

*Looking Ahead:
Keeping Green Infrastructure Viable*

January 23, 2017



River City



Pilot Project Background Information

- Located only in street rights-of-way
- Primarily residential areas
- Some commercial frontage
- Uses a variety of technologies
- Some have underground storage pipes

1,100
Linear Feet
Permeable Pavers



4,300
Linear Feet
Porous Sidewalk



67
Rain Gardens



2
Cascade
Rain Gardens



28
Curb Extension
Rain Gardens

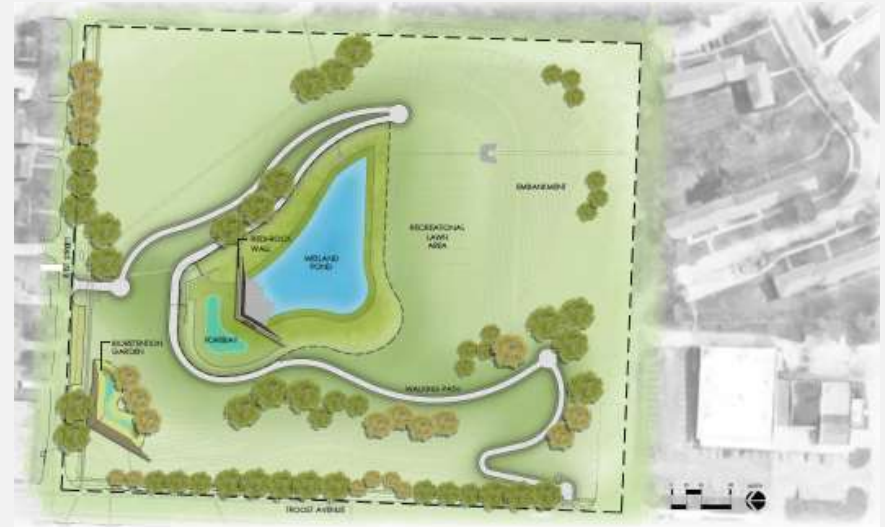


36
Bioretention
Rain Gardens



Middle Blue River Basin

- Taking a modified approach in remainder of basin – under construction now
- Stormwater is being routed to green infrastructure in Parks, vacant parcels, and city parcels
- Includes some street rights-of-way where larger lots weren't available



Utility Work

- Utility work is an **unpredictable maintenance variable**
- Especially true in street rights-of-way
- Let's follow the path of the mud...



One Call Notifications

- Missouri One Call
- Polygons placed around green infrastructure features
- Email notifications received whenever excavation tickets are created
- Contact made with excavator to coordinate
- Ticket status added in online system (no conflict, maps uploaded, etc.)
- www.searchandstatus.com option

MISSOURI ONE CALL				
ROUTINE				
Ticket No:	170111750			
Request Date:	1/11/17	Time:	2:20 PM	Type: CALL
Work to Begin Date:	1/14/17	Time:	12:00 AM	
Send To:	KCWAT01	Seq No:	5	Map Ref: MBR GREEN INF PILOT PROJ
Link To Map for KCWAT01				
CALLER INFORMATION				
Caller Name:		Phone:		
EXCAVATOR INFORMATION				
Excavator Name:		Phone:		Rec: Y
Address:				
Cell Number:		Fax Number:		
Contact Email:				
Onsite Contact:		Phone:		
EXCAVATION INFORMATION				
Type of Work:	REMOVE STUMP			
Equipment:	STUMP GRINDER			
Work Done For:				
Trenchless Excav: N	Explosives: N	Area Marked: H	Depth: 3FT	
LOCATION INFORMATION				
County:	JACKSON			
City:	KANSAS CITY	City Limits:	Y	
Address:	1123 E 76TH ST			
Between:	TROOST AVE	and	LYDIA AVE	
Location of Work:				
MARK FRONT OF PROPERTY. CALL [REDACTED] BEFORE MARKING BEGINS SO HE CAN POINT OUT AREA.				
Remarks:				
Map Coord NW Lat:	38.9895072	Lon: -94.5749228	SE Lat: 38.9888849	Lon: -94.5744704
Map Twp:	48N	Rng: 33W	Sect-Qtr:	16-NW
MEMBERS NOTIFIED				
DISTRICT	COMPANY NAME	UTILITY TYPE		
ATT401	ATT DISTRIBUTION	TEL		
GOOGL02	GOOGLE FIBER	FO		
KCWAT01	KC GREEN INFRASTRUCTURE	SD,SS		
KJ	MISSOURI GAS ENERGY	G		

