Green Infrastructure Progress Report
Upper Rouge Tributary Area

Fiscal Year July 1, 2015 – June 30, 2016

NPDES Permit No. MI0022802

Detroit Water and Sewerage Department
735 Randolph
Detroit, MI 48226

August 1, 2016

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Annual Progress Report

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ACRONYMS/ABBREVIATIONS

Acronyms/Abbreviations	Definition
BSEED	Buildings, Safety Engineering and Environmental Department
CPC	City Planning Commission
CSO	Combined Sewer Overflow
DBA	Detroit Building Authority
DEGC	Detroit Economic Growth Corporation
DFC	Detroit Future City
DLBA	Detroit Land Bank Authority
DPW	Department of Public Works
DWSD	Detroit Water and Sewerage Department
EPA	Environmental Protection Agency
FY	Fiscal Year
GLRI	Great Lakes Restoration Initiative
GLWA	Great Lakes Water Authority
GRDC	Grandmont Rosedale Development Corporation
GSD	General Services Department
HRD	Detroit Housing and Revitalization Department
JET	City of Detroit Jobs and Economy Team
MDEQ	Michigan Department of Environmental Quality
MDOT	Michigan Department of Transportation
MG	Million Gallons
MLBA	Michigan Land Bank Authority
MOU	Memorandum of Understanding
MS4	Municipal Separate Storm Sewer System
NPDES	National Pollutant Discharge Elimination System
NWI	Northwest Interceptor
O&M	Operations and Maintenance
P&DD	Planning and Development Department
ROW	Right-of-way
RPR	Resident Project Representative (for construction)
SEMCOG	Southeast Michigan Council of Governments
TAC	Technical Advisory Committee
TNC	The Nature Conservancy
URT	Upper Rouge Tributary Area/ Upper Rouge Tunnel/
USDOT	United States Department of Transportation

1.0 EXECUTIVE SUMMARY

In 2010, the City of Detroit embarked on an Alternative Rouge River Combined Sewer Overflow (CSO) Control Program that would result in reduced costs for CSO control and would take into account the significant changes in land use in the City of Detroit. A component of this alternative CSO program was an investment in green infrastructure (GI) solutions that would help to reduce the volume of runoff into the combined sewer system.

Green infrastructure programs are, by nature, a mix of actions from public and private entities. The Detroit Water and Sewerage Department (DWSD) has the objective of making the greatest feasible progress toward reduced runoff to the combined sewer system, whether it is through direct implementation projects, through coordination with other agencies, or through institutional actions that change the way that storm water is managed on parcels. All of these actions result in a reduction in the volume and rate of flow delivered to the combined sewer system.

In Fiscal Year 2016 (FY2016), DWSD worked on both projects and institutional issues as part of the green infrastructure program. The hallmark of the program is that this has been a highly collaborative effort, supported by significant partners in such entities as the Detroit Parks and Recreation Department (PRD), Detroit General Services Department (GSD)Detroit Land Bank Authority (DLBA), the Building, Safety and Environmental Engineering Department (BSEED), the Planning and Development Department (P&DD), the Department of Public Works (DPW), the University of Michigan Water Center, and many community groups including Grandmont Rosedale Development Corporation, Friends of Rouge Park, Cody Rouge Community Action Alliance, Warrendale Community Organization, and the Viola Liuzzo Park Association.

The efforts of DWSD, these other agencies, and community groups have led to the following significant, measurable progress:

- Expenditures or construction contracts in progress that result in investments of over $10.6 million in the green infrastructure program. Ongoing or completed construction includes bioretention practices on demolition sites (the “ecological restoration of demolition sites” project), green street projects and storm water management work in parks. A number of larger scale projects are in various phases of development and design. Expenditures are detailed in Section 3.
- An estimated reduction in runoff volume during the 2-year 24-hour storm event in the URT of 43.98 MG, versus the overall performance goal of 2.8 MG. Of this, DWSD has funded projects that account for approximately 1.51 MG, including 0.13 MG in DWSD funded demolitions. Other changes in impervious cover, primarily associated with demolitions, account for an estimated 42.47 MG of runoff has been eliminated. Demolition volume reduction is reported in Table 8, and DWSD funded project volume is reported in **Error! Reference source not found.**. The overall performance goal is 2.8 MG.
- Net reduction of approximately 1,399 acres of impervious cover in the URT, which accounts for both reductions through demolition and increases from development. This change is over the period of April 2010 to June 2016, equating to 42.6 MG of estimated runoff reduction during the design storm event. This work has largely been performed by other City of Detroit departments or agencies, specifically BSEED from 2010 – 2013 and DLBA from 2014 – 2016. DLBA has adopted standards of site restoration that are designed to promote the reduction of runoff. DWSD also invested over $660,000 in demolitions over this period. An estimated net reduction of 3,141 acres of impervious area has occurred City-wide between 2010 and 2016.
- A number of projects are in design for FY2017 that will provide larger scale storm water management and significant impacts. Additional projects that will be ready for bidding in FY2017 include Detroit Public School green infrastructure projects, additional public park projects and neighborhood scale projects.
- Progress toward the development of a post-construction storm water ordinance as well as “greening of the code”. When complete, the ordinance and code updates will help to maintain the newly created hydrologic function of existing or newly created open space across the City. In both FY2015 and FY2016, DWSD conducted a series of workshops with stakeholders to gain early input during drafting of the ordinance. DWSD also met with several developers who were in early phases of site design, so that the proposed storm water management concepts could be considered, even prior to ordinance enactment.
- Development of a drainage charge credit system. DWSD is in the process of developing a credit program to accompany the drainage charge system. The drainage charge manual, including chapters related to the credit program, are in development. DWSD has focused on developing the necessary calculations for obtaining credits using a suite of eligible green infrastructure practices. Although this credit system is not

yet available, property owners are proactively converting over impervious parcel acres to managed storm water area. Property owners who have worked on implementing storm water management for credits City-wide include General Motors (364 acres), Fiat Chrysler (FCA) (123 acres), Jefferson Village (up to 100 acres) and the Borman site (approximately 43 acres). These projects have the potential to reduce the annual runoff to the sewer system by over 80% for the area controlled. The Borman site is located in the URT. Volume reduction associated with these projects is determined on an annual basis and is estimated at approximately 30 MG per year.

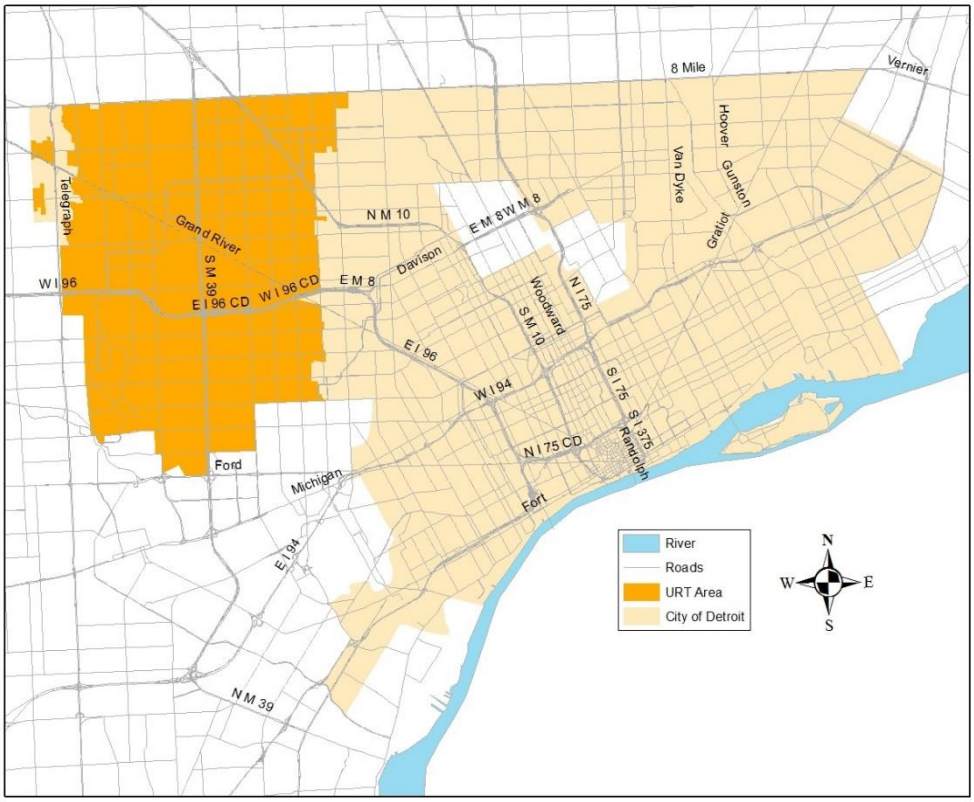
PURPOSE OF THIS REPORT

The Detroit Water and Sewerage Department (DWSD) and the Great Lakes Water Authority (GLWA) are jointly responsible for developing and implementing the Alternative Rouge River Combined Sewer Overflow (CSO) Control Program. This CSO Control Program is designed to restore water quality and protect public health, while staying within the City's financial means to pay for new projects. The program encompasses a 25-year phased plan that focuses on green infrastructure (GI) solutions along with "right-sized" conventional CSO control facilities. DWSD is responsible for the implementation of the GI program.

This document is the Green Infrastructure Annual Progress Report for FY2016, which corresponds to the time period of July 1, 2015 – June 30, 2016. An annual progress report is required according to the permit (NPDES MI0022802 Part I.A.15.d.5.a) that:

1) *Summarizes the GI implementation work during the preceding DWSD fiscal year that has been undertaken and completed as part of the Green Infrastructure program,*
2) *Contains a work plan for GI implementation projects for the next DWSD fiscal year,*
3) *Documents the annual expenditure for the preceding DWSD fiscal year,*
4) *Documents a cumulative total-spent-to-date on the GI program, and*
5) *Includes an updated estimate of the volume of wet weather flow that has been removed from the combined sewer system as a result of the Green Infrastructure program, using agreed upon calculation techniques.*

Figure 1 Upper Rouge Tributary Area Location



PROGRAM GEOGRAPHY AND BACKGROUND

The Green Infrastructure Program is focused on a 37.5-square-mile portion of the City of Detroit where CSO discharges are tributary to the Upper Rouge River. This portion of the City, alternately referred to as the Upper Rouge Tunnel area and the Upper Rouge Tributary (URT) area comprises approximately 27% of the City of Detroit and is illustrated in Figure 1. This area was identified for a program of both traditional CSO controls and green infrastructure in 2010, following the cancellation of the CSO tunnel project due to escalating costs and financial challenges. The URT includes a complex network of combined sewers. Combined sewage flows in the URT that exceed the capacity of the interceptor system are either discharged from uncontrolled outfalls or treated at the Hubbell-Southfield CSO Facility. The area includes a variety of neighborhood, industrial, and commercial areas which are in varying states of stability. The potential of storm water to be converted to CSO discharges is a factor in prioritizing efforts, while the local socio-economic conditions are a determinant in the type of project implemented.

In previous reports, the major institutional changes that occurred from FY 2013- FY 2015 have been discussed. These include the City's bankruptcy and the significant role that the Detroit Land Bank Authority assumed relative to blight removal and management of publicly owned residential parcels in the City.

In the current fiscal year, the bifurcation of the GLWA and DWSD was finalized. As of January 2016, DWSD is operating under new executive management with a new vision for the direction of DWSD. That vision includes an emphasis on responsiveness to the retail customer. With new executive management in place, DWSD has identified new priorities with a strong focus on green infrastructure. Thus expanding Detroit's green infrastructure program and coordinating that program with other City departments will not only control storm water but will aid in stabilizing neighborhoods and improving the quality of life in the City. DWSD's newly defined goals include:

- System renewal and reconfiguration
- Department staff and systems improvement
- Financial performance
- Customer service

With 138 square miles of green opportunity, DWSD sees the potential to be a benchmark city for storm water management using green infrastructure. The department's new executive management team is emphasizing the potential for Detroit to be a national leader in green infrastructure. Other City departments, namely the Planning and Development Department (P&DD) and Housing and Revitalization Department (HRD) have undergone profound change in the past year and are key partners in the green infrastructure program. P&DD hired a new director, Maurice Cox, and multiple staff who are experienced in landscape architecture and green infrastructure. HRD is working with green infrastructure efforts financed through Housing and Urban Development (HUD) Community Development Block Grants (CDBG) funds.

The working relationships between the DWSD Green Infrastructure Program, City of Detroit departments and other authorities and groups continue to be cooperative and positive. The development of more structured coordination between City departments is planned to facilitate coordination of activities and goals. DWSD, operating under the authority of the Office of the Mayor, is expected to lead this coordinated effort. DWSD's green infrastructure team is currently working with Bloomberg Associates to define and implement the coordinating structure for green infrastructure implementation in Detroit.

The focus of activities in FY2016 has been on project implementation, drainage charge program coordination and credit development, as well as continued building of institutional structures to support internal and external project coordination.

MAXIMIZING FLOW MANAGEMENT BENEFITS

The ultimate regulatory goal of green infrastructure implementation is a reduction in storm water entering the combined sewer system, which, in turn, will help to reduce untreated combined sewer overflows. DWSD recognizes that its direct spending on project implementation represents only a portion of the overall actions that result in a change in flow to the combined sewer system. As a result, the green infrastructure program includes significant efforts on institutional structures and policies, and coordination with other activities and partners, which will result in changes in storm water generation and management. Many of the actions that will increase or decrease the quantity of flow entering the sewer will be a result of activities such as demolition, redevelopment,

and storm water management retrofits by private property owners seeking to reduce their drainage charges. The combined sewer system performance will benefit greatly from this implementation by others if systems are in place to support and guide these investments.

Major efforts underway to support land use changes or implementation of storm water management/green infrastructure by others:

- DWSD is working with various City departments and stakeholders to continue developing a post-construction storm water ordinance and to "green the municipal code" to remove barriers to green infrastructure implementation– activities that will result in management of storm water on parcels.
- DWSD is working to update the drainage charge system, refine data to improve accuracy, and develop a credit system to enable customers to receive a reduction in their drainage charge through storm water management. Within the City, customers actively took steps to manage storm water on-site in 2015, resulting in approximately 600 acres of managed land.
- The Detroit Land Bank Authority (DLBA) is working to demolish vacant and blighted structures. DWSD quantified the land use changes in the City from 2010 through June 2016 through new aerial photography. DWSD currently estimates that 1,399 acres of impervious area have been removed in the URT through demolitions in this period.

DWSD Project Implementation

In FY2016, DWSD's Green Infrastructure program expended or awarded projects worth approximately $6.6 million, as shown in Table 1. Of this amount, $2.0 million previously transferred to DPW was claimed in FY 2015, and this is reflected in the amounts claimed for FY2016. In addition, several adjustments were made for program expenditures in prior years. A more detailed description of expenditures is included in Section 3.0, Investment in Green Infrastructure.

Table 1 FY2016 Expenditure Summary

Effort	Expenditures and awarded projects in 2016	Amount reported in FY2016 annual report	Comments
Code and Ordinance Efforts	$376,625	$(17,846)	Prorated current and prior expenditures by 19.8%, results in a reported decrease in creditable expenditure
Project Management and Planning	$282,036	$282,036	Includes consultant and allowance for staff time
Drainage Charge Program Adjustments		$(141,718)	Removed reporting of drainage charge related efforts
Outreach	$119,612	$119,612	Green Infrastructure program related outreach
Tracking / Impervious Cover Analysis	$204,070	$40,406	Prorated by share of URT to City total (19.8%)
Project Implementation	$3,689,681	$2,635,181	$1,054,500 in construction was invoiced under PW6968. This amount was previously claimed in 2015 when funds were transferred to DPW
Subtotal	**$4,672,024**	**$2,917,671**	
Project Implementation (bid but not spent)	$1,974,624	$1,029,124	Includes $945,500 under contract for PW6968, previously claimed in FY2015 for transportation corridor projects (when funds were transferred to DPW). Will be fully accounted for in FY2017 report.
Totals	**$6,646,648**	**$3,946,796**	

Cumulative Project Expenditures

The spending requirement for the GI Program is for a cumulative expenditure of $30 million by 2019. Through June 30, 2015, $6,719,276 of expenditures were claimed. With the additional work in the current fiscal year, the total expenditure as of June 30, 2016, is $9,598,743.

A number of larger projects are in design for bidding and construction to initiate in FY2017 and FY2018.

In addition, the Program has a goal of reducing runoff volume to the combined sewer system during the 2-year, 24-hour event by 2.8 MG. Including those projects previously completed or currently under construction, an estimated 1.51 MG will be removed per this benchmark. When all activities implemented by the City of Detroit are accounted for, including demolitions, the estimated total flow reduction in the URT during the 2-year, 24-hour event is 43.98 MG.

Annual Report Organization

Details for the various items in the permit requirement are presented in this Progress Report. It is structured in the following manner:

- Section 2 summarizes the planning, coordination and implementation efforts undertaken during FY2016.
- Section 3 provides a financial summary of the investments made toward the green infrastructure program, both for the preceding year and the cumulative total to date.
- Section 4 documents the estimated volume of wet weather flow removed as a result of the green infrastructure program.
- Section 5 summarizes the planned activities for the upcoming year.

2.0 PLAN IMPLEMENTATION – FY2016

The Green Infrastructure Plan is a requirement for DWSD under the NPDES permit (Permit No. MI0022802), issued by MDEQ (State of Michigan Department of Environmental Quality, 2013). The permit requires DWSD to develop and implement a plan that will describe a process for locating, designing, constructing, operating, and evaluating GI in the sewersheds for 17 outfalls to the Rouge River. The permit identifies specific elements that will be included in the Plan including downspout disconnection, demolitions, tree planting, vacant lot greening, bioswales along roadways and parking lots, rain barrels and rain gardens at properties, and programmatic and policy type elements. The 2014 Plan was submitted to MDEQ on August 1, 2014, and was conditionally approved by MDEQ on May 8, 2015.

DWSD's Green Infrastructure Program is envisioned as a continually evolving effort to identify and implement projects and programs that will reduce CSO discharges while benefiting the community. It will be coordinated with other activities in the City that impact storm water runoff. Because of the dramatic land use changes in the City of Detroit, the storm water management benefits will develop from three primary mechanisms (1) DWSD or City of Detroit implemented projects for storm water management/ green infrastructure; (2) green infrastructure (or traditional storm water management) implementation on existing or redeveloped sites; and (3) change in impervious area. The change in impervious cover is primarily occurring through City of Detroit actions to reduce blight and demolish vacant properties. DWSD's program includes directly implemented projects and the advancement of institutional structures that will result in better storm water management on parcels. These actions will be funded by property owners and have minimal cost to DWSD. Therefore, the Program includes a suite of activities which consider long-term and short-term objectives, and balance institutional structures with project implementation.

DWSD's Green Infrastructure Program included five major activities. Progress on each of those activities over the last year is described in this section. Table 2 provides an overview of the status of each identified activity, with additional detail in the following sections for activities with significant efforts.

