Funding the Long-Term Operation and Maintenance of Stormwater Best Management Practices

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CRWP is a non-profit technical organization formed by the townships, villages, cities, counties, and park districts of the Chagrin watershed to develop and implement innovative solutions to address current, and minimize new, flooding, erosion, and water quality costs and to control the increasing infrastructure costs associated with urban/suburban development. CRWP provides Members with advice and assistance on zoning and subdivision codes, implementation of these codes, development plan review, and other best practice implementation at Member direction.

Cover Photographs.
Top Left: Bioretention Example at Sterncrest Road Orange Village, Ohio. (Photo by: Rachel M. Webb, CRWP)
Top Right: Wet Extended Detention Pond. (Photo from Ohio Rain Water and Land Development Manual)
Bottom Left: Infiltration Trench. (Photo from Ohio Rain Water and Land Development Manual)
INTRODUCTION

Long-term operation and maintenance of stormwater best management practices (BMPs) is essential to effective management of stormwater quality and quantity and control of community infrastructure costs. BMP maintenance is often not provided for in development plan approvals, or is delegated to homeowner associations. These associations are poorly equipped, and often unwilling, to manage and fund the maintenance of stormwater BMPs. This deficiency is particularly acute for water quality BMPs that are designed to trap significant amounts of sediment.

Lack of regular and long-term maintenance and the necessary funding for this maintenance decreases the efficiency of BMPs, and presents significant costs for local governments and landowners. Proper inspection, maintenance, and funding requirements within local stormwater management regulations ensure that BMPS are designed to facilitate inspection and maintenance and can help to ensure that regular inspection and maintenance activities are completed. Such requirements are also a component of the Ohio Environmental Protection Agency’s (Ohio EPA) Phase II Stormwater Management Program for designated Municipal Separate Storm Sewer Systems (MS4s) and the NPDES Construction General Permit (GCP).

Per Ohio EPA, the new GCP requires a stand alone inspection and maintenance plan for stormwater BMPs that includes the following information:

- Entity responsible for inspection and maintenance of the BMP.
- The routine and non-routine maintenance tasks to be undertaken.
- Schedule for inspection and maintenance.
- Legally-binding maintenance easements and agreements.
- Mapping showing all access and maintenance easements.

Chagrin River Watershed Partners, Inc. (CRWP) has developed two models to assist local governments, landowners, and designers with the design, construction, and long-term operation, maintenance, and funding of stormwater BMPs. These models are:

- Model Comprehensive Stormwater Management Ordinance
- Model Inspection and Maintenance Agreement (Appendix A)

(The models are available from the CRWP, but must be tailored for each community)

With the regulatory requirements in place through these models for proper design and long-term inspection and maintenance, local governments must also have a funding mechanism to ensure that money is available for inspection and maintenance; that periodic and generally lower cost preventive maintenance occurs; and that residents and elected officials are not surprised by large scale BMP failures. This document summarizes funding mechanisms available to local governments for the perpetual inspection, operation, and maintenance of stormwater BMPs. The first series of mechanisms are large scale mechanisms that would fund an overall stormwater management program in a community including the development of standards, regulations, training for local engineers, inspections, mapping, preventive maintenance, and other activities throughout a community. The second series of mechanisms represent BMP or development specific approaches that communities can implement as development projects occur.
FUNDING SOURCES FOR LONG-TERM INSPECTION AND MAINTENANCE OF STORMWATER BEST MANAGEMENT PRACTICES

The Large Scale: Funding Community-Wide Stormwater Management Regulation, Planning, and Implementation

Option 1: General Tax Revenues
Tax revenues are a source of funding, particularly for the long-term inspection and maintenance of existing runoff and drainage facilities. The benefits and protection to the public from continued safe and effective operation of these facilities justifies the use of general revenue funds. The downside of using tax revenues, particularly from a general fund, for a community-wide stormwater management program is that these activities must compete each year with other programs included in the community's annual operating budget. This yearly competition can lead to inconsistent and unreliable funding and make securing a long-term financial commitment to the development of a comprehensive stormwater management program difficult. Nevertheless, tax revenues remain a popular funding source because the collection and disbursement system is in place and familiar.

