for continuous evaluation (Vigoda, 536). Methods of analyzing collaborative efforts include the following: observation, participant reaction, network analysis, meeting notes, communication tracking (Provan et al., 2005; Keast et al., 2004; Foster-Fishman et al., 2001).

*Analysis of collaboration's applicability to certain areas*

Collaboration tends to function better in certain areas and under certain conditions. These conditions determine the collaborative capacity necessary to promote effective collaboration and “build sustainable community change” (Foster-Fishman et al., 2001, 242). Research has shown that product-oriented collaborations, such as collaborative art projects, tend to have more clearly delineated roles with efficiency being the primary objective (i.e., completing the art piece with the given resources and talent). However, integrated collaborations, such as the prisoner re-entry program, emphasize the process, conversations and empowerment of those involved in the collaboration. This

often results in flexible roles and a smaller emphasis on efficiency (John-Steiner, Weber, Minnis, 1998).

More specifically, there are certain elements of collaborative efforts that have been shown to be more effective, including having a *common mission*, the *interdependence of resources*, the use of *facilitative leadership among equal partners*, and *the ability to respond to change*.

(i) Having a *common mission* for the collaborative effort is essential to the development of positive attitudes about the need and value of collaboration. This common mission fosters a perception that participation benefits from the collaboration outweigh the participation costs (Foster-Fishman et al., 2001). Huxham and Vangen (2000) call this concept *collaborative advantage*; in other words something is achieved that could not have been without collaboration. Important in this is the idea of protecting common resources from free rider effects of the collaborative effort (Gray and Wood, 2001; Hardin, 1968; Olson, 1965).

(ii) *Resource interdependence*—where two or more organizations are dependent on each other for resources—is one of the key elements of a collaborative effort because of a continually diminishing resource basis (Hall, 2002). This shortage of resources draws organizations together for collaborative efforts. In this paper, the term *resource* is defined broadly. It encompasses both tangible resources (facilities, supplies, funds) and intangible resources (human and social capital, participant skills, information). Each organization in the collaborative effort has access to varying resources that can contribute to sharing information, funds, social support, facilities and personnel. One of the first steps toward resource interdependence is the awareness and recognition by participants that their

organization is interdependent with the other collaborative partners (Hall, 2002). From this resource interdependence awareness and the common mission, the intersectoral collaboration can develop formal or informal structures as appropriate with the given available resources. Examples of these structures are ad hoc groups, exchanges (bargaining), formalized agreements, and mandates.

Once organizations are aware of their interdependence, importance can be placed on developing social capital and developing member capacity—the skills and knowledge individuals can use to affect change—and organizational or infrastructure capacity—the diverse set of skills brought by all those in the network (Foster-Fishman et al., 2001). Often individual participants in a collaborative effort who provide significant amounts of high quality (and commonly unpaid) labor can add tremendous growth and positive development (Nocon et al., 2004). These two statements combined can make collaborative efforts extremely successful and satisfying for participants in the collaboration.

(iii) *The use of facilitative leadership among equal partners* stresses the importance of coalition building over hierarchical control in intersectoral collaboration (Keast et al., 2004). In collaborative settings, all participants are theoretically on the same playing field, but there is often a facilitator, employed by the partnership, who—by training, education, or association—often has a greater level of understanding about the collaborative setting than the rest of the participants (Huxham and Vangen, 2000). This role can rotate among different participants in the group, but requires the use of effective leadership skills, interpersonal relationships and the vision “to transform individual interests into a dynamic collective force that achieves targeted outcomes” (Foster-

Fishman et al., 2001, 253). The facilitator displays these skills by preparing meeting agendas and notes, facilitating meetings, and all additional communication with the collaborative (Keast et al., 2004). The leader as a facilitator should help develop self-managing work teams; in other words, the leader has the goal of helping participants lead themselves (Huxham and Vangen, 2000).