Table 2 GI Plan Activities – FY2016 Progress

Task ID	Activities Discussed in 2015 GI Plan	Target Completion Date (GI Plan)	Current Status	Updated Completion Date
Activity 1 – Policies, Procedures and Standards				
1-1	Codes and Ordinances	FY2016 focused on post-construction storm water ordinance and "greening of the code".	Draft post-construction storm water ordinance complete with the exception of alternative compliance; revised code language drafted and under review	April 2017
	Comment: See detailed discussion in following section. DWSD formed a Storm Water Technical Advisory Committee (TAC) comprised of city department staff to provide input on key aspects of the post-construction storm water ordinance and "greening of the code." Working with TNC to develop alternate compliance options for offsite mitigation and payment in-lieu options as a component of the post-construction storm water ordinance. With the exception of alternative compliance, ordinance components have been proposed by staff, vetted by stakeholders, revised based on input and legal review. The draft ordinance will be finalized as a draft upon completion of alternative compliance analysis and finalized alternative compliance proposal, including input from stakeholders. At that point it will be submitted as a draft to the City Planning Commission and City Council. Completion date relates to readiness for City council action.			
1-2	Storm Water Design Manual	Publically available version by June 2016.	In progress	April 2017
	Comment: Overall scheduled delayed to remain in alignment with the post-construction storm water ordinance efforts.			
1-3	Drainage Charge Credit System	Draft available for public comment January 1, 2016.	In progress	October 1, 2016
	Comment: See detailed discussion in following section. Program rollout was deferred to address a number of complex issues and customer impact. Phased changes to the drainage charge system are being implemented as of July 1, 2016.			
1-4	Green Streets Standards	General timeframes. Draft standards by June 30, 2016. Final by June 30, 2017.	Not started	

Task ID	Activities Discussed in 2015 GI Plan	Target Completion Date (GI Plan)	Current Status	Updated Completion Date
	Comment: Bloomberg Associates is working with the City on efforts involving complete streets. Activities included an April 2016 workshop with dozens of state, city, and local stakeholders in an effort to generate street design ideas that could be implemented quickly using temporary materials; showcase innovation; deliver immediate results; leverage local partnerships; and integrate bike, pedestrian and transit planning; consideration of potential projects which include a new civic square at Woodward Avenue and Jefferson Avenue; a redesigned, safer intersection of Gratiot Avenue and Randolph Street; and bike infrastructure/complete street pilots on Grand River. The team is continuing to work on implementation or specific projects and discussing methods for incorporating related street design guidance into any future strategic plan development efforts.			
1-5	Structure Demolition and Lot Greening Standards	Standards were adopted by DLBA in the FY2015	As needed	
	Comment: DWSD has provided technical assistance upon request. DLBA adopted site restoration standards.			
1-6	Public Storm Water Maintenance Guidance	Publically available version by June 2016	Not started	October 2016
	Comment: Schedule based on overall codes and ordinance schedules in order to be consistent with the code, which has shifted in schedule during FY2016 due to the development of alternate compliance options by TNC, as well as other DWSD and city priorities. The Public and Municipal Storm Water Maintenance Guidance will be developed concurrently with the Storm Water Design Manual.			
1-7	Municipal Storm Water Maintenance Manual	Draft manual July 31, 2017	In progress	
	Comment: Schedule based on overall codes and ordinance schedules in order to be consistent with the code, which has shifted in schedule during FY2016 due to the development of alternate compliance options by TNC, as well as other DWSD and City priorities. The Public and Municipal Storm Water Maintenance Guidance will be developed concurrently with the Storm Water Design Manual.			
1-8	Tracking System	Updated impervious cover analysis data complete by December 31, 2015. Other systems ongoing.	In progress	
	Comment: DWSD is currently tracking all green infrastructure investments in GIS data sets. Detailed impervious cover for the City of Detroit was completed in 2015 based on April 2015 aerial photography.			
Activity 2 - Prototype Projects				
2-1	Small Scale Greening	Ecological design project construction to be completed by November 2015. Evaluation of other greening opportunities in FY2016.	Eco design construction complete. Selection of additional sites in progress.	.
	Comment: See detailed discussion in following section.			

Task ID	Activities Discussed in 2015 GI Plan	Target Completion Date (GI Plan)	Current Status	Updated Completion Date
2-2	Large Scale Greening and Historic Stream Corridors	Ongoing planning and project development FY2016	In progress	
	Comment: See detailed discussion in following section. A number of neighborhood scale opportunities are in various stages of design.			
2-3	Public Facilities Green Infrastructure/ Flow Management	Select initial projects by October 31, 2015.	One project with two sites selected. Additional locations in progress.	
	Comment: See detailed discussion in following section. A preliminary list of projects has been developed that must be reviewed with the agencies prior to project selection.			
2-4	Historic Stream Corridors	Ongoing planning and project development FY2016.	See Comment	Now being reported under Activity 2-2
	Comment: Activity now being reported as part of Activity 2-2 Large Scale Greening			
2-5	Municipal Parks Green Infrastructure/ Flow Management	Select initial projects by October 31, 2015. Implement Stoepel Park and other selected project(s) in 2016.	In Progress	Complete Stoepel Park and Liuzzo Park in October 2016. Construct Crowell Recreation Center in late 2016.
	Comment: Stoepel and Liuzzo Parks and the Crowell Recreation Center projects are either bid or pending bid as of June 30, 2016. See detailed discussion.			
2-6	Transportation Corridor Flow Management	Develop prioritized opportunity list by January 31, 2015. Project selection and implementation schedule by May 31, 2015. Annual updates and coordination with city departments, county and state. Project completed final design in FY 2015. Construction financed.	Projects are under construction	Construction of current projects expected complete fall 2016.
	Comment: Projects in collaboration with DPW are currently under construction. See detailed discussion.			
Activity 3 - Continued Implementation				
3-1	Downspout Disconnection - Homes	Program under review.	In Progress	See comment.

Task ID	Activities Discussed in 2015 GI Plan	Target Completion Date (GI Plan)	Current Status	Updated Completion Date
	Comment: Downspout disconnection efforts are being emphasized through the drainage charge credit program.			
3-2	Downspout Disconnection - Multi-Family Residential, Commercial, and Industrial	Non-SFR properties are included either in 2-3 Public Facilities Flow Management addressed through drainage charge/code review activities.	In progress	See comment
	Comment: Downspout disconnection efforts are being emphasized through the drainage charge credit program.			
3-3	Demolitions and Site Restoration	Coordination with DLBA and DBA ongoing.	Ongoing	TBD
	Comment: DWSD has been in regular contact with the DLBA regarding demolition coordination. The DLBA has primarily been focused on the demolition efforts using Hardest Hit Funds.			
3-4	Tree Plantings	Majority of opportunity locations completed. No additional plantings planned for 2016.	Complete	Complete
	Comment: No additional activities planned at this time.			
Activity 4 - Long Term Performance				
4-1	Updated Collection Systems Model	Complete by June 30, 2015	Complete	
	Comment: GLWA currently has a project for the "West Side Model" in progress. This modeling effort includes extensive data collection to better understand the system operation.			
4-2	Green Infrastructure Performance Planning	Complete by June 30, 2015	In progress	September 30, 2016
	Comment: Monitoring of the Ecological Restoration of Demolition Sites projects is underway. The current year's monitoring period is expected to be complete by September 30, 2016.			
4-3	Green Infrastructure Benefits Evaluation	Complete by June 30, 2016.	Future	June 30, 2017
	Comment: The intent of this effort was to evaluate processes and strategies as well as evaluate storm water management and other benefits. This work will be performed in FY2017 as part of CIP planning and projects evaluation.			
4-4	Amendment to the Supplemental Report on Alternative CSO Controls for the Upper Rouge	Complete by January 1, 2017	Future	January 1, 2017

Task ID	Activities Discussed in 2015 GI Plan	Target Completion Date (GI Plan)	Current Status	Updated Completion Date
	Comment: DWSD has initiated development of the full plan for $50 million implementation spend in the URT. This work involves prioritization of outfalls and assessment of CSO reduction impacts associated with the green infrastructure spending requirement. The completion date for this permit requirement is under discussion with GLWA and DWSD relative to the West Side Model Project. This activity is related to the green infrastructure program requirements but is not a part of the program.			
4-5	Legal agreements for long-term sustainability	Ongoing	Ongoing	
	Comment: DWSD has executed or initiated discussion on legal agreements for joint public projects. Green infrastructure on private property will be incentivized/ sustained through the financial incentives of the drainage charge credit program or the post-construction storm water ordinance (pending).			
Activity 5 - Stakeholder and Community Engagement				
5-1	Green Infrastructure Website	Ongoing	Ongoing updates.	Ongoing updates
	Comment: The green infrastructure website was merged with the City website as part of DWSD restructuring. Content related to projects has been updated.			
5-2	Drainage Charge Credit Program Stakeholder Engagement	Anticipated launch is fall 2015.	In progress	Ongoing as drainage charge program is rolled out to the public.
	Comment: Customer focus groups and a retail customer advisory committee were initiated in fall 2015 and are continuing. This work is a part of the drainage charge program (investment not included in green infrastructure expenditures).			
5-3	Drainage Charge Toolbox	Materials available in draft form by January 31, 2016.	In progress	Fall 2016
	Comment: As noted for Activity 1-3; overall launch delayed to confirm data integrity, incorporate a phased implementation of the updates and provide public notification. This work is a part of the drainage charge program (investment not included in green infrastructure expenditures).			
5-4	Drainage Charge Training Workshops	Concurrent with Drainage Charge launch and outreach.	Concurrent with Green Credit Public Launch	Fall 2016
	Comment: This work is a part of the drainage charge program (investment not included in green infrastructure expenditures).			
5-5	Green Infrastructure Case Studies and Demonstration Projects	Ongoing with initial case studies developed by June 2015.	In progress	Ongoing

Task ID	Activities Discussed in 2015 GI Plan	Target Completion Date (GI Plan)	Current Status	Updated Completion Date
	Comment: Stakeholder and community engagement is conducted as part of the GI design process. Information is disseminated through fact sheet mailings, a series of public meetings, and meeting summary mailings, groundbreaking ceremonies, and dedication/ribbon cutting events. There is also opportunity for the public to be involved in the planting portion of the project or receive training on volunteer maintenance activities as applicable. A number of GI tours will be held over FY2017			
5-6	Green Infrastructure Forum	Annually in May	Moved to 2017	Spring 2017
	Comment: Outreach efforts to a broader stakeholder group have been provided through code and ordinance outreach sessions, drainage charge outreach and various standing groups (e.g. Erb Blue/Green group and City Council Green Task Force (blue/green subgroup)). An overall forum will be held in 2017 to share the findings of the Green Infrastructure Steering Committee vision/goal setting.			
5-7	Stakeholder Involvement and Education Strategy	Draft by September 30, 2014. Finalize Plan with input by December 31, 2015.	Being implemented; regularly updated.	FY2016 updates reflect new DWSD goals, priorities, and processes for outreach.
	Comment: Strategy is being coordinated with new DWSD public affairs group as of January 2016. Additional coordination with overall City of Detroit public affairs group.			
5-8	Overarching Green Infrastructure Educational Campaign	Ongoing	Ongoing	Ongoing
	Comment: Work is being coordinated with a variety of partners, including those who participate in the Erb coordinated blue/green infrastructure group and other City departments and agencies.			

Additional information is provided for various major activities in the following sections.

ACTIVITY 1 - POLICIES, PROCEDURES AND STANDARDS

Institutional processes that are put in place by DWSD and the City of Detroit will drive implementation of green infrastructure on parcels and private property in the long term. Within the URT area, approximately 70 percent of the land area is made up of parcels and 63 percent of the total impervious area is located on parcels. Managing flow from these parcels is directly related to the institutional processes that are in development.

Significant efforts occurred relative to activities 1-1 and 1-3, which are discussed below.

Activity 1-1 Codes and Ordinance

DWSD completed a review of existing codes and ordinances and presented findings in a workshop of City departments in November 2014. The review revealed that there are three areas where the code could be amended to better support the implementation of green infrastructure: The development of post-construction storm water management regulations, the revisions of existing regulations to allow multiple benefits to be achieved in landscaping areas, and the update of parking requirements and standards to allow for the reduction of impervious area within off-street parking areas. DWSD is currently working with the Mayor's Office, the Building, Safety Engineering and Environmental Department (BSEED), the Planning and Development Department (P&DD), and other departments to develop new post-construction storm water management performance

standards and address existing code language that acts as a barrier to green infrastructure implementation. This group became known as the Technical Advisory Committee (TAC).

DWSD developed the draft post-construction storm water management ordinance in FY2015 based on input received during a stakeholder input session held in December 2015 and ongoing input from the TAC. The draft then went through numerous reviews by the City's Law Department and DWSD general counsel during the first part of 2016. Simultaneous to this, the City began the effort to "green the code", making implementation of GI practices more feasible and accepted for property owners based on the findings of the initial 2014 code review. To facilitate this process the City held a work session in February 2016 to consider specific code revisions and worked to finalized proposed changes in weekly TAC meetings throughout the spring. The proposed revisions were presented to stakeholders on July 21, 2016, for input. Table 3 highlights the TAC meetings, both web-based and in person, intended to address issues related to the post-construction storm water ordinance and the greening of Detroit's municipal code.

In addition, during the spring of 2016, The Nature Conservancy (TNC) conducted an options analysis to see which alternate compliance mechanisms (i.e., off-site mitigation, payment-in-lieu) that are utilized in other cities might be appropriate and beneficial for the City of Detroit and evaluated the impacts to developers who will be regulated by the new rules. For this effort, TNC and DWSD researched existing programs in other cities, interviewed local developers and conducted a demand analysis to see which land use typologies would be most likely to utilize alternate compliance options. The options analysis was completed in July 2016 and will be presented to DWSD management, the TAC, and stakeholders for input.

Table 3 Significant Codes and Ordinance Meetings

Date	Representatives	Purpose
7/21/15, 12/12/15, Listening sessions on 11/30/15 and 06/01/16	Sierra Club, Land, Inc., Eastern Market, Friends of the Rouge, Erb Family Foundation, American Rivers, DPW, DWSD, P&DD, CPC, BSEED, Councilman Benson's office, Sustainable Water Works, Mayor's office, Detroit Future City, The Nature Conservancy, Recovery Park, Greening of Detroit, Tetra Tech, Mannick and Smith, MDEQ, SEMCOG, MDOT, Environmental Consulting and Technology, Zachary and Associates, Giffels Webster, Bedrock Real Estate Services, NTH Consultants, Great Lakes Environmental Law Clinic, Redico, 42nd Parallel Group, Roncelli, Inc., Wade Trim, Oakland County WRC.	Post-Construction Storm Water Management Regulation Stakeholder Working Sessions – Ordinance Update and Stakeholder Input Meeting for Proposed Code Updates
2016: 01/25, 02/10, 02/15, 03/07, 03/14, 03/21, 04/04, 04/14, 04/18, 05/23, 06/06, 06/23	Members from the Technical Advisory Committee (TAC) including the following departments within the City including: DWSD, BSEED, DPW, P&DD, CPC, and Legal. TNC also a member of the TAC.	Weekly meetings with TAC to review current codes and identify road blocks for green infrastructure under the current codes and ordinances. Propose revisions to the codes to incentivize green infrastructure practices in the following areas: landscaping/open space updates, parking requirements, and parking design.
3/07/16, 4/25/16	Wayne County, DWSD, Tetra Tech	Review Storm Water Ordinance development.
2016: 01/22, 02/26, 03/17, 03/23, 04/14	Subcommittee includes various members from the TAC. Department include DWSD, BSEED, DPW, Legal, and outside members from The Nature Conservancy, Greening of Detroit and SEMCOG as well as Tetra Tech	Design manual and policy manual chapter development.

Date	Representatives	Purpose
2016: 04/25, 06/13, 06/22	Tetra Tech and DWSD Legal Department	Review draft storm water ordinance language
2016: 05/10, 05/26, 06/13, 06/21	DWSD, BSEED, DPW, P&DD, and Tetra Tech	Develop Site Plan Review Process for Storm Water Ordinance
2016: 05/19, 05/23, 06/15	DWSD, BSEED, DPW, P&DD, Housing, The Nature Conservancy and Tetra Tech	Alternate Compliance Options Analysis
2016: 04/26, 06/21	BSEED, DWSD, GLWA, P&DD, and various Stakeholders	Green Infrastructure Tour of various project within Detroit

Activity 1-3 Drainage Charge Credit System

DWSD funds wet weather related costs (e.g., CSO control, treatment of wet weather flows at the treatment plant) through a drainage charge. Technical work to define impervious acreage and initial evaluation of drainage charge policy issues was implemented in 2015. In January of 2016, the new executive management team at DWSD made revisions to the drainage charge system a priority of the organization. A program management team was established that included finance, legal, technical, billing, IT, customer service and public outreach functions. A phasing plan was developed to align each property in the City to a consistent method of billing. Beginning in FY2017, DWSD will gradually convert each parcel in the City to a bill based on impervious cover. Customers will be notified of the advances in technology and the standardization of billing method as well as the impact it has on their drainage charge bill. A public outreach and community engagement strategy is being implemented to ensure customers are receiving adequate information about the program updates. In addition, a credit system is being developed that will result in reduced bills for those customers who manage their flows on-site. As part of the green infrastructure program, DWSD is reporting efforts toward the development of the credit system and other outreach efforts with property owners that are necessary to result in on-site implementation. DWSD is in discussions with over 30 major property owners on strategies to control storm water that could lead to reduced bills. These properties are inside and outside the URT. Costs associated with the drainage charge program are not reported as part of the green infrastructure spend associated with the NPDES permit.

ACTIVITY 2 – PROTOTYPE PROJECTS

Activity 2-1 Small Scale Greening: Ecological Restoration of Demolition Sites

In cooperation with the Detroit Land Bank Authority (DLBA) and the University of Michigan Water Center, DWSD completed construction of four bioretention practices on eight cleared residential lots within the NWI area to help manage local road runoff. Under a grant from the Erb Family Foundation, the University of Michigan Water Center research team will assess social and water quality impacts resulting from these green infrastructure practices. The lots were cleared of blighted homes to assist in the stabilization and beautification of the neighborhood. The four project areas were completed in fall 2015. DWSD worked with project partners to plan and host a ribbon cutting celebration at the Evergreen location with local leaders, community residents, and students in May 2016. Table 4 identifies the location, actual construction cost, total tributary acres, and anticipated performance of the practices, while

shows the location of the vacant lot bioretention areas and Figure 3 shows a photo of the Evergreen site from the May 2016 ribbon cutting celebration.

Table 4 Ecological Design Project Cost and Performance

Lot Address	Contractor Cost	Cost Effectiveness ($/gal)	Total Tributary Drainage Area (Acres)	Performance (MG)	% of 2-Year Design Storm	Status
8287-8303 Evergreen	$150,781	$6.28	0.72	0.024	Retain: 100%	Constructed summer/fall 2015
8091-8097 Vaughan	$122,192	$6.79	0.52	0.018	Retain: 100%	Constructed summer/fall 2015
8084-8092 Stahelin	$136,299	$5.45	0.53	0.025	Retain: 100%	Constructed summer/fall 2015
8027-8035 Greenview	$122,269	$8.73	0.46	0.014	Retain: 100%	Constructed summer/fall 2015
Estimate of (Retained) Runoff Reduction (MG)				**0.081**		

Figure 2 Ecological Design Project Locations

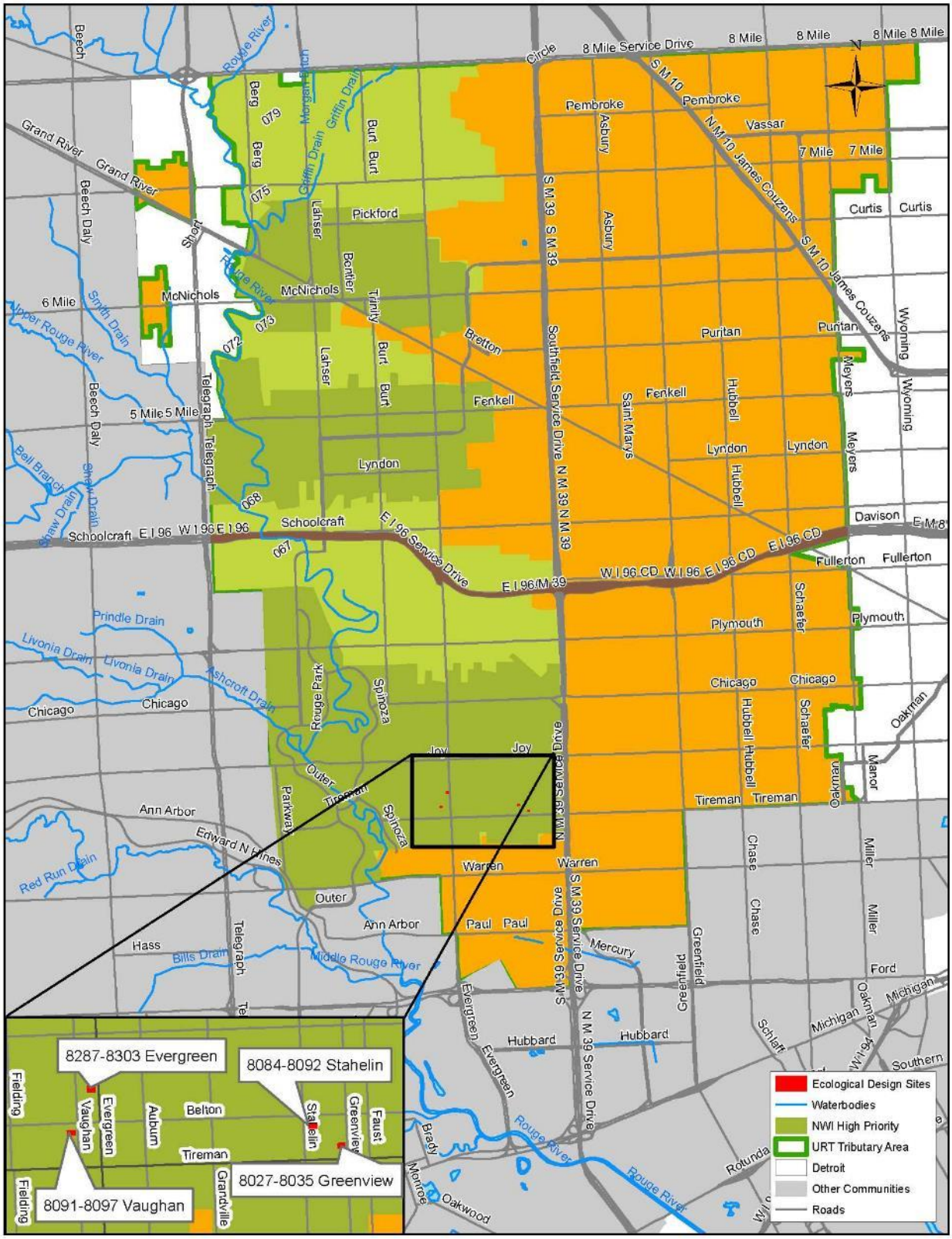


Figure 3 Vacant Lot Bioretention on Evergreen Street During May 2016 Ribbon Cutting Celebration

DWSD initiated work on additional activities associated with small scale greening in FY2016. The first of these was monitoring of the four vacant lot bioretention sites. DWSD is currently working with several project partners to conduct testing and monitoring at the four sites. Second, DWSD initiated work on the selection of additional sites. Details about these efforts are included in Section 5.0, Activity 2-1.