Option 2: Stormwater Utilities/Stormwater Management Departments
A stormwater utility can be created by a single unit of local government or any combination thereof. Large multi-community entities, such as counties and regional authorities, provide benefits in terms of enabling a watershed approach to project selection, regulatory standards, and training, but also require greater collaboration to ensure those local governments and residents impacted by utility fees understand and support the distribution of benefits. Much of the following discussion deals with setting up a utility within one community, however the lessons learned would apply to multi-government efforts as well.

Creating the Utility: Generally a community enacts two ordinances to create a utility. The first ordinance establishes the various components of the utility and the second determines the rate structure. Forming a utility through two separate ordinances allows the flexibility to alter the rate structure at a later date without having to revise the ordinance governing the basic structure of the utility. The first ordinance may also include a statement of the goals of the utility and discuss the benefits of a comprehensive stormwater management program. The second ordinance structures the service charges to create a logical and equitable relationship between the amount of stormwater leaving a property, the impacts to the stormwater system, benefits to the rate payer, and the amount assessed.

What Does a Utility Do? The components of a stormwater utility generally include:
- An administrative structure to collect fees and manage the overall program.
- Development of a stormwater management plan for the area covered by the utility and related ordinances to ensure implementation of stormwater BMPs, inspection, and routine and long-term maintenance.
- Erosion and sediment control requirements and related inspections or enforcement programs during construction activities.
➢ A program for the detection and elimination of illicit discharges and/or illegal connections.

➢ Water quality monitoring programs and monitoring of BMP effectiveness.

➢ Maintenance of the stormwater management system. This generally involves a discussion of which components of the system are the responsibility of the stormwater utility and which are private property issues.

➢ Public education on the water quality and quantity issues involved with land use change and urban/suburban activities.

➢ Organization of NPDES Phase II permit compliance on some level. This may include holding the permit, organizing co-permitees for multi-community utilities, or providing guidance to entities that each hold their own permit.

*Advantages and Disadvantages of Stormwater Utilities:* Communities that have adopted stormwater utilities have identified advantages and disadvantages.

**Advantages**

➢ An equitable system of collecting funds for stormwater management. Stormwater utility fees are commensurate with the runoff volume or pollutant load produced from a property. Typically the fee for each property is calculated from the area and percent of impervious surface cover. Therefore, the less runoff produced by a property, the lower the stormwater utility fee.

➢ The stormwater utility provides a predictable and dependable amount of annual revenue dedicated to the implementation of stormwater management. Stormwater management priorities do not have to directly compete with other governmental services for general revenues and the stormwater utility revenue is in a separate fund dedicated solely to stormwater management.

➢ Stormwater utilities provide predictable funding levels that allow for the orderly implementation of stormwater management projects.

➢ Stormwater utilities based on impervious cover fees have withstood legal challenge and are in place nationwide.

**Disadvantages**

➢ Elected officials and the public may view stormwater utilities as another tax. As a result, it is necessary to make clear the need for, and benefits of, such a program and quickly implement noticeable improvements at the start of the stormwater management program.

➢ Adoption of a stormwater utility will result in initial administrative costs for development of the ordinance and billing system, and for necessary public education.
The stormwater utility may be best established on a regional level and, as a result, will initially require significant efforts to build regional cooperation.

**Stormwater Utility Case Studies**

**Takoma Park, Maryland:** Takoma Park established a utility in 1996 with primary responsibility for construction and maintenance of the stormwater drainage system, review of stormwater management plans, inspection and enforcement activities, watershed planning, and water quality monitoring. The user fees are based on the amount of impervious area on a property. The annual fee for single family residences was set at $48 in 2007. Non-residential and multifamily properties were charged based on actual impervious area as compared to the average single-family property. Tax-exempt properties are not exempt from the stormwater management fee, but properties used for public purposes and owned by a state, county or city agency, or volunteer fire department are exempt. In 1999 the stormwater budget was $184,000, with $183,000 generated from user fees and $1,000 from permit fees. In 2008 the stormwater budget was $356,013.

