Meeting Notes – Workshop 5

Project:	CR STORM WATER MASTER PLAN
Subject:	Project Team Meeting
Date:	Wednesday, January 27, 2016
Attendees:	Garrett Prestegard, David Wallace, Jonathan Durst, Sandy Pumphrey, Loren Snell, Ryan Bemrich, Terry Tiedemann, Brock Holub, Cara Matteson, Jim Greene, Mike Kuntz, Michael Butterfield, David Dechant, Mike Schubert

Agenda

Objectives

- Review and discuss model implications of Capital Improvements Plan
- Follow up on Policy Recommendations
- Overview of Future Considerations and Financial Needs

Stormwater Master Plan Development

- Refresh Master Plan Goals
    - Phase 1 - Prioritization criteria and list for FY2017
    - Phase 2 - Develop a model for broader analysis of problems and project solutions
    - Phase 3 - Develop a living document to be integrated with annual capital improvements planning
- TM Status
    - Final FY 2017 CIP Summary TM - complete.
    - TM 1.0 - Existing System refined and resubmitted November 23
    - TM 2.0 - Asset Management submitted / Comments December 11
    - TM 3.1 - Macro Modeling submitted November 30 / Comments December 21
    - TM 3.2 - Basin Modeling submitted January 14
    - TM 6.0 – Policy Recommendations submitted January 14 / Comments January 25
    - TM 7.0 – Future Considerations submitted January 25
    - TM 5.0 – Financial Plan submitted January 26
    - TM 4.0 – Capital Improvements Plan anticipated mid February
    - Executive Summary TM – anticipated submittal early March
    - Draft Plan – anticipated submittal early March
    - Final Documents – anticipated submittal late April
- Capital Improvements Plan Refinement
    - Kenwood Basin Model – Improvements Discussion
    - Macro Model – Improvements Discussion
- Policy Recommendations
    - Questions on Comments
- Future Considerations
    - Overview

- Financial Needs
    - Overview
    - Recommendations
    - Info Needs
- Set Date for Workshop 6
    - Week of March 14 or 21?

Meeting Discussion

Several first time participants were introduced. HDR reviewed the meeting objectives, master plan goals, and status of deliverables.

It was noted that there have been multiple dollar figures in the press on the total potential capital need. It was clarified that the original figure of $50 million was based on issues identified as a result of the June 2014 flash flood event plus other projects already in the CIP. Going forward, a total need of $50 million to $100 million is anticipated as modeling identifies additional needs not reflected in the current CIP.

Public roll-out of the Stormwater Master Plan was discussed. The City will determine a plan internally and discuss with HDR what assistance might be needed. A public open house will likely be held.

It was also discussed that a meeting to brief Streets and Development Services on the results of the Macro Model would be beneficial in terms of looking for opportunities to integrate stormwater with other needs.

Capital Improvements Plan Refinement

HDR is using the results of the Kenwood Basin modeling to formulate ways to assess validity and priority of existing CIP projects in the basin. Sticking with the concept of the master plan as a living document, HDR is using the Kenwood Basin model to develop a strategy for CIP development from model results. The strategy includes consideration of a variety of project approaches and a methodology for determining solutions. Project approaches include green infrastructure, local or satellite detention, regional detention, and conveyance improvements. The strategy is intended to provide an overall holistic view for each basin so that solutions for various problem areas compliment each other when/where possible and entail more than simply providing additional conveyance capacity.

- The Kenwood Basin was subdivided into 20 project areas. Basin catchments, soil types, and bottleneck segments found in the preliminary results were all used to determine boundaries for project areas. Data already in the model provided characteristics for each problem area.
- The model does not account for curbs. While this is somewhat of a conservative approach, it is potentially representative of many areas that either do not have curbs or have had asphalt overlays that effectively reduce the curb height.

- Cedar Lake was added to the model following Workshop 4 to simulate how it is impacted by storm flows from Kenwood Basin.
- Green infrastructure is generally more reliable for and targeted at water quality benefits than it is for reducing water quantity. While it can still be beneficial to reducing storm water runoff, it would generally not be prudent to rely on green infrastructure as the primary approach at a master planning level.
    - The best locations for green infrastructure are areas with suitable soil types and an opportunity to convert impervious surfaces to pervious areas. Much of the basin does not have soil types conducive to infiltration.
    - The soil profiles south of 2nd Avenue along 15th and 16th Streets SE could be suitable for green infrastructure. The suitable soils may enable volumetric benefits to the area of A & B Avenues at 15th Street NE.
    - Funding mechanisms to incentivize a stronger approach to green infrastructure on private property should be considered. Similar to private source I&I reduction, there could be a public benefit to green infrastructure related improvements that reduce stormwater runoff from private property, thereby justifying use of public money.
- In examining basins, consideration should be given to opportunities for catchment cross-connections that may relieve a bottleneck.
- HDR presented a spreadsheet showing a screening process and a measles chart that identifies areas suitable for the various project approaches. The tables and charts used for the screening include assumptions identified by HDR to help the process; these assumptions include, for example, identifying 3-acre private parcels with 50% or more impervious area as potential targets for local detention. Adjusting these assumptions during future efforts could yield different results. HDR will include a list of assumptions in the Capital Improvements Plan TM. HDR agreed to provide mapping showing the location of potential detention sites identified.
- The screening process demonstrated that no one approach, green infrastructure, detention, conveyance, is a “silver bullet” with respect to the problems in the Kenwood Basin.
- There was discussion of the 5 year nested 24 hour design storm event and whether it might be too conservative. It was agreed that HDR will spot check some of the modeled predicted peak flows relative to simple rationale formula predicted peak flows.
- Using the proposed strategy to develop or refine stormwater policies was discussed. Example policy considerations discussed included:
    - The level of design storm, duration, and type of storm for the various project types; potentially a different storm for detention projects, green infrastructure, or conveyance and considerations on impacts outside the public right-of-way. More particularly, whether or not a 5 year nested 24 hour design storm event is appropriate for conveyance. Additionally, green infrastructure for infiltration and water quality would normally be designed to capture a smaller storm event (1.25 inches).

    - Using various design storms and durations to assess the severity of an issue and establish priorities. In other words, is property damage incurred during a 1- or 2-year nested storm, 5-year, 10-year, or larger? Does a conveyance bottleneck occur under a 1-year nested storm, 5-year, 10-year, or larger?
- The screening process includes a "volume accounting" worksheet to show potential volume reductions by various project types and the volume remaining the may require conveyance improvements. It was discussed through this that upstream solutions may have downstream benefits. Something specific to consider in subsequent modeling is how a detention basin near the Rockwell Collins facility at 35th Street NE would benefit the system downstream.
- Basic order-of-magnitude unit costs need to be developed for the strategies to assess potential overall costs. HDR will identify unit costs for conveyance ($ per inch-diameter per linear foot), detention ($ per acre-foot), and green infrastructure ($ per SF for rain gardens or $ per LF for bioswales).

There was discussion as to how the macro model should be used to inform the current CIP. Until the individual basin models are completed, the CIP will remain as previously developed. The macro model will identify the relative magnitude of potential additional needs and inform the prioritization of basins for basin model development. HDR agreed to provide shape files for the approximately 20 basins.

Policy Recommendations
Anderson-Bogert acknowledged receipt and briefly discussed City comments on TM 6.0 Policy Considerations. The City agreed to send copies of several policy drafts (Private I/I, Stormwater ERU, and Topsoil).

Future Considerations
HDR presented a very brief overview of the Future Considerations TM that was submitted in January 2016. Both the MS-4 and GP-2 permits can be found on the City's website.

Financial Needs
HDR presented an overview of the Financial Needs TM that was submitted in January 2016. Impacts of the Matrix report recommendations were discussed. The City indicated that the report recommended capital equipment expenditures that would likely occur this current fiscal year. Some recommendations, such as annual cleaning of every storm inlet, remain under consideration and would have a significant O&M cost. The full financial impact of the Matrix report is still to be determined.

Workshop 6
The City will send a meeting invite for Workshop 6 the week of March 14 or 21.

Action Items

1. HDR (Mike B. and Mike S.) and the City (Garrett P.) will set up a meeting to brief Streets and Development on the results of the Macro Model.

2. HDR (Mike S.) will send data on the watersheds and basin configurations to Ryan B.
3. City will consider public communications/open house as master plan nears completion.
4. HDR (Mike S.) will send list of sites (GIS) identified in the Kenwood screening for satellite/local detention to the City.
5. HDR will use the rational method to spot-check the catchments against model predictions.
6. HDR (Mike S.) will send a list of assumptions used in the screening & measles chart.
7. City (Garrett P.) send Anderson-Bogert copies of several policy drafts (Private I/I, Stormwater ERU, and Topsoil).
8. HDR (Dave D) will locate copies of the City's MS-4 and GP-2 permits from the City's website.
9. City (Garrett P.) will send a meeting invite for Workshop 6.

I. SCOPE OUTLINE

A. TASK SERIES 100 – PROJECT MANAGEMENT

Task 110 – Team Management and Project Control
Task 120 – Project Initiation
Task 130 – Project Management Plan
Task 140 – Quality Control

PHASE 1 – FY 2017 CIP Development

B. TASK SERIES 200 – PHASE 1 – FY 2017 CIP DEVELOPMENT

Task 210 – Collect and Review Available Information
Task 220 – Draft Stormwater Master Plan Outline
Task 230 – Workshop 1
Task 240 – Site Visits, Alternative Evaluation, Concept Refinement
Task 250 – Develop/Confirm Costs and Preliminary Priorities
Task 260 – Draft FY 2017 CIP TM
Task 270 – Workshop 2
Task 280 – Finalize FY 2017 CIP Summary TM

PHASE 2 – Stormwater Master Plan

C. TASK SERIES 300 – EXISTING SYSTEM

Task 310 – Compile and Review Existing Background Information
Task 320 – Regulatory Summary
Task 330 – Watershed Summary
Task 340 – Existing System TM

D. TASK SERIES 400 – ASSET MANAGEMENT

Task 410 – Summary of Stormwater Assets
Task 420 – Condition Assessment
Task 430 – Level of Service
Task 440 – Maintenance Levels
Task 450 – Asset Management Plan Improvement Recommendations
Task 460 – Asset Management TM

E. TASK SERIES 500 - HYDRAULIC INVESTIGATION

Task 510 – Model Selection
Task 520 – Critical Area Identification
Task 530 – Hydraulic Model Development
Task 531 – Data Cleanup
Task 532 – Macro-Scale Model Development
Task 533 – Identify System Deficiencies
Task 540 – Workshop 3
Task 550 – Critical Basin-Scale Model Development
Task 560 – Field Investigations
Task 570 – Model Validation
Task 580 – Alternatives Analysis
Task 590 – Workshop 4

F. TASK SERIES 600 – CIP IMPROVEMENTS PLAN

Task 610 – Recommended Projects
Task 620 – Project Prioritization
Task 630 – Workshop 5
Task 640 – Documentation

G. TASK SERIES 700 – TEN YEAR FINANCIAL PLAN

Task 710 – Summary of Expenses
Task 720 – Estimated Cash Flow Projection
Task 730 – Revenue Options
Task 740 – Financial Plan