One Call Notifications

- Each notification costs about \$1.50 plus staff review and coordination time
- For current projects, about 25 notifications received per month

LOCATOR
TICKET MANAGEMENT

ONE CALL CONCEPTS
When safety is on the line.

ISITE HomeContactHelpAdminReportsChat

Map TicketsPrint TicketsBatch Process Tickets

No unviewed emergency tickets
iSite User:

Change Current Display
Ticket Set: Tickets without Responses
Districts: MO - KCWAT01 (KC GREEN INFRASTRUCTURE)
Refine Search: Select Field = +
Date Received Between: 12/13/2016 and 01/13/2017

Unviewed Emergency Viewed Emergency Priority Meeting Past Due Locked Renewal

3 ticket records found.

Tickets for District All
(12/13/2016 to 01/13/2017)

<input type="checkbox"/>	# ↑↓	Begin ↑↓	Header ↑↓	Street ↑↓	City ↑↓	District ↑↓	Loc ↑↓	Company Name ↑↓	Status ↑↓
<input type="checkbox"/>	170120366	01/18/2017 00:00	RENEWAL	PASEO BLVD	KANSAS CITY	KCWAT01			Not yet responded
<input type="checkbox"/>	170111750	01/14/2017 00:00	ROUTINE	1123 E 76TH ST	KANSAS CITY	KCWAT01			Not yet responded
<input type="checkbox"/>	170111857	01/14/2017 00:00	ROUTINE	E 31 ST	KANSAS CITY	KCWAT01			Not yet responded

One Call Notifications

- Includes a map showing our polygon (blue) and excavation area (red)



One Call Notifications

- Set up takes time at first
- Missouri One Call has been very accommodating of this new use
- Don't create polygons around projects under construction...leads to MANY unneeded notifications
- Education/outreach opportunity for each and every ticket
- Without a notification, it would have taken more time to figure out who caused this...



One Call Notifications

- To get it repaired like this...



Maintenance Costs & Planning

- Approximately \$1 to \$2 per square foot per year to maintain the pilot project
- Clearly define expectations and responsibilities for maintenance



Green Infrastructure Monitoring



Pilot Green Infrastructure Results

- Improved water quality
- Repair of 75-year old sewers to “like new” condition
- Traffic calming through installation of curb extensions
- Replacement of dead or ailing street trees
- Replacement of sidewalks, curbs, and street resurfacing south of 75th Street