**Boulder, Colorado:** Boulder established a utility in 1973 under the control of the City Manager and housed in the Department of Public Works. The utility’s primary responsibilities are public education, detection of illicit connections and illegal dumping, water quality monitoring, and routine maintenance. Residential user fees are based on property area. The 2008 monthly residential charge for properties up to 15,000 square feet is $83.40 annually, properties between 15,000 and 30,000 square feet pay $104.4 annually, and properties larger than 30,000 square feet pay $125.40 annually. Commercial fees are based on a percentage of impervious and pervious surface area. All owners of developed property are required to pay user fees. Undeveloped parcels are exempt from this fee. In 1996 these fees generated $5.4 million. The utility will issue bonds for capital projects. The utility charges a fee for the development of previously undeveloped property, annexation of developed property, and changes or additions to developed property. These fees are used solely for capital improvements, reconstruction, or expansions. The 2008 budget was approved for $7,727,000.

**Cincinnati, Ohio:** Cincinnati formed a utility in 1985 because the City’s infrastructure was over 100 years old and the City did not have the money to fix its many failures. In 2008 residential rates for one and two-family houses under 10,000 square feet were $32.40 annually; one and two-family houses over 10,000 square feet were billed $45.36 annually. These fees are based on how much runoff is contributed by these properties, and defined as an equivalent runoff unit (ERU). All other properties, including multi-family residences, commercial, and industrial lots, are billed at $2.70 per equivalent runoff unit (ERU). The utility’s annual revenue in 2008 was $6.8 million.

While some of the utility’s time is spent responding and reacting to problems, much of its efforts focus on prevention such as maintaining flood protection structures, preparing city and regional master plans, and initiating capital improvements. Most of the money generated is used for drainage system maintenance and improvements. Since the utilities establishment in 1985 the utility responded to citizen requests and corrected over 12,000 maintenance problems. Along with responding to problems, the utility routinely maintains drainage systems such as cleaning catch basins, mowing and cleaning ditches, and repairing pipes and culverts. The utility is also
responsible for flood protection, developing a design manual to guide the elimination and prevention of conditions that cause drainage and flood problems, and water quality monitoring.

Lake County, Ohio: Lake County’s Stormwater Management Department (LCSMD) was formed in 2003 and as of October 2008 has 14 of the 23 communities in Lake County as members. The Department partners with other agencies providing services to these communities. These agencies include CRWP, Lake County General Health District, Lake County Soil and Water Conservation District, and the County Engineer. The LCSMD offers two service levels:

- Level One consists of the LCSMD providing coverage of the first three Minimum Control Measures (MCMs) of Ohio EPA’s Phase II Stormwater Management Program. Three (3) communities are involved with the utility at that level. The user fee charged to Level One communities is $9.60 per year ($0.80 per month) per Equivalent Residential Unit (ERU). An ERU is defined as one residential dwelling unit or 3,050 square feet of impervious area on a non-residential parcel.

- Level Two communities receive coverage of all six Phase II MCM’s as well as funding for operations and maintenance of regional infrastructure and capital projects. LCSMD defines regional as drainage courses that serve several properties and discharge directly to Waters of the State; drain more than one subdivision; or detain/retain substantial stormwater beyond the development in which the facility is contained. The user fee charged to Level Two communities is $30.00 per year ($2.50 per month) per ERU.

The total amount of user fees collected from LCSMD’s 14 member communities was approximately $2 million for 2007. The user fees are placed on the properties tax bill with approximately 40% coming from non-residential properties and 60% from residential properties. LCSMD also has a credit manual for non-residential properties through which property owners can receive a credit on their stormwater user fee for the implementation of BMP’s on their site that reduce stormwater runoff. To date less than 10 properties have taken advantage of the credit program.

The Smaller Scale: Funding Development-Specific Stormwater BMP Inspection and Maintenance

Option 1: Drainage Maintenance Districts
A drainage maintenance district provides a mechanism whereby a property owner and a county, city or village can establish a permanent funding stream for the inspection and maintenance of stormwater BMPs on a development-by-development basis. This does not provide comprehensive funding for stormwater management in a community but can ensure that new stormwater infrastructure is properly inspected and supported.

The case of a county the establishment of such drainage maintenance districts involves the following steps for each subdivision covered by the district.