H. TASK SERIES 800 – POLICY RECOMMENDATIONS

Task 810 – Current Policies and Planning Goals
Task 820 – Floodplain Management
Task 830 – Green Infrastructure BMPs
Task 840 – Future Policies
Task 850 –Policy TM

I. TASK SERIES 900 – FUTURE CONSIDERATIONS

Task 910 – Development and Growth
Task 920 – Regulatory/Water Quality Changes
Task 930 – Maintenance Procedures
Task 940 – Watershed Management Considerations
Task 950 – Stormwater Master Planning

J. TASK SERIES 1000 – STORMWATER MASTER PLAN

Task 1010 – Stormwater Recommendations Summary
Task 1020 – Executive Summary
Task 1030 – Draft Plan
Task 1040 – Workshop 6
Task 1050 – Final Plan

Stormwater Master Plan

Workshops

1 Kickoff Meeting Phase 1 and 2
2 Review Draft FY 2017 CIP TM
  Discuss Existing System
  Discuss Model Selection / Development
3 Macro Level Model Results
  Initiate Basin Level Model
  Discuss Asset Management
4 Basin Level Model Results
  Discuss Financial Planning
  Discuss Policy Consideration
  Discuss Future Considerations
5 FY18 Capital Improvements Plan
  Financial Plan
  Policy Consideration
  Future Considerations
6 Executive Summary
  Draft Plan

Stormwater Master Plan

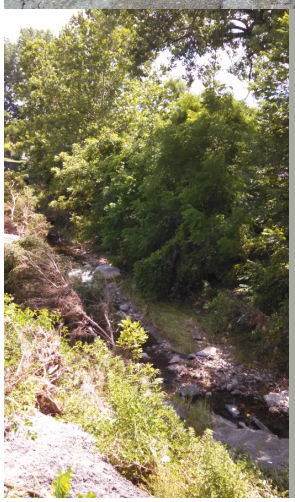
Table of Contents

Executive Summary
TM 1.0 – Existing System
TM 2.0 – Asset Management
TM 3.1 – Macro-Scale Model Results
TM 3.2 – Basin Scale Modeling Results
TM 4.0 – Capital Improvements Plan
TM 5.0 – Financial Plan
TM 6.0 – Policy Recommendations
TM 7.0 – Future Considerations

Stormwater Master Plan

Table of Contents

Contract Approval	June 9, 2015
Task Series 100 Project Management	June 24, 2016
Task Series 200 – Phase 1 – FY 2017 CIP Development Draft Technical Memorandum	**August 21, 2015**
Task Series 200 – Phase 1 – FY 2017 CIP Development Complete	**September 4, 2015**
Task Series 300 – Existing System Draft Technical Memorandum	September 25, 2015
Task Series 400 – Asset Management Draft Technical Memorandum	January 8, 2016
Task Series 500 – Hydraulic Investigation Draft Technical Memorandum	January 29, 2016
Task Series 600 – CIP Improvements Plan Draft Technical Memorandum	February 19, 2016
Task Series 700 – Ten Year Financial Plan Draft Technical Memorandum	February 19, 2016
Task Series 800 – Policy Recommendations Draft Technical Memorandum	February 5, 2016
Task Series 900 – Future Considerations Draft Technical Memorandum	February 5, 2016
Task Series 1000 – Stormwater Master Plan Draft Executive Summary	**March 4, 2016**
Task Series 1000 – Stormwater Master Plan Complete	**June 3, 2016**



Stormwater Master Plan Workshop 5

CIP Development
January 26, 2016

HDR

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01 OBJECTIVES

02 APPROACH

03 EVALUATION

04 DISCUSSION

01 OBJECTIVES

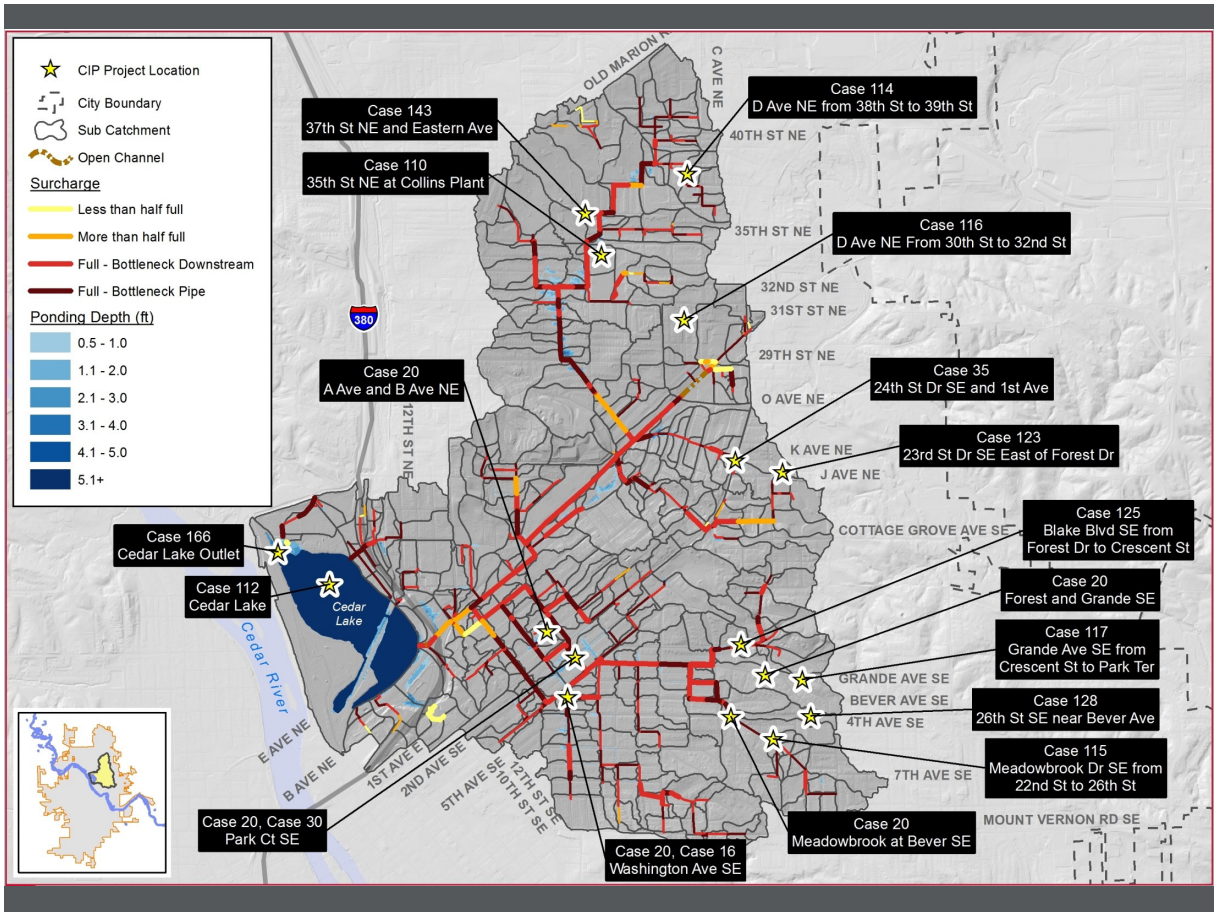
STORMWATER MASTER PLAN UPDATE TASKS

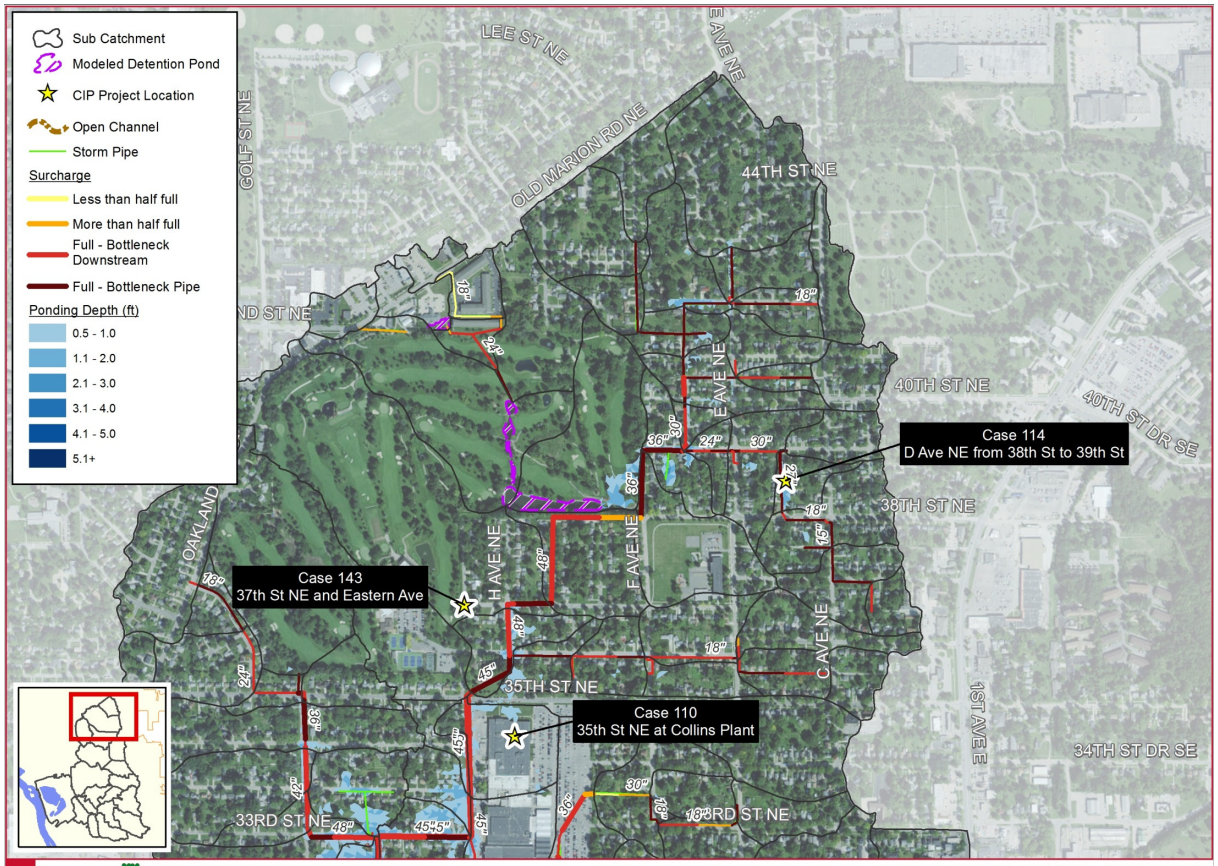
- Phase 1
  - FY 2017 CIP Development
- Phase 2
  - Existing System Summary
  - Asset Management
  - Hydraulic Investigation
  - **CIP Improvement Plan**
  - Ten Year Financial Plan
  - Policy Recommendations
  - Future Considerations