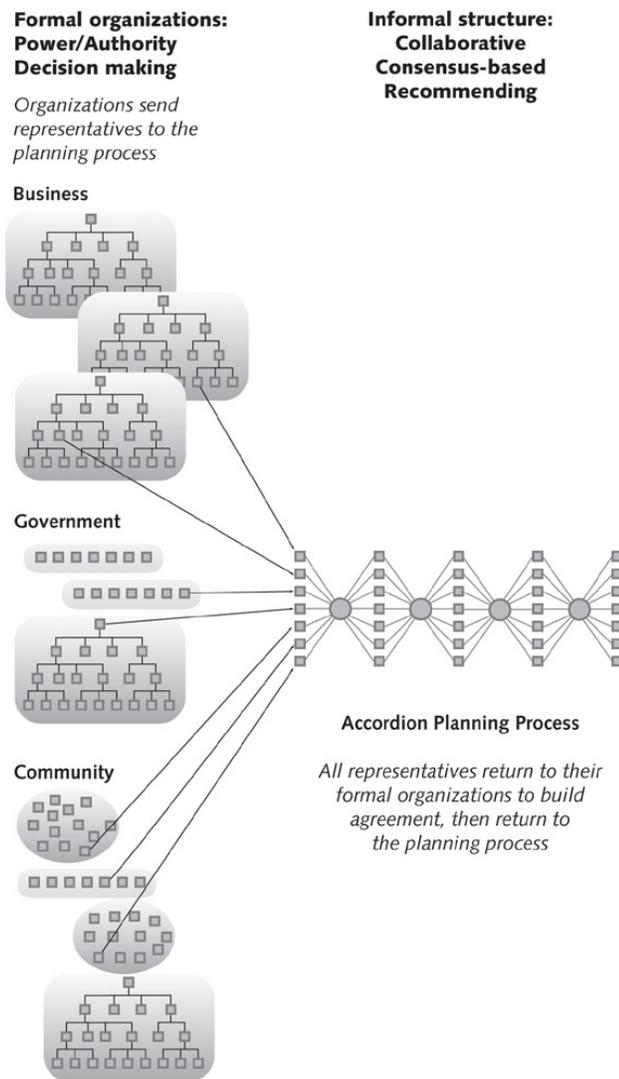
Nocon, Nilsson, and Cole (2004, 200) presented a framework for the interplay between the facilitator and the general participant by coining the terms “spider” and “firesoul.” The role of the spider requires the facilitator to be an attentive presence who listens to the discussion and then translates, negotiates, coordinates and articulates the efforts back to the rest of the collaborative. The rest of the participants in the collaboration form a web around this person (or the person develops the collaborative web around them), but every link and strand is interdependent on the other. The firesoul, then, encompasses those individuals who bring extensive energy (fire) to their roles, often above and beyond what is expected or being compensated.

(iv) *The ability to respond to change* is the icing on the cake for successful collaborations. Intersectoral collaborations need to interact with other communities and coalitions addressing similar issues, to identify new innovations and best practice solutions (Foster-Fishman et al., 2001). The cultures and contexts in which collaborations operate are constantly changing, so being able to change and respond are key elements to the sustainability of the efforts (Nocon et al., 2004).

This interplay between facilitator and participants, participants and their respective organizations, respective organizations and each other, and respective organizations and their changing environments is reflected in Straus’s (2000) accordion

planning process. Figure 5 displays this planning process, reflecting the dynamic nature of intersectoral collaboration. Much like an accordion that expands and contracts, representatives from different organizations and communities come together for collaborative efforts before returning to their organizations and communities only to come back together again at another time.

Figure 5. Accordion planning process.



Source: Straus, 2000, 76

### **The Roadblocks to Effective Collaboration**

For as many reasons that collaboration works, there exist roadblocks to effective collaborative efforts. Commonly, "...miscommunication, conflicting goals, unreliable finances, and lack of time and human resources" are the culprits (Nocon et al., 2004, 370). Beyond these distinctions, there are four primary roadblocks to effective collaboration: accountability, trust, leadership and politics.

(i) The issue of accountability is critical in collaborative efforts. In an environment of equality and interdependence, who is ultimately accountable in intersectoral collaboration? If all parties are equal, who is really accountable to whom? Additionally, who will perform the necessary oversight to make sure the work that was agreed upon with the common mission is actually being achieved?

(ii) Issues of trust and informal networks pervade discussion as well (Keast et al., 2004). Interpersonal relationships are essential to collaboration, reflected in the previous section with regard to resource interdependence. Participants must be able to trust each other to work for their mutual benefit. Many participants may already know each other and have previously existing pockets of trust. These personal ties can greatly enhance commitment to the common mission, but these ties might not be sustainable if one or more of the individuals previously acquainted with one another leaves their respective organizations (Provan et al., 2005). That said, an intersectoral effort should strive to have a combination of formal, professional ties and informal, personal ties to achieve sustainability.