Pilot Project Results

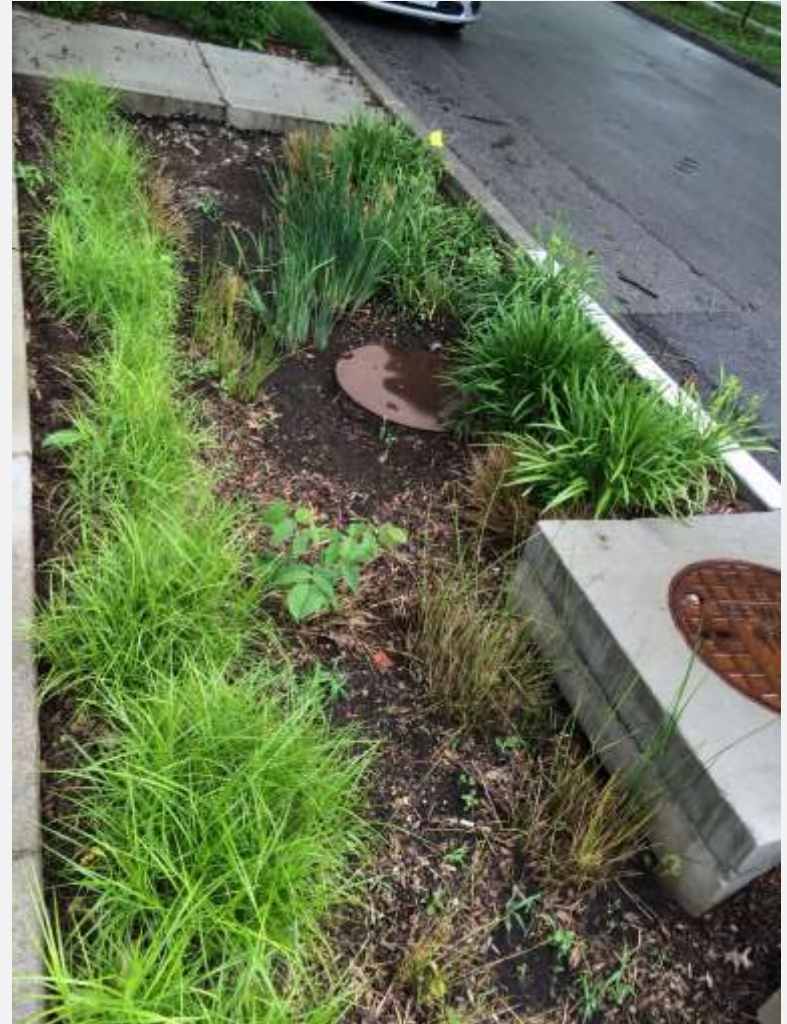


Visual & Scientific Monitoring

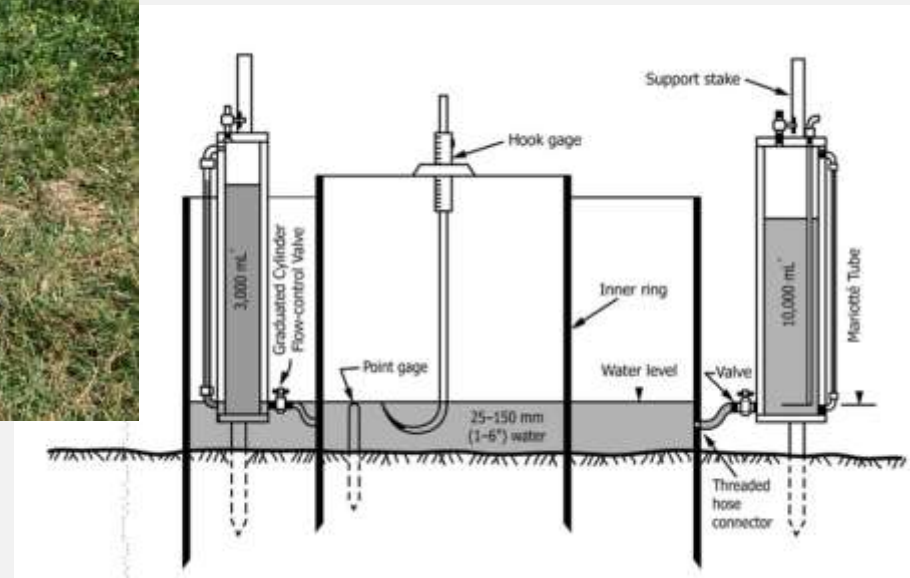
- Visual – Standing water, plant growth, erosion, settlement
- Scientific – Double Ring Infiltrometer (ASTM D3385-09)