02 APPROACH

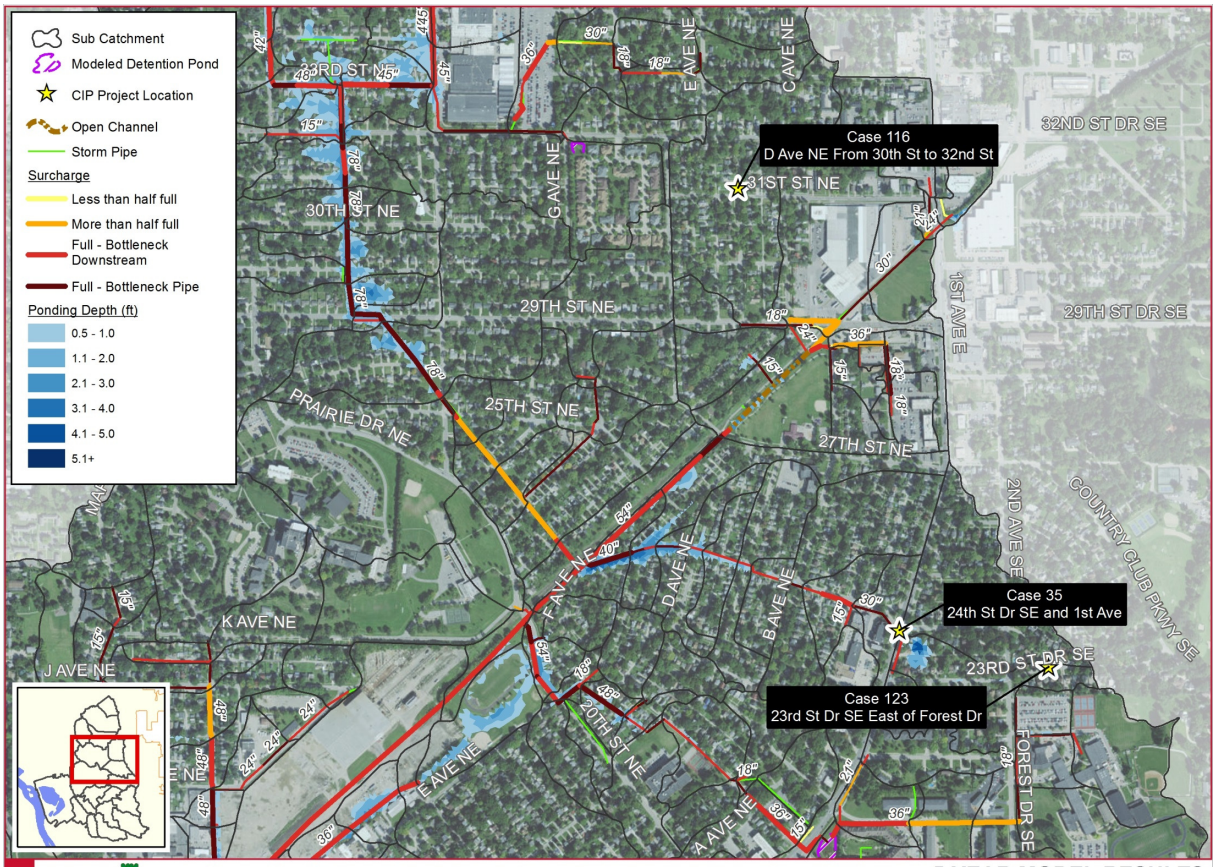
Applying Basin Modeling Results

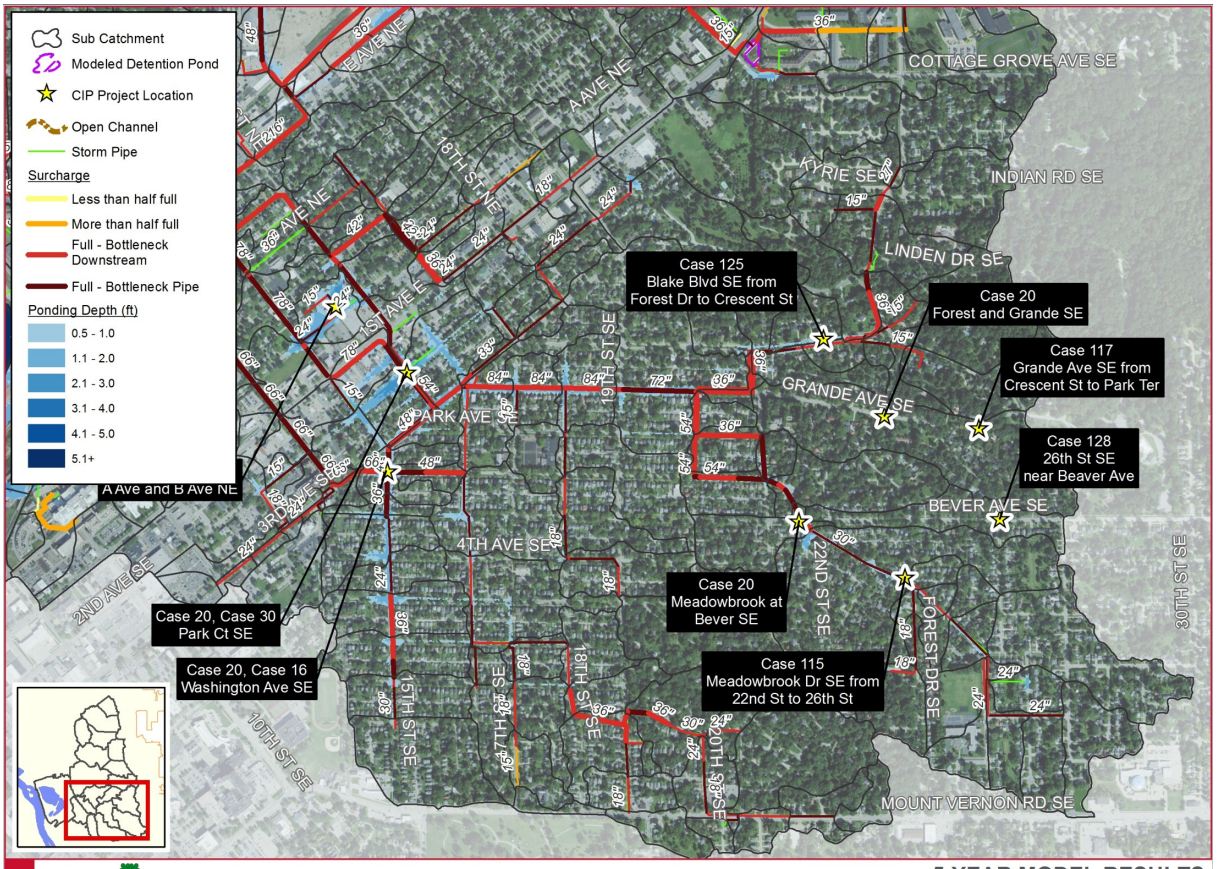
- Identify problem areas
- Characterize individual project basins
- Evaluate feasibility and potential effectiveness of mitigation strategies





5-YEAR MODEL RESULTS
KENWOOD WATERSHED, NORTH


Sub Catchment
Modeled Detention Pond
CIP Project Location
Open Channel
Storm Pipe
Surcharge
Less than half full
More than half full
Full - Bottleneck Downstream
Full - Bottleneck Pipe
Ponding Depth (ft)
0.5 - 1.0
1.1 - 2.0
2.1 - 3.0
3.1 - 4.0
4.1 - 5.0
5.1+
Case 116
D Ave NE From 30th St to 32nd St
Case 35
24th St Dr SE and 1st Ave
Case 123
23rd St Dr SE East of Forest Dr
23RD ST NE
30TH ST NE
31ST ST NE
29TH ST NE
25TH ST NE
27TH ST NE
PRAIRIE DR NE
K AVE NE
J AVE NE
F AVE NE
E AVE NE
D AVE NE
C AVE NE
B AVE NE
A AVE NE
G AVE NE
20TH ST NE
32ND ST DR SE
29TH ST DR SE
1ST AVE E
2ND AVE SE
COUNTRY CLUB PKWY SE
23RD ST DR SE
FOREST DR SE
5-YEAR MODEL RESULTS
KENWOOD WATERSHED, CENTRAL


Sub Catchment
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CIP Project Location
Open Channel
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Less than half full
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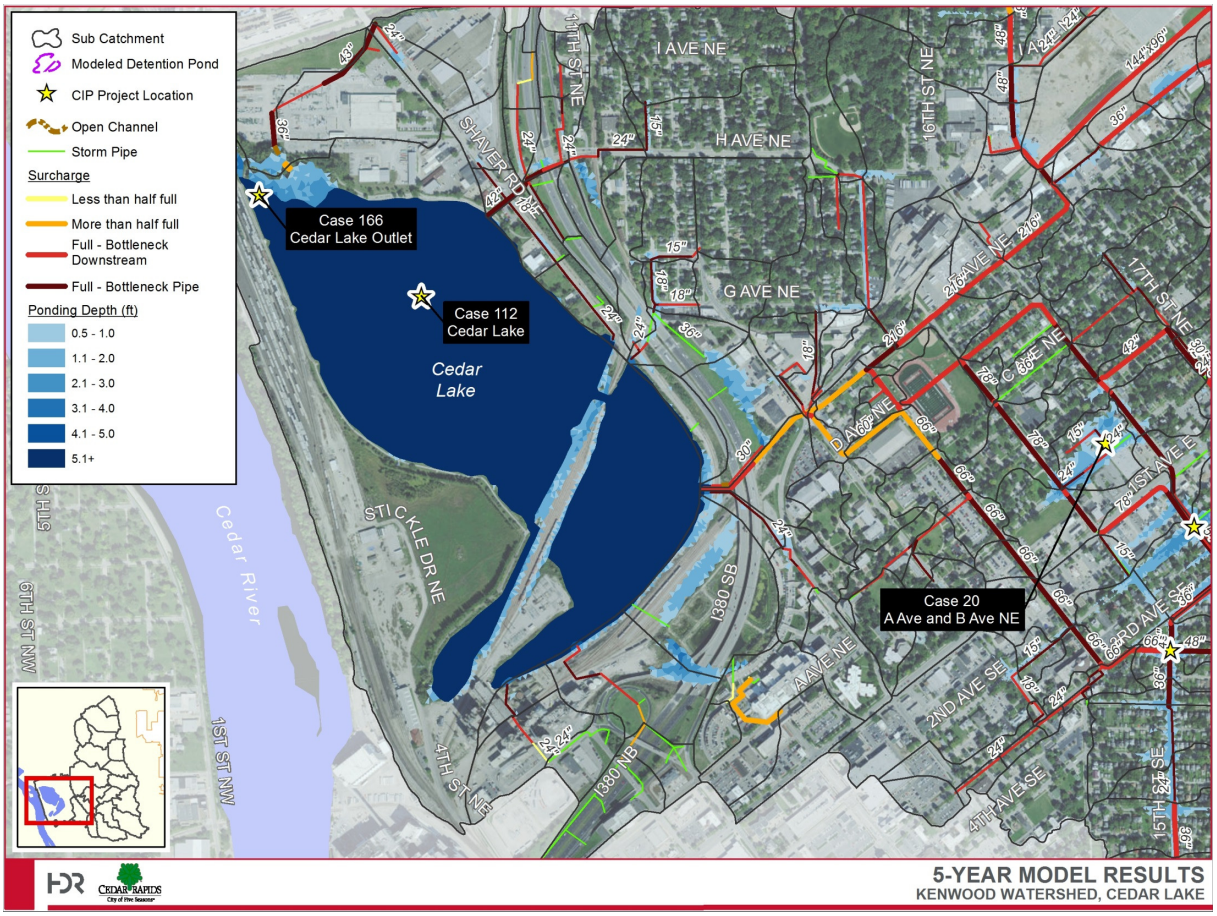
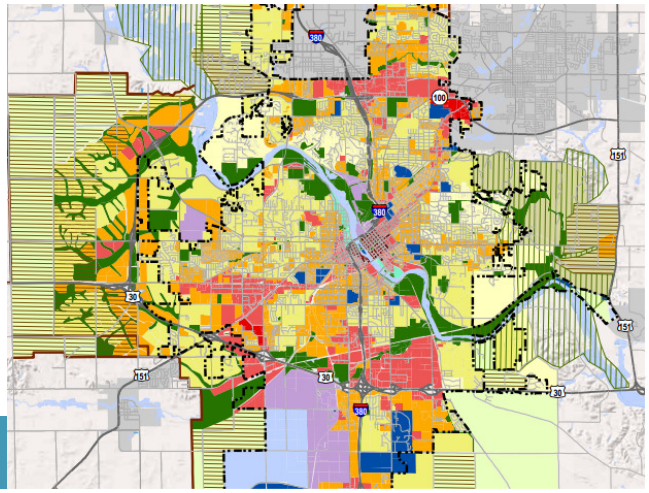
Ponding Depth (ft)
0.5 - 1.0
1.1 - 2.0
2.1 - 3.0
3.1 - 4.0
4.1 - 5.0
5.1+
A Ave and B Ave NE
Case 125
Blake Blvd SE from Forest Dr to Crescent St
Case 20
Forest and Grande SE
Case 117
Grande Ave SE from Crescent St to Park Ter
Case 128
26th St SE near Beaver Ave
Case 20
Meadowbrook at Bever SE
Case 20, Case 30
Park Ct SE
Case 20, Case 16
Washington Ave SE
Case 115
Meadowbrook Dr SE from 22nd St to 26th St
COTTAGE GROVE AVE SE
KYRIE SE
INDIAN RD SE
LINDEN DR SE
GRANDE AVE SE
PARK AVE SE
BEVER AVE SE
4TH AVE SE
2ND AVE SE
MOUNT VERNON RD SE
FOREST DR SE
22ND ST SE
30TH ST SE
19TH ST SE
18TH ST SE
17TH ST SE
16TH ST SE
15TH ST SE
10TH ST SE
5-YEAR MODEL RESULTS
KENWOOD WATERSHED, SOUTHEAST



