



TOWNSHIP OF FERGUSON

Program Level of Service Options

October 24, 2017

PROGRAM GAP OR NEED	ASSUMPTIONS AND NOTES	LEVEL OF SERVICE OPTIONS
I. STORMWATER COLLECTION SYSTEM OPERATIONS & MAINTENANCE		
<p>A. Drainage Inlets</p> <p>The DPW staff expressed an interest to increase the time and effort dedicated to stormwater inlet inspections, cleaning, and any resulting minor repair. This effort is separate of the Capital Improvements program which seeks to replace drainage inlets. Currently time is split among other DPW tasks (streets, sewer, etc.) The Township owns and maintains approximately 1,970 inlets within the Township stormwater collection system. There are an additional 1,333 privately owned drainage inlets.</p>	<ul style="list-style-type: none"> In previous years, additional maintenance crew had been allocated for paving repairs. After an evaluation of efficiency and cost-effectiveness, the paving will now be subcontracted out to permit a new emphasis on inlet repair and maintenance. A GIS database has been set up, but does not include photo or video attribution. Current level of effort involves a two-person crew, with a crane truck. This task is seldom performed separately. Assume each inlet requires 2-person crew for 2 hours (total of 4 man-hours). A more regimented inlet inspection program will reveal the need to develop a strategy to repair or replace 1,970 existing (aged) drainage inlets. 	<p><u>High LOS</u></p> <ul style="list-style-type: none"> Dedicate 30% of Maintenance Hours (approximately 1,248 man-hours per year) to inspect, clean, and repair (as necessary) drainage inlets (full cycle in approx. 6 years) Develop a GIS-linked condition assessment inventory in conjunction with inspections. <p><u>Medium LOS</u></p> <ul style="list-style-type: none"> Dedicate 15% of Maintenance Hours (approximately 624 man-hours per year) to inspect, clean, and repair (as necessary) drainage inlets (full cycle in 13 years) Develop a GIS-linked condition assessment inventory in conjunction with inspections. <p><u>Basic LOS</u></p> <ul style="list-style-type: none"> Dedicate 10% of Maintenance Hours (approximately 416 man-hours per year) to inspect, clean, and repair (as necessary) drainage inlets (full cycle in 19 years) Develop a GIS-linked condition assessment inventory in conjunction with inspections. <p><u>Current LOS</u></p> <ul style="list-style-type: none"> Continue to inspect only on an as-needed basis or as time permits with lag or delays in other projects and efforts.

<p>B. Piping</p> <p>The Township system consists of approximately 175,155 lineal feet (33 miles) of drainage (collection) piping.</p>	<ul style="list-style-type: none"> • The Township does not have CCTV coverage of their stormwater collection system. • A GIS database has been set up, but does not include condition assessment: photo or video attribution. • A comprehensive cleaning and flushing program has not been undertaken in the Township. • A large portion of the Township system is corrugated metal pipe, which is likely deteriorated given recent repairs and projects. • The Township has completed their first pipe lining project as a means to reduce construction costs to repair lines versus replace them. • A more regimented inspection & condition assessment program will reveal the need to develop a strategy to repair or replace 33 miles of existing pipe. 	<p><u>High LOS</u></p> <ul style="list-style-type: none"> • Set target for CCTV coverage across the entire system within 5 years and begin rescreening areas receiving a score of 3 on the NASSCO scale. • Link existing CCTV data to stormwater pipes in GIS and begin to link findings as additional attributes. <p><u>Medium LOS</u></p> <ul style="list-style-type: none"> • Set a target for CCTV coverage across the entire system within 8 years and begin rescreening areas receiving a score of 3 on the NASSCO scale. • Link existing CCTV data to stormwater pipes in GIS and begin to link findings as additional attributes. <p><u>Current / Basic LOS</u></p> <ul style="list-style-type: none"> • Continue with reactive efforts only. No additional efforts beyond those associated with future paving project(s). • Begin to link existing CCTV data to stormwater pipes in GIS and begin to link findings as additional attributes.
<p>C. Curb Conveyance</p> <p>The Township maintains all curbing as a conveyance system component for stormwater flow management.</p>	<ul style="list-style-type: none"> • Curbing is not currently considered in the Capital Improvements Plan beyond what is associated with upcoming or pending street restoration projects. • Street sweeping program keeps curb (gutter) free of debris and materials. • An inspection & condition assessment program will reveal the need to develop a strategy to repair or replace existing curbing along 56 miles of street. 	<p><u>Medium / High LOS</u></p> <ul style="list-style-type: none"> • Develop system to assess curbing conditions for approx. 56 miles of street and proactively repair / replace curbing to ensure proper conveyance of gutter flows. • Continue street sweeping program at current frequency/interval. • Evaluate the impact of Snow Operations on the Stormwater System and consider incorporating into Stormwater Maintenance Schedules and Budget. <p><u>Current / Basic LOS</u></p> <ul style="list-style-type: none"> • Continue replacing damaged curbs associated with street projects or as critical repair (i.e., curbing causes safety hazard). • Continue street sweeping program at current frequency/interval.