- Property owner requests that the stormwater BMPs for a subdivision be accepted into the County Drainage Maintenance District and that an annual assessment be collected.
- County Commissioners accept the request to establish the District, and
- County Commissioners establish the annual assessment.
The landowner must also place restrictions and easements on each lot within the subdivision that has storm water infrastructure, specifying inspection and maintenance activities to be performed. The County Engineer is responsible for performing the inspection and maintenance activities with funding from the annual assessment placed on each lot. Drainage Maintenance Districts have become a common practice in counties in Ohio to fund their storm water inspection and maintenance activities.

Cities and villages could follow a similar approach for the assessment of individual lots in a subdivision to ensure the proper inspection and long term operation and maintenance of stormwater BMPs. In this case the city or village council would accept the District and establish the annual assessment, and city engineer would be responsible for the inspection and maintenance activities.

Geauga County, Ohio: Under leadership of the Geauga County Engineer, Planning Commission, and Soil and Water Conservation District, Geauga County has a mandatory program for all new subdivisions in the County to come into a Drainage Maintenance District. The County Engineer manages the drainage district and the Soil and Water Conservation District performs inspections of the BMPs. As part of the subdivision approval process, appropriate easements for drainage must be shown on the subdivision plat and held by the Board of County Commissioners.

The initial investment into the Drainage Maintenance District fund is made by the developer based on the percentage of the total cost of the construction of the stormwater infrastructure for the subdivision. The percentage of initial investment ranges from 2-10%, and is set by the County Engineer on a case by case basis based on the type of stormwater infrastructure. On average the percentage is approximately 4% of the construction costs. Once the fund is established the Board of County Commissioners will approve an annual assessment on each lot for improvements in the subdivision under Ohio Revised Code section 6137. Since the project’s inception in 2007 there are approximately eight established drainage maintenance districts on new developments, and the County is offering a voluntary program to develop drainage maintenance districts on previously built subdivisions. In these cases if immediate maintenance is necessary funds already collected by the homeowners association would be used to cover the costs or the cost of the maintenance would be collected through the County tax authority.

Option 2: Permit Fees
Collecting permit fees to finance runoff inspection and maintenance is a long standing funding procedure. Most governmental entities, local, county, and state, can establish and collect fees and other charges to obtain operating funds for programs and services. Many inspection services, most notably the construction inspection of erosion and sediment control measures and permanent drainage and runoff management facilities, are financed at least in part through fees collected by permitting agencies. Unlike taxes or some utility charges, inspection costs are borne by those who need them. The permit fee collection program should have a demonstrable link to the runoff management or drainage systems. The public agency should demonstrate a direct link between the permit fees collected and the permitted project. One method is using dedicated accounts for individual projects and facilities. Like Drainage Maintenance Districts, permit fees apply to specific developments and do not enable local governments a funding stream for a comprehensive stormwater management program.
CONCLUSION
This document provided a brief overview of common mechanisms available to communities to fund the inspection, operation and maintenance of stormwater BMPs, and comprehensive stormwater programs. If your community would like further information on any of these options, to discuss an option not listed, or copies of the model comprehensive stormwater management ordinance, please contact the Chagrin River Watershed Partners, Inc. at 440-975-3870.
Appendix A

MODEL INSPECTION AND MAINTENANCE AGREEMENT FOR STORM WATER BEST MANAGEMENT PRACTICES

PLEASE NOTE

- This model Inspection and Maintenance Agreement is for use in conjunction with the requirements of Section XXXX.08 and XXXX.12 of CRWP’s Model Ordinance for Comprehensive Storm Water Management to ensure the long term operation, maintenance, and funding of storm water best management practices.
- This model agreement must be tailored to each development project to list the specific BMPs covered by the agreement, and the funding and operation and maintenance conditions accepted by the Community.
- Please contact CRWP for assistance in tailoring this model to your community’s needs.