Problem Areas

- Forest Ave SE and Grand Ave SE
- Mound View/ Wellington Heights Neighborhoods
- Washington Ave
- Kenwood Park / Rockwell Collins 35th Street Campus
- Eastern Ave Trunk Sewer Alignment
- F Ave NE / 24th St NE
- 24th St NE and 1st Ave SE

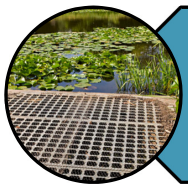


Kenwood Prioritized CIP Project Areas

1. **Forest and Grande SE (Case 20)**
   Conveyance capacity limited resulting in flooded neighborhood
2. **Meadowbrook at Bever SE (Case 20)**
   Flooding in yards
3. **Park Court SE (Case 20, 30)**
   Flooding at Park Ct caused by overland flow
4. **Washington Avenue SE (Case 20, 16)**
   Flooding at Washington Avenue SE caused by overland flow
5. **A Avenue and B Avenue NE (Case 20)**
   Extensive property damage from flash flooding
6. **35th Street NE at Collins Plant (Case 110)**
   Potential building flooding
7. **D Avenue NE from 38th St to 39th St (Case 114)**
   Localized flooding caused by undersized storm sewer
8. **Meadowbrook Drive SE from 22nd Street to 26th Street (Case 115)**
   Aging and undersized / no storm infrastructure. Overland flow caused road damage and flooding

Green Infrastructure

- High percentage of existing impervious area
- Suitable soil type
- Manageable Surcharge Volumes



Local Distributed Detention

- Available Land (parks/municipal or large private lots)
- Downstream Bottleneck
- Moderate Surcharge Volume

Regional Detention

- Available Land (large area)
- Downstream bottlenecks
- Moderate Surcharged Volume

Conveyance Improvements

- High potential peak discharge vs capacity
- Street ponding/ flow with no storm sewer
- Bottleneck Segment

03 EVALUATION

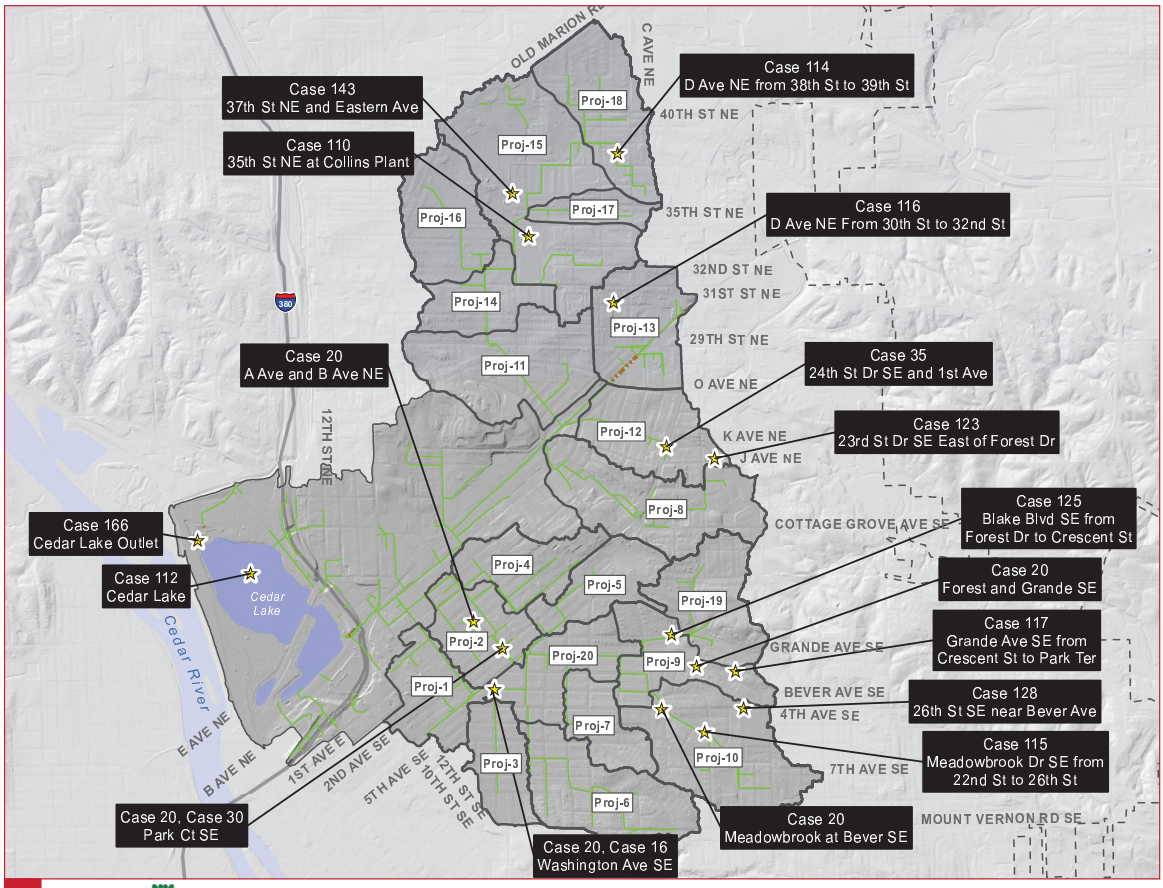
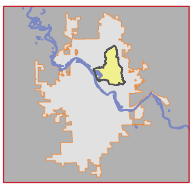


FIGURE 1
PROJECT AREA CATCHMENTS
KENWOOD WATERSHED

- CIP Project Location
- City Boundary
- Project Area Catchment
- Proj-X Project Area Catchment ID
- Cedar River
- Storm Pipe
- Open Channel



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DATA SOURCE: City of Cedar Rapids

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CITY OF CEDAR RAPIDS
STORMWATER MASTER PLAN

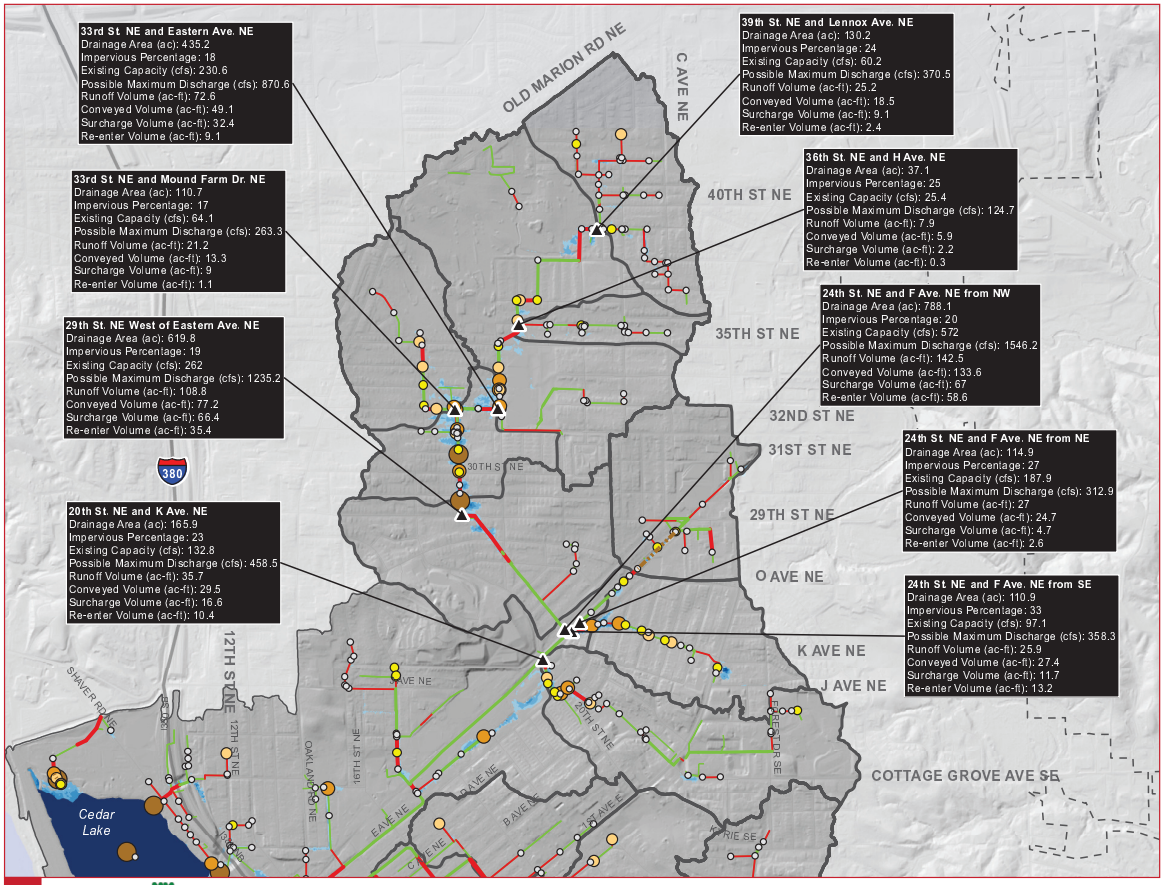

FIGURE 2
5-YEAR MODEL RESULTS
KENWOOD CATCHMENTS - NORTH

City Boundary
Open Channel
Summary Point
Project Area Catchment
Storm Pipe
Full - Bottleneck Pipe