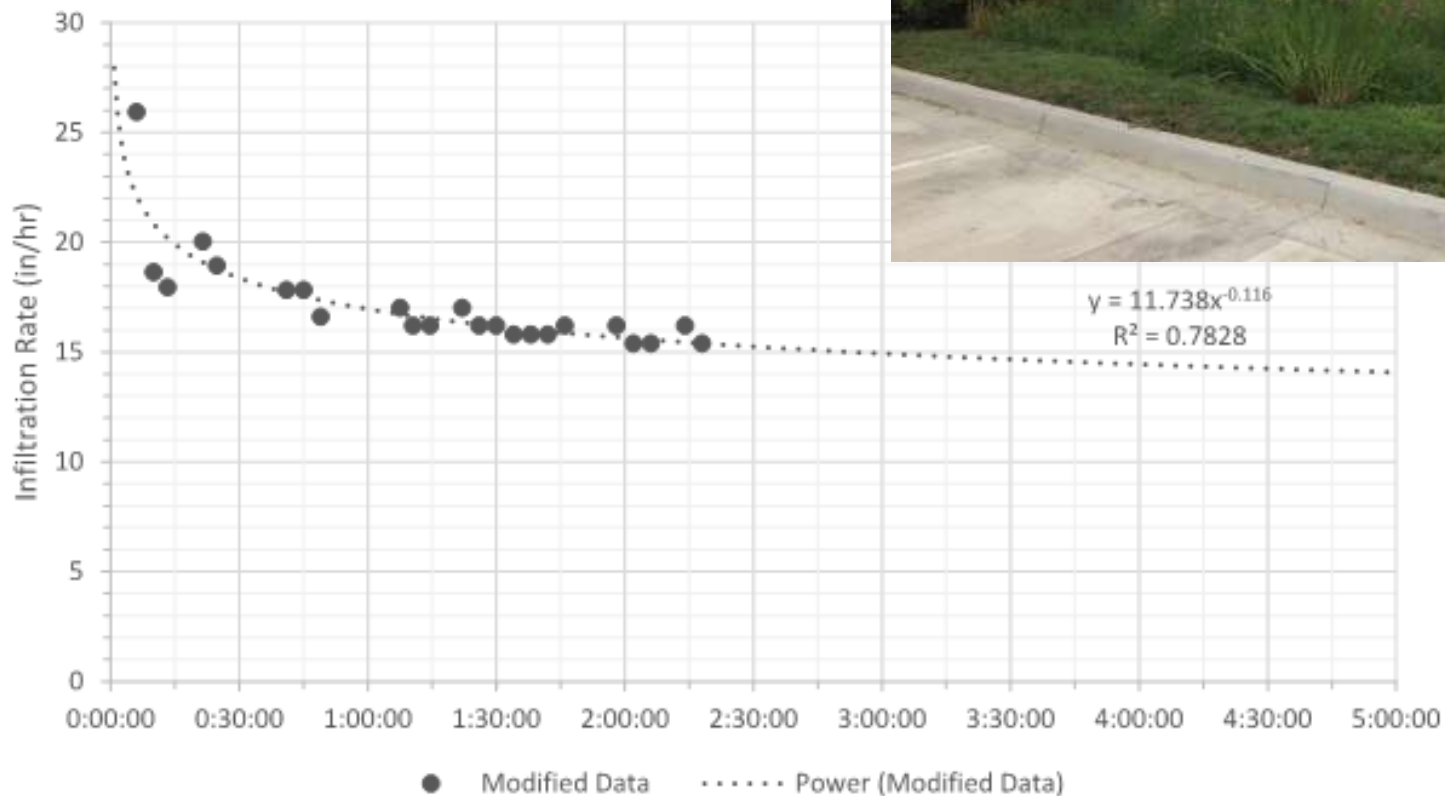
Visual Observations: Erosion/Settlement