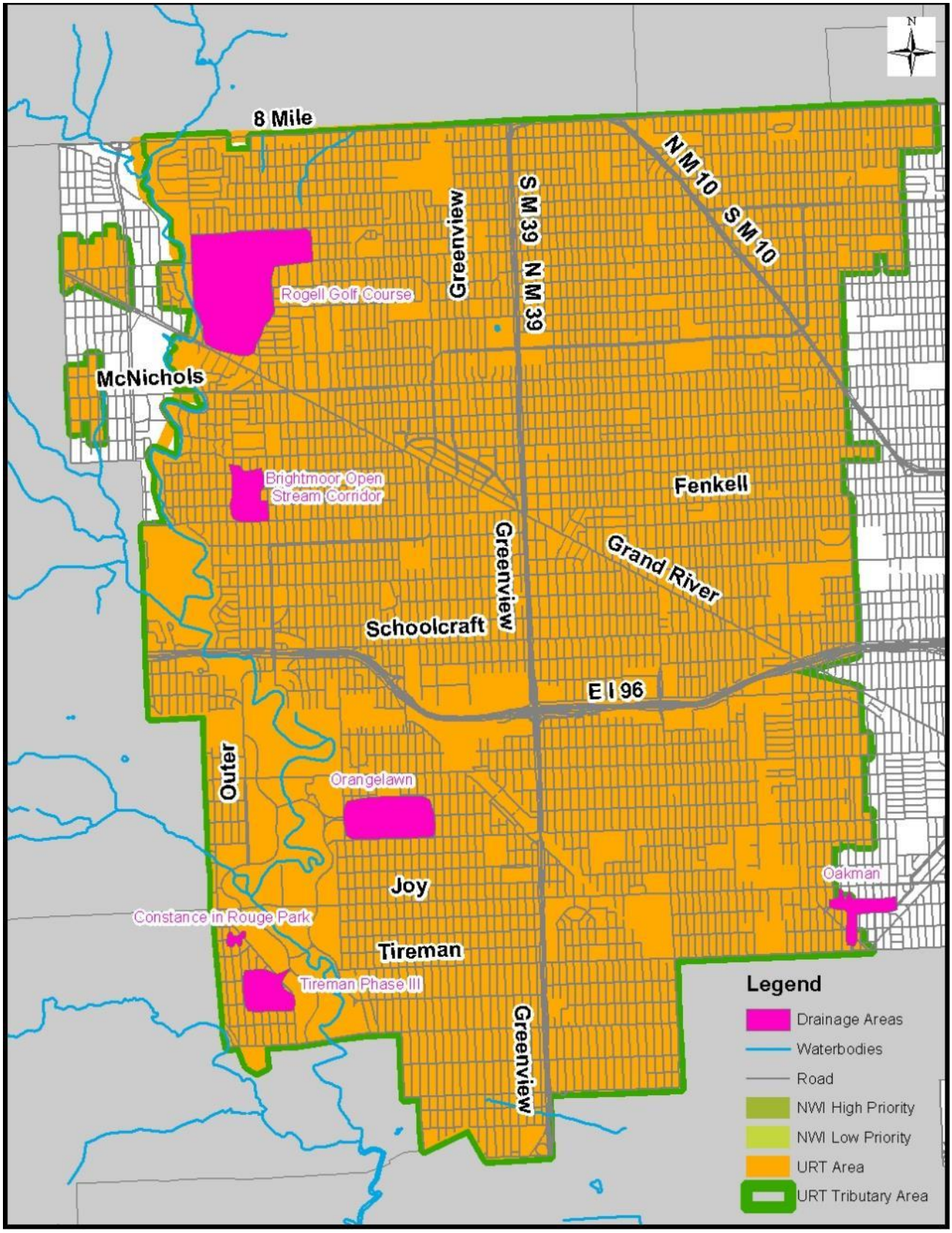
Activity 2-2 Large Scale Greening

Large scale greening includes projects that aggregate smaller individual projects together into one larger implementation project or projects that serve a neighborhood scale. Tasks associated with this activity performed during FY2016 include:

- Meetings were held with P&DD, HRD, DLBA, and with other agencies or groups that work on similar issues to discuss coordination and concept designs for large scale greening projects.
- Based on meetings and preliminary data review, the following project locations were selected for development of concept designs. Potential drainage areas that are being evaluated for the concept designs are shown on Figure 4.
    - Oakman Boulevard
    - Orangelawn
    - Tireman Phase III
    - Constance storm water diversion (in Rouge Park)

  - Rogell Golf Course and neighborhood area
  - Brightmoor (previously reported under Activity 2-4 Historic Stream Corridors)
- Existing site data, such as FEMA flood data, utility information, soil borings, and catch basin locations were gathered and reviewed for the selected project locations.
- Concept designs have been developed or are underway for the list of selected projects. Specific information associated with the project locations is presented below.

Figure 4 Large Scale Greening/Neighborhood Scale Opportunities



Oakman Boulevard

Oakman Boulevard is located in the Aviation neighborhood on the southeast corner of the URT. It is a two-way street divided with a large green boulevard separating the opposing directions of traffic. Each travel direction has two full travel lanes and a parking lane. The conceptual design for Oakman Boulevard is based on an analysis of basement backup data provided by FEMA for this area. Many of the residential homes in the surrounding project area, particularly in the northwest corner of the project area, have sustained basement flooding during large rain events caused by inadequate capacity of the combined sewer to carry wet weather flows. In this concept, storm water runoff will be managed in a series of bioretention and underground storage (UGS) practices within the boulevard median of Oakman Boulevard. Figure 5 shows the drainage areas for Phases I and II. Estimated drainage area size is 43.6 acres. Both types of practices will be sized to retain or detain runoff from the 90% event from their respective drainage areas. The intent for this alternative is to reduce basement backups caused from exceeding the capacity of the combined sewer. This will be accomplished through retention and detention of storm water runoff before entering the combined sewer. In addition, some storm water will be rerouted from overloaded local sewers.

DWSD is currently completing the conceptual design of the Oakman Blvd system. Work to date has included: conceptual design, field survey, sewer system investigation, utility data collection, conceptual design. Work proposed for FY2017 is discussed in Section 5.0.

Figure 5 Oakman Boulevard Drainage Areas (Phase I and Phase II)

Orangelawn

Orangelawn Street is located just west of Rouge Park and between Plymouth Road on the north and Chicago on the south. The concept for Orangelawn includes a neighborhood scale project that captures storm water runoff from surrounding streets and conveys the water to green infrastructure practices proposed in the wide right-of-way between the road and the sidewalk. Work to date has included gathering of existing utilities, field investigations for system configuration, and early concept design.

Tireman Phase III

Tireman Phase III is the last of a three-phased design along Tireman Avenue west of the Rouge River, from Chatham to Outer Drive. Phases I and II are under construction and are reported under the transportation corridor projects. Phase III of the design consists conceptually of a proposed new storm sewer pipe that captures the overflow from Phases I and II and conveys it east to the Rouge River. Completion of the design of this phase is anticipated in FY2016 and construction is intended to begin summer 2017. Activities in FY2016 included utility information gathering and modeling of the tributary area to support design.

Constance Phase II

The Constance Phase II green infrastructure project is part of a two-phased design along Constance Street west of the Rouge River, from Parkway Street to Outer Drive. Phase I included sewer construction that is being implemented in PW-6968 in 2016, with construction completion expected in the fall. This work is discussed under transportation corridor projects.

Phase II of the design includes a proposed constructed wetland and educational feature in Rouge Park that will capture storm water from the newly constructed separate storm sewer along Constance. In FY2016 the concept was coordinated with Friends of Rouge Park in order to reach agreement on the general design. Survey, geotechnical work and wetland mapping were performed. Figure 6 shows a conceptual rendering of the proposed storm water feature in the park. Conceptual design is currently in process and is anticipated to move into implementation for FY2017.

Figure 6 Concept Rendering of Constance Phase II in Rouge Park

Other Project Areas

Several additional project locations are under review for future design consideration. These locations are neighborhood scale projects that would incorporate a large storm water management feature in a central location in the neighborhood to provide an amenity to the area. The various locations have been identified through various methods, including planning meetings with Detroit HRD and P&DD, and Brightmoor community partners. DWSD is in the early stages of conceptual design and anticipates design to proceed in FY2017 and construction to follow in future reporting periods. In FY2016 information was gathered about the condition of these neighborhoods and the utilities in the area. Potential tributary areas were evaluated and initial concept layout was identified. The following are locations currently under review:

- Rogell Golf Course Neighborhood – Concept design developed for this location includes conveying storm water from adjacent residential streets into the historic golf course and creating a large constructed wetland type feature in the park. A proposal to convey overflow from the feature directly to the Rouge River is being considered.
- Brightmoor (previously reported as Activity 2-4 Historic Stream Corridors) – Concept design to use a historic stream corridor as a natural placement location for green infrastructure practices. Historic stream corridors are, in essence, a location where the natural topography allows for the creation of storm water practices that can be used for runoff from streets and parcels in the vicinity. Conceptual design did not advance for this project in FY2016.

Activity 2-3 Public Facilities Flow Management

In previous reporting periods, three major public entities within the City of Detroit were contacted and pursued to improve parcel drainage management including:

- Detroit Public Schools (DPS)
- City of Detroit General Services Department (GSD)
- Organizations managing large public housing facilities (e.g. Detroit Housing Commission).

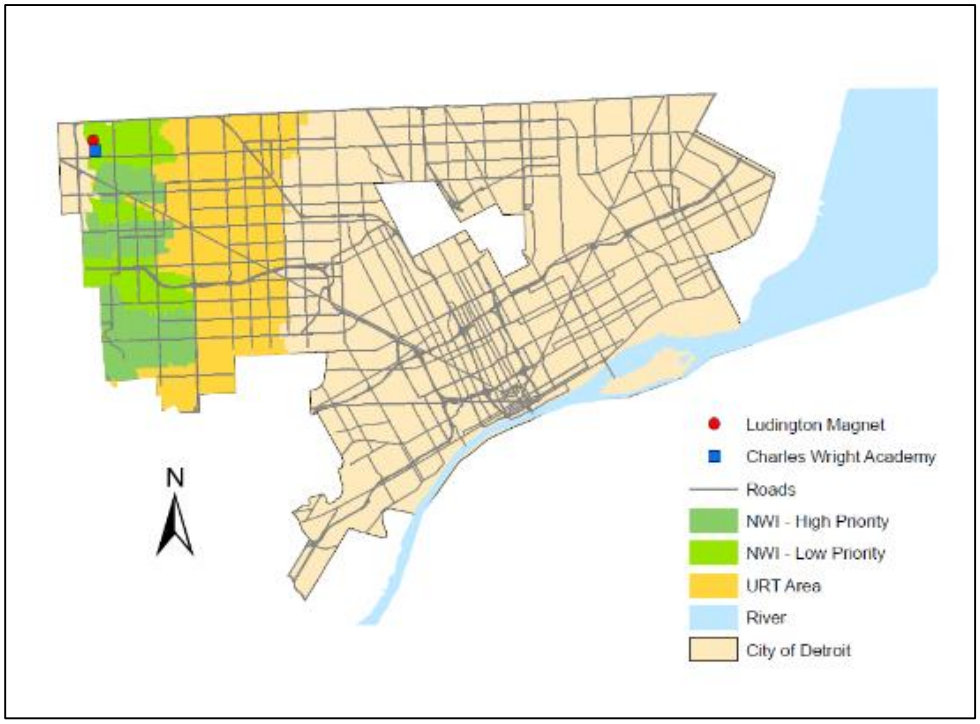
The focus in FY2016 was on advancing projects associated with Detroit Public Schools.

Detroit Public Schools

In 2015, a review of 28 active Detroit Public Schools (DPS) within the project area was conducted to determine which have the greatest potential site drainage improvement opportunity. Ten schools were selected for additional field investigations and a comprehensive analysis. Upon completion of the comprehensive analysis, three schools were selected for further concept design development including Gompers Elementary, Ludington Magnet Middle School, and Charles Wright Academy. Gompers Elementary school was put on hold for future design while Ludington Magnet and Charles Wright were selected for 2016 design and 2017 construction.

Ludington Magnet Middle School is located at 19501 Berg Road in Detroit and is adjacent to the north of Charles Wright Academy at 19299 Berg Road. The schools are bounded by Seven Mile Road on the south, Berg Road on

Figure 7 Ludington Magnet Middle School and Charles Wright Academy Location Map



the east, Pembroke Avenue on the north and the Rouge River on the west. Figure 7 shows the location of the school properties within the City and URT project area.

Land Use and Drainage Area Ludington Magnet Middle School

The combined school property of Ludington Magnet Middle School and Charles Wright Academy consists of approximately 43 acres, of which 14.03 acres are included in the drainage area to the combined sewer system. Table 5 provides a summary of the land use types in the project area. Overall approximately 20% of the property is covered by impervious surface. Large grassy areas surround the school on all sides with heavily wooded areas on the southern and western property boundary.

Table 5 Drainage Area for DPS GI Project

Area Name	Area (acres)
Roof Area	3.49
Paved Area	4.48
Lawn/Trees	6.06
Total Drainage Area	**14.03**

Ludington Magnet Middle School

The majority of flow on the Ludington Magnet Middle school property is generated from the roof and grassy areas to the east. Currently, the majority of the roof area at Ludington Magnet Middle School drains to the existing DWSD Pembroke CSO Outfall. The grassy lawn areas on the east and north sides of the school are designed to drain to yard catch basins which convey the flow to the existing storm water system that discharges to the Pembroke Outfall.

Charles Wright Academy

The majority of flow generated at Charles Wright Academy consists of drainage from the roof and parking lot areas and overland flow from the west side of the property. The entire roof system drains through three separate storm leads that exit the building on the east side. All three storm leads discharge into the site's combined sewerage piping which discharges to DWSD's combined sewer system at a manhole on the south side of the building. Paved parking and walkways, along with lawn areas on the west side of the building, also drain into the combined sewer system through catch basins. There are three sanitary leads that exit the north and west sides of the building, separate from the roof storm drains, and tie into the same combined sewer piping as the roof.

Concept Design

The school sites' infrastructure and existing green space were examined to determine the potential green infrastructure practices and associated locations which would not conflict with existing sewers, other known utilities, or the school's use of property. Preliminary constructability reviews were conducted to ensure the potential concepts were viable. These reviews included examination of the FEMA 100-year floodplain map, which indicated that major flooding is not a primary concern in the areas proposed for GI practice. Preliminary investigations also determined there were potential wetland areas between the schools in a natural depressed area leading to the river that would need to be avoided.

DWSD drafted a Memorandum of Understanding with DPS in November of 2015 that was placed on hold due to DPS staff transitions. DWSD and DPS are currently negotiating maintenance obligations for the proposed GI practices.

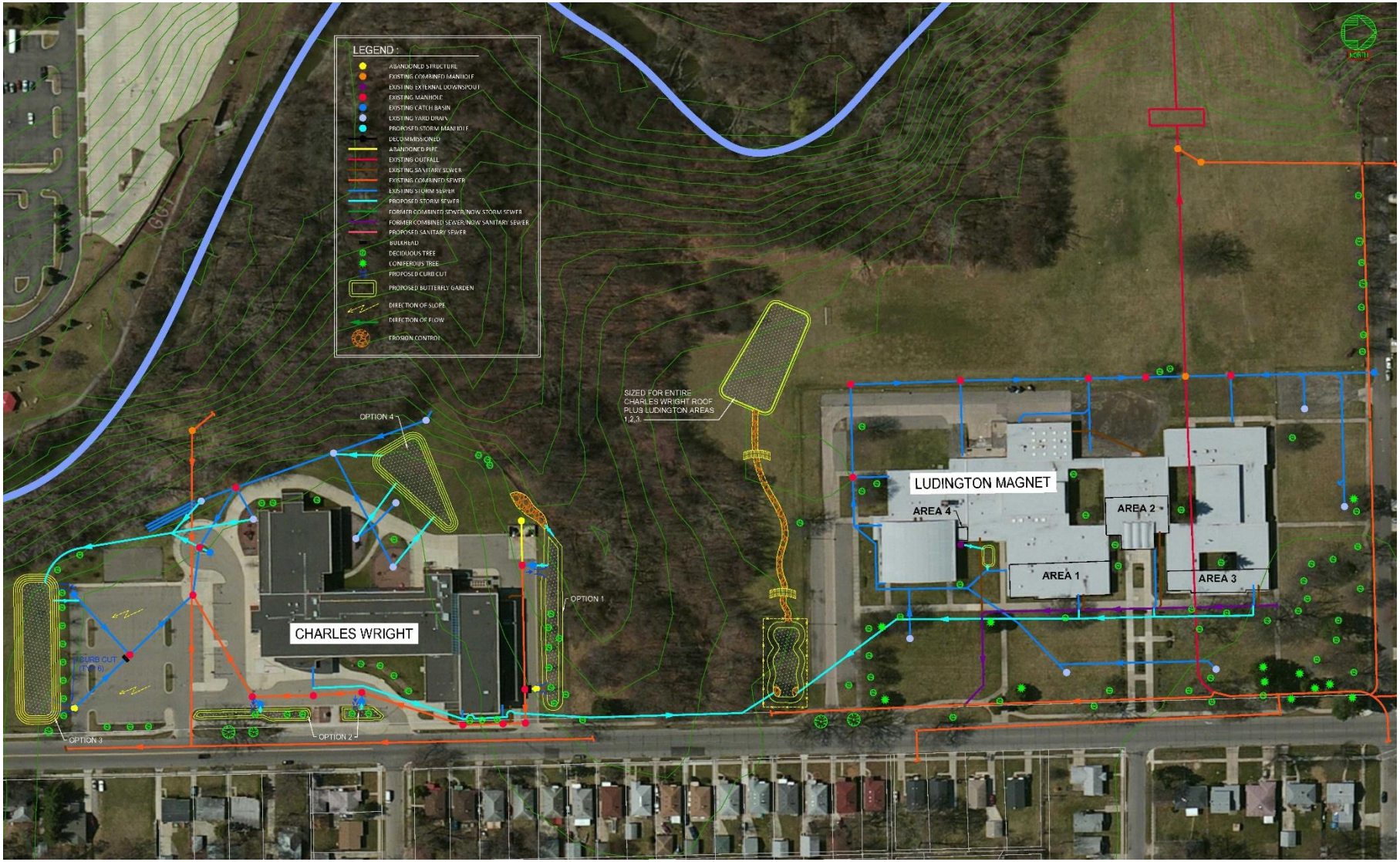
Design progress meetings held with DPS on February 10, 2016, and June 6, 2016, focused on the reduction of storm water runoff from entering DWSD's combined system as well as the following:

- Educational benefits
- GI practices options
- Conservation of trees
- Maintenance obligations
- Permit requirements
- Construction schedule
- Cost

Two storm water management alternatives have been developed for the Ludington Magnet Middle School and Charles Wright Academy properties. The first concept design mainly discharges all storm water from each school property to the Upper Rouge River through new outfalls as shown in Figure 8. The second concept involves installation of several smaller rain garden systems and a large GI practice between two schools to manage roof and parking lot drainage, as shown in Figure 9. Similar to the first concept, the second concept design discharges overflow from all GI practice to the Upper Rouge River through new outfalls. This would completely remove storm water from both properties from the combined sewer system.