Overflow Manholes (Acre-Feet)
>0 - 0.5
0.5 - 1
1 - 2
2 - 5
>5

Ponding Depth (ft)
0.5 - 1.0
1.1 - 2.0
2.1 - 3.0
3.1 - 4.0
4.1 - 5.0
5.1+

0 Feet 1,400

DATA SOURCE: City of Cedar Rapids

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CITY OF CEDAR RAPIDS
STORMWATER MASTER PLAN

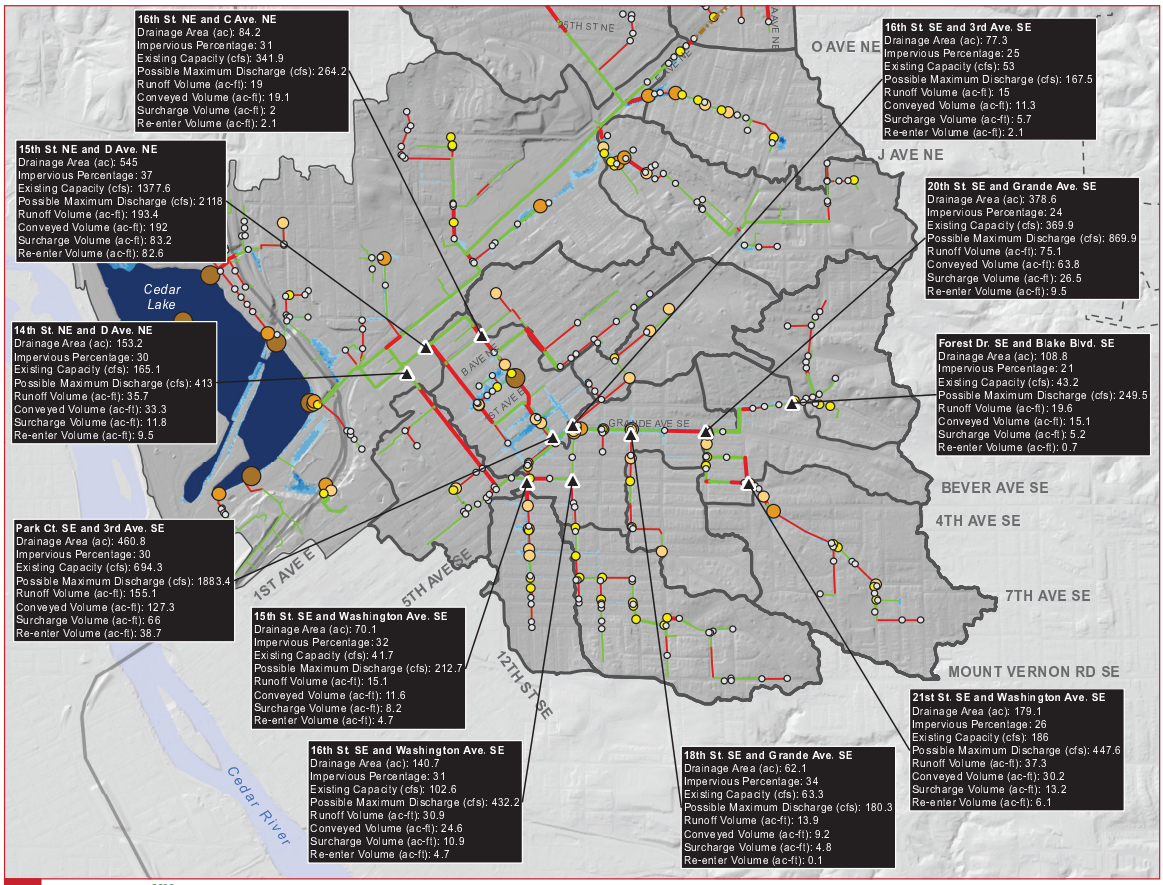

FIGURE 3
5-YEAR MODEL RESULTS
KENWOOD CATCHMENTS - SOUTH

City Boundary
Open Channel
Summary Point
Project Area Catchment
Storm Pipe
Full - Bottleneck Pipe

Overflow Manholes (Acre-Feet)
>0 - 0.5
0.5 - 1
1 - 2
2 - 5
>5

Ponding Depth (ft)
0.5 - 1.0
1.1 - 2.0
2.1 - 3.0
3.1 - 4.0
4.1 - 5.0
5.1+

0 Feet 1,400

DATA SOURCE: City of Cedar Rapids

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CITY OF CEDAR RAPIDS
STORMWATER MASTER PLAN

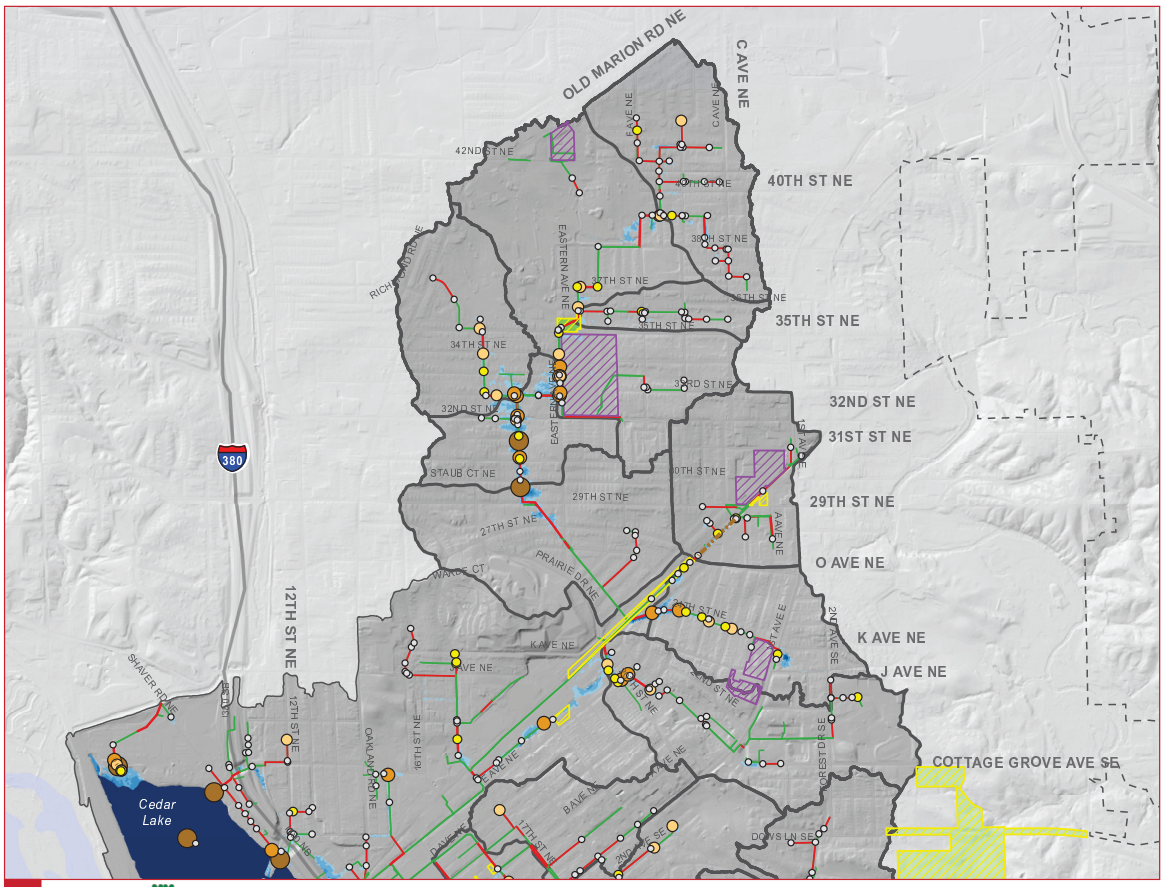


FIGURE 4
PARKS AND CITY-OWNED PARCELS KENWOOD CATCHMENTS - NORTH

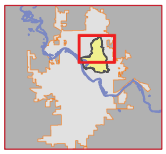
- City Boundary
- Open Channel
- Project Area Catchment
- City-Owned Parcel
- Parcel > 3 AC & > 50% Impervious
- Park
- Storm Pipe
- Full - Bottleneck Pipe

Overflow Manholes (Acre-Feet)

- >0 - 0.5
- 0.5 - 1
- 1 - 2
- 2 - 5
- >5

Ponding Depth (ft)

- 0.5 - 1.0
- 1.1 - 2.0
- 2.1 - 3.0
- 3.1 - 4.0
- 4.1 - 5.0
- 5.1+



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DATA SOURCE: City of Cedar Rapids