This Inspection and Maintenance Agreement, made this ______ day of ______________ 200_, by and between the [party responsible for the project on which the storm water best management practices will be located] (hereafter referred to as the Owner) and the [Community] hereafter referred to as the Community, provides as follows:

WHEREAS, the Owner is responsible for certain real estate shown as Tax Map No. (parcel number) that is to be developed as (development’s official name) and referred to as the Property; and,

WHEREAS the Owner is providing a storm water management system consisting of the following storm water management practices (list all components of the storm water management system) as shown and described on the attached Comprehensive Storm Water Management Plan (attach copy of development’s approved plan); and,

WHEREAS, to comply with Section XXXX.XX of the Codified Ordinances of the [Community] Comprehensive Storm Water Management, pertaining to this project, the Owner has agreed to maintain the storm water management practices in accordance with the terms and conditions hereinafter set forth.

NOW, THEREFORE, for and in consideration of the mutual covenants and undertaking of the parties, the parties hereby agree as follows:

FINAL INSPECTION REPORTS AND AS BUILT CERTIFICATION
The Owner shall certify in writing to the [Community] within 30 days of completion of the storm water management practices that the storm water management practices are constructed in accordance with the approved plans and specifications. The Owner shall further provide As Built Certifications of the locations of all access and maintenance easements and each storm water
management practice, including those practices permitted to be located in, or within 50 feet of, water resources, and the drainage areas served by each storm water management practice.

MAINTENANCE PLANS FOR THE STORM WATER MANAGEMENT PRACTICES

1. The Owner agrees to maintain in perpetuity the storm water management practices in accordance with approved Maintenance Plans listed in #2 below and in a manner that will permit the storm water management practices to perform the purposes for which they were designed and constructed, and in accordance with the standards by which they were designed and constructed, all as shown and described in the approved Comprehensive Storm Water Management Plan. This includes all pipes and channels built to convey storm water to the storm water management practices, as well as structures, improvements, and vegetation provided to control the quantity and quality of the storm water.

2. The Owner shall provide a Maintenance Plan for each storm water management practice. The Maintenance Plans shall include a schedule for monthly and annual maintenance. The Owner shall maintain, update, and store the maintenance records for the storm water management practices. The specific Maintenance Plans for each storm water management practice are as follows:

Note: This section must be tailored to the BMPs approved for a specific development and the maintenance necessary and associated schedule for each BMP. The following are example BMPs.

(a) Stormwater Pond Maintenance. To be completed MONTHLY.
   (1) Remove floating debris.
   (2) Remove woody vegetative growth from pond area including embankments.
   (3) Remove trash and/or accumulated sediment.
   (4) Remove obstructions in orifices and/or outlets.

(b) Stormwater Pond Maintenance. To be completed ANNUALLY.
   (1) Repair erosion to outfall or spillway.
   (2) Repair and/or replace damaged structures, such as catch basins, risers, pipes, and headwalls.
   (3) Repair animal burrows and/or other leaks in the dam structures.
   (4) Remove debris from overflow spillway and grates.
   (5) Mow embankments and remove woody vegetation on embankments.
   (6) Inspect and remove invasive plants.
   (7) Dredge pond on a 3-7 year cycle or as necessary to retain design capacity.

(c) Infiltration Trench Maintenance. To be completed MONTHLY.
   (1) Remove debris and or sediment from inlet and outlet pipes.
(2) Minimize heavy equipment, including mowers, in the vegetated areas to reduce compaction.

(3) Check observation wells 72 hours after rain events twice a year to ensure dewatering between storms is taking place at the facility. Repair as necessary to ensure functionality.

(4) Repair washed-out/damaged check dams.

(d) Infiltration Trench Maintenance. To be completed ANNUALLY.
(1) Remove sediment in sediment traps and pretreatment swales
(2) Check and remove any tree cover over trenches.
(3) Remove any aggregate (soil/mineral based) deposits.

(e) Bioretention Area Maintenance. To be completed MONTHLY.
(1) Minimize heavy equipment, including mowers, in the vegetated areas to reduce compaction.
(2) Remove and replace any diseased or dead plant material. If specific species are not successful in the bioretention area, replace as appropriate to ensure full vegetation as designed.

(f) Bioretention Area Annual Maintenance. To be completed ANNUALLY.
(1) Replace mulch at a depth of no greater than 3” and cover the entire area.
(2) Remove compacted mulch prior to new mulch placement.
(3) Repair any areas that have eroded.
(5) Ensure cell is dewatering with in 1.66 days or 40 hours as required by the Ohio EPA and not bypassing facility. Repair as necessary to ensure functionality.