Figure 8 DPS Storm Water Management Concept 1

Figure 9 DPS Storm Water Management Concept 2



Major Large Public Housing Institutional Properties

In early FY2016, DWSD met with the Detroit Housing Commission (DHC) to explore the potential of green infrastructure at John Smith Homes and other such facilities. As a result of institutional obstacles, it was determined that pursuit of green infrastructure projects at large public housing facilities would be deferred for the near term.

Activity 2-5 Municipal Parks Flow Management

Municipal parks provide an opportunity to manage not only runoff generated within the park, both also from adjacent roads. Management of runoff generated on municipal park parcels is often accomplished by redirecting the impervious surfaces to open spaces within the park or reconstructing the paved surfaces as porous pavement. Additional storm water from adjacent roads can sometimes be directed to the public park in an effort to further manage storm water.

The following tasks were completed in previous reporting periods:

- A comprehensive analysis of all parks within the URT was conducted.
- Parks were prioritized based on weighting factors generated from the analysis. This prioritization list will be continually updated as site conditions change or additional information becomes available.
- To ensure efficiency in municipal land selection, all parks within the URT were given an initial rating of priority, high, moderate, or low based on how each park was scored. Supporting information was retained to avoid reanalyzing parks at a later date.
- From the prioritization list, five parks were chosen based on their scores and project feasibility.

Table 6 Proposed Park Improvements

Park Name	Location	Construction Cost	Cost Effectiveness ($/gal)	Performance (MG)*	% of 2-Year Design Storm	Status
Stoepel Park No. 1	NWI	$549,452	$6.27	Retain: 0.09	46%	Under construction
Liuzzo Park	NWI	$384,917	$12.15	Retain: 0.03	35%	Under construction
Crowell Recreation Center	NWI	Estimated $600,000	Estimated $6.41	Retain: 0.09	100%	Design complete
*Performance is based on volume reduction during a 2-year 24-hour storm event						
Estimate of (Retained) Runoff Reduction (MG)				**0.21**		

Stoepel Park No 1

Stoepel Park No. 1 is approximately 30 acres in size, and is located within the northeast section of Detroit's Brightmoor Neighborhood within the designated URT priority area. The park provides baseball/softball amenities to the Rosedale Grandmont Little League nonprofit organization which serves roughly 400-800 youth participants annually.

The green infrastructure project includes two pocket bioretention practices that manage the storm water runoff generated from tributary areas along Westwood Street. This runoff will be collected in trench drains constructed in Westwood Street and routed to the proposed bioretention areas. The sewer routing to the bioretention areas will include overflow structures and sewers back to the existing sewer system. The project also includes removal of the existing paved parking lot and replacement with a permeable parking lot constructed of open-graded aggregate to reduce runoff from the parking area. Figure 10 through Figure 13 show construction, the drainage

areas, bioretention locations, and the redesigned parking lot in Stoepel Park No.1. In 2014, Sue McCormick, then director of DWSD, made a commitment to implement storm water management in Stoepel Park in a manner that provided additional park amenities, using the Recreation Department's Natural Resource Trust Fund. This project is an outcome of that commitment.

DWSD completed the final design in March 2016 and advertised for construction bids starting March 15, 2016. Four construction bids received on April 15, 2016, ranged from $488,764 to $698,271. DWSD awarded the contract to the low bidder, WCI Contractors, for $488,764.15. With contract markup, the construction cost will be $549,452. WCI Contractors started construction in June 2016 and is scheduled for completion in October 2016.

Figure 10 Stoepel Park No 1 Drainage Areas

Figure 11 Stoepel Park No 1 North Bioretention

Figure 12 Stoepel Park No 1 South Bioretention and Parking Lot

Figure 13 Stoepel Park No. 1 Construction Photos

Liuzzo Park

Liuzzo Park is a 2.5 acre park with no recreational amenities. A complete park renovation is scheduled to take place in summer 2016 due to neighborhood-led fundraising efforts and an investment by the City of Detroit to renovate 40 neighborhoods. The park renovation, which includes a paved walking path, pickleball courts, and playground and fitness equipment, will change the level of imperviousness within the park compared to its current undeveloped state.

To incorporate green infrastructure with the park improvements, storm flow from the existing roads on the north and east sides of the park, as well as runoff from within the park, will be diverted into three separate surface bioretention practices. The practices, shown in Figure 14, include a pocket bioretention practice near the northwest corner of the park, a more decorative rain garden at the northeast corner of the park at one of the park's proposed main entrances, and a third bioretention practice in the southeast corner of the park. The practices and associated sewers were located and laid out to avoid conflicts with existing trees and other proposed park improvements coordinated by the Parks and Recreation Department with support from the General Services Department.

Figure 14 Liuzzo Park Bioretention Concept

DWSD completed the design in May 2016 and advertised for construction bids starting May 17, 2016. Three bids were received for construction of the project on June 3, 2016, ranging in cost from $366,558 to $462,410. The contract was awarded to the low bidder, WCI

Contractors, for $366,558. With contract markup, the construction value is $384,917. Figure 15, Figure 16, and Figure 17 show scenes from the groundbreaking celebration held on July 12, 2016.

Figure 15 DWSD at Liuzzo Park Groundbreaking Celebration

Figure 16 Viola Liuzzo Park Association with Green Infrastructure Liuzzo Park Groundbreaking Ceremony

Figure 17 Liuzzo Park Groundbreaking Ceremony

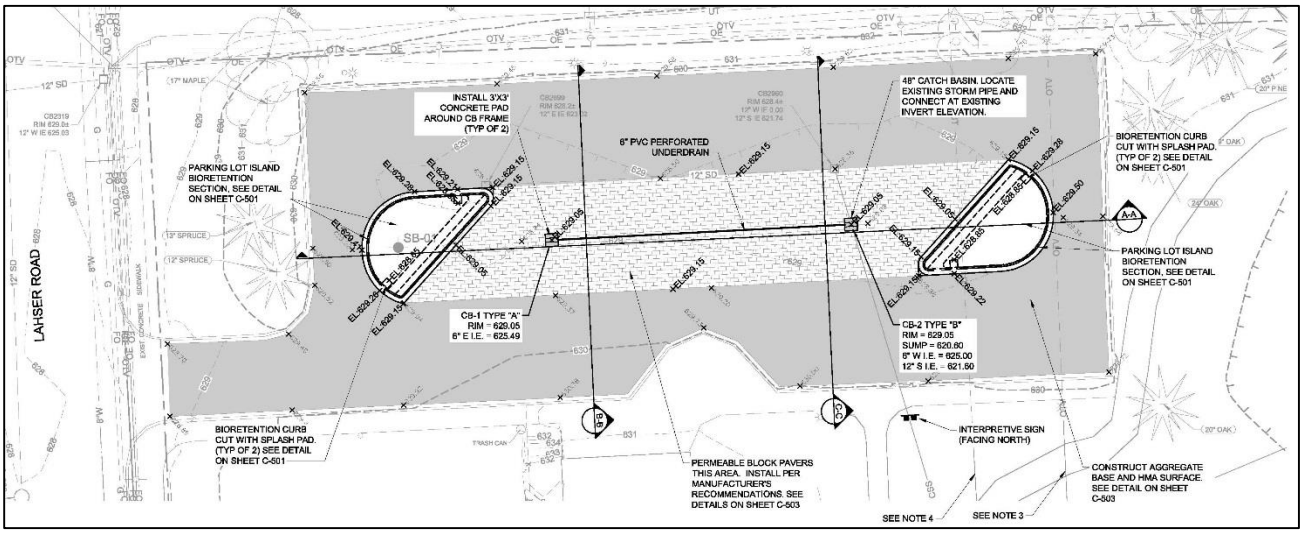
Crowell

Crowell Recreation Center is currently an active recreation facility that serves the surrounding neighborhood in northwest Detroit. The recreation center facility and its surrounding park, Hope Playground, sit in the center of the Riverdale neighborhood and are surrounded primarily by single-family residential properties.

Runoff collected within and tributary to the north parking lot and the south parking lot will be managed by permeable block pavement and bioretention islands. Each parking lot will have two bioretention islands that will overflow to the permeable block pavement. The permeable block pavement will be installed in the center parking spaces of each respective lot. The GI practice design is shown in Figure 18.

Routing will need to avoid any mature trees within the right-of-way or in the park, in addition to any park features such as pathways, playgrounds and ball fields.

Figure 18 Crowell Recreation Center Parking Lot GI Practice Design



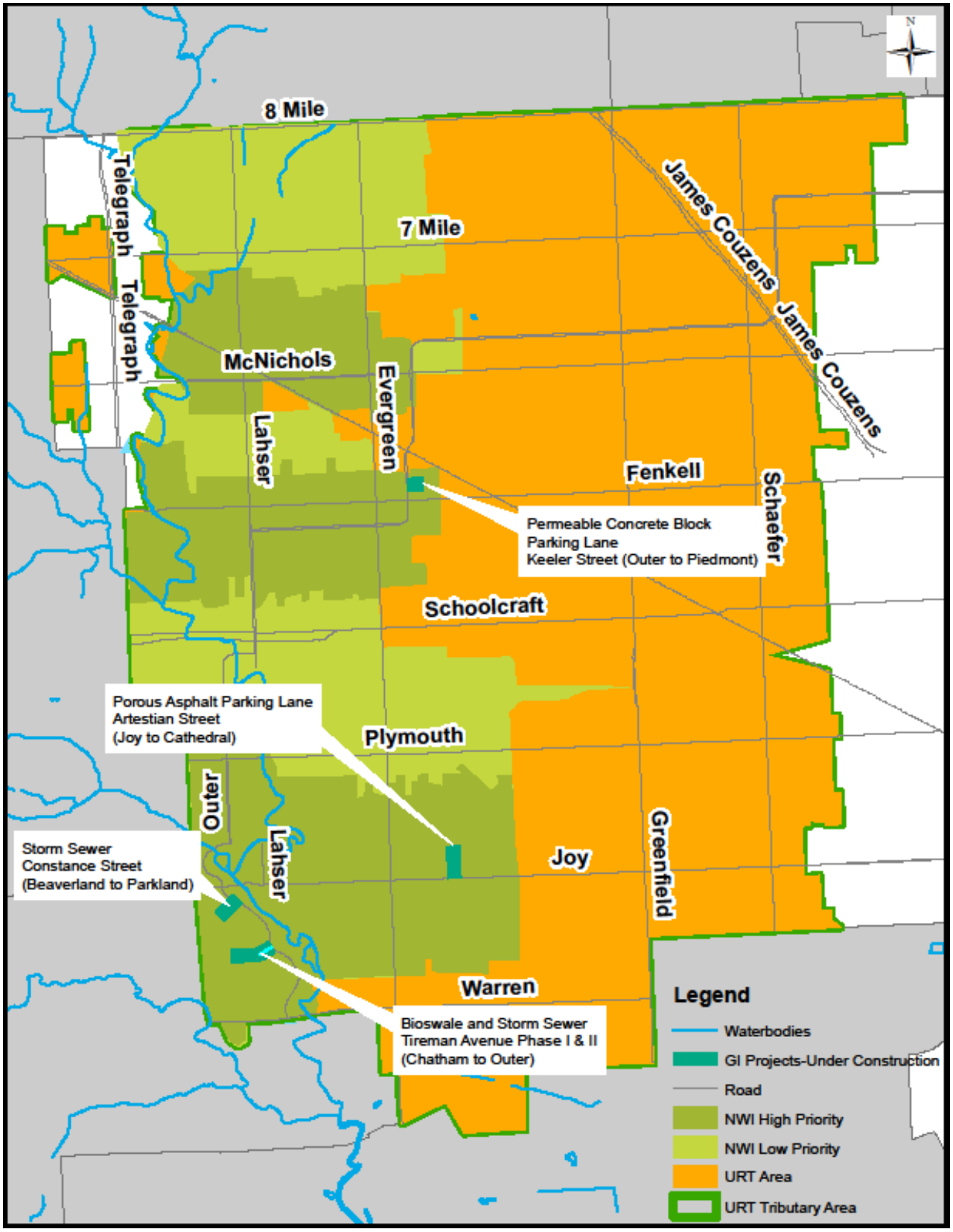
Activity 2-6 Transportation Corridor Flow Management

In 2016, the construction of PW6968 commenced and was approximately 50% at the end of the fiscal year. Initial interdepartmental funding was not sufficient for Constance Street storm sewer that was originally bid under the contract, however, this work was added by change order after further cost effective analysis. The Tireman Phase II bioswale was implemented in two contracts. The earthwork contract was completed in the fall of 2015. The landscaping contract was initiated but not completed in the fiscal year. Some modifications are planned for the Tireman bioswale to ensure that it is able to drain in the winter months when the ground is frozen. Locations of transportation corridor projects are shown in Figure 19 and financial and performance information is summarized in Table 7.

Table 7 Transportation Corridor Projects

Road Name	Location/GI Type	Estimated Construction Cost	Cost Effectiveness ($/gal)	Performance (MG)	% of 2 Year Design Storm	Status
Artesian Street (Cathedral to Joy)	NWI Porous asphalt	$447,000	$7.45	Retain: 0.06 Detain: 0.16	27%	PW6968; under construction 2016
Constance Street (Beaverland to Parkland)	NWI Ph I: Storm sewer; Ph II: storm water practice in Rouge Park	$474,000 (street) $900,000 (Phase II) $1,374,000 (est. total)	$2.50	Retain: 0.55 Detain: 0	100%	Storm Sewer PW6968; under construction 2016; Phase II included under large scale greening 2017
Comment: This project includes construction of a storm sewer along Constance Street and a large surface storage feature within Rouge Park to discharge to an existing outfall to Bigelow Drain, tributary to Rouge River (Outfall R-17). The "retained" volume is the volume for the 2-year event that is removed from the combined system. The storm water practice will provide attenuation of the peak flow from the 10-yr 1-hr event, will promote infiltration, will improve water quality and will provide an educational and aesthetic amenity in the park.						
Keeler Street (W. Outer Dr. to Piedmont)	NWI Permeable Pavers	$279,000	$6.98	Retain: 0.04 Detain: 0.07	87%	PW6968; under construction 2016
Tireman Avenue Phase I & II (Chatham to Outer Dr.)	NWI Ph I: Storm sewer; Bioswales; Ph II: bioswales	$1,079,000 (bioswales/sewer) $424,000 (park bioswale) $1,503,000	$10.02	Retain: 0.15 Detain: 0.15	29%	Phase I: Bid PW6968; construction spring 2016 Phase II: construction complete Phase III: future
Comment: This is Phase I and II of a three-phase project. Phase I and II include storm sewer and bioswales on Tireman. Phase III includes green infrastructure and an outfall to the Rouge River via Rouge Park. Phase III will also collect additional storm water from Sawyer Street. Once Phase III is complete, approximately 1 MG of runoff will be removed from the combined sewer system for the 2-year 24-hour event. (See discussion in large scale greening).						
Estimate of Retained Runoff Reduction (MG)				**0.80**		

Figure 19 Transportation Corridor Project Locations



Work included in the transportation corridor project included two types of permeable pavement: Porous asphalt on Artesian and pavers on Keeler. Construction photos for these projects are shown in Figure 20 and Figure 21.

Figure 20 Artesian Street Porous Asphalt Construction

Figure 21 Keeler Street Permeable Paver Construction Photos

Constance Street storm sewer work will allow for collection of storm water in Rouge Park, into the proposed bioretention/ wetland area currently being designed. Construction activity on Constance is shown in

Figure 22 Constance Street Phase I Construction

Tireman Phase I is also a component of PW6968. This phase consists of bioswales along the green space between the road and sidewalk that captures road runoff from Tireman Avenue. Overflow from the bioswales is conveyed to a separate storm sewer that runs east along Tireman where it is temporarily connected back into the combined sewer just west of Parkland Street. Phase I is currently under construction and is scheduled to be complete in fall 2016.

Tireman Phase II includes a large bioswale in Rouge Park on the north and south sides of Tireman Avenue between Parkland Street and Outer Drive. This practice captured sheet flow runoff from the adjacent roadway as well as road runoff conveyed to the bioswales from catch basins capturing drainage from the intersection of Parkland Street and Tireman Avenue. The overflow for the bioswales in the park is also temporarily connected back into the combined sewer system at Parkland Street. Phase II construction was initiated in FY2016 with an excavating contract. The project landscaping and enhancements contract was initiated in FY2016 and will conclude in FY2017.

Figure 23 provides an overview of the Tireman Avenue Phase I and Phase II projects. Figure 24 through Figure 28 show the work at various phases of construction.

Figure 23 Tireman Avenue Bioswale Project Area

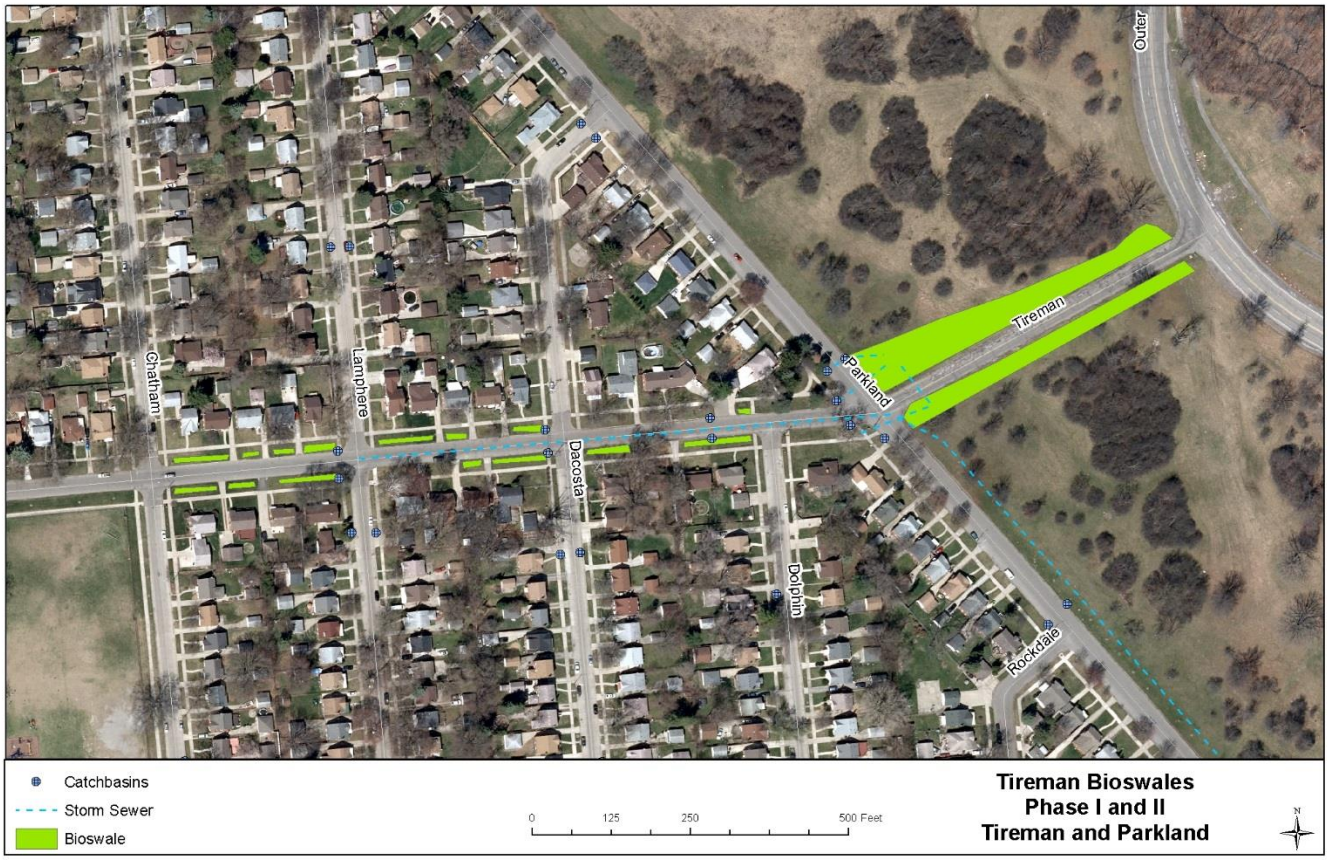


Figure 24 Tireman Phase I Construction

Figure 25 Tireman Avenue Bioswale (Phase I) Underdrain Construction Photo

Figure 26 Tireman Avenue Bioswale (Phase I) Final Grading Construction Photo

Figure 27 Tireman Phase II Bioswale in Rouge Park Construction

Figure 28 Tireman Avenue Bioswale (Phase II) in Rouge Park Construction Photo

ACTIVITY 3 – CONTINUED IMPLEMENTATION

DWSD has previously participated in a series of projects including downspout disconnection, demolitions and site restoration, and the planting of trees in the area. Activities will continually adapt based on current conditions and needs. The general status of this fiscal year's efforts are detailed in the sections below.