(iii) Leadership in intersectoral collaboration can be tricky. Typical leadership in hierarchical organizations assumes that there is a formal leader with managerial

responsibility and hierarchical advantage over followers (Huxham and Vangen, 2000). However, leadership in collaborative settings is really about the influence or transformation of individuals and ideas based on the presumption of specified goals and the common mission of the collaboration. Finding that balance of facilitative leadership in a setting of equal partners is not easy. Additionally, burnout is likely among chief leaders in a collaborative effort (Huxham and Vangen, 2000). This burnout can greatly hinder the sustainability of collaboration.

(iv) Politics and political power play a key role in furthering or limiting collaborative success (Hall 2002). Structure in public sector collaborations is often determined by policy makers or funders rather than determined by those in the collaboration (Huxham and Vangen, 2000). The challenge for those working in intersectoral collaboration lies in the ability to overcome these structural challenges to fulfill the directives of the common aims set forth in the intersectoral collaboration. What might be good for one organization in the collaboration might not be beneficial for another, so this balance of power dynamics can present problems with developing a common mission and establishing trust. As mentioned in the discussion of the players involved in collaboration, governmental authorities can be positive forces for collaboration. However, too much governmental interference into community organizations' administration can lead to less responsiveness to constituents needs as the collaborators are constantly addressing governmental needs over citizen needs (Hall, 2002).

## **Case Study: The Effectiveness of Intersectoral Collaboration in Stormwater Management**

High quality water is more than the dream of the conservationists, more than a political slogan; high quality water, in the right quantity at the right place at the right time, is essential to health, recreation, and economic growth.

EDMUND S. MUSKIE, U.S. Senator, speech, 1 March 1966

Collaboration's effectiveness is best illustrated through specific situations and circumstances. One very interesting situation and the impetus for this thesis is that of the collaboration between Eastern Michigan University (EMU) and the City of Ypsilanti regarding the issue of stormwater management. This case study will first detail information on EMU, Ypsilanti, and stormwater management, providing a context for the analysis of the collaborative efforts. Next, a description of the EMU Stormwater Management Work Group will be provided. Then, an exploration of the effectiveness of intersectoral collaborative efforts between EMU and Ypsilanti in stormwater management will be assessed in accordance with the concepts discussed previously on collaboration.

The specific questions to be answered after this case study include the following: What are the potential barriers to collaborative action in local stormwater management? What are the most appropriate strategies for overcoming these barriers? What can be learned from other experiences with collaborative action at the local level? And, finally, what lessons might shared with others who are engaged in similar nested agreements?

*Eastern Michigan University*

Eastern Michigan University (EMU) is a four-year state university with 22,000 students from varied ages, ethnicities, nationalities, and creeds. The university was founded in 1849 and prides itself on being an exciting place to visit, to study, to research, to teach, to work and to grow. Its core values include:

- Teaching and learning
- Excellence
- Human dignity and respect
- Diversity
- Scholarship and intellectual freedom
- Public engagement
- Leadership and participatory decision making
- Integrity

Eastern Michigan University found its home in historic Ypsilanti, Michigan in 1849 as a normal college, focusing on the education of future teachers. It grew from a single building to a campus of over 800 acres including 18 miles of walkways and 122 buildings. Of undergraduate students, 69 percent are full-time and 60 percent are women. The most common majors are education, business, social sciences and history, science and engineering, English and health professions. EMU's student population is approximately 70 percent white; 16 percent black; 3 percent international; 6 percent undeclared; 2.5 percent Asian-American; 2 percent Hispanic and 0.5 percent Native-American. Eastern Michigan University employs about 689 full-time faculty and 1,100 staff members. Ninety-four percent of EMU professors have doctoral degrees or terminal degrees in their field. The student to faculty ratio is 19:1 (Eastern Michigan University, 2008).

*City of Ypsilanti*

Ypsilanti, Michigan was incorporated as a village in 1832 and as a city in 1858. The incorporated area of the city encompasses 4.2 square miles, half of which the EMU campus occupies. It has a council-manager form of local government. The population as of the 2000 census is 22,362 (City of Ypsilanti, 2009).

Ypsilanti found its humble beginnings as a trading post with connections to bustling development in Detroit and Chicago. A combination of agriculture and manufacturing sustained the growth and development of the city (Colburn, 1923). Ypsilanti has gone through many economic rollercoasters but was recently named “A Cool City,” by Michigan’s Governor Jennifer Granholm and has been receiving support for urban improvements (City of Ypsilanti, 2009).