<p>D. Channels</p>	<ul style="list-style-type: none"> • The Township has approx. 48 miles of roads without curbing, assumed for this study to require side and drainage channels. Assume channels are required on one side only (i.e., 24 miles of channels) • In addition, there numerous 'backyard' channels that convey runoff and require some degree of maintenance. • Current efforts include 7 crew members, working 80 hours (for total of 560 man-hours). • Aside from channel maintenance, efforts also include regrading the berm along the roads (to ensure proper flow of runoff). • An inspection & condition assessment program will reveal the need to develop a strategy to repair or replace 24+ miles of existing channels. • Township is responsible for flows handled by roadside ditches in both urban and rural areas. • Resources are limited to address ditch maintenance. • Ditches can be a nuisance problem or a constriction for flow management. Level of service should be clear on public responsibilities. • Flooding can occur at choke points in more rural areas. • Debris management in ditch line should be considered in level of service clarification. Frequency of cleaning/repair/piping is important to clarify. 	<p><u>High LOS</u></p> <ul style="list-style-type: none"> • Develop an inventory of the Township owned Channels, complete a basic condition rating, covering the system over 3 years. • Develop a retrofit prioritization project for all channels. • Increase effort to triple current level (1,680 man-hours) <p><u>Medium LOS</u></p> <ul style="list-style-type: none"> • Develop an inventory of the Township owned Channels, complete a basic condition rating, covering the system over 5 years. Increase effort to double current level (1,120 man-hours) <p><u>Current / Basic LOS</u></p> <ul style="list-style-type: none"> • Develop an inventory of the Township owned Channels, complete a basic condition rating, covering the system over 8 years. • Continue current level of effort, making repairs as needed.
<p>E. BMPs / Basins</p> <p>An evaluation of the roles and responsibilities for Private BMPs / basins is discussed in III Regulation and Enforcement.</p>	<ul style="list-style-type: none"> • An inspection & condition assessment program will reveal the need to develop a strategy to repair or replace existing BMPs. 	<p><u>High LOS</u></p> <ul style="list-style-type: none"> • All BMPs operating as designed. • Develop an inventory of the Township owned BMPs, complete a basic condition rating, covering the system over 3 years. • Develop an inventory of the Privately owned BMPs, complete a basic condition rating, covering the system over 3 years. • Develop a retrofit prioritization project for all Township owned BMPs.

		<p><u>Medium LOS</u></p> <ul style="list-style-type: none"> Develop an inventory of the Township owned BMPs, complete a basic condition rating, covering the system over 5 years. Develop an inventory of the Privately owned BMPs, complete a basic condition rating, covering the system over 5 years. <p><u>Current / Basic LOS</u></p> <ul style="list-style-type: none"> Develop an inventory of the Township owned BMPs, complete a basic condition rating, covering the system over 8 years. Develop an inventory of the Privately owned BMPs, complete a basic condition rating, covering the system over 8 years. Continue current level of effort, making repairs as needed.
F. Stormwater System Maintenance Equipment	<ul style="list-style-type: none"> A “flush” truck for in-house ability to flush out the stormwater system as needed without the need to wait for contracting or continued sharing of equipment with other operations can enhance system maintenance. The purchase of a “vac” truck that would permit the DPW staff to perform inlet maintenance more frequently (to reduce flooding and sediment transport) A dedicated stormwater CCTV rig (truck and camera) would provide capability to complete an assessment of underground systems and maintain on-going inspection. Purchasing dedicated Stormwater Maintenance Equipment would decrease mobilization costs. Current spending is about \$ 10,000 per year to rent CCTV rig (for use with future paving projects). 	<p><u>High LOS</u></p> <ul style="list-style-type: none"> Purchase all three pieces of equipment, with dedicated staff for each using short term bank financing and pay back over a 5-year period. <p><u>Medium LOS</u></p> <ul style="list-style-type: none"> One large equipment acquisition, with other pieces rented/shared as currently done, with staff dedicated to newly acquired equipment. <p><u>Basic LOS</u></p> <ul style="list-style-type: none"> Purchase CCTV Rig Continue policy of rental and shared equipment as needed, including sharing a non-dedicated work force to operate equipment. <p><u>Current LOS</u></p> <ul style="list-style-type: none"> Continue policy of rental and shared equipment as needed, including sharing a non-dedicated work force to operate equipment.