Activity 3-1 and 3-2 Downspout Disconnections

In previous fiscal years, a feasibility analysis was performed to determine whether or not a new downspout disconnection plan should be implemented. Based on neighborhood participation rates, number of connected downspouts and a review of DWSD's available information, neighborhoods were identified that would be candidates if a program were to move forward. Furthermore, properties held by large land banks and major institutions were evaluated, and both the National Community Stabilization Trust and Housing for Urban Development would be willing to assist by requiring disconnection for residential housing loans or refinancing within the city limits. In general, participation rates were low, even with the provision of training and materials to home owners. There are two primary mechanisms that will work to accomplish downspout disconnections:

First, there is extensive interest by neighborhood groups in downspout disconnection for drainage charge credits. Therefore, the use of drainage charge credits to stimulate removal of downspouts is the primary mechanism that DWSD will use for encouraging and promoting downspout disconnection. Drainage charge credits are expected to be a major incentive for residential and non-residential downspout disconnection and flow management. Incentives are being developed within that structure to promote downspout disconnection.

Second, the City of Detroit is working to improve the quality of housing in the City. Housing stock changes through the removal of structures in poor condition (demolition), sale of homes through the DLBA auction process (requires improvements to the home to achieve code compliance), and in some cases blight enforcement actions that require homeowners to upgrade their properties. One element of the building inspection process includes ensuring that downspouts are present and are "directed away from the foundation".

These actions will gradually result in a reduction in the number of connected downspouts and the redirection of roof drainage onto lawn areas.

Activity 3-3 Demolitions and Site Restoration

In FY2015, DWSD completed an aerial flight of the city. Post processing of the aerial imagery was completed in FY2016, which resulted in a City-wide detailed impervious cover dataset. Figure 29 below provides an example of the data resolution compared between 2010 and 2015 imagery and impervious cover.

The pace of demolitions in the URT continued at a significant rate over the past fiscal year. DWSD estimated total impact of demolitions from a variety of data sources. Estimated recent and cumulative impact of demolitions is summarized in Table 8. Note that the quantification of the change in impervious cover is based on actual change from 2010 to 2015 (which includes both increases and decreases in cover). Prior estimates were based on the number of demolitions only without new impervious cover data.

Locations of URT demolitions in FY2016 are shown in Figure 30.

Table 8 Impervious Cover Summary

Statistic	URT (acres)	City-wide (acres)
Impervious Acres in 2010	13,016	48,581
Impervious Acres as of April 2015	11,667	45,639
Subtotal Change in impervious cover	1,349	2,942
Demolitions (acres) since April 2015 flyover	50	199
Net estimated change in impervious cover	1,399	3,141
Estimated Runoff Reduction (MG)	**42.58**	**95.60**

Figure 29 Impervious Cover Quality Comparison

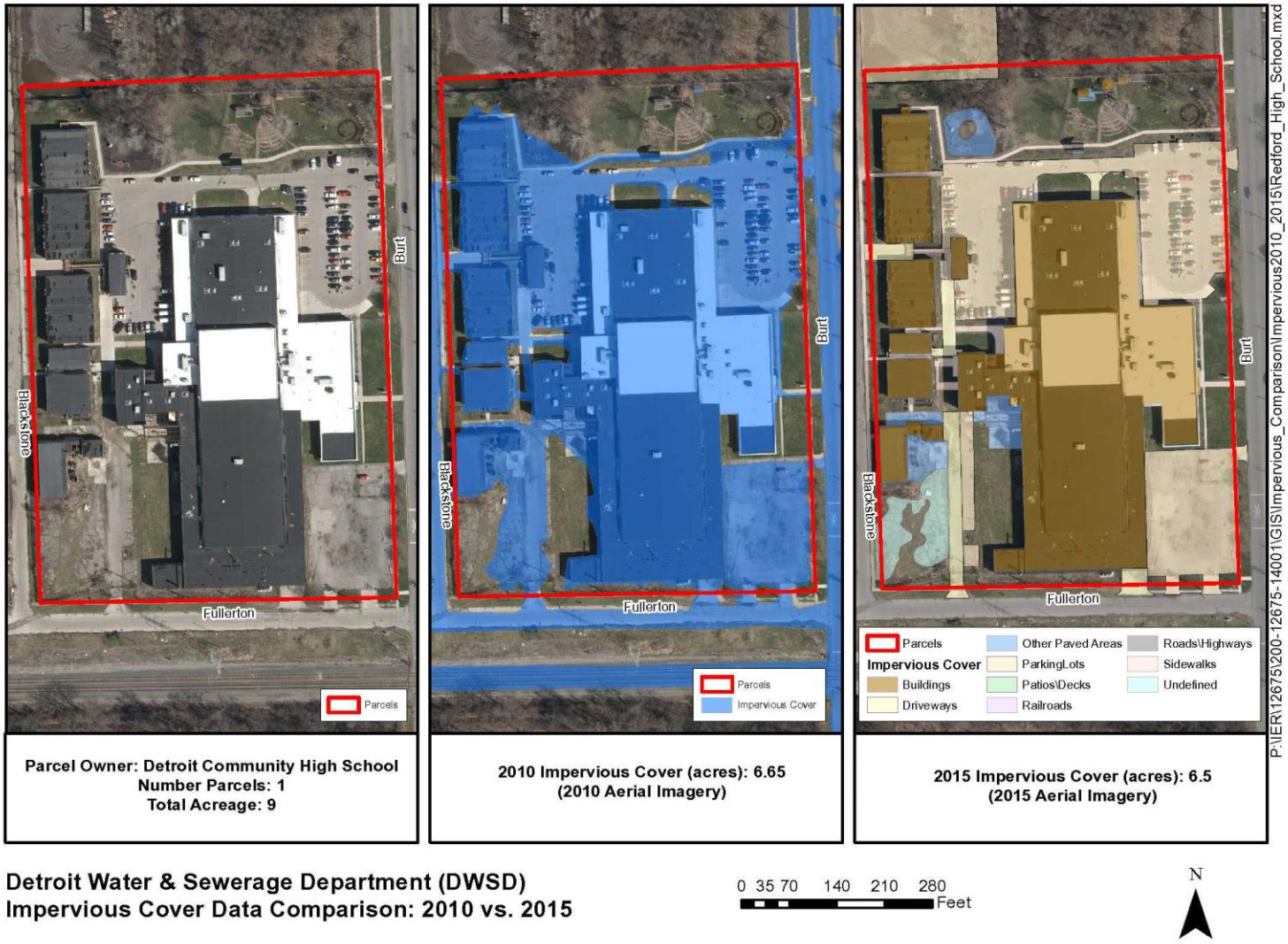
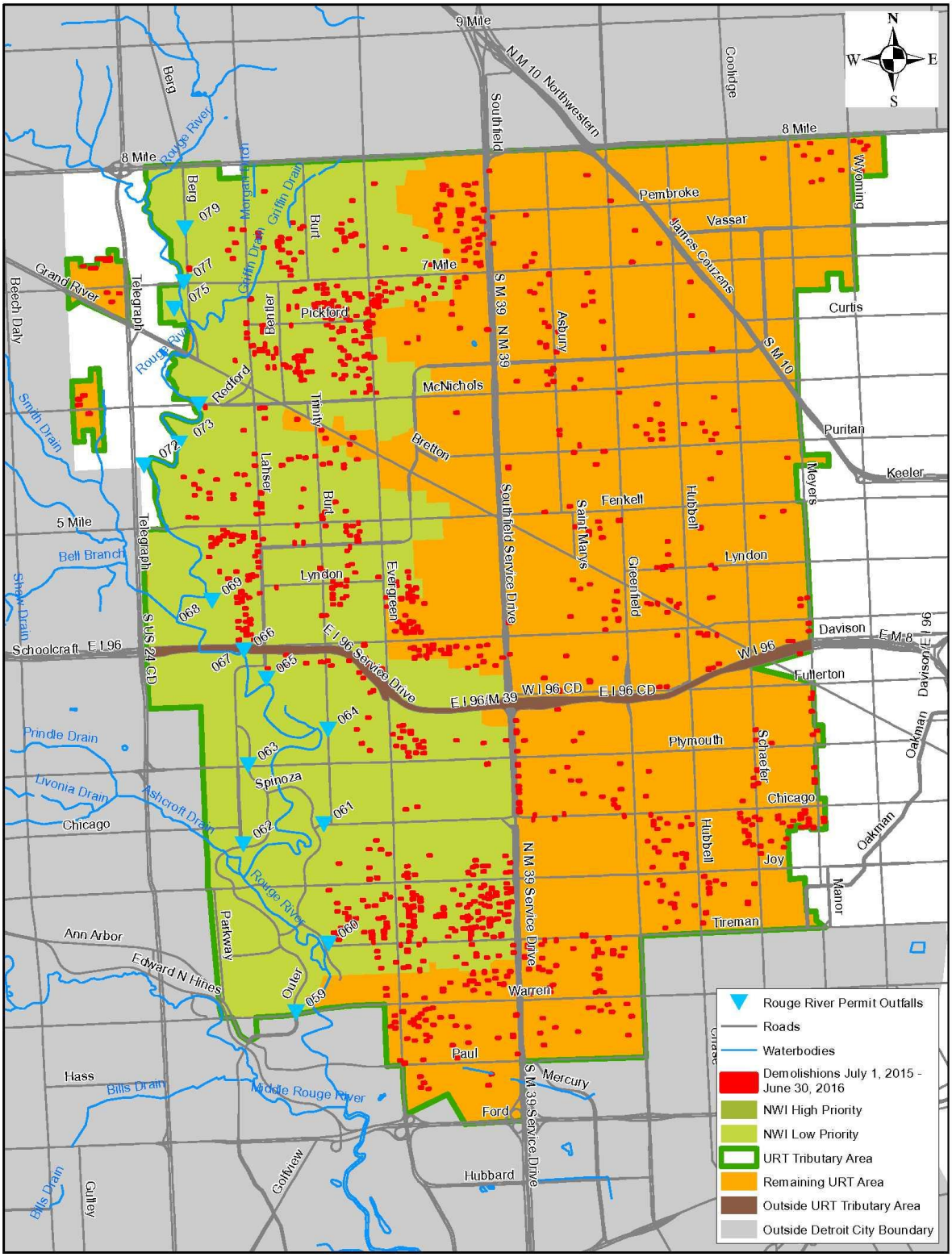


Figure 30 URT Area Demolitions, July 1, 2015 - June 30, 2016



Activity 3-4 Tree Planting

DWSD has previously funded tree planting through The Greening of Detroit. This work was originally performed under contract CS-1546. Later efforts were performed under CS-1522. Cumulative to date, DWSD's team has planted 7,117 trees in the URT area under the DWSD Green Infrastructure Program, as summarized in and shown on Table 9.

Table 9 Tree Planting Summary

Description	Number of Trees Planted in the URT Area	Estimated Runoff Reduction (MG)
Through FY 2011 Street Trees	332	0.009
Through FY 2011 Park Trees	769	0.022
FY 2011-2012 Street Trees	985	0.028
FY 2012-2013 Street Trees	1,867	0.052
FY 2012-2013 Park Trees	170	0.005
FY 2013-2014 Street Trees	1,219	0.034
FY 2014-2015 Street Trees	1,493	0.042
FY 2014-2015 Park Trees	282	0.007
Total	**7,117**	**0.199**

ACTIVITY 4 – LONG TERM PERFORMANCE

Activities associated with long term performance over the period of FY2016 were limited. In current planning efforts, DWSD is working on developing a capital improvement plan (CIP) for the full $50M green infrastructure spend requirement.

ACTIVITY 5 – STAKEHOLDER AND COMMUNITY ENGAGEMENT

DWSD continued a wide range of internal and external stakeholder engagement and outreach activities during FY2016. There has been an increased emphasis on stakeholder and community engagement related to development of the post-construction storm water ordinance and greening of the municipal code, as well as refinements to the drainage charge and development of the credit program. DWSD has also coordinated with stakeholders to conduct project-specific outreach and engagement and continued exploring processes and institutional structures for coordinated, collaborative citywide green infrastructure outreach and engagement.

During FY2016, DWSD coordinated with the departments, agencies, and groups listed below.

Internal DWSD Groups

- DWSD Customer Services
- DWSD Financial Planning Division
- DWSD GIS Group
- DWSD Water Supply Operations
- DWSD Public Affairs

City Government

- Buildings, Safety Engineering and Environmental (BSEED)
- Planning and Development (P&DD)
- Public Works (DPW)
- Housing and Revitalization (HRD)
- Jobs and Economy Team (D)
- General Services – parks
- General Services – buildings
- Neighborhoods
- City Planning Commission
- Mayor's office

Agencies

- Detroit Land Bank Authority
- Detroit Building Authority
- Wayne County Department of the Environment
- Wayne County Road Commission
- Michigan Department of Transportation (MDOT)
- Detroit Economic Growth Corporation
- Michigan Department of Environmental Quality (MDEQ)
- United States Environmental Protection Agency (US EPA), Region V
- Detroit Public Schools
- Detroit Housing Commission
- Michigan State Housing Development Authority
- DTE Energy

Organizations

- Detroit Future City
- Sierra Club
- Erb Family Foundation
- Detroit Greenways Coalition
- Brightmoor Alliance
- Grandmont Rosedale Development Corporation
- The Nature Conservancy
- Bloomberg Associates
- Rosedale Grandmont Little League Baseball
- Joy Southfield Development Corporation
- Friends of Rouge Park
- Far West Detroit Civic Association
- Cody Rouge Neighborhood Partnership
- Cody Rouge Community Action Alliance
- Warrendale Community Organization
- Viola Liuzzo Park Association

Institutions

- University of Michigan
- Wayne State University
- Lawrence Tech University

Groups

- Green Infrastructure Task Force – blue/green subcommittee
- Erb Family Foundation Blue Green Infrastructure Workgroup

Stakeholder outreach and participation has been, and will continue to be an important aspect of DWSD's overall Green Infrastructure Plan. DWSD's green infrastructure stakeholder outreach is comprised of three components: 1) Storm water drainage charge reduction through green infrastructure implementation; 2) Green infrastructure project-specific outreach; and 3) Overarching, collaborative green infrastructure public education campaign. All green infrastructure outreach activities conducted during FY2016 touch on one or more of these branches.

Drainage Charge and Green Credit Outreach and Engagement

A drainage charge customer steering committee was formed in late fall 2015 to actively engage customers and solicit input throughout the program rollout. Collateral materials have been developed to communicate the overall drainage charge program, phased scheduled, and property information.

Green Infrastructure Project-Specific Outreach

Project specific outreach includes coordination with neighborhood groups and stakeholders, public meetings, informational mailings, signage, and celebratory events. Ongoing outreach efforts related to specific projects is discussed with the specific projects.

Overarching, Collaborative Green Infrastructure Public Education Campaign

Coordination with the various stakeholders through the Erb Blue/Green Infrastructure Workgroup…logo branding discussions and logo redesign

Activity 5-1 Green Infrastructure Website

As a result of changes to the overall City of Detroit website platform, DWSD's website shifted in look and feel in FY2016. DWSD continued to update the information on the existing storm water and green infrastructure pages with new project information and fact sheets. During FY2016, DWSD met with the City of Detroit's information technology staff to discuss additional changes needed for the DWSD website to assist with customer service related to the drainage charge and green credit program. The City of Detroit information technology staff support development of a unique format for the DWSD drainage charge and green credit program. DWSD Public Affairs staff and the DWSD drainage charge program management team will work with the City of Detroit's information technology staff to create an updated website and web-based tools to support the drainage charge and green credit program during FY2017. The updated DWSD green infrastructure web page is at http://www.detroitmi.gov/How-Do-I/Find/Green-Infrastructure and the DWSD storm water web page is at http://www.detroitmi.gov/How-Do-I/Find/Storm-Water and the DWSD drainage charge web page is at http://www.detroitmi.gov/drainage.

In addition, DWSD began working with TNC and The Greening of Detroit, as well as other key green infrastructure stakeholders, to provide input on a citywide green infrastructure website that would include mapping and project performance information. This collaborative effort is funded through an Erb Family Foundation grant and will result in a preliminary website functionality plan that DWSD could use for future improvements to the green infrastructure website.

Activity 5-2 Drainage Charge Program Stakeholder Engagement

DWSD has worked with Project Innovations and The Allen Lewis Agency in FY2016 to further develop and implement drainage charge program stakeholder outreach and engagement activities. DWSD planned and hosted three focus group meetings for residential, commercial, and faith-based customers in October 2015. DWSD convened a Drainage Charge Customer Steering Committee in November 2015 to provide DWSD with input on the drainage charge and green credit program. In March 2016, DWSD began working with The Allen Lewis Agency to create an updated stakeholder outreach and engagement strategy for the drainage charge effort. DWSD hosted additional Drainage Charge Steering Committee meetings in April and July 2016. DWSD has also reached out to other stakeholder groups in the city to share information and obtain input on the drainage charge and green credit program, including the Arab American/Chaldean Merchants Association and the Erb Family Foundation Blue-Green Infrastructure Work Group. DWSD uses feedback from the Drainage Charge Steering Committee and other stakeholder groups to help refine messages and the outreach strategy for the drainage charge and green credit program.

Activity 5-3 Drainage Charge Toolbox

This activity is related to the refinement of the drainage charge and development of the green credit program. DWSD began developing the Drainage Charge Program Manual, which includes details on the drainage charge calculations, adjustments to the drainage charge bill, and the process for obtaining a green credit. This activity will be available to the public in FY2017.

Activity 5-4 Drainage Charge Training Workshops

This activity is related to the drainage charge and green credits program. Training workshops did not occur in FY2016 because the refined drainage charge rate and green credit program were in development.

Activity 5-5 Green Infrastructure Case Studies and Demonstration Projects

DWSD continued the development of project fact sheets for the green infrastructure projects, including the Cody Rouge vacant lot bioretention gardens, the road resurfacing projects underway in conjunction with the Detroit Department of Public Works, Stoepel Park No. 1 improvements, and Viola Liuzzo Park revitalization. Case study fact sheets include project overviews and updates on project implementation for use during community stakeholder meetings and other outreach activities to reach key stakeholders. The current versions of the existing suite of green infrastructure case study fact sheets are available on DWSD's green infrastructure web pages. In addition, DWSD planned and hosted a green infrastructure tour in FY2016 for city department staff participating on the storm water TAC to develop the post-construction storm water ordinance and greening of Detroit's municipal code.