The Huron River runs through the center of Ypsilanti with many recreational points of interest by the river (Frog Island Park, Riverside Park). Accordingly, Ypsilanti resides in the Huron River Watershed, specifically in the “Middle Huron”, which encompasses nearly 900 square miles in southeastern Michigan (Huron River Watershed Council, 2006).

*Stormwater and Stormwater Management*

The National Pollutant Discharge Elimination System (2008) defines stormwater as “runoff that is generated when precipitation from rain and snowmelt events flows over land or impervious surfaces and does not percolate into the ground”. The conversion of traditionally rural or agricultural land into urban and suburban areas “profoundly altered how water flows during and following storm events” (The National Academy of

Sciences, 2008, 1). The loss of adequate water-retaining functions in previously existing soil and vegetation through the development of rural lands causes stormwater to reach streams in short bursts without being naturally filtered.

Development causes an increase in *impervious surfaces*, namely roads, parking lots, roofs and other flat surfaces that cause water from storms to runoff into streams. This stormwater runoff flows over the land and other impervious surfaces and accumulates debris, chemicals, sediments and other pollutants including nutrients, suspended solids, organic carbon, bacteria, hydrocarbons, trace metals, pesticides, and chlorides that can negatively impact water quality if the runoff is untreated (NPDES, 2008). In addition to the damage caused by pollutants collected as stormwater flows over impervious surfaces, stormwater discharge can cause harm to aquatic habitats by increasing water velocity and volume in rivers and streams. Stormwater runoff can also have a thermal impact by increasing the water temperature and harming the aquatic life of a particular lake, river or stream used to a cooler temperature. Finally, development and increased runoff decrease the rate of groundwater infiltration and groundwater quality resulting in dry or contaminated wells (Schuler, 2000).

The issue of stormwater management is particularly poignant in urban, developed areas. The National Academy of Sciences (2008, 1) identifies urban stormwater as the primary source of impairment for “13 percent of assessed rivers, 18 percent of lakes, and 32 percent of estuaries” nationwide, which is significant since urban areas only constitute 3 percent of land mass use in the United States.

Historically, stormwater management only referred to flood control. This makes sense because prior to large scale urban and suburban development and the great

increases in population throughout the 19<sup>th</sup> and 20<sup>th</sup> centuries, there was no need for pollution control and maintenance (The National Academy of Sciences, 2008). Recently, however, stormwater management has been professionalized to encompass many more elements beyond flood control.

Basic stormwater management takes two forms: nonstructural and structural. Nonstructural stormwater management seeks to reduce the volume of runoff and pollutants from new developments by using products with fewer pollutants, improving urban design (i.e., reducing area of impervious surfaces), shifting downspouts from impervious to porous surfaces, conserving natural areas and improving watershed and land use planning. Structural stormwater management, on the other hand, seeks to reduce the stormwater volume and pollutants by capturing and reusing stormwater (rain barrels, tanks, cisterns, retention ponds) and improving the infiltration rate of stormwater by using permeable pavement and installing bioswales and rain gardens. In general, nonstructural management is favorable to structural because it is less resource intensive and is a form of management that is preventative rather than reactive (The National Academy of Sciences, 2008).

### *Permitting Process*

Many laws and regulations controlling provisions of stormwater management exist. The three main divisions in stormwater management regulation are the federal, state, and local levels. The laws and policies at each of these levels establish a framework for the authorization, encouragement, prevention or restriction of private and public activities that positively or negatively affect the environment (Ruswick, 2003). The

division of regulation and management over these levels results in a fragmented regulatory framework for stormwater management.

On the federal level, there are several major policy initiatives that have shaped the implementation of stormwater management. One of the first pieces of legislation dealing with water quality was the Federal Pollution Control Act of 1948. In 1972, the Clean Water Act shifted responsibility for pollution control from state and local government to the federal government. The Clean Water Act established the National Pollutant Discharge Elimination System (NPDES), a permitting program for point source pollution control. The initial focus of NPDES was industrial and wastewater treatment plant discharges; however, the Water Quality Act of 1987 mandated the U.S. Environmental Protection Agency (EPA) control stormwater discharges under NPDES (Michigan Department of Environmental Quality, 1999).