HDR CEDAR RAPIDS City of Five Seasons

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STORMWATER MASTER PLAN

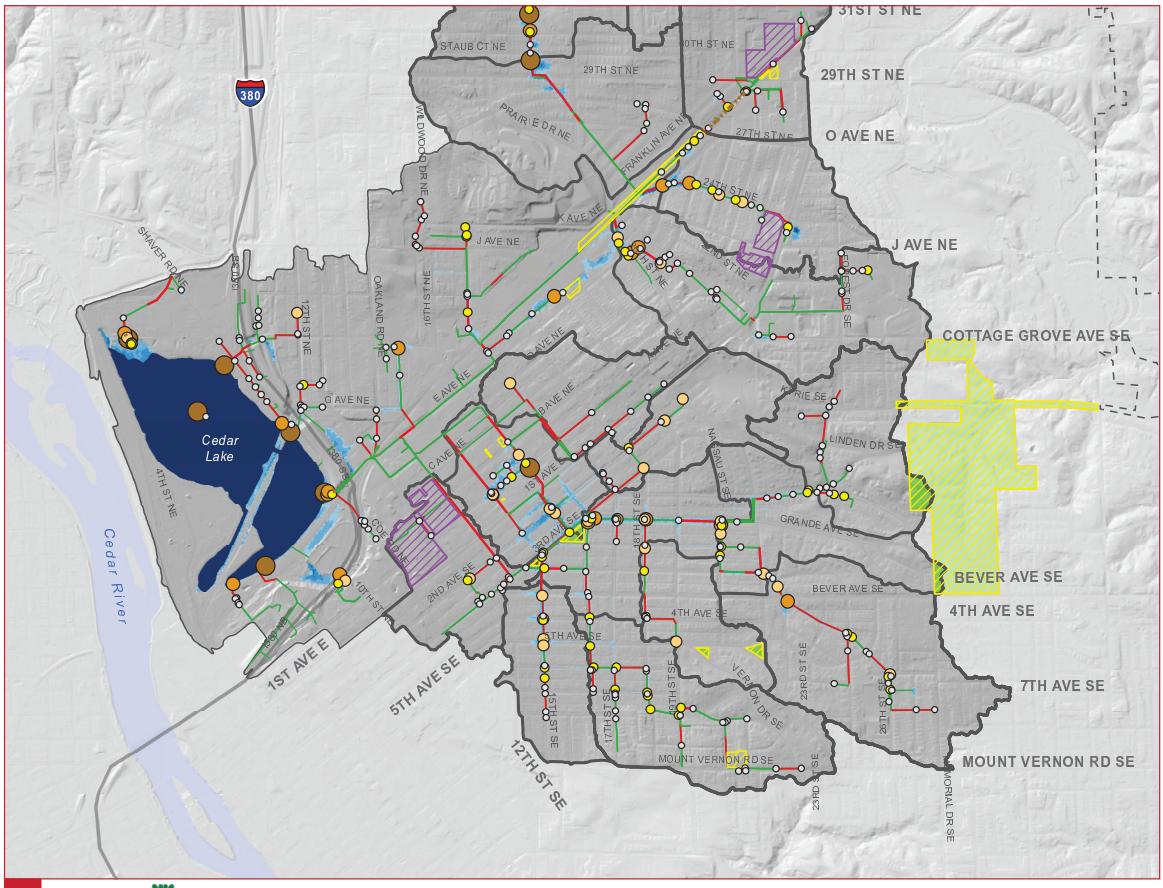


FIGURE 5
PARKS AND CITY-OWNED PARCELS KENWOOD CATCHMENTS - SOUTH

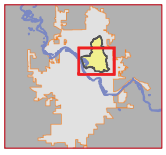
- City Boundary
- Open Channel
- Project Area Catchment
- City-Owned Parcel
- Parcel > 3 AC & > 50% Impervious
- Park
- Storm Pipe
- Full - Bottleneck Pipe

Overflow Manholes (Acre-Feet)

- >0 - 0.5
- 0.5 - 1
- 1 - 2
- 2 - 5
- >5

Ponding Depth (ft)

- 0.5 - 1.0
- 1.1 - 2.0
- 2.1 - 3.0
- 3.1 - 4.0
- 4.1 - 5.0
- 5.1+



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DATA SOURCE: City of Cedar Rapids

HDR CEDAR RAPIDS City of Five Seasons

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CITY OF CEDAR RAPIDS
STORMWATER MASTER PLAN

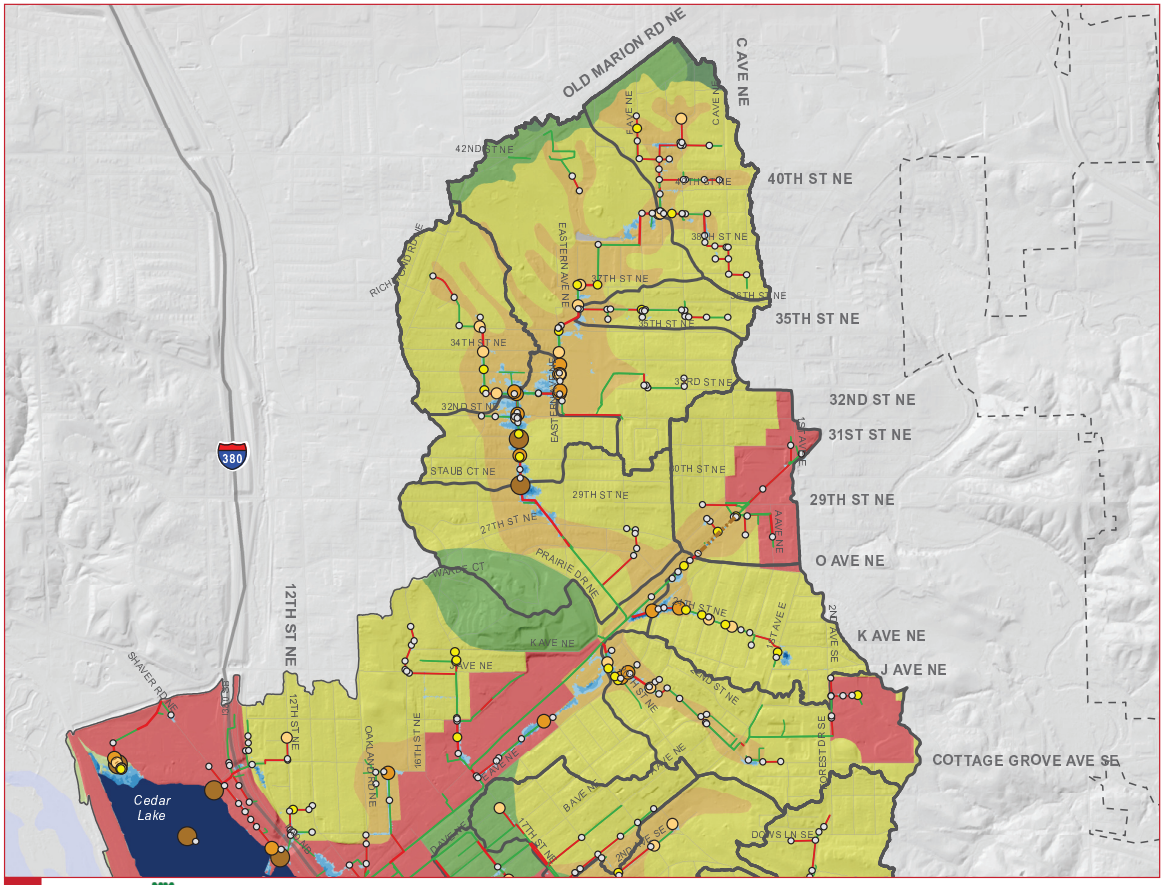
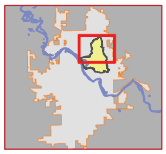


FIGURE 6
HYDROLOGIC SOIL GROUPS
KENWOOD CATCHMENTS - NORTH

City Boundary
Open Channel
Project Area Catchment
Storm Pipe
Full - Bottleneck Pipe

Overflow Manholes (Acre-Feet)
- >0 - 0.5
- 0.5 - 1
- 1 - 2
- 2 - 5
- >5

Ponding Depth (ft)	Hydrologic Soil Group
0.5 - 1.0	A
1.1 - 2.0	B
2.1 - 3.0	B/D
3.1 - 4.0	C
4.1 - 5.0	C/D
5.1+	D



0 Feet 1,400

DATA SOURCE: City of Cedar Rapids

HDR CEDAR RAPIDS City of Five Seasons

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CITY OF CEDAR RAPIDS
STORMWATER MASTER PLAN

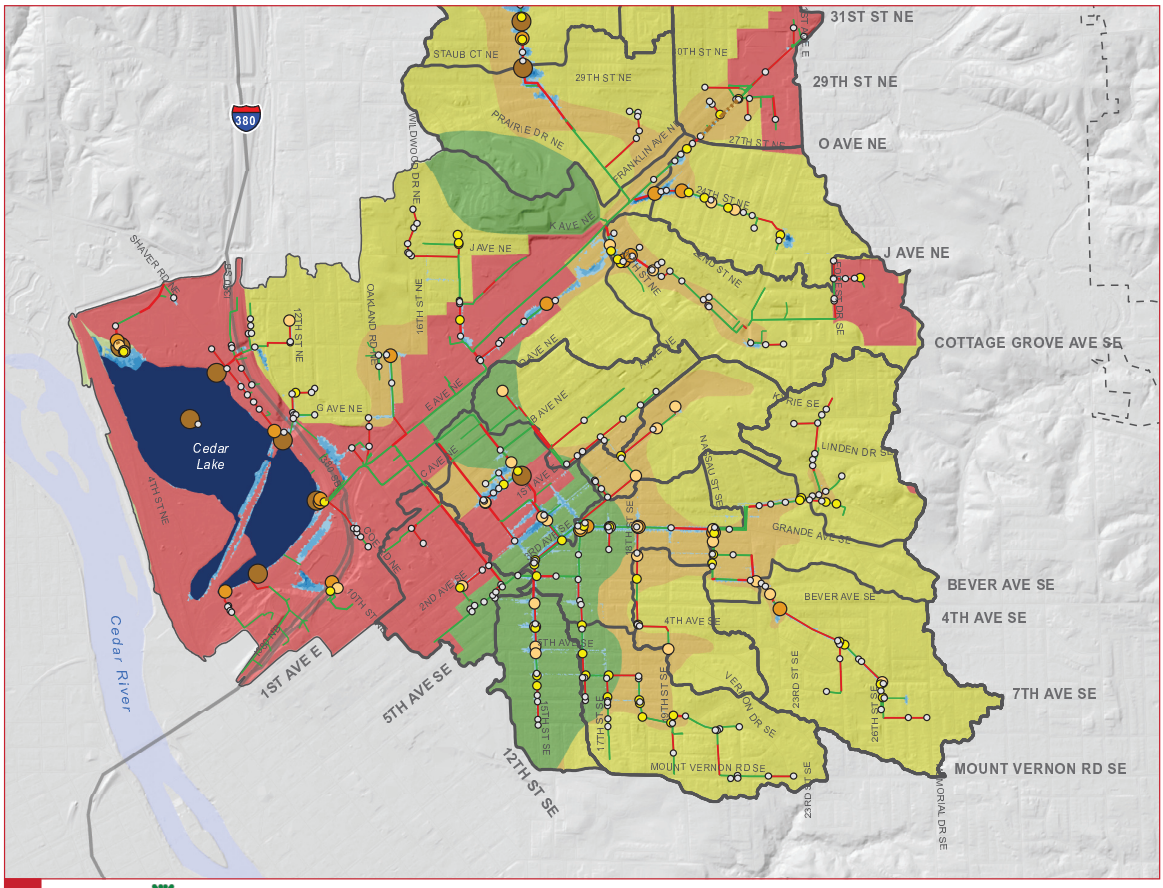
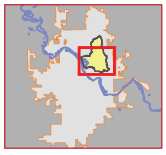


FIGURE 7
HYDROLOGIC SOIL GROUPS
KENWOOD CATCHMENTS - SOUTH

City Boundary
Open Channel
Project Area Catchment
Storm Pipe
Full - Bottleneck Pipe

Overflow Manholes (Acre-Feet)
- >0 - 0.5
- 0.5 - 1
- 1 - 2
- 2 - 5
- >5

Ponding Depth (ft)	Hydrologic Soil Group
0.5 - 1.0	A
1.1 - 2.0	B
2.1 - 3.0	B/D
3.1 - 4.0	C
4.1 - 5.0	C/D
5.1+	D