Activity 5-6 Green Infrastructure Forum

A significant amount of stakeholder engagement took place in FY2016 through stakeholder meetings related to the post-construction storm water ordinance development and greening of the municipal code, the drainage charge and green credit program development, and specific DWSD-funded green infrastructure projects. DWSD also attended the One Water Summit in June 2016, during which time DWSD gained key insights on institutional structures for Detroit that would make green infrastructure a more sustainable city initiative. These numerous stakeholder engagement activities related to ongoing green infrastructure related program development, coupled with the initial conceptualization of a city-level Green Infrastructure Steering Committee, served as green infrastructure forums in many ways and shifted DWSD's target fall 2015 date for holding a formal, comprehensive green infrastructure forum in FY2016. As DWSD continues to work with external stakeholders, specifically members of Erb's Blue-Green Infrastructure Work Group, DWSD will determine an appropriate time to plan and coordinate a green infrastructure forum that can highlight the green credit program, alternate compliance options related to the post-construction storm water ordinance, and

Activity 5-7 Stakeholder Involvement and Education Strategy

DWSD initially developed a draft Green Infrastructure Stakeholder Outreach Strategy in September 2014 that identifies three branches of outreach consisting of the six elements of stakeholder outreach used in EPA's *Getting In Step Guide*. As mentioned above, the three branches include: 1) Storm water drainage charge reduction through green infrastructure implementation; 2) Green infrastructure project-specific outreach; and 3) Overarching, collaborative green infrastructure public education campaign. During FY2016, DWSD updated the three branches of this strategy through separate involvement and education strategy documents.

The first branch of involvement and education related to the drainage charge as been a significant focus for DWSD in FY2016. DWSD developed a stand-alone drainage charge and green credit stakeholder involvement and education strategy as discussed under Activity 5-2.

The second branch of stakeholder outreach—green infrastructure project-specific outreach—has been a significant focus of FY2016 outreach activities, particularly with new DWSD Public Affairs staff. DWSD continued stakeholder education for the road resurfacing projects initiated in FY2015, sending updated letters and fact sheets to surrounding community residents with information on what to expect and who to contact with questions and concerns. DWSD also worked with University of Michigan Water Center, Cody Rouge Community Action Alliance, Warrendale Community Organization, and the Dixon Academy Learning Center to plan and conduct a ribbon cutting celebration for the completed Cody Rouge vacant lot bioretention gardens in May 2016, as discussed under Activity 2-1. DWSD worked with project partners to develop permanent, educational signage for each of the four vacant lot bioretention areas, as shown in Figure 31.

Figure 31 Permanent educational signage installed at the Evergreen bioretention garden site during the May 2016 groundbreaking celebration event with DWSD, University of Michigan Water Center, community partners and local leaders

For the FY2016 green infrastructure projects located in parks, DWSD developed project specific stakeholder involvement and education strategies that identify key project partners and stakeholders, engagement activities, potential messaging, and educational materials, along with a stakeholder involvement and education schedule. DWSD planned and coordinated outreach for the Stoepel Park No. 1 bioretention construction and parking lot improvements with the Grandmont Rosedale Community Development Corporation and the Rosedale Grandmont Little League. Stakeholder involvement and education for Stoepel Park No. 1 in FY2016 included a one-page project fact sheet distributed during little league registration in February 2016, a community mailing containing a letter and updated project fact sheet in May 2016, and fact sheet distribution at the little league opening day celebration. For Liuzzo Park, FY2016 stakeholder involvement and education activities included attending Viola Liuzzo Park Association board meetings to present bioretention concept designs for feedback. DWSD also coordinated with the Viola Liuzzo Park Association, the General Services Department, Parks and Recreation Department, Department of Neighborhoods, and the Office of the Mayor to plan a groundbreaking ceremony, DWSD prepared a project fact sheet for the Liuzzo Park revitalization project and sent out a large mailing to surrounding community residents with an invitation to participate in the groundbreaking celebration.

Figure 32 Educational poster designed by DWSD to educate groundbreaking celebration participants on the project elements, including bioretention

The third branch of stakeholder outreach—the overarching, collaborative green infrastructure public education campaign—is discussed under Activity 5-8.

Activity 5-8 Overarching Green Infrastructure Educational Campaign

An overarching green infrastructure education campaign has been a topic of discussion from FY2015, with progress in FY2016. DWSD participated in meetings with key Detroit green infrastructure partners, including Erb Family Foundation, The Greening of Detroit, Sierra Club, Wayne State University, and SEMCOG, about common use of the *Detroit's Green Space, Blue Water* logo. DWSD updated the original logo, created by SEMCOG, in FY2016 for use on stakeholder outreach materials and signage. The meeting focused on possible redesign of the logo, as well as potential criteria for using the logo by public and private entities implementing green infrastructure projects in Detroit. The DWSD Public Affairs team determined that the updated logo should continue to be used without additional modifications. During the June 2016 Erb Blue-Green Infrastructure Work Group in June 2016, the DWSD executive management team stated support for common use of the *Detroit's Green Space, Blue Water* logo among Detroit's green infrastructure partners. DWSD began development of a logo usage manual, similar in nature to the logo usage manual recently released by the City of Detroit for the new city logo. DWSD is also working with participants on the Erb Blue-Green Infrastructure Work Group to refine green infrastructure messaging. As discussed under Activity 5-1, DWSD is working with TNC and The Greening of Detroit, as well as other key local green infrastructure partners, to collaborate on centralized, collaborative Detroit green infrastructure website that contains comprehensive information and links to DWSD's green credit program and other green infrastructure project information.

3.0 INVESTMENT IN GREEN INFRASTRUCTURE

Since the inception of DWSD's Green Infrastructure Program, a variety of implementation projects and coordination efforts have occurred. These projects include stakeholder workshops, distribution of education materials, and efforts toward tree planting, demolitions, small scale lot greening, and downspout disconnections.

The costs included in this report include the following:

- Efforts implemented through Contract CS-1522, which include professional services and construction.
    - Professional services items include: project selection, survey, geotechnical, field investigations, neighborhood characterizations, project design, project specific outreach and stakeholder engagement, interagency coordination, bid administration, construction administration and resident project representative (RPR) services.
    - Construction includes earned contract value (including unpaid retainage) and contract markup on contractors.
- Construction not implemented through CS-1522. These amounts include earned construction value. These values may include retainage which has not been released. They may also include agency administrative costs (such as DPW oversight), although DPW administrative costs are not included in FY2016 values.

The costs in this report do not include the following:

- Efforts associated with the drainage charge program
- Construction markup for DPW administration of PW6968. These costs have not yet been determined. DWSD will confirm all costs associated with the PW6968 contract in FY2017 report.
- Effort associated with locations outside of the URT.

The following costs have been prorated or adjusted:

- Codes and ordinance efforts were prorated as 19.8% of the total investment. This was based on the URT as 19.8% of the City as a whole. Code and ordinance efforts for FY2015 were also prorated in this annual report which results in a reduction in the reported spend for FY2015.
- Work associated with the impervious cover analysis City-wide was prorated to 19.8% as described for the codes and ordinance effort.
- Drainage charge efforts previously reported have been backed out of the report. This is shown as an adjustments to FY2016.
- Investment associated with PW6968 of $2 million was reported in FY2015 when funds were encumbered for DPW costs. The current and future spend on this contract is reported, but then adjusted for this prior reporting of these costs.

The net reported value for FY2016, which includes actual spend, adjustments for prior years and the value of executed construction contracts is $3,946,796.

Costs (including adjustments) are identified in Table 10 and Table 11 and displayed on Figure 33

Table 11 DWSD Green Infrastructure Program Expenditures Summary

Fiscal Year	Expenditures	Adjustments	Revised Expenditures	Cumulative
FY2010-FY2013	$ 1,029,137	$ -	$ 1,029,137	$ 1,029,137
FY2014	$ 1,238,864	$ -	$ 1,238,864	$ 2,268,002
FY2015	$ 4,413,070	$ -	$ 4,413,070	$ 6,681,072
FY2016	$ 3,151,807	$ (234,136)	$ 2,917,671	$ 9,598,743
FY2016+ Construction Under Contract	$ 1,029,124	$ -	$ 1,029,124	$ 10,627,867

Figure 33

Table 10 Green Infrastructure Program Cumulative Expenditures

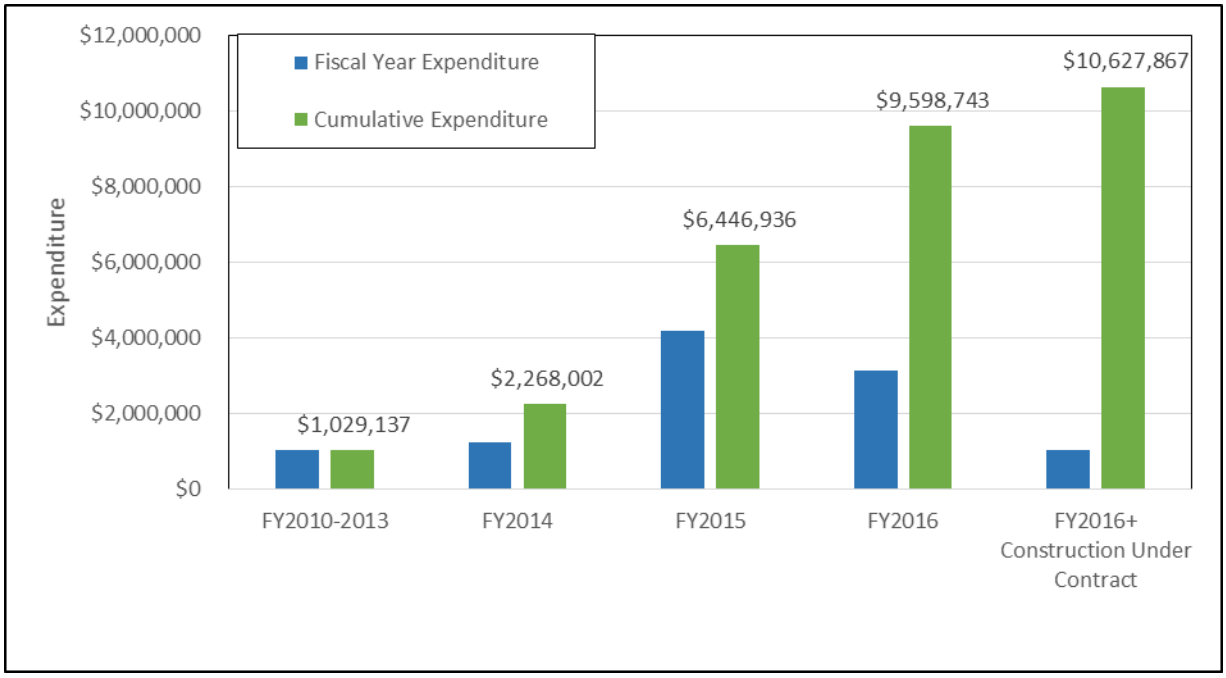
Activity	Prior Years		FY2016 Annual Report				Totals	Notes
	FY2010- FY2015 Professional Services	FY2010- FY2015 Construction	FY2010- FY2015 Adjustments	FY2016 Professional Services	FY2016 Construction Contractor (earned value)	FY2016 Construction Contractor (residual contract value)	Cumulative Expenditures	
General Project Management	$ 330,342	$ -		$ 132,374			$ 462,716	
Activity 1 – Policies, Procedures and Standards								
1-1 Codes and Ordinances 1-2 Storm Water Technical Reference Manual 1-4 Green Streets Standards 1-5 Structure Demolition and Lot Greening Standards 1-6 Public Storm Water Maintenance Guidance 1-7 Municipal Storm Water Maintenance Manual	$ 115,234	$ -	$ (92,417)	$ 74,572			$ 97,388	Adjusted prior work to prorate relative to URT as share of City as a whole (19.8%)
1-3 Drainage Charge Credit System	$ 78,390	$ -	$ (78,390)				$ -	Removed prior work from summary per MDEQ direction
1-8 Tracking System				$ 40,406			$ 40,406	Includes new impervious cover analysis efforts prorated by 19.8%
Activity 2 - Prototype Projects								
2-1 Small Scale Greening Ecological restoration of demolition sites	$ 129,106	$ 25,000		$ 185,084	$ 519,958		$ 859,148	Includes design, construction, monitoring efforts and additional site selection.
2-2 Large Scale Greening and 2-4 Historic Stream Corridors	$ 112,271	$ -		$ 551,298			$ 663,569	Includes survey, geotech, planning, concept and detailed design to date.
2-3 Public Facilities Flow Management and 2-5 Municipal Parks Management	$ 227,389	$ -		$ 788,847	$ 36,249	$ 861,870	$ 1,914,355	Residual contract value is for Stoepel Park and Liuzzo.
2-6 Transportation Corridor Flow Management	$ 267,259	$ 2,000,000		$ 219,575	$ 1,368,643	$ 1,112,754	$ 2,968,231	Adjustments are for DPW funds transfer reported in FY2015, and are taken against current and future expenditures for PW-6968
2-6 Transportation Corridor Flow Management (adjustment)					$ (1,054,500)	$ (945,500)		
Activity 3 - Continued Implementation								
3-1 and 3-2 Downspout Disconnection	$ 38,788	$ 151,846		$ 184			$ 190,819	No longer tracked
3-3 Demolitions and Site Restoration	$ 83,134	$ 579,334		$ 112			$ 662,580	
3-4 Tree Plantings	$ 37,009	$ 1,385,663		$ 312	$ 19,420		$ 1,442,403	

Activity	Prior Years		FY2016 Annual Report				Totals	Notes
	FY2010- FY2015 Professional Services	FY2010- FY2015 Construction	FY2010- FY2015 Adjustments	FY2016 Professional Services	FY2016 Construction Contractor (earned value)	FY2016 Construction Contractor (residual contract value)	Cumulative Expenditures	
Activity 4 - Long Term Performance								
2014 GI Plan	$ 498,374	$ -					$ 498,374	
Annual Reports	$ 35,686	$ -		$ 35,686			$ 71,371	
4-1 Updated Collection Systems Model								Under separate DWSD contract
4-2 Green Infrastructure Performance Planning 4-3 Green Infrastructure Benefits Evaluation 4-5 Legal agreements for long-term sustainability	$ 29,414	$ -		$ 38,977			$ 68,391	General efforts to ensure sustainability; $50M CIP development
4-4 Amendment to the Suppl. Report on Alt. CSO Controls for the Upper Rouge								Not included as part of green infrastructure spend
Activity 5 - Stakeholder and Community Engagement								
5-1: Green Infrastructure Website 5-5: Green Infrastructure Case Studies and Demonstration Projects 5-6: Green Infrastructure Forum 5-7: Stakeholder Involvement and Education Strategy 5-8: Overarching Green Infrastructure Educational Campaign	$ 143,504	$ -		$ 119,612			$ 263,116	All outreach activities
5-2: Green Rewards Program Stakeholder Engagement 5-3: Green Rewards Toolbox 5-4: Green Rewards Training Workshops	$ 63,328	$ -	$ (63,328)				$ -	Related to Drainage Charge and no longer reported
DWSD Staff	$ 350,000	$ -		$ 75,000			$ 425,000	
Total			$ (234,136)	$ 2,262,037	$ 889,769	$ 1,029,124	$ 10,627,867	

Table 11 DWSD Green Infrastructure Program Expenditures Summary

Fiscal Year	Expenditures	Adjustments	Revised Expenditures	Cumulative
FY2010-FY2013	$ 1,029,137	$ -	$ 1,029,137	$ 1,029,137
FY2014	$ 1,238,864	$ -	$ 1,238,864	$ 2,268,002
FY2015	$ 4,413,070	$ -	$ 4,413,070	$ 6,681,072
FY2016	$ 3,151,807	$ (234,136)	$ 2,917,671	$ 9,598,743
FY2016+ Construction Under Contract	$ 1,029,124	$ -	$ 1,029,124	$ 10,627,867

Figure 33 DWSD GI Program Expenditures



4.0 VOLUMETRIC REDUCTIONS

QUANTIFICATION

The runoff volume estimates for discrete storm events are based on NRCS curve number hydrology calculations. Green infrastructure practices that are designed to manage storm water runoff are calculated based on the runoff volume from the tributary area. In the case of practices which result in a land cover conversion the managed runoff calculation is based on the change in curve numbers. Detailed information of the NRCS Curve Number approach is available in the NRCS Part 630 National Engineering Handbook (NRCS, USDA, 2004). The initial abstractions assumption inherent in the NRCS approach was updated according to the ASCE *State of the Practice Curve Number Hydrology* (Hawkins, 2009). Volume calculations are summarized in **Error! Reference source not found.** for a single 2-year, 24-hour storm event (equivalent to approximately 2.34 inches of rainfall).

Estimated runoff reduction volumes for tree planting are based on 7,117 trees being planted in the URT since the inception of the program. The planting locations and methods are such that the greatest benefit from a storm water runoff perspective is from tree canopy interception. Tree canopy interception rates are based on interception capabilities as planted. As the trees grow and the canopy increases, the interception will increase and the corresponding runoff reduction estimates from tree plantings will increase.

Table 12 Annual Storm Water Runoff Volume Reduction Summary

Activity	FY2010-FY2013	FY2014	FY2015	FY2016	Cumulative Total (MG)[1]
Activity 2-1 Small Scale Greening	N/A	0.02	N/A	0.08	0.10
Activity 2-2 Large Scale Greening	N/A	N/A	N/A	0.55	0.55
Activity 2-5 Municipal Parks Flow Management	N/A	N/A	N/A	0.21	0.21
Activity 2-6 Transportation Corridor Flow Management	N/A	N/A	0.11	0.14	0.25
Activity 3-1 and 3-2 Downspout Disconnection	N/A	0.06	N/A	N/A	0.06
Activity 3-3 Demolitions and Site Restoration	N/A	0.13	N/A	N/A	0.13
Activity 3-4 Tree Planting	0.12	0.03	0.05	N/A	0.20
Total					**1.51**
[1] Projected value for Constance project in Rouge Park					

5.0 ACTION PLAN FOR FY2017

INTRODUCTION

This section provides a description of the action plan for FY2017. Much of this work was originally identified in the 2014 Green Infrastructure Plan. However, some tasks have been completed, other tasks have been added, and some tasks have been modified or deleted. The structure continues the original concept of five categories of activities:

1. Policies, Procedures and Standards
2. Prototype Projects
3. Continued Implementation
4. Long Term Performance
5. Stakeholder and Community Engagement

IMPLEMENTATION SCHEDULE

The schedule for implementation of green infrastructure projects has been developed to identify specific activities and the proposed schedule for implementation. In the first year of implementation of the GI Plan, some activities were prioritized over others, resulting in either tasks being completed ahead of the original schedule or delayed relative to the dates presented. Capitalizing on opportunities, the program completed design and bidding of transportation corridor projects well ahead of what was originally envisioned. Code and ordinance efforts were also accelerated based on the significant interest in new development in the City. The following section includes an updated implementation plan based on results of FY2016, and includes some items that were not identified in the 2014 Plan. Note that **bolded dates** shown in the tables below are actual dates. Tasks within specific activities that have been completed have been removed from this section.

SUMMARY OF ACTIVITIES

Table 13 provides an overview of the action items planned. Additional details describing the individual activities are provided in the subsequent sections.

Table 13 Proposed FY2017 Activities

No.	Activities	Proposed Schedule
Activity 1 – Policies, Procedures and Standards		
1-1	Codes and Ordinances	FY2017 to focus on post-construction storm water ordinance and “greening of the code”.
1-2	Storm Water Design Manual (for Storm Water Ordinance)	Publically available version by April 2017.
1-3	Drainage Charge Credit System	Draft publically available by October 1, 2016.
1-4	Green Streets Standards	General timeframe is to develop draft standards by June 30, 2016, and final by June 30, 2017. This effort is influenced by DWSD but lead by other agencies.
1-5	Structure Demolition and Lot Greening Standards	No new tasks anticipated for FY2017.
1-6	Public Storm Water Maintenance Guidance	Publically available version by October 2016.
1-7	Municipal Storm Water Maintenance Manual	Draft manual July 31, 2017.