II. STORMWATER COLLECTION SYSTEM CAPITAL IMPROVEMENTS

A. Drainage Inlets	<ul style="list-style-type: none"> • A more regimented inlet inspection program (developed in “I. O&M A. Drainage Inlets”) will reveal the need to develop a strategy to repair or replace 1,970 existing (aged) drainage inlets. • Current effort involves a four (4) person crew, at a duration of about 4 weeks per year • Efforts in the CIP are typically more involved than those covered in the lighter maintenance and repair under I.A • If inlet box condition is good, efforts may just be to replace inlet top and grate. 	<p><u>Medium / High LOS</u></p> <ul style="list-style-type: none"> • Develop a condition assessment based prioritization program to proactively rehab/replace inlets. <p><u>Current / Basic LOS</u></p> <ul style="list-style-type: none"> • Continue to rehab /replace inlets as needed (in advance of street projects).
B. Piping	<ul style="list-style-type: none"> • The Township has a Capital Improvements Plan, but it is not based on collected (pipe specific) assessment data. • Pipes are typically replaced in conjunction with a road projected and not based on pipe conditions. • Condition assessment of pipe and other collection infrastructure is needed to identify capital priorities (developed in “I. O&M B. Piping”). 	<p><u>High LOS</u></p> <ul style="list-style-type: none"> • Develop a condition assessment based prioritization program that evaluates the status of the collection system independent of or at a higher priority than roadway projects. Replace all CMP within 5 years. <p><u>Medium LOS</u></p> <ul style="list-style-type: none"> • Develop a condition assessment based prioritization program that evaluates the status of the collection system and potential roadway projects. Replace all CMP within 10 years. <p><u>Current / Basic LOS</u></p> <ul style="list-style-type: none"> • Continue to evaluate and rehab/replace pipes only in conjunction with anticipated roadway projects.
C. Curb Conveyance	<ul style="list-style-type: none"> • Curb repair, as related to stormwater conveyance, rarely requires anything more than minor repairs. • Condition assessment of curbs is needed to identify capital priorities (developed in “I. O&M C. Curb Conveyance”). 	<p><u>Current/ Basic LOS</u></p> <ul style="list-style-type: none"> • Continue to evaluate and rehab/replace curbs as needed.

D. Channels	<ul style="list-style-type: none"> Condition assessment of channels is needed to identify capital priorities (developed in "I. O&M D. Channels"). 	<p><u>Medium / High LOS</u></p> <ul style="list-style-type: none"> Develop a condition assessment based prioritization program that evaluates the status of the roadside and backyard ditches (flooding and erosion) that are in need to rehab/retrofitting. <p><u>Current LOS</u></p> <ul style="list-style-type: none"> Rehab/retrofit channels as needed.
E. BMPs / Basins	<ul style="list-style-type: none"> Clarification of roles and responsibilities for public/private systems may result in increased need for investment in basin repairs/rehabilitation. BMPs are inspected as part of the overall infrastructure inspection program which is resource limited (part-time employee). Condition assessment of existing BMPs is needed to identify capital priorities (developed in "I. O&M E. BMPs/Basins"). 	<p><u>High LOS</u></p> <ul style="list-style-type: none"> Develop a condition assessment based prioritization program that evaluates the status of the BMPs that are in need to rehab/retrofitting. Increase Private owned BMP inspection to approximately 50% a year (59 BMPs) Additional LOS linked to policy review and adoption regarding public and private facilities ("III. Regulation and Enforcement"). <p><u>Medium LOS</u></p> <ul style="list-style-type: none"> Develop a condition assessment based prioritization program that evaluates the status of the BMPs that are in need to rehab/retrofitting. Additional LOS linked to policy review and adoption regarding public and private facilities ("III. Regulation and Enforcement"). Increase BMP inspection to approximately 35% a year (41 BMPs). <p><u>Current / Basic LOS</u></p> <ul style="list-style-type: none"> Rehab/retrofit BMPs as needed. Continue to inspect approximately 20% of BMP's per MS4 Permit requirements. Inspect and document all publicly owned BMP's (23 total).