0 Feet 1,400

DATA SOURCE: City of Cedar Rapids

HDR CEDAR RAPIDS City of Five Seasons

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CITY OF CEDAR RAPIDS
STORMWATER MASTER PLAN

City of Cedar Rapids
Storm Water Master Plan
CIP Strategy
Kenwood Basin 5-Yr Storm Results - Basin Characteristics

Priority Bottleneck Areas				Upstream Area (Local)						Peak Flow (cfs)			Improvement Strategies				CIP Priority		
Project Area Catchment ID	Area Description	Type* (I, T, C, or L)	Size	Total Acres	Pervious (%)	Impervious (%)	Type A and B Soils (%)	Parks and Municipal Land (Acres)	Parks and Municipal Land (%)	Existing Capacity	Possible Maximum	Ratio of Possible Maximum/Capacity	Green Infrastructure	Local Detention	Regional Detention	Conveyance Improvements	Existing CIP Project / Case Number	Overall CIP Rank	Recommended Kenwood CIP Priority
Proj-1	14th St. NE & D Ave. NE	I	66" RCP	83.1	71%	29%	23.1%	0.1	0.1%	165	413	2.5		2		2	N		
Proj-2	15th St. NE & D Ave. NE	I	13' x 8' RCB	86.9	63%	37%	50.9%	0.7	0.9%	1378	2118	1.5	2				Y, Case 20	19	✔
Proj-3	15th St. SE & Washington Ave. SE	T	36" Brick	70.1	68%	32%	92.5%	0.0	0.0%	42	213	5.1	2			1	Y, Case 20, Case 16	14	
Proj-4	16th St. NE & C Ave. NE	T	36" RCP & 60" RCP	84.2	69%	31%	18.2%	0.0	0.0%	342	264	0.8				2	Y, Case 20	19	✔
Proj-5	16th St. SE & 3rd Ave. SE	T	36" Brick	77.3	75%	25%	2.2%	0.0	0.0%	53	168	3.2				1	N		
Proj-6	16th St. SE & Washington Ave. SE	T	48" RCP	140.7	69%	31%	13.0%	1.6	1.2%	103	432	4.2		2		2	N		
Proj-7	18th St. SE & Grande Ave. SE	C	36" RCP	62.1	66%	34%	0.0%	1.0	1.6%	63	180	2.8		2		2	N		
Proj-8	20th St. NE & K Ave. NE	T	54" RCP	165.9	77%	23%	0.0%	0.0	0.0%	133	459	3.5				1	Y, Case 123	43	✔
Proj-9	20th St. SE & Grande Ave. SE	I	72" RCP	90.7	75%	25%	0.0%	1.4	1.5%	370	870	2.4		2		2	Y, Case 20 & 117	11, 34	✔
Proj-10	21st St. SE & Washington Ave. SE	T	54" RCP	179.1	74%	26%	0.0%	0.0	0.0%	186	448	2.4				2	Y, Case 20, 115 & 128	12, 32, 47	✔
Proj-11	24th St. NE & F Ave. NE from NW	I	84" RCP	168.3	76%	24%	16.4%	0.0	0.0%	572	1546	2.7				1	N		✔
Proj-12	24th St. NE & F Ave. NE from SE	T	54" Arch pipe	110.9	67%	33%	0.0%	0.6	0.5%	97	358	3.7				1	Y, Case 35	59	
Proj-13	24th St. NE and F Ave. NE from NE	T	54" RCP	114.9	73%	27%	0.0%	0.5	0.4%	188	313	1.7					Y, Case 116	33	
Proj-14	29th St. NE West of Eastern Ave. NE	I	84" Arch pipe	73.9	76%	24%	0.0%	0.0	0.0%	262	1235	4.7		2		1	N		✔
Proj-15	33rd St. NE & Eastern Ave. NE	I	Dual 60" Arch pipe	267.9	85%	15%	7.8%	1.6	0.6%	231	871	3.8		1		1	Y, Case 110	29	✔
Proj-16	33rd St. NE & Mound Farm Dr. NE	T	48" RCP	110.7	83%	17%	0.1%	0.0	0.0%	64	263	4.1				2	N		
Proj-17	36th St. NE & H Ave. NE	C	27" RCP	37.1	75%	25%	0.0%	0.1	0.3%	25	125	4.9				2	Y, Case 143	71	
Proj-18	39th St. NE & Lennox Ave. NE	C	48" Arch pipe	130.2	76%	24%	13.6%	0.0	0.0%	60	371	6.2				1	Y, Case 114	31	
Proj-19	Forest Dr. SE & Blake Blvd. SE	T	36" RCP	108.8	79%	21%	0.0%	3.7	3.4%	43	250	5.8		2		2	Y, Case 125	41	
Proj-20	Park Ct. SE & 3rd Ave. SE	I	84" RCP & 54" RCP	90	63%	37%	43.5%	0.9	1.0%	694	1883	2.7	2			2	Y, Case 20, Case 30	13	✔

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City of Cedar Rapids
Storm Water Master Plan
CIP Strategy
Kenwood Basin Mitigation Strategy Feasibility Analysis

		Green Infrastructure			Local Detention				Regional Detention			Conveyance Improvements		
Project Area Catchment ID	Area Description	>30% Impervious	>40% Type A or B soils	1" Surcharge Volume/ DA	Parks or Municipal Land (>1%)	Private Parcels > 3 ac and >50% imp	Downstream Bottleneck	1' Surcharge Volume/Storage Area	Large Parcel(s)	Downstream Bottleneck	5' Surcharge Volume/ Parcel Area	Potential Peak/Capacity >2	Overland Conveyance	Section Bottleneck
Proj-1	14th St. NE & D Ave. NE			●		●		●				●		●
Proj-2	15th St. NE & D Ave. NE	●	●											●
Proj-3	15th St. SE & Washington Ave. SE	●	●				●			●		●	●	●
Proj-4	16th St. NE & C Ave. NE	●		●									●	●
Proj-5	16th St. SE & 3rd Ave. SE			●			●			●		●	●	●
Proj-6	16th St. SE & Washington Ave. SE	●		●	●		●			●		●		●
Proj-7	18th St. SE & Grande Ave. SE	●		●	●		●			●		●		●
Proj-8	20th St. NE & K Ave. NE					●			●		●	●	●	●
Proj-9	20th St. SE & Grande Ave. SE				●		●			●		●		●
Proj-10	21st St. SE & Washington Ave. SE			●			●			●		●		●
Proj-11	24th St. NE & F Ave. NE from NW			●								●	●	●
Proj-12	24th St. NE & F Ave. NE from SE	●				●						●	●	●
Proj-13	24th St. NE and F Ave. NE from NE			●										●
Proj-14	29th St. NE West of Eastern Ave. NE					●	●			●		●	●	●
Proj-15	33rd St. NE & Eastern Ave. NE			●		●	●	●		●		●	●	●
Proj-16	33rd St. NE & Mound Farm Dr. NE						●			●		●		●
Proj-17	36th St. NE & H Ave. NE			●			●			●		●		●
Proj-18	39th St. NE & Lennox Ave. NE			●			●			●		●	●	●
Proj-19	Forest Dr. SE & Blake Blvd. SE			●	●		●			●		●		●
Proj-20	Park Ct. SE & 3rd Ave. SE	●	●				●			●		●		●

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City of Cedar Rapids
Storm Water Master Plan
CIP Strategy
Kenwood Basin 5-Yr Storm Results - Volume Accounting

Project Area Catchment ID	Area Description	Local Volume Surcharge acre-ft	Green Infrastructure Volume Redution acre-ft	Local Detention Reduction acre-ft	Remaining Local Surcharge acre-ft	Cummulative Surchage acre-ft	Regional Detention Volume Reduction acre-ft	Remaining Volume Surcharge acre-ft
Proj-1	14th St. NE & D Ave. NE	3.5	0.0	0.0	3.5	11.8	0.0	11.8
Proj-2	15th St. NE & D Ave. NE	15.2	7.2	0.0	15.2	74.6	0.0	74.6
Proj-3	15th St. SE & Washington Ave. SE	8.2	5.8	0.0	8.2	8.2	0.0	8.2
Proj-4	16th St. NE & C Ave. NE	2.0	0.0	0.0	2.0	2.0	0.0	2.0
Proj-5	16th St. SE & 3rd Ave. SE	5.7	0.0	0.0	5.7	5.7	0.0	5.7
Proj-6	16th St. SE & Washington Ave. SE	10.9	0.0	1.6	9.3	9.3	0.0	9.3
Proj-7	18th St. SE & Grande Ave. SE	4.8	0.0	1.0	3.8	3.8	0.0	3.8
Proj-8	20th St. NE & K Ave. NE	16.6	0.0	0.0	16.6	16.6	0.0	16.6
Proj-9	20th St. SE & Grande Ave. SE	8.1	0.0	1.4	6.7	21.4	0.0	21.4
Proj-10	21st St. SE & Washington Ave. SE	13.2	0.0	0.0	13.2	13.2	0.0	13.2
Proj-11	24th St. NE & F Ave. NE from NW	0.5	0.0	0.0	0.5	38.0	0.0	38.0
Proj-12	24th St. NE & F Ave. NE from SE	11.7	0.0	0.0	11.7	11.7	0.0	11.7
Proj-13	24th St. NE and F Ave. NE from NE	4.7	0.0	0.0	4.7	4.7	0.0	4.7
Proj-14	29th St. NE West of Eastern Ave. NE	25.0	0.0	5.6	19.4	37.5	0.0	37.5
Proj-15	33rd St. NE & Eastern Ave. NE	21.1	0.0	29.7	0.0	9.1	0.0	9.1
Proj-16	33rd St. NE & Mound Farm Dr. NE	9.0	0.0	0.0	9.0	9.0	0.0	9.0
Proj-17	36th St. NE & H Ave. NE	2.2	0.0	0.0	2.2	2.2	0.0	2.2
Proj-18	39th St. NE & Lennox Ave. NE	9.1	0.0	0.0	9.1	9.1	0.0	9.1
Proj-19	Forest Dr. SE & Blake Blvd. SE	5.2	0.0	3.7	1.4	1.4	0.0	1.4
Proj-20	Park Ct. SE & 3rd Ave. SE	18.2	7.5	0.9	17.3	57.4	0.0	57.4