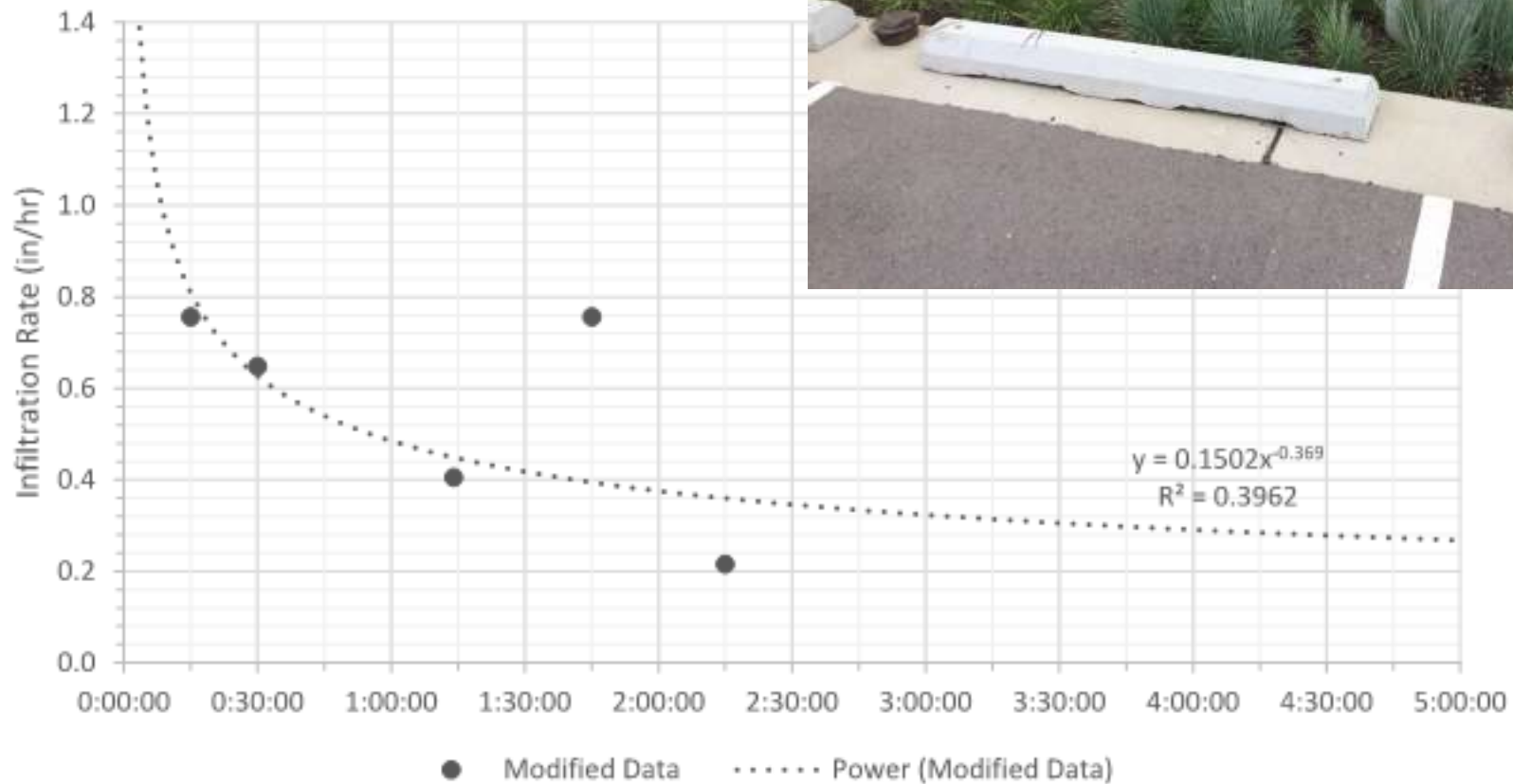
Double Ring Infiltrometer



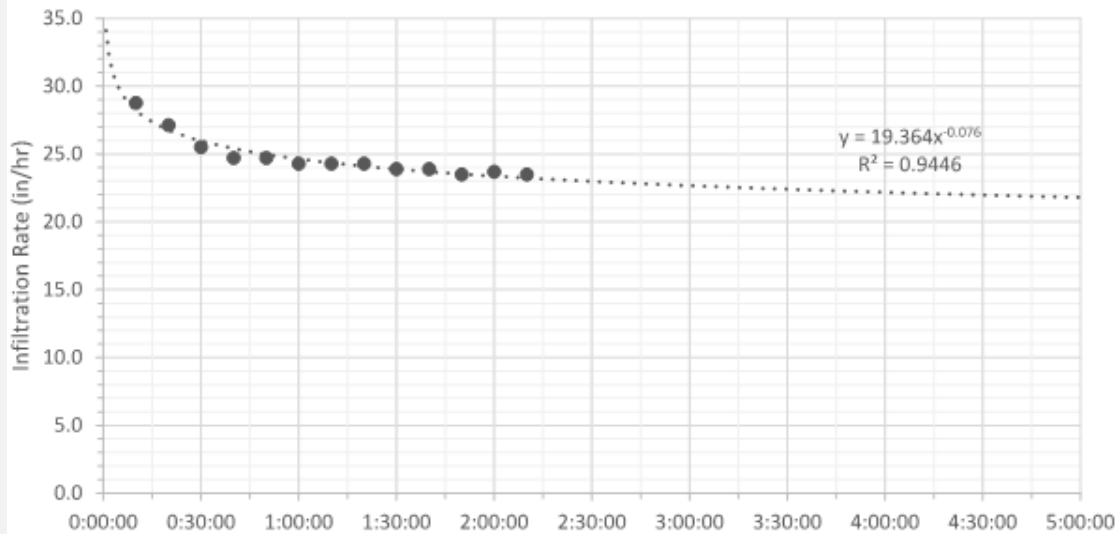