The EPA put in place the permitting program in two stages—Phase I in 1990 and Phase II in 1999—which set forth requirements for municipal storm sewer systems and industrial activities. This system resulted in the identification of hundreds of thousands of sources requiring permits including business, governments and nonprofit agencies (Chestnut, 2003). Under the NPDES storm water permit program, operators of large, medium and regulated small municipal separate storm sewer systems (MS4s) require authorization to discharge pollutants under an NPDES permit. MS4s are defined as public jurisdictions that own, operate or control stormwater conveyance systems, which include pipes, streets, drains, or features that collect and discharge stormwater to surface water networks or other conveyance systems. EMU and the City of Ypsilanti qualify as MS4s and are required to implement programs and practices to control the respective polluted

stormwater runoff. Programs must include the development and implementation of best management practices (BMPs) and measurable goals for the following six minimum measures, and include evaluation and reporting efforts:

1. Public education and outreach,
2. Public participation/involvement,
3. Illicit discharge detection and elimination,
4. Construction site runoff control,
5. Post-construction runoff control, and
6. Pollution prevention/good housekeeping for municipal operations.

The Michigan Department of Environmental Quality (MDEQ) is the primary regulatory body on stormwater management in the state of Michigan. In compliance with the aforementioned federal policies, the state enforces the individual permits from municipalities and industries such as local governments, cities, townships, universities, and construction companies.

Because every municipality has a different geography and climate (political and meteorological), it would be difficult for MDEQ and the EPA to set specific standards for stormwater management. Therefore, stormwater permits give a high level of discretion to the community “to set their own standards, develop their own pollution control schemes, and to self-monitor” (The National Academy of Sciences, 2008).

Additional state legislation also has indirect relations to stormwater management. These include the Michigan Drain Code, established in 1956, with the primary goal of improving the drainage of agricultural lands to prevent flooding; the Land Division Act in 1967, with the objective of regulating land subdivision to promote public health, safety, and general welfare (and also includes provisions for the review of adequate stormwater facilities within a proposed subdivision); and the Michigan Environmental

Protection Act (MEAP) in 1970, which provides protection of the air, water, and other natural resources. The MEAP gives the right to any person in the state of Michigan to bring action against another person, agency or corporation for conduct that may pollute, impair or destroy the air, water, or natural resources.

*EMU Stormwater Management Work Group*

Eastern Michigan University and the City of Ypsilanti (hereafter the City) established a nested jurisdictional permit compliance agreement for stormwater management in 2003. Because of its population, the City falls under Phase II of the NPDES permit. In order to increase efforts at the University, in February 2008, the EMU Board of Regents authorized University administration and staff to work cooperatively with the City and utilize respective resources to meet the permit regulations. The result of this authorization was the formation of the Eastern Michigan University Stormwater Management Work Group (called the Work Group). This Work Group is comprised of EMU students, faculty and staff, city representatives, and an outside consultant. The author joined the Work Group in October 2007 and quickly became involved in planning efforts to fulfill stormwater management permit requirements, more specifically with the BPMs and measurable goals for the areas of public education and outreach and public involvement/participation. As a student representative on the Work Group, the author assisted in development and implementation of public education and involvement programs on campus to promote awareness of stormwater management issues and best practices.

The Work Group identified “Measures of Success” in its plans and on its website that provide the guiding force for its activities (see Appendix A for a complete listing of these measures). The comments in this case study focus on issues of public education, outreach and involvement.

The primary transactions of the Work Group are the Work Group meetings; in October 2007, members were meeting monthly. As opportunities arose for increased student involvement in activities, meetings began to occur on a bi-weekly basis through April 2008. Since courses at EMU end in April, meetings continued monthly throughout the summer. Once fall courses resumed in September, bi-weekly meetings continued through December 2008. After that, budget cuts in the stormwater program limited meetings to a quarterly (or as needed) basis until the point in time when this paper was written.

The author’s involvement with the Work Group revolved around the BMPs of public education, outreach, involvement, and participation. These BMPs translated to assisting with and developing several events to engage the public (mostly EMU students) in stormwater management activities. This case study will detail the following public involvement and education events planned by the Work Group: storm drain labeling, Capture the Trash, the GREEN Tent at the Ypsilanti Heritage Festival, and the Washtenaw County Hazardous Waste Drop-off.