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04 DISCUSSION

Storm Sewer Master Plan Workshop 4 TM 7.0 Future Considerations

January 27, 2016

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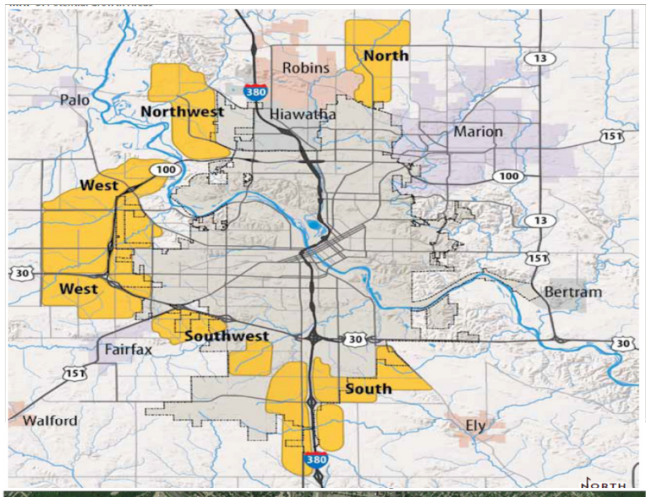
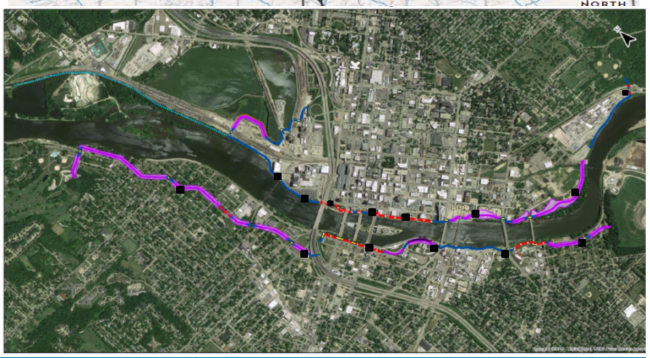
Future Considerations

- Implementation
- Roles and Responsibilities
- Growth Areas
- Regulatory Requirements
- Flood Control System

- Attachment A - MS4 Permit
- Attachment B – Construction General Permit



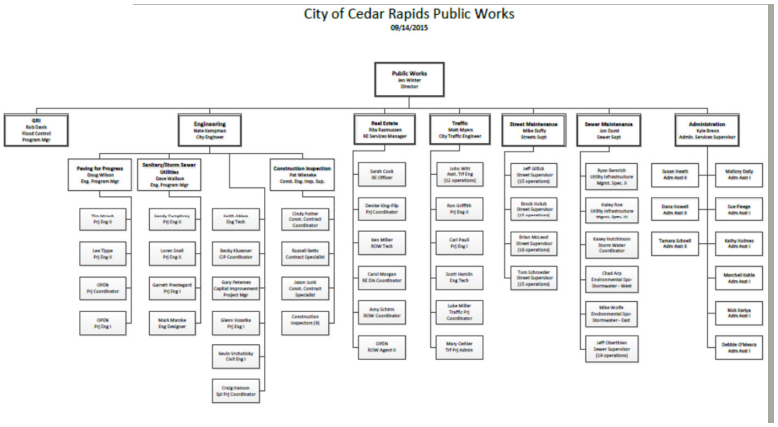


Roles & Responsibilities

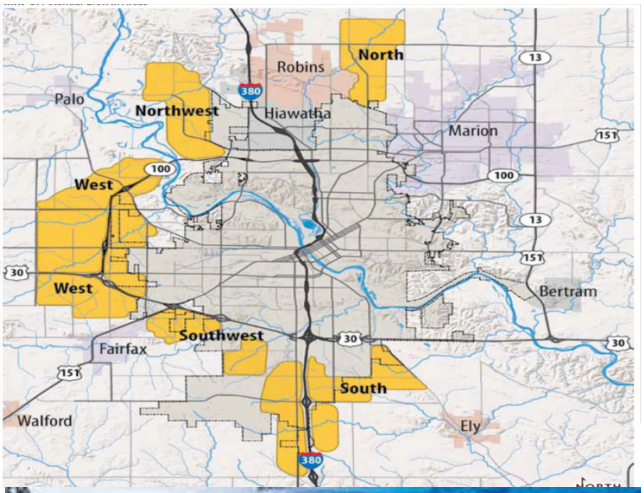
- Responsibility for Development and Implementation
  - Sewer Utility Engineering Manager
  - w/ Sewer Supt, Proj Engineers, & Stormwater Coordinator
- Living Document Update
  - CIP – Annual
  - Basin Modeling – Annual
  - Specific Financial Plan
  - Comprehensive Updates – 5 years

Implementation

- City Council
  - Infrastructure Committee
  - Flood Control System Committee
  - Development Committee
- City Manager's Office
- Stormwater Commission
- Public Works Department
  - Public Works Director
  - City Engineer
  - Flood Control Program Manager
  - Sewer Utility Engineering Manager
  - Sewer Superintendent
  - Project Engineer
  - Engineering Designer
  - Geospatial Data Specialist
  - Stormwater Coordinator
  - Environmental Specialist Stormwater
- Development Services

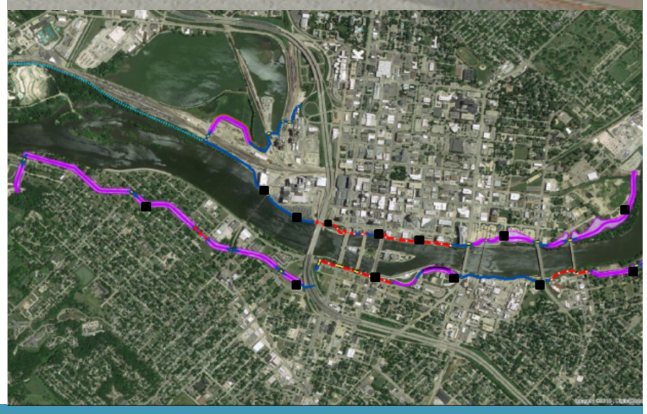


Growth Areas & Regulatory Requirements



- Growth Areas
  - West - Iowa Highway 100 expansion, and incorpor the natural environment as an amenity.
  - Southwest - Industrial projects & emerging neighborhoods.
  - South - Major employer & large parcel projects
  - North - Residential development & continuous parkway.
  - Northwest - Residential neighborhoods.
- Regulatory Requirements
  - Federal
  - State

Flood Control System



- Components
  - Combination & Removable Walls
  - Gate Closures
  - Pump Stations
- O&M
  - Component Maintenance
  - Deployment – Highly Variable
  - Inspection
  - Training
- Responsibility?
  - Levee & floodwall - Public Works or Parks & Recreation?
  - Pump stations - Water Pollution Control
- Updated Deployment Study
  - USACE East Side

Storm Sewer Master Plan Workshop 4 TM 5.0 Financial Needs

January 27, 2016

HDR

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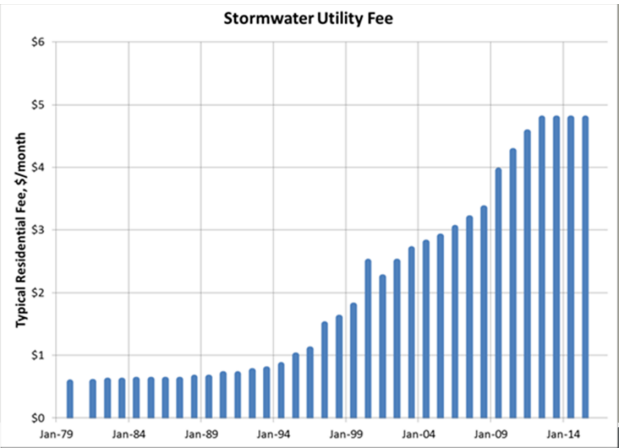
Financial Needs

- Background Information
  - Stormwater Accounts
  - Historic Account Data
  - Historic Rates
  - Other Stormwater Utilities
- Analysis
  - Current Fiscal Year Budget
  - Financial Forecast
  - Funding Gap
  - Revenue Sources
- Recommendations

- A – 671 Storm Sewer Operations
- B – 304 Storm Sewer CIP
- C – 10 Year Stormwater Utility Forecast



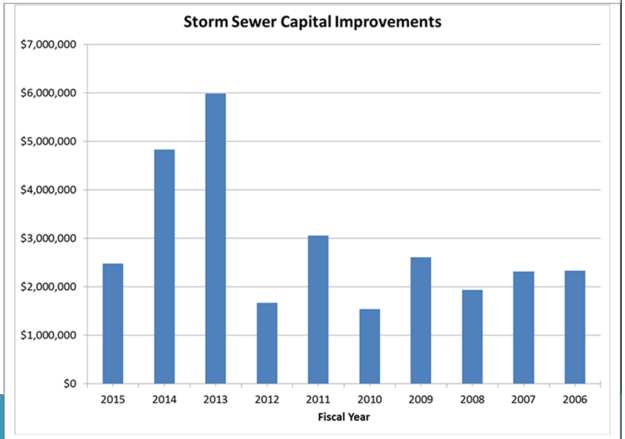
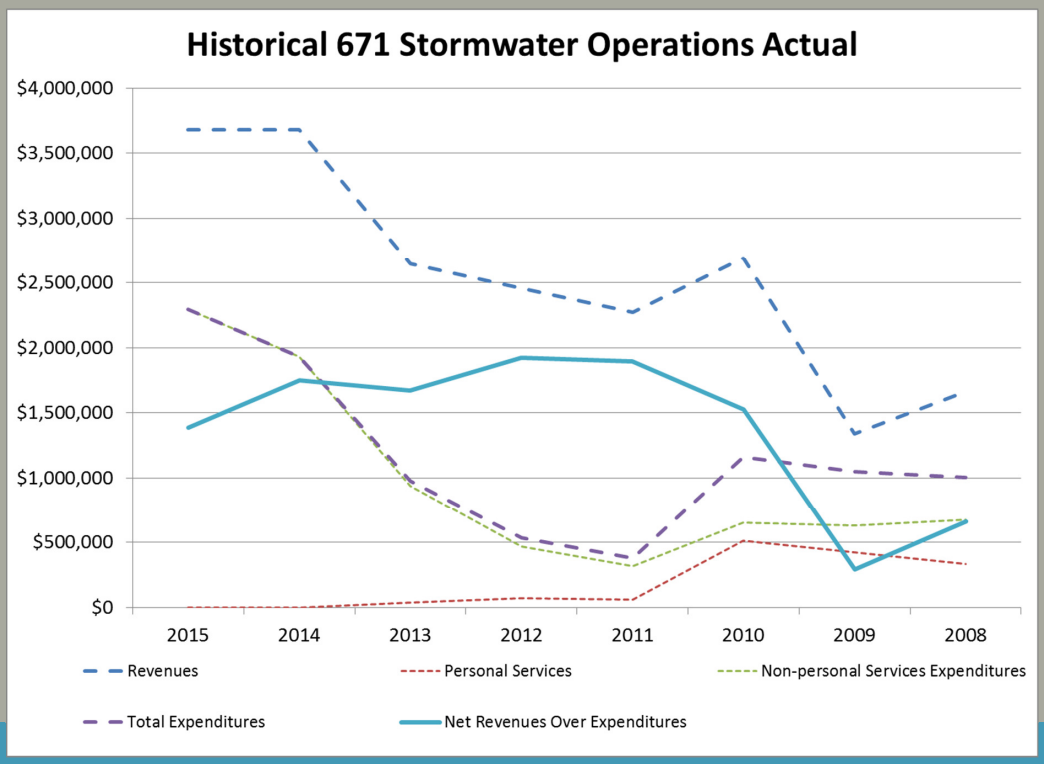


Figure 2 - Storm Sewer Related Capital Expenditures

Historical 671 Storm Sewer Operations Actuals



Historical 304 Capital Expenditures