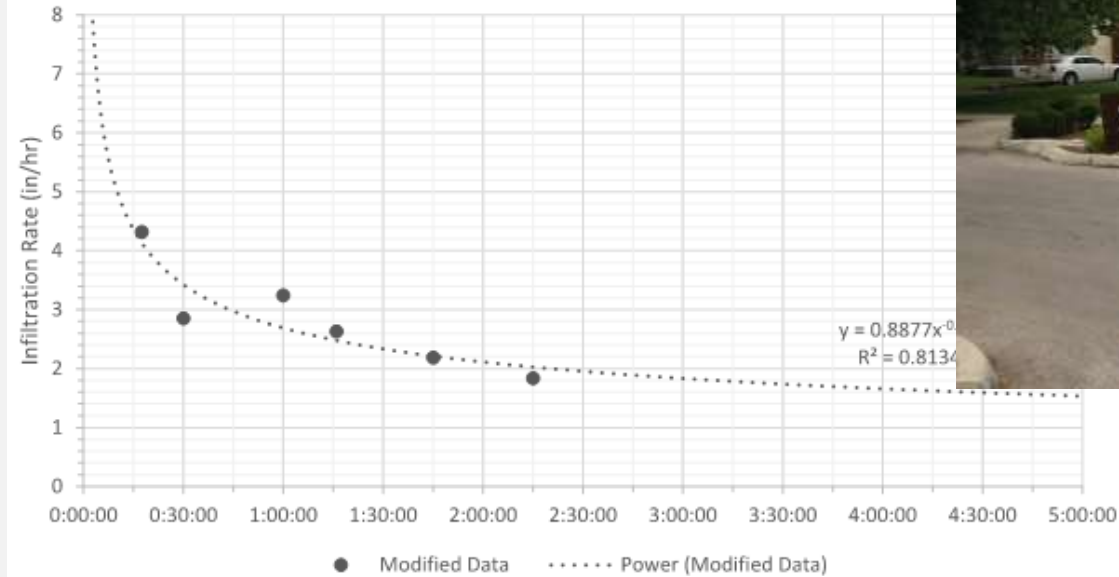
Rain Garden Infiltration