In October 2007, the group began discussing plans to label storm drain catch basins on EMU’s campus with the decals shown in Figure 6. The first event on November 28, 2007 brought in 7 volunteers and served as an experiment both in the labeling process and in how to effectively organize volunteers for the labeling. The Work

Group concluded that a team environment with delegated responsibilities (i.e. note taker, labeler, map holder) would be the most effective way to label the drains, keep accurate records on the maps, and provide an engaging experience for volunteers.

Figure 6. “No Dumping, Drains to River”

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Photo Courtesy of Robin Miller

A follow-up event was planned for March 29, 2008, which attracted over 40 volunteers to label nearly 200 storm drains. The event was promoted through several student organizations and academic departments which explained the increase in attendance. The team environment was quite effective and the Work Group received a majority of positive feedback from student volunteers (“met a lot of new people”, “enjoyed the opportunity to serve the community”, “great chance to network and meet people”, “enjoyed helping the environment and raising awareness about this issue”, “it was a great way to see the campus and get involved”, “easy way to make a big environmental impact on campus”). Suggestions for improvement came in the need for better maps and smaller teams. Both of these were taken into account in the future drain labelings. The event planned for October 28, 2008 was postponed due to bad weather, but

between 30-40 volunteers were expected. The event was finally held on March 28, 2009, with 25 volunteers labeling an estimated 160 storm drains.

On April 12, 2008, the Work Group helped to sponsor Capture the Trash, a competitive clean-up of two of Ypsilanti's parks by the Huron River. The Work Group arranged for a rain barrel display to be placed by the pavilion where nearly 60 volunteers gathered for the clean-up. The clean-up was interrupted by rain so volunteers saw first-hand how a rain barrel works to divert runoff into a place where it can be used again. Plus, the service of the volunteers in picking up trash in the parks prevented that trash from running into the Huron River.

During the summer, planning and implementation of a GREEN Tent at the Ypsilanti Heritage Festival occurred; the event was held August 15-17, 2008. The GREEN Tent is a collaboration of the Work Group with many area public, private and nonprofit organizations to promote environmental awareness and action with an emphasis on promoting stormwater management practices. Other collaborators included (but are not limited to) the Michigan Department of Environmental Quality, the Ypsilanti Food Co-op, Schupan Recycling, and the Huron River Watershed Council. Aside from the opportunities to learn more about stormwater management, the Work Group passed out surveys to gauge local citizens' stormwater knowledge. Over the course of three days, 205 surveys were collected and the data were compiled into a spreadsheet for future use. The Work Group has been meeting with the area GREEN Tent partners to develop plans for the 2009 Ypsilanti Heritage Festival. These meetings have been occurring every two months but will increase in frequency as the festival approaches.

Finally, the Work Group participated in the Washtenaw County Hazardous Waste Drop-off Day on November 1, 2008 as a partnership between the Work Group, the EMU Physical Plant, and Washtenaw County. Nine student volunteers helped during two shifts to administer surveys to gather demographic data and measure patrons' knowledge of hazardous waste disposal procedures.

**Lessons Learned: Relating EMU Stormwater Management Work Group to  
Intersectoral Collaboration**

Although the Work Group itself is an example of collaboration, the Work Group reaches out to many community partners in pursuit of its mission (see Appendix B for a full listing of community partners). The Work Group, with members representing various public, private and nonprofit organizations, is an example of intersectoral collaboration. Representatives from these sectors work together for the broader benefit of promoting proper stormwater management practices, which, in turn, ensure water quality improvements for generations to come. Decisions are typically made by group consensus. On some occasions, decisions are impacted by the budget, but often members work together to find creative solutions to their problems. All partners benefit from the additional support and resources provided by the others, but there are occasions where this collaborative atmosphere creates confusion and complexities with the involvement of competing or conflicting interests. The main roadblocks revolve around issues of accountability and leadership.

For example, the roadblock of accountability comes into play with the relationship of the City Department of Public Works (DPW) with the Work Group. When

the Work Group was formalized in 2007, the DPW Director was very passionate about stormwater management issues and his energy and enthusiasm led him to be a firesoul in DPW and the Work Group. That individual, however, moved to another position, and his replacement is not as enthusiastic about the activities of the Work Group. This has translated into some miscommunications between the Work Group and the City. For instance, when it came time to submit a progress report on permit compliance to the Michigan Department of Environmental Quality, the consulting firm that the City contracted to prepare the report decided to submit it early without informing the Work Group, so much of the input from the Work Group on increased student and public involvement was not included.