<p>F. Green Infrastructure (BMPs)</p>	<ul style="list-style-type: none"> Increasing inventory of BMPs not associated with the PRP Projects could include additional retrofits of existing municipal BMPs and neighborhood projects (such as rain barrel installation). The Township has conducted a “tree survey” to inventory street trees and urban tree canopy. 	<p><u>High LOS</u></p> <ul style="list-style-type: none"> Develop an enhanced prioritization program to identify & implement locations for new municipal BMPs with a goal of a 10% runoff volume reduction in five years. Implement streetscape program to increase tree canopy by 20% in five years. <p><u>Medium LOS</u></p> <ul style="list-style-type: none"> Develop a simple prioritization program to identify locations for new municipal BMPs with a goal of a 5% runoff volume reduction in five years. Implement streetscape program to increase tree canopy by 15% in five years. <p><u>Basic LOS</u></p> <ul style="list-style-type: none"> BMPs provided only as part of PCSM Plans for new development. Develop a streetscape program with a goal to increase tree canopy by 5% in five years. <p><u>Current LOS</u></p> <ul style="list-style-type: none"> BMPs provided only as part of PCSM Plans for new development.
<p>III. REGULATION & ENFORCEMENT</p>		
<p>A. Private Stormwater Facility O&M</p> <p>Clarification of roles and responsibilities for Township and private owners should be reviewed</p>	<ul style="list-style-type: none"> One of the prominent issues throughout Ferguson is a lack of maintenance on some privately owned (orphaned) BMPs that can result in fines, often on one ‘owner’ that is managing the structure on behalf of multiple lots. Failure to maintain facilities causes the Township to lead the effort to perform needed maintenance given that in some instances, public street runoff is entering the facility. Determine impacts of public drainage on private system as part of the definition of roles and responsibilities. 	<p><u>Medium / High LOS</u></p> <ul style="list-style-type: none"> Establish a working group to define new policy to provide Township services on privately owned facilities, with the Township providing routine maintenance and rehabilitation services where runoff is from public areas / streets and rights-of-way only. Develop an inventory of all Private BMPs with O&M agreements, photos, and other information attributed in GIS.

	<ul style="list-style-type: none"> Determine financial impacts for public services, staffing and evaluate local rules and regulations to determine if amendments are required. Use the clarification of roles and responsibilities between public and private owners of drainage infrastructure to refine maintenance agreements between the two. 	<u>Current / Basic LOS</u> <ul style="list-style-type: none"> Maintain current policy of private owner responsibility for operation and maintenance of stormwater facilities receiving runoff from private area(s). Enforce current policy.
B. Public Stormwater Facility O&M	<ul style="list-style-type: none"> There are some publicly owned stormwater facilities. The Township has tried to align stormwater facility location (and maintenance) to public use / recreation sites. Service level (frequency of maintenance for example) should be explicitly defined between public and private roles and responsibilities. Street Sweeping program to be accounted for in Curb Conveyance section. 	<u>Medium / High LOS</u> <ul style="list-style-type: none"> Develop an inventory of all Township BMPs with O&M agreements, photos, and other information attributed in GIS. <u>Current / Basic LOS</u> <ul style="list-style-type: none"> Inspect and document all publicly owned BMP's (23 total).
C. Permit Compliance (MS4)	<ul style="list-style-type: none"> The MS4 permit outlines that the Township will perform various "core" activities, generally in 6 predefined areas. Using clarified roles and responsibilities, the Township is in better position to define Best Practices that comply with MS4 requirements for good housekeeping responsibilities as well as oversight of private systems. 	<u>Basic LOS</u> <ul style="list-style-type: none"> Continue to conduct activities and programs as needed to meet permit obligations.
D. Permit Compliance (PRP) The Township participates in a "regional" Pollutant Reduction Plan that is being prepared by a consultant with collaboration between MS4 within the region. The draft version is currently under review and scheduled for a public meeting.	<ul style="list-style-type: none"> Initial reductions for the PRP are tied to a 10% goal for the first five-year cycle (of the renewed permit) for reduction of sediment, phosphorus, and nitrogen contribution from the permitted urban area. Expectation is that subsequent permit cycles will require additional reductions. The Township will contribute a combined 5-year total of approximately \$500,000 for design, permitting and construction towards projects that result in the implementation of the PRP (once approved by PA DEP). Planning beyond the five-year permit period is important (e.g., ensure that future goals can be met and that investments are made in the drainage system to optimize impacts and pollutant reductions). 	<u>Basic LOS</u> <ul style="list-style-type: none"> Continue to conduct activities and programs as needed to meet permit obligations.