No.	Activities	Proposed Schedule
1-8	Tracking System	Tracking systems ongoing.
Activity 2 - Prototype Projects		
2-1	Small Scale Greening	Evaluation of other greening opportunities in FY2017. Modification of existing Ecological Restoration of Demolition Sites projects to accommodate additional tributary area in FY2017. Additional vacant lot bioretention locations in FY2017.
2-2	Large Scale Greening	Ongoing planning and project development and implementation of concept designs FY2017-FY2018.
2-3	Public Facilities Green Infrastructure/ Flow Management	Identify additional projects by October 31, 2016.
2-4	Historic Stream Corridors	Reported as part of Activity 2-2 Large Scale Greening.
2-5	Municipal Parks Green Infrastructure/ Flow Management	Ongoing implementation, including design and construction for identified opportunities FY2017. Evaluate opportunities in Rouge Park corridor FY2017 and program improvements.
2-6	Transportation Corridor Flow Management	Update prioritized opportunity list by October 2016. Project selection and implementation schedule by November 2016. Annual updates and coordination with city departments, county and state.
Activity 3 - Continued Implementation		
3-1	Downspout Disconnection - Homes	Coordination with community groups for downspout disconnection programs in conjunction with drainage charge credit system and outreach.
3-2	Downspout Disconnection - Multi-Family Residential, Commercial, and Industrial	Non-SFR properties are included either in 2-3 Public Facilities Flow Management or addressed through drainage charge/code review activities.
3-3	Demolitions and Site Restoration	Coordination with DLBA and DBA is ongoing.
3-4	Tree Plantings	No additional plantings planned for FY2017.
Activity 4 - Long Term Performance		
4-1	Updated Collection Systems Model	Model work is being updated by GLWA.
4-2	Green Infrastructure Performance Planning	The “Ecological Restoration of Demolition Sites” monitoring is ongoing with the initial monitoring period through September 30, 2016. Monitoring of other projects will be planned as they are implemented.
4-3	Green Infrastructure Benefits Evaluation	Complete as part of CIP planning effort. Draft completion January 1, 2017. Include in FY2017 annual report.
4-4	Amendment to the Supplemental Report on Alternative CSO Controls for the Upper Rouge	This completion date is under discussion with GLWA and DWSD relative to the West Side Model Project. DWSD intends to prepare a Green Infrastructure CIP for $50 million in spend by January 1, 2017.
4-5	Legal agreements for long-term sustainability	Ongoing activity.

No.	Activities	Proposed Schedule
Activity 5 - Stakeholder and Community Engagement		
5-1	Green Infrastructure Website	Ongoing updates.
5-2	Green Credits Program Stakeholder Engagement	Ongoing activity.
5-3	Green Credits Toolbox	Initial materials available in fall 2016.
5-4	Green Credits Training Workshops	Concurrent with Green Credits Public Launch. Fall 2016
5-5	Green Infrastructure Case Studies and Demonstration Projects	Ongoing with case study updates to include monitoring/performance information as available
5-6	Green Infrastructure Forum	Spring 2017, to share findings of Green Infrastructure Steering Committee vision/goal setting.
5-7	Stakeholder Involvement and Education Strategy	Ongoing updates and modifications to drainage charge and green credit strategy, project specific-strategies, and overarching education strategy.
5-8	Overarching Green Infrastructure Educational Campaign	Complete logo usage manual with key partner feedback by September 2016; participate in collaborative green infrastructure website/mapping tool planning grant project funded by Erb Foundation.

ACTIVITIES DESCRIPTIONS

ACTIVITY 1 – POLICIES, PROCEDURES AND STANDARDS

Institutional processes will drive implementation of green infrastructure on both parcels and rights-of-way in the long term. DWSD will implement processes within its ability and will work with other City departments to promote other institutional processes. DWSD is currently in the early stages of development of these programs. Efforts will initially be focused on working through policy and process issues on the variety of programs. These programs are expected to evolve and the action plan as presented is based on the current definition of objectives and constraints. Any activities that were completed in prior years have been removed from this section and planned activity tables.

1-1 Codes and Ordinances

DWSD is working with BSEED, P&DD, DPW, the Law Department, the Legislative Policy Division and The Nature Conservancy (TNC) to finalize development of a new post-construction storm water management ordinance and revisions to the existing code to remove barriers to green infrastructure generally. Amongst other items, these efforts are intended to address questions related to roof drain disconnections and site development standards. The following activities are envisioned to be part of FY2017:

- Continue coordination with BSEED, P&DD, DPW and other relevant departments that manage the zoning, building codes and site reviews/ permitting in the city.
- Continue to engage stakeholders regarding the proposed storm water ordinance and code revisions.
- Post-construction storm water ordinance:
    - Continue the development of a post-construction storm water ordinance. A draft ordinance is essentially complete other than language for alternative compliance. The ordinance is being vetted through the various departments, including legal, and affected stakeholders.
    - Present draft ordinance and revised code language to the City Planning Commission and City Council for review and approval.

- "Greening of the Code"
  - Continue to assess barriers posed by existing regulations, internal policies and land use plans which may impede the implementation of green infrastructure.
  - Continue development of revised code language to facilitate green infrastructure.
- Provide education and training for stakeholders and City staff that are unfamiliar with green infrastructure and how it performs.
- Continue to coordinate the development of the Storm Water Management Design Manual with the modifications to the City's codes and ordinances.

The milestone schedule for these efforts is:

Task ID	Activity	Target/Actual Start	Target/Actual Complete
1-1-1	Code and ordinance review and recommended modifications	**June 1, 2014**	**November 2016**
1-1-2	Provide education and training for City staff	**April 1, 2014**	Ongoing
1-1-3	Post-construction storm water ordinance	**January, 2015**	May 2017
1-1-4	Code updates to remove barriers to green infrastructure	**June 2015**	May 2017

1-2 Storm Water Management Design Manual

A technical design manual is being developed in conjunction with the development of the post-construction storm water ordinance. This manual will serve as a resource manual for both applicants and City personnel to ensure compliance with the post-construction storm water ordinance (Note: purpose narrowed from the GI Plan). The manual will also address the permit requirements (Part I.A.15.d.9) pertaining to storm water controls for projects requiring a Part 41 construction permit issued by MDEQ. Design standards of green infrastructure practices will be included in the manual as well as the following topics:

- Applicability of the requirements for new development, redevelopment, and municipal projects including roadway improvements.
- Design criteria for site drainage, roadway and parking lots, and flow conveyance of sewers, culverts, and open channels. The design criteria will address water quantity and quality considerations. Design standards for both the combined sewered areas and the separately sewered areas will be addressed.
- Overview of drainage design methodologies and acceptable practices.
- Storm water control measures design considerations for systems such as green roofs, water harvesting, bioretention, tree plantings, porous pavements, and detention and retention basins.
- Special conditions and constraints for environmentally sensitive areas, floodplain encroachments, and contaminated sites.
- Procedures and submittals requirements for site plan approval.
- Operation and maintenance practices, agreements and easements.
- Design and construction performance certifications.
- Erosion and sediment control for construction sites.

Development of the manual is a collaborative effort between City departments. As such, a subcommittee working group was developed and has met to provide comments and revisions during chapter development. In addition, meetings have been held with Wayne County in efforts to coordinate and understand ordinance development between the two government agencies. DWSD is leading the effort in drafting the manual but adoption of the manual will require the participation of other departments.

The milestone schedule for these efforts is:

Task ID	Activity	Target Start	Target Complete
1-2-1	Manual development	October 2015 (revised)	December 2016 (review with City Council for adoption)
1-2-2	Manual clarifications; addenda (as needed)	January 2017	June 2017 published
1-2-3	Provide education and training	April 2017	Ongoing

1-3 Drainage Charge Credit System

DWSD is in the process of updating its drainage charge system. The drainage charge system distributes costs associated with wet weather flows based on parcel imperviousness. This task is focused on the development of a drainage charge credit system to encourage implementation of green infrastructure and other storm water management practices on parcels. These practices may be implemented as redevelopment occurs or as retrofits to existing sites. The following activities are being conducted as a part of developing a credit system:

- Continue evaluation of similar programs in other communities for criteria and process.
- Continue definition of potential drainage charge reductions that are consistent with DWSD's permit compliance goals to reduce storm water volume, CSO discharges, and total volume to treatment.
- Continue conducting meetings with rate payers to identify areas of flexibility that should be considered in the drainage charge calculation methodology.
- Internal DWSD task force continue working to define policies and clarify processes as well as implement the drainage charge and credit program.
- Ongoing coordination with code and ordinance issues to facilitate property owner ability to implement green infrastructure practices.
- Ongoing implementation of community conversation with stakeholder group and broader audience. (Reported under Activity 5-2).
- Development of a summary policy and procedures manual (under activity 1-3) and a "toolbox" for ratepayers (Reported under Activity 5-3). *Draft policy and procedures manual in process and under DWSD task force team review.*
- Quantification of DWSD investment through direct support and credits.
- Begin instructional workshops about the drainage charge system and credit program.

The milestone schedule for these efforts is:

Task ID	Activity	Target Start	Target Complete
1-3-1	Draft manual for drainage charge system	**March 2015**	August 2016
1-3-2	Final manual for drainage charge system	August 2016	June 2017
1-3-3	Provide education and training	August 2016	Ongoing through FY2018
*Comment: Changes to the drainage charge are being implemented beginning July 2016 with changes to bills occurring in October 2016 and phased in through FY2018. The Drainage Charge Manual will be available in August 2016, and will be treated as a living document for the first several years of the program.			

The drainage charge in Detroit is currently one of the highest drainage charges in the country. It is expected that as drainage credits are rolled out to the entire city (planned for October 1, 2016) many customers will be motivated to reduce their impervious area and adopt green infrastructure approaches. A substantial effort was

completed to update the parcel-based impervious data and additional efforts are underway to display the updated information to customers, and provide tools so that customers may estimate their drainage credits under various approaches.

1-4 Green Streets Standards

Green Street standards will document the process, procedures and design standards for managing runoff on City streets and county roadways. These standards may be developed as a reference manual or have the force of policy. Green streets design needs to involve a variety of departments and agencies representing City (and potentially other streets), utilities, DDOT (bus service), planning, emergency services (e.g., fire), and other stakeholders. The following tasks are planned for this activity:

- Potential projects under consideration include a new civic square at Woodward Avenue and Jefferson Avenue; a redesigned, safer intersection of Gratiot Avenue and Randolph Street; and bike infrastructure/complete street pilots on Grand River.
- Team continuing to work on implementation of specific projects and discussing methods for incorporating related street design guidance into any future strategic plan development efforts.

The original milestone schedule in the Green Infrastructure Plan was to complete final standards by June 2017. That date will need to be revised as approach is clarified in FY2017.

1-5 Structure Demolition and Lot Greening Standards

There is no specific planned additional work on this item. Separate efforts are underway related to greening of vacant lots. Refer to Activity 2-1 Small Scale Greening.

1-6 Public Storm Water Maintenance Guidance

A maintenance guidance document is being developed as part of the green credits toolbox materials (Activity 5-3), including drainage charge program manual. A target audience for this guidance is private property owners receiving drainage credits for storm water management practices such as rain gardens, rain barrels, and disconnected downspouts. This guidance will address common types and frequency of maintenance activities. Inspection and recordkeeping for practices receiving storm water drainage credits will also be addressed. Development of the maintenance guidance is being coordinated with the development of the storm water technical design manual, and as such, will be vetted through a subcommittee of City department staff and key stakeholders.

The milestone schedule for these efforts is:

Task ID	Activity	Target Start	Target Complete
1-6-1	Manual development	October 1, 2015	Publically available version by September 2016.
1-6-2	Manual clarifications; addenda (as needed)	January 2017	June 2017
1-6-3	Provide education and training	June 2016	Ongoing

1-7 Municipal Storm Water Maintenance Manual

The target audience for this manual is the municipal staff responsible for caring for the publically owned and maintained storm water management practices. Municipal staff includes but is not limited to DWSD. The objective of the manual is to identify methods and approaches to maintain green infrastructure practices. This manual will address institutional and technical issues, inspections, and recordkeeping, amongst other efforts.

The milestone schedule for these efforts is:

Task ID	Activity	Target Start	Target Complete
1-7-1	Draft manual	August 1, 2015	July 31, 2016
1-7-2	Final manual	August 1, 2016	July 31, 2017
1-7-3	Provide education and training	June 1, 2016	Ongoing

1-8 Tracking System

DWSD is developing a tracking and performance assessment database for green infrastructure implementation activities. The objective of this database is to define, at a minimum, the location, ownership, financial investment, performance, and installation date of the green infrastructure practices. Three primary types of data will be maintained by DWSD:

- DWSD constructed or direct funded green infrastructure. *In process.*
- Privately owned green infrastructure practices that qualify for drainage charge credits. *Tracking tool for parcel based practices is currently under development in conjunction with the drainage charge credit program and is anticipated to be available starting in October 2016.*
- General land use cover change over time. *Updated impervious cover analysis data complete as of December 31, 2015.*

Future needs will include:

- Developing an asset management system for GI maintenance activities. This is expected to work with other asset and maintenance systems operated by DWSD.
- Developing a tracking system for private investments that result in a drainage charge credit.

Supplemental efforts include the following:

- Identifying other green infrastructure inventories within southeast Michigan.
- Mapping of GI practices for public education purposes. *Conceptual public facing map tool under development by The Nature Conservancy with DWSD a partner in the concept development and with funding from the Erb Foundation.*

The milestone schedule for these efforts is:

Task ID	Activity	Target Start	Target Complete
1-8-1	Draft tracking system	**June 1, 2014**	July 31, 2015
1-8-2	Final tracking system	August 1, 2015	July 31, 2016
1-8-3	Provide education and training	June 1, 2015	Ongoing
1-8-5	Mapping tool of GI practices (TNC-led project under Erb Foundation grant)	July 1, 2016	March 2017

ACTIVITY 2 - PROTOTYPE PROJECTS

Implementation of green infrastructure requires the development of new policies, processes, and procedures. It also requires additional understanding of the performance, costs, and implementation realities associated with various project types. DWSD has worked to form relationships with a number of relevant agencies, organizations and community groups. In the process of working with these entities, a number of issues have been discussed regarding project responsibilities and concerns. The realities of policies, processes, and procedures can best be realized in the process of implementing projects. DWSD is in the process of launching a series of prototype projects that will help answer the following questions:

- What policy issues need to be addressed and what procedures need to be developed in order to implement a specific project type?
- What is the timeframe associated with implementing various types of projects? What is the appropriate planning cycle?
- How well does the project type control runoff and reduce CSO discharge?
- How much does the project cost to implement?
- What technical issues need to be addressed to design and implement the project?
- What institutional issues need to be addressed to design and implement the project?
- Who will own and maintain the project upon completion?
- What project types will the community accept and in what conditions?

A range of project types has been identified for inclusion in the prototype implementation. These project types include:

- Land assembly and large scale greening - Concept design phase
- Municipal property roof and parking lot management - Implementation phase
- Municipal parks - Implementation phase
- Road decommissioning - Concept phase
- Rights-of-way storm water management - Implementation phase
- Managing right-of-way runoff on vacant lots - Implementation phase
- Managing pump stations discharge on vacant lots - Conceptual planning phase

2-1 Small Scale Greening

Small scale greening projects include parcel-based practices on individual parcels. Several small parcels grouped together are also considered small scale. Storm water runoff from the site is managed and additional runoff from adjacent parcels and the roadway may also be managed. Examples of small scale greening include vegetating vacant lots or installing bioretention systems in conjunction with building demolitions. In this case, the void left after removing a demolished structure (including the basement) is used for a bioretention system and road runoff is diverted into the practice. Four of these systems have been constructed in FY2016 through a joint project with DLBA, DBA, the University of Michigan Water Center and Wayne State University. This project is referred to as *Ecological Restoration of Demolition Sites.*

DWSD is working with the department's green infrastructure program consultants, the University of Michigan Water Center, and Wayne State University to conduct testing and monitoring at the Ecological Restoration Sites to study the effects these bioretention areas have on the reduction of rainwater inflow to the combined sewer system. The monitoring sites are located to the north and south of Belton Street between Greenview Road and Vaughan Street. The main objectives for monitoring at these sites include:

- Quantifying the change in runoff entering the combined sewer due to the presence of the bioretention system
- Quantifying the infiltration volume, rate and duration occurring
- Quantifying the extent, rate and duration of groundwater mounding
- Supporting the university research team's monitoring efforts
- Optimizing the outlet control system to maximize the subgrade infiltration while not causing excessive groundwater mounding that may affect adjacent infrastructure and getting the system ready for the next storm event
- Comparing and contrasting the results between sites

The monitoring plan for these sites includes rainfall, inflow, outflow, groundwater, and photographic monitoring activities. Monitoring at each site is scheduled to occur between July and September of 2016. Each site has an installed rain gauge. The rain gauges will record rainfall in 5 minute increments. Inflow into the GI practice first passes through a filter and is then discharged into the manhole sump near the street. This manhole is being used by university researchers for the collection of water samples. The sump prevents heavy debris from entering the system. Once the sump water elevation reaches the invert of the inflow pipe, flow will be conveyed and discharged to the rain garden. Outflow monitoring will occur at the 48-inch manhole where the underdrain pipes connect at the rear of the site. Each site will have four groundwater monitoring locations where data will be recorded on a 5 minute time step. Groundwater mounding at each site will be monitored to help determine the

discharge pipe elevations and gate position to minimize the amount of storm water that enters the sewer system and maximize the natural infiltration. Each site will be equipped with a motion activated trail camera. This camera will aid in understanding the source of potential vandalism as well as log the effects these gardens have on the neighborhood residence and wildlife.

DWSD plans to modify the existing Ecological Restoration of Demolition Sites project locations in FY2017. The initial design diverted one side of the roadway into the bioretention cells. The proposed modification would result in the opposite side of the street also entering these practices. This would effectively double the tributary area at a reasonable cost. This work will follow the completion and evaluation of results from the monitoring program described above. Final decision on implementation will follow completion of that work.

Additional opportunity locations for installing bioretention systems on vacant lots that capture and store road runoff have been identified in FY2016 and are under final review and selection in FY2017. The locations were selected based on where two or more adjacent parcels were vacant, proximity to catch basins, and neighborhood vacancy classification. These additional locations are owned by either the DLBA or Grandmont Rosedale Development Corporation (GRDC) and are referred to as *Vacant Lot Bioretention Sites*.

A second project that will be explored is the greening of poorly vegetated sites. The GLRI project on the east side of Detroit is exploring vacant lot greening, and the hydrological performance of vacant lots. Detroit Future City helped lead a team to develop a rapid assessment tool for vacant lots. As part of the GLRI project, Don Carpenter of Lawrence Technological University is performing hydrologic evaluations of various sites. Lessons learned from this project will help identify beneficial practices in the URT. An exploratory project for greening of vacant lots based on this newly gained information is planned for FY2017. This project will help to define cost effective future actions.

The milestone schedule for these efforts is:

Task ID	Activity	Target Start	Target Complete
2-1-3	Identification of project opportunities, selection, design and construction	Ongoing	
2-1-4	Vacant Lot Greening Exploratory Project in collaboration with Detroit Future City	January 2017	June 2017
2-1-5	Ecological Restoration of Demolition Sites – post-construction monitoring	July 2016	September 2016
2-1-6	Vacant Lot Bioretention Sites – site final selection and design	July 2016	March 1, 2017
2-1-7	Vacant Lot Bioretention Sites – bidding & construction	March 2017	November 2017
2-1-8	Ecological Restoration of Demolition Sites – site modifications	March 2017	November 2017

2-2 Large Scale Greening

DWSD is developing multiple neighborhood scale projects. Current focus of this work is on conceptual and detailed design. Construction initiation of at least two projects will occur in FY2017; priority implementation projects are Oakman Boulevard Phase I and Constance Phase II. Actual implementation of other projects will be based on final project costs, CSO and basement backup protection potential, neighborhood stabilization potential, and funding objectives for each fiscal year. DWSD also plans to apply for State Revolving Fund (SRF) loans, which will be for FY2018 projects.