Accountability in the group is maintained by the group members themselves. Because membership is voluntary (except for the payment of the stormwater management consultant), each representative is present on their own accord because of their commitment to the common mission. In the case of the DPW Director, stormwater management is rather low on his list of priorities (which include managing all of the public works for a city in an economic downturn). This results in sporadic involvement with the Work Group and creates tension between the Work Group and the City.

Additionally, the roadblock of leadership (and leadership capacity) has become apparent. Early on in with the Work Group, participation and leadership were divided rather equally. The EMU Physical Plant representative controlled the purse strings of the operation and hired a stormwater management consultant to facilitate the collaborative effort (i.e. meetings, communications, coordination). The other members of the group at that time were an EMU faculty member and a representative from the Office of Health

and Safety. Meetings were run efficiently with meeting notes emailed out to all members within 24 hours of the meeting. The Work Group was supportive of one another and exhibited a developing degree of trust and cooperation. This positive direction continued until September 2008, when the representative from the Office of Health and Safety moved to another position and no longer attended Work Group meetings and functions. This, along with threats of budget cuts, added an element of scarcity to the Work Group.

Although members had always been ingenious about creative problem solving, with one member gone and potentially diminishing resources in the future, meetings were influenced by an awareness of the need for efficiency in all measures. Since then, meetings have become infrequent and limited to one hour. To add fuel to the fire, the author is leaving the Work Group soon, so pressure shifted to finding a replacement student representative for the Work Group. The infrequent meeting times made it difficult to invite prospective replacements to become involved in the group. It has become essential, though, to have a prominent student leader represented, so there will be some challenges in the future with integrating “replacements” into the Work Group.

Additionally, since the role of Work Group facilitator and manager has been placed upon the stormwater management consultant for the past three years, this individual is starting to display signs of burning out. Inconsistent communication, lack of energy at meeting and events, and a general wearing down of passion have been exhibited for the past few months. This indicates the need for leadership to be rotated to promote the sustainability of the Work Group.

Another challenge exists in measuring the efficiency and effectiveness of public education and involvement, which are at the heart of the Work Group’s mission. The

Work Group uses many active approaches, seen in the storm drain labeling events, park clean-ups, GREEN Tent activities and hazardous waste removal. The Work Group has begun look into other methods of public education and engagement, especially passive programming (attention grabbing signs, posters, brochures, grassroots marketing), but has not yet acted on any of these plans. Both active and passive approaches are difficult to measure and track because the goal of these activities is to change a perception and viewpoint of the world. A simple survey or evaluation cannot possibly capture a change in perception.

### **Conclusion**

Despite the challenges and roadblocks, there is much to be learned from collaboration. The complex and messy social issues that exist today are not being effectively solved through traditional hierarchical means. Although sometimes it would seem that providing additional money for organizations to tackle these problems would be a solution, allocating more money for programs that are not working is not the solution (Keast et al., 2004). Collaboration provides a way for related organizations to work together without having to be formally connected. Networked or intersectoral collaborative structures lead to creative problem solving, but this problem solving is often a secondary result of the relationships and processes established with the network or collaboration, not merely the intersectoral structure itself (Keast et al., 2004). Additionally, conflicting goals and priorities among those in the collaboration can greatly affect the outcome of collaborative initiatives. The results of collaboration often do not

have to do with tangible, measurable results (data, figures, numbers), but with changing relationships and perceptions. These changes are intangible and not easily measured.

There are, thankfully, many strategies to overcome these challenges. Taking time in the beginning of a collaborative effort to think strategically and provide space for participants in the collaborative to develop relationships and processes helps participants build trust and a commitment to the common mission. As participants enter and leave the collaborative effort, time should be taken to both orient new participants and acknowledge the efforts of outgoing participants. This helps maintain the long-term sustainability and trust levels within the group, change perceptions about each participant's contribution to the whole collaborative and recognize the value of relationship building. A greater focus on community capacity building (workshops, seminars, trainings) will provide more opportunities for collaborative community engagement. Providing longer time frames for evaluation will alleviate the challenges of measuring the outcome of collaborative efforts and will provide more time to analyze and track changing relationships and perceptions (Keast et al., 2004).