E. Outfall Screening (Illicit Discharge)	<ul style="list-style-type: none"> • The Township currently conducts their own screening of the 126 outfalls that are regulated per the MS4 Permit (as part of the Illicit Discharge Detection and Elimination Program). • Inspections are conducted using part time staff (20 hours per week). • Outfall Screenings are not performed using GIS data collection methods (i.e. electronic forms that attribute the system map). • Township maintains written program for detection of illegal discharges to the regulated public drainage system, including protocols for detection and removal of such. 	<p><u>High LOS</u></p> <ul style="list-style-type: none"> • Increase screening outfalls to a rate of 100% per year (entire system is screened five times over a five-year period). • Include additional outfalls to screening list <p><u>Medium LOS</u></p> <ul style="list-style-type: none"> • Increase screening outfalls to a rate of 40% per year (entire system is screened twice over a five-year period). • Include additional outfalls to screening list <p><u>Current / Basic LOS</u></p> <ul style="list-style-type: none"> • Continue screening outfalls at a rate of 20% per year (entire system is screened over a five-year period).
F. Post Construction Management	<ul style="list-style-type: none"> • Alignment of roles and responsibilities can provide the Township clarity of regulatory oversight for development impacts on drainage and water quality. • Township is required to inspect all private facilities to ensure performance is sustained and the facility (BMP) is maintained. • Township must maintain a written program for oversight of BMPs, including local authority to do so. • Township is to promote LID (low impact development – Green Infrastructure) for private land development. 	<p><u>High LOS</u></p> <ul style="list-style-type: none"> • Continue inspection at a rate of 100% per year (entire inventory is inspected five times over a five-year period). • Prepare and enact revisions to Ordinances that mandate LID techniques and establish criteria for their use, design, and construction. <p><u>Medium LOS</u></p> <ul style="list-style-type: none"> • Continue inspection at a rate of 40% per year (all facilities are screened twice over a five-year period). • Prepare and enact revisions to Ordinances that mandate LID techniques and establish criteria for their use, design, and construction. <p><u>Current / Basic LOS</u></p> <ul style="list-style-type: none"> • Continue inspection at a rate of 20% of all private facilities a year. • Continue with Ordinances that only “encourage” use of LID.

IV. STORMWATER PROGRAM ADMINISTRATION

<p>A. Stormwater Staffing</p> <p>Stormwater staffing resources allows the Township to meet the current LOS within the existing Stormwater Program. Additional or increased LOS will require an evaluation of current and future staffing as a consequence of future LOS desires and Township goals.</p>	<ul style="list-style-type: none"> The role of Permit Administrator is shared between the Township Engineer and a part-time (approx. 20hrs/week) Stormwater Inspector. Township expressed interest in growing this position to a full time (40 hours per week) Stormwater Program Coordinator position to assist with MS4 permitting responsibilities. Dedicated maintenance staff for system inspections including CCTV can enhance response time and obtain needed infrastructure condition assessment. <p>Additional stormwater related efforts conducted by the Township:</p> <ul style="list-style-type: none"> GIS specialist: maintains the system map, including ensure all data is developed on a consistent and timely manner. Coordination of Land Development Planning with PSCM Plan Review. Currently Public Education is largely handled by the Township Engineer. Program could include this as a responsibility under the scope of full time Stormwater Program Coordinator. Community engagement with organizations such as Master Gardeners provides a broader outreach and education effort. Social media and website is used by Township for digital communication/education. Township is required to the education of the community and employees for identification and elimination of illegal connections to the drainage system as well as issues such as prevention of non-stormwater entering the system. 	<p><u>Basic / Medium / High LOS</u></p> <ul style="list-style-type: none"> To be evaluated in an impact study of the desired LOS for the various Stormwater activities. <p><u>Current LOS</u></p> <ul style="list-style-type: none"> Continue to split the Permit Administrator role between the Township Engineer and part time Stormwater Inspector. Evaluate the Stormwater Inspector position commitment against the targets set for the Township to determine if additional hours are required in this position.
<p>B. Partnering</p>	<ul style="list-style-type: none"> Township partners with various local governments as well as Centre County Conservation for permit compliance. Operating agreements may need review to ensure expanded permit requirements are being met. Roles and responsibilities between partners is less formal for some activities and specifically defined in memorandums of understanding. Various permit elements require public education. Partners can play a key role. 	<p><u>Current / Basic LOS:</u></p> <ul style="list-style-type: none"> Maintain current partnerships and continue to identify opportunities to share responsibilities when advantageous to the Township.