A description of each project currently under development follows:

Oakman Boulevard

Oakman Boulevard is located in the Aviation neighborhood on the southeast corner of the URT. It is a two-way street divided with a large green boulevard separating the opposing directions of traffic, as shown in Figure 34. Each travel direction has two full travel lanes and a parking lane. The conceptual design for Oakman Boulevard is

based on an analysis of basement backup data provided by FEMA for this area and includes green infrastructure practices sized to manage the 90% storm event.

DWSD is currently finishing up the conceptual design and will begin detailed design in 2016 with construction planned in 2017. Because this work in being implemented on a long linear corridor, the project is divided into Phase I and Phase II with the divide between the two phases being the high point along Oakman. Detailed design is expected to be completed for both phases simultaneously and construction split into a multi-year project (FY2017 and FY2018). Public outreach and stakeholder engagement will be a major activity in FY2017 through the design process. The total tributary area identified for this project is up to 43.6 acres with 24 acres of impervious area managed.

Figure 34 Oakman Boulevard

Orangelawn

DWSD is currently initiating work on a neighborhood scale project that evaluates storm water and CSO reduction at outfalls to which Orangelawn and the surrounding neighborhood discharge. The project concept includes directing storm water to bioretention areas along the Orangelawn right-of-way, potentially disconnecting them completely from the combined sewer system or otherwise allowing them to drain back to the combined sewer system. The actual configuration of the storm sewer system is being evaluated through record review and field survey. Level of implementation will be scaled based on expected benefit of the work to CSO performance, as the combined sewer on Plymouth and West Chicago have a higher probability of transferring flows from east of Southfield Freeway and are not believed to act in an isolated manner. The model will calculate conceptual levels of green infrastructure practices required to achieve certain levels of CSO discharge reductions. Once the level of green infrastructure is calculated in the model, design will begin in preparation for construction. Design is anticipated to be complete in FY2017 and construction would commence in FY2018. Similar to Oakman Boulevard, public outreach and stakeholder engagement will be an important component of this project as it moves through the design phase. Approximately 120 acres of potential tributary area are being evaluated as part of this project.

Figure 35 Orangelawn Street – Typical ROW Configuration

Figure 36 Orangelawn Conceptual Project Tributary Area

Tireman Phase III

Tireman Phase III is the last of a three-phased design along Tireman Avenue west of the Rouge River, from Chatham to Outer Drive. Phase I is currently under construction and is scheduled to be complete in fall 2016. Major construction of Phase II was completed in FY2016, with the exception of landscaping and drainage enhancements, which will be complete in fall 2016.

Phase III of the design consists conceptually of a proposed new storm sewer pipe that captures the overflow from Phases I and II and conveys it east to the Rouge River. Completion of the design of this phase is anticipated in FY2017 and construction is intended to begin FY2018. As part of the project design, the overall impact of this project and the Constance Phase II project on the Warren outfall is being evaluated.

Constance Phase II

Phase I (reported under 2-6 Transportation Corridor Flow Management) is currently under construction and is scheduled to be complete in fall 2016.

Phase II of the design includes a proposed constructed wetland type feature in Rouge Park and will capture storm water from the newly constructed separate storm sewer along Constance. Conceptual design will be finalized including coordination with the Friends of Rouge Park, City of Detroit and neighborhood input on the concept. Additional tributary area may be identified to improve the project performance. Design completion and bidding is expected in March 2017 for construction in FY2017.

Other Project Areas

Several additional project locations are under review for future design consideration. These locations are neighborhood scale projects that would incorporate a large storm water management feature in a central location in the neighborhood to provide an amenity to the area. The various locations have been identified through various

methods including during planning meetings with Detroit HRD and P&DD and Brightmoor community partners. DWSD is in the early stages of conceptual design and anticipates design to proceed in FY2017 and construction to follow in future reporting periods. The following are locations currently under review:

- Rogell Golf Course Neighborhood – FY2017 efforts will focus on refinement of the preliminary concept in partnership with P&DD and HRD. The golf course is currently privately owned. The City is planning to engage in conversations with the landowner to either acquire the land or work collaboratively to implement a regional storm water amenity on the property and develop an MOU for long-term maintenance.
- Brightmoor (previously reported as Activity 2-4 Historic Stream Corridors) –This project will require detailed review of adjacent property ownership to identify publicly owned parcels in the vicinity of the historic stream corridor, identification of potential areas tributary to practice areas and means of routing flows, coordination with existing utilities along with significant public outreach and stakeholder engagement. Design and construction of this concept is anticipated to span multiple reporting periods with design starting in FY2017.

2-3 Public Facilities Flow Management

Management of storm water from public buildings and parking lots focuses on redirecting storm water to green infrastructure practices for infiltration, detention and potential direct discharge to receiving streams. Emphasis is on roof and parking lot runoff. The primary focus in previous fiscal years was on Detroit Public School sites. Two schools have been selected for implementation projects. Activities for FY2017 include:

- Work with City of Detroit General Services for additional project opportunities.
- Review DWSD and GLWA CSO and other facilities for potential green infrastructure opportunities.
- Review City-owned facilities, including the West Side DWSD Yard for project opportunities.
- Implement DPS projects.

Ludington Magnet Middle School and Charles Wright Academy

DPS is in the process of finalizing their selected concept for green infrastructure at Ludington Magnet Middle School and Charles Wright Academy. Preliminary 30% design documents for the selected concept will be submitted to DPS in August 2016 for review. Project review and progress meetings will be held between DWSD's design team and DPS throughout the project development, with major design review workshops held at each milestone through final design. The final design is anticipated to be complete and issued for bid in April 2017 to begin construction in June 2017. These implementation projects require a memorandum of understanding between DWSD and DPS. A draft MOU was prepared that clarifies issues of funding, ownership, maintenance, and education. The MOU will be finalized in FY2017.

Additional project investigations and identification are planned for fall 2016, with projects scheduled for implementation in FY2017 and FY2018.

2-4 Historic Stream Corridors

This activity has been incorporated into Activity 2-2 Large Scale Greening and will not be reported on separately.

2-5 Municipal Park Green Infrastructure/Flow Management

Management of storm water in municipal parks includes management of impervious surfaces within the park and/or redirecting storm water from adjacent roads into green infrastructure practices in the park. Storm water management projects on municipal park land will be coordinated with GSD, the Parks Department and DPW. Many of the parks have local citizen groups that will also be included in the project development. Crowell Recreation Center has been the subject of design efforts and is expected to move into implementation in FY2017. Activities for FY2017 include:

- Based on work performed in FY2016, develop an updated prioritized list of parks projects that incorporates community input.
- Based on the prioritized list, it is expected that one or more prioritized projects will be advanced to implementation.

- Stoepel Park: Complete construction and finalize maintenance manual.
- Liuzzo Park: DWSD worked with the Office of the Mayor, the Parks and Recreation Department, General Services Department, and the Viola Liuzzo Park Association to hold a groundbreaking event in July 2016. WCI Contractors started construction in July 2016, with an expected completion date of October 2016. Complete construction and finalize maintenance manual.
- Crowell Recreation Center: Complete design and move into implementation.

The estimated milestone schedule for these efforts is:

Task ID	Activity	Target Start	Target Complete
2-5-1	Updated prioritized opportunities; seek community input in prioritization. Initial project selections.	August 1, 2016	October 31, 2016
2-5-2	Crowell Recreation Center final design	July 1, 2016	August 15, 2016
2-5-3	Design for newly selected site(s) FY2016-2017	November 1, 2016	April 2017
2-5-5	Stoepel Park Construction and maintenance plan development	June 2016	November 2016
2-5-6	Liuzzo Park Construction and maintenance plan development	July 2016	November 2016
2-5-7	Crowell Recreation Center construction	September 2016	August 2017
2-5-8	Bidding and construction initiation for other selected sites	April 2017	November 2017

2-6 Transportation Corridor Flow Management

Transportation corridor flow management has focused on integrating green infrastructure with DPW projects. Four such projects were designed and bid in FY2016 and are under construction, which is scheduled for completion in FY2017. Additional projects anticipated in FY2017 include the following.

- Coordinate with the Detroit Department of Public Works (DPW) on roadway resurfacing projects for 2017. Standard details have been developed for permeable pavement projects that could be easily repeated. DWSD may also propose some additional locations based on suitability for green infrastructure. DPW's road resurfacing list is updated annually between late summer and early fall, for construction the following summer.
- DWSD will evaluate additional locations for projects in road corridors. In particular, DWSD has begun exploration of bioswales in boulevard areas. These opportunities are being evaluated at more of a neighborhood scale, although all work is anticipated to be performed in public rights-of-way or parcels.
- In collaboration with other City Departments, evaluate larger corridor opportunities to be considered in the Green Infrastructure CIP.

The focus for work in FY2017 will be on coordination of large scale greening (neighborhood plans) with DPW road implement projects and identification of additional opportunities for longer term planning.

ACTIVITY 3 - CONTINUED IMPLEMENTATION

DWSD has previously participated in a series of projects including downspout disconnection, demolitions and site restoration, and planting trees in the area. Each of these activities will be continued in the future and adapted for current conditions. Current focus for each of these projects includes the following:

3-1 Downspout Disconnection - Homes

Disconnection of downspouts for homes, including single family residential, duplex and townhomes requires working with the property owner, resident and BSEED. The primary mechanism to accomplish these disconnections, outside of green infrastructure funding, will be through drainage charge credits and code compliance.

3-2 Downspout Disconnection - Multi-Family Residential, Commercial, and Industrial

Opportunities for disconnection of downspouts for multi-family residential, commercial, industrial and institutional properties are limited unless other green infrastructure practices are included. This is due to the lack of lawn area on most parcels into which downspouts could be discharged. Downspout disconnection for these properties will therefore be included in greening of public parcels (for public sites) or through property owner actions associated with the drainage charge credit system (private parcels). DWSD is intending to provide technical assistance to property owners to better support their implementation of green infrastructure on site.

The code review work being performed under Activity 1-1-4 will help streamline private property discharge of roof runoff into green infrastructure practices, for both new development and retrofits.

3-3 Demolitions and Site Restoration

Residential demolitions in the City of Detroit are managed through the Detroit Land Bank Authority (DLBA) and the Detroit Building Authority (DBA). Commercial demolitions involve DBA and BSEED.

DWSD's strategy will be to support demolitions which cannot be funded through other mechanisms and will result in removal of significant impervious area. As such, these demolitions may include isolated single-family homes or non-single-family residential properties. DWSD funded demolitions will require control of runoff from the site as a condition of the funding.

DWSD is in regular communication with the DLBA and the DBA so that specific opportunities may be considered as the demolition activities continue. These may include DWSD involvement such as assisting with restoration of large demolition sites, such as school properties, which could also be used for storm water management from surrounding areas.

Other ongoing activities relate to demolitions. These activities include:

Activity 1-5 Structure Demolition and Lot Greening Standards
Activity 2-1 Small Scale Greening
Activity 2-2 Large Scale Greening

3-4 Tree Planting

Tree planting efforts were advanced in FY2014 and FY2015, with more than double the planned number of trees planted in the fiscal year. DWSD has no specific plans to plant additional trees in FY2017 outside of specific green infrastructure projects.

ACTIVITY 4 - LONG TERM PERFORMANCE

The objective of the Green Infrastructure Program is ultimately to reduce CSO discharges. As green infrastructure projects are implemented, a better understanding will be developed of the performance of green infrastructure.

Specific activities planned for FY2017 include:

- Evaluation of performance of various green infrastructure practices. This will include collaboration with the work being performed under the GLRI project to better quantify performance of vacant lands of various types, as well as selective monitoring of installed green infrastructure practices. An example of this activity is the monitoring of the Ecological Restoration of Demolition Sites.
- Development of a longer term Green Infrastructure CIP with projects identified up to and in excess of the $50 million spend requirement. This will involve collaboration with other City departments and

prioritization of areas where green infrastructure can work to reduce CSO discharges, relieve basement backup, collaborate with other project opportunities, and provide community benefits in terms of neighborhood stabilization and quality of life.

- Legal agreements between DWSD and the property owners for green infrastructure sites will be prepared to ensure long-term sustainability. The agreements will be prepared in conjunction with the project design and construction. Agencies include DLBA, DPS, DPW and General Services (for parks).
- Coordination with the West Side Model efforts to better understand the behavior of the sewer system on the west side and in the URT area.

Task ID	Activity	Target Start	Target Complete
4-2	Development of monitoring plans and implementation to evaluate questions of hydrology and green infrastructure performance (specifically ecological restoration of demolition sites and coordination with GLRI).	**September 2014**	September 30, 2016 and ongoing
4-3	Study to evaluate benefits that can be achieved through green infrastructure implementation based on projects implemented and data collected (specifically evaluation of neighborhood scale implementation)	August 1, 2015	June 2017
4-5	Legal agreements for long-term sustainability.	**January 1, 2015**	Ongoing
4-6	Green infrastructure CIP development	**July 1, 2016**	January 1, 2017

ACTIVITY 5 - STAKEHOLDER AND COMMUNITY ENGAGEMENT

In FY2017, DWSD will continue to work with key partners to collaborate on stakeholder involvement and education activities with the goal of gaining insight, input, implementation support, and balanced public policy. Efforts will also be made to promote implementation of green infrastructure on parcels. Stakeholder and community engagement will continue be a fundamental component of the post-construction storm water ordinance development and the greening of the municipal code, each green infrastructure implementation project, and the drainage charge and green credit program. DWSD will also focus efforts on supporting the development and implementation of an internal Green Infrastructure Steering Committee to help craft a shared city-wide vision for green infrastructure in Detroit.

5-1 Green Infrastructure Website

Phased communications and outreach that informs customers and facilitates a sustainable and successful implementation of its drainage charge and green credit program will be the primary focus in FY2017. In addition to public and media engagement and marketing and educational collateral, DWSD will launch a dedicated drainage web presence (www.detroitmi.gov/drainage) and online tools including an external parcel viewer, green infrastructure mapping and knowledge base. Collaborating with the City of Detroit's information technology staff, city departments as well as NGO partners, DWSD will use this dedicated webpage to provide real-time program updates and marketing collateral. DWSD will continue to update existing green infrastructure and storm water web pages as new information is available. These pages will be linked to the drainage web page. As DWSD plans to launch a new customer care portal in Q1 2017, additional interactive website functionality will occur in later phases of the program.

Task ID	Activity	Target Start	Target Complete
5-1-1	Draft Website	**February 2015**	**April 2015**
5-1-2	Final Website	**May 2015**	**June 2015**
5-1-3	Launch drainage dedicated website	July 2016	July 2016
5-1-3	Website Updates	Ongoing by program phase	

5-2 Green Credits Program Stakeholder Engagement

This activity is the outreach component associated with Drainage Charge and Green Credit Program under development that DWSD will roll out in FY2017. Based on input from the Drainage Charge Steering Committee and the Erb Blue-Green Infrastructure Work Group Communications subcommittee, DWSD will develop a more refined stakeholder engagement approach for the green credit program that mirrors the roll-out of the refined drainage charge focused on impervious acreage. These engagement activities will include training dedicated drainage charge/green credit customer service representatives, Detroit green infrastructure partners that have expertise and interest in conducting green credit training and outreach using DWSD information and tools, and conducting one-on-one consultations with customers who are interested in applying for green credits. See Activity 5-4 below.

The milestone schedule for these efforts is:

Task ID	Activity	Target Start	Target Complete
5-2-1	Engagement Program (identification)	July 1, 2015	September 30, 2015
5-2-2	Engagement Program (input sessions)	October 1, 2015	December 31, 2015
5-2-3	Engagement Program (notification)	January 1, 2016	June 30, 2016

5-3 Green Credits Toolbox

DWSD is developing the Drainage Charge Program Manual that includes chapters on how to apply for green credits.

The milestone schedule for these efforts is:

Task ID	Activity	Target Start	Target Complete
5-3-1	Draft Technical Support Materials	July 1, 2016	August 31, 2016
5-3-2	Final Technical Support Materials	September 1, 2016	July 1, 2017 and ongoing

5-4 Green Credits Training Workshops

DWSD will develop and implement two types of training workshops to promote implementation of green infrastructure and participation in the Green Credits program: (1) training for city department staff and other local partners that will help educate rate payers on DWSD's programs and requirements; and (2) training for rate payers seeking to learn more about the storm water drainage charge and how to obtain a discount through the Green Credits program. The types of workshops may be modified or expanded to specifically target other audiences such as consulting engineers, small businesses or faith community/non-profit properties. Workshops will be tailored to the audience and present instruction in the various materials that have been developed.

The schedule for these activities will parallel the drainage charge system development. Initial expectations include:

Task ID	Activity	Target Start	Target Complete
5-4-1	Internal City Staff Workshop	January 1, 2016	August 31, 2016
5-4-2	Public workshops	September 1, 2016	July 1, 2017 and ongoing

5-5 Green Infrastructure Case Studies and Demonstration Projects

DWSD will continue to highlight examples of public and private GI projects through case studies, distributed as fact sheets on the DWSD Green Infrastructure website or through presentation materials. DWSD will continue to

update existing project fact sheets with new project information and details as available and will create new fact sheets for new DWSD funded projects.

The milestone schedule for these efforts is:

Task ID	Activity	Target Start	Target Complete
5-5-1	Draft Case Studies	**Ongoing**	Ongoing
5-5-2	Final Case Studies	Ongoing	Ongoing

5-6 Green Infrastructure Forum

DWSD recognizes the importance of sustaining communication and coordination among City department staff and key green infrastructure partners throughout the city that play a role in green infrastructure implementation. In FY2017, DWSD will work with the Office of the Mayor and other key city departments to convene and facilitate a Detroit Green Infrastructure Steering Committee with initial support from Bloomberg Associates. The goal of the Detroit Green Infrastructure Steering Committee will be to craft a shared vision for green infrastructure implementation, as well as shared definitions and goals, and identify opportunities for technical and resource coordination. The work of the Detroit Green Infrastructure Steering Committee will lay the foundation for the anticipated Detroit Green Infrastructure Forum to highlight existing and future projects and roll-out the city's shared green infrastructure vision. DWSD will plan and host, with assistance from other key green infrastructure partners, this green infrastructure forum or conference for a variety of stakeholders to discuss issues related to green infrastructure. The first forum is anticipated to occur in spring 2017, depending on the work of the steering committee.

The milestone schedule for these efforts is:

Task ID	Activity	Target Start	Target Complete
5-6-1	FY2017 green infrastructure forum planning	February 2017	April 2017
5-6-2	FY2017 green infrastructure forum and highlights report	May 2017	June 2017

5-7 Stakeholder Involvement and Education Strategy

DWSD will continue to update and adjust existing stakeholder involvement and education strategies related to the drainage charge and green credit program, DWSD-funded green infrastructure projects, and shared green infrastructure logo usage manual. These individual strategies are based on DWSD's overall stakeholder involvement and education strategy developed in 2014. In FY2017, DWSD will review and adapt these strategies based on stakeholder feedback. For green infrastructure project stakeholder involvement and education strategy implementation, the focus in FY2017 will include ribbon cutting celebrations for Liuzzo Park and Stoepel Park No. 1, as well as groundbreaking celebrations for planned projects. DWSD will develop project-specific involvement and education strategies and implement these strategies with input and coordination from city and community project stakeholders. These activities will include, at a minimum, input meetings and educational mailings.

The milestone schedule for these efforts is:

Task ID	Activity	Target Start	Target Complete
5-7-1	Review existing strategies	**Ongoing**	**Ongoing**
5-7-2	Update strategies	Documents remain working drafts	

5-8 Overarching Green Infrastructure Educational Campaign

DWSD will continue to coordinate with key partners to develop and implement overarching green infrastructure educational messages, branding logo, and collaborative website. These activities represent an ongoing effort.

The milestone schedule for these efforts is:

Task ID	Activity	Target Start	Target Complete
5-8-1	Overarching green infrastructure educational campaign		Ongoing

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