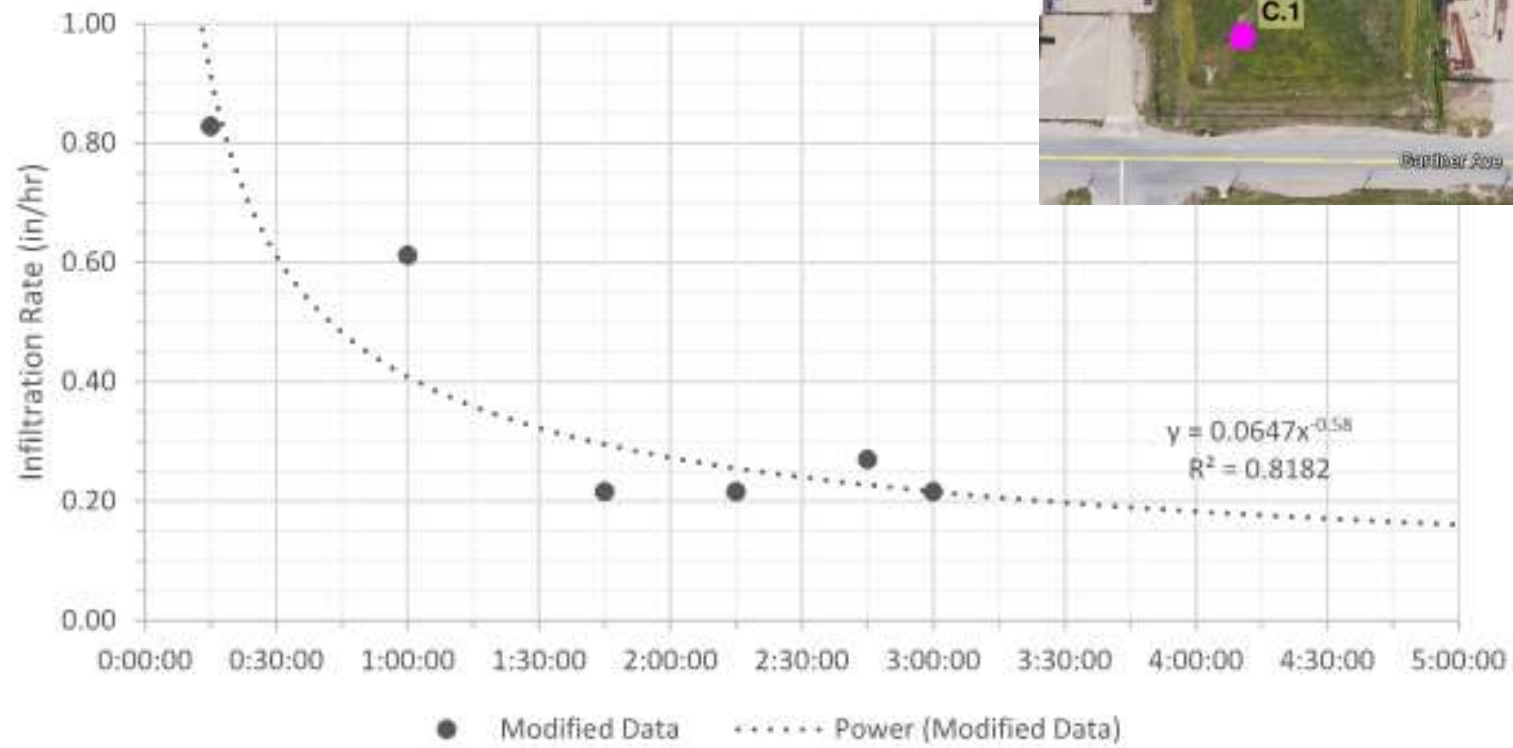
Bio-Swale



Bioretention



Dry Detention



Outcomes of Monitoring

- Retrofits to forebays



Future Monitoring

- **2017 Monitoring Plan**

- Monitor Same Locations to Track Temporal Effects
- Expand Locations to Include New GI Locations
- Test Other Infiltration Monitoring Methods vs. Double Ring

- **Evaluate Other Monitoring Methods**

- Soil Moisture and Temperature Sensors
- Ponding Depth and Drawdown Rates
- Still Photos and/or Digital Cameras
- Real-time and/or online data



Contact Information



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THANK YOU.