Suggestions for further study of intersectoral collaborative efforts include looking at how technology affects collaborative efforts (Crampton, 2001) and using network analysis to more adequately demonstrate the connections and relationships among intersectoral collaborations (Provan et al., 2005). The Work Group communicates more and more through electronic means as its base of community partners grows and the budget allowed for face-to-face meetings decreases. Analyzing the effectiveness of technology could provide an interesting perspective on this shift. Network analysis, on the other hand, is useful for the structure of the network and how the formal and informal

organizational systems are interrelated and affect community outcomes as a whole. It allows participants in the collaborative to see the forest of the network rather than merely the trees (Provan et al., 2005).

Intersectoral collaboration in stormwater management should continue.

Stormwater management, long overlooked in the arena of pollution control and water quality, is an extremely complex and messy issue that will only become more pervasive as development increases without thought to long term infrastructure sustainability. Steps taken to work on an intersectorally collaborative basis will provide a strong foundation for combating future affects of development and will ensure the continued quality of water resources.

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## Appendices

### Appendix A – Measures of Success

#### **ADOPT-A-STREAM PROGRAMS**

- Track the number of participants in Adopt-A-Stream programs.
- Water quality at Adopt-A-Stream sites.
- The quantity of trash and debris removed by Adopt-A-Stream volunteers.

#### **ATTITUDE SURVEYS**

- The number of citizens solicited to complete surveys.
- The number of completed surveys.
- A survey of citizens gauging change in attitude/behavior after stormwater education activities are held.

#### **COMMUNITY HOTLINES**

- The number of hotlines established to handle stormwater-related concerns.
- The number of calls received by hotlines.
- The number of problems/incidents remedied as a result of hotline calls.

#### **REFORESTATION PROGRAMS**

- The number of volunteer tree planters.
- The number of trees planted.
- The number of acres planted with trees.

#### **STAKEHOLDER MEETINGS**

- The number of meetings held.
- The number of attendees.
- The number of actions taken as a result of stakeholder meetings.

#### **STORM DRAIN STENCILING**

- The number or proportion of drains stenciled.
- The number of stenciling volunteers.
- The number of drains stenciled.
- Changes in water quality at outfalls of stenciled areas.

#### **STREAM CLEANUP AND MONITORING**

- The number of stream cleanups.
- The number of cleanup participants.
- The quantity of waste collected as a result of cleanup efforts.
- The number of stream miles cleaned.
- Water quality at the stream cleanup sites.

#### **VOLUNTEER MONITORING**

- The number of volunteers participating in monitoring programs.
- The frequency of monitoring in the watershed.
- The number of volunteer monitoring stations established in the watershed.
- The number of volunteer monitoring training sessions held.
- The number of actions that were taken as a result of the monitoring data collected by volunteers.

#### **WATERSHED ORGANIZATION**

- Whether or not a watershed organization was established.
- The number of participants in the watershed organization.
- The number of actions taken as a result of the watershed organization.

#### **WETLAND PLANTINGS**

- The acres of land planted.
- The number of volunteers that participated in planting.
- The number of planting events held.

Source: Eastern Michigan University and City of Ypsilanti Stormwater Management Program, 2006

Appendix B – EMU Stormwater Management Work Group Community Partners

Governmental Partners

Eastern Michigan University  
City of Ypsilanti  
Washtenaw County Drain Commission  
Washtenaw County Department of Public Works  
Washtenaw County Hazardous Waste Programs  
Michigan Department of Environmental Quality  
Southeast Michigan Council of Governments  
Environmental Protection Agency  
City of Ann Arbor  
Ypsilanti Township  
Superior Township

Nonprofit Partners

Huron River Watershed Council  
Ypsilanti Food Co-op  
Growing Hope  
Ypsilanti Heritage Festival

Private Sector Partners

Schupan Recycling  
A3C Architects of Ann Arbor  
Abraham Consulting  
Insight Design Landscape Architects  
Stormwater Management Services LLC  
Grassroots EMU  
Neighborhood Associations

Current Financial Supporters of the Middle Huron Program

City of Ann Arbor  
Ann Arbor Charter Township  
Barton Hills Village  
Chelsea City  
Dexter Village  
Eastern Michigan  
Loch Alpine Sanitary Authority/Webster Township  
Lodi Township  
Pittsfield Charter Township  
Scio Township  
Superior Charter Township  
University of Michigan  
Van Buren Charter Township  
Washtenaw County  
City of Ypsilanti  
Ypsilanti Charter Township