(g) Maintenance Plans for all Storm Water Management Practices with decentralized design criteria shall be drawn up to comply with the latest edition of the Ohio Department of Natural Resources Division of Soil and Water Conservation “Rainwater and Land Development Manual”.

3. The Owner shall perform all maintenance in accordance with the above Maintenance Plan and shall complete all repairs identified through regular inspections, and any additional repairs as requested in writing by the [Community].

INSPECTION AND REPAIRS OF STORM WATER MANAGEMENT PRACTICES
1. The Owner shall inspect all storm water management practices listed in Section B above, every three (3) months and after major storm events for the first year of operation.

2. The Owner shall inspect all storm water management practices listed in Section B above at least once every year thereafter.

3. The Owner shall submit Inspection Reports in writing to the [Community] engineer within 30 days after each inspection. The reports shall include the following:
The date of inspection; ___________________________________________
Name of inspector; ______________________________________________
The condition and/or presence of:
(i) ____________________________________________________________
(ii) ____________________________________________________________
(iii) ____________________________________________________________
(iv) ____________________________________________________________
(v) ____________________________________________________________
(vi) ____________________________________________________________
(vii) ____________________________________________________________
(viii) Any other item that could affect the proper function of the Facility.

4. The Owner grants permission to the [Community] to enter the Property and to inspect all aspects of the storm water management practices and related drainage whenever the [Community] deems necessary. The [Community] shall provide the Owner copies of the inspection findings and a directive to commence with the repairs if necessary.

5. The Owner shall make all repairs within ten (10) days of their discovery through Owner inspections or through a request from the [Community]. If repairs will not occur within this ten (10) day period, the Owner must receive written approval from the [Community] engineer for a repair schedule.

6. In the event of any default or failure by the Owner in the performance of any of the covenants and warranties pertaining to the maintenance of the storm water management practices, or the Owner fails to maintain the storm water management practices in accordance with the approved design standards and Maintenance Plan, or, in the event of an emergency as determined by the [Community], it is the sole discretion of the [Community], after providing reasonable notice to the Owner, to enter the property and take whatever steps necessary to correct deficiencies and to charge the cost of such repairs to the Owner. The Owner shall reimburse the [Community] upon demand, within thirty (30) days of receipt thereof for all actual cost incurred by the [Community]. All costs expended by the [Community] in performing such necessary maintenance or repairs shall constitute a lien against the properties of the Owner. Nothing herein shall obligate the [Community] to maintain the storm water management practices.

**FUNDING**
The Owner shall specify the method of funding for the perpetual inspection, operation, and maintenance of the storm water management practices listed in this Inspection and Maintenance Agreement. This funding mechanism shall be approved by the [Community].

**INDEMNIFICATION**
The Owner hereby agrees that it shall save, hold harmless, and indemnify the [Community] and its employees and officers from and against all liability, losses, claims, demands, costs and expenses arising from, or out of, default or failure by the Owner to maintain the storm water management practices, in accordance with the terms and conditions set forth
herein, or from acts of the Owner arising from, or out of, the construction, operation, repair or maintenance of the storm water management practices.

The parties hereto expressly do not intend by execution of this Inspection and Maintenance Agreement to create in the public, or any member thereof, any rights as a third party beneficiary or to authorize anyone not a party hereof to maintain a suit for any damages pursuant to the terms of this Inspection and Maintenance Agreement.

This Inspection and Maintenance Agreement shall be a covenant that runs with the land and shall inure to the benefit of and shall be binding upon the parties hereto, their respective successors and assigns, and all subsequent owners of the property.

The current Owner shall promptly notify the [Community] when the Owner legally transfers any of the Owners responsibilities for the storm water management practices. The Owner shall supply the [Community] with a copy of any document of transfer, executed by both parties.

Upon execution of this Inspection and Maintenance Agreement, it shall be recorded in the Clerk's Office of the Circuit Court of [County], Ohio, at the Owner's expense.

IN WITNESS WHEREOF, the Owner has caused this Inspection and Maintenance Agreement to be signed in its names by a duly authorized person.

________________________________________
(Sign) Individual Owner

________________________________________
(Please type)

By: ________________________________________
Appropriate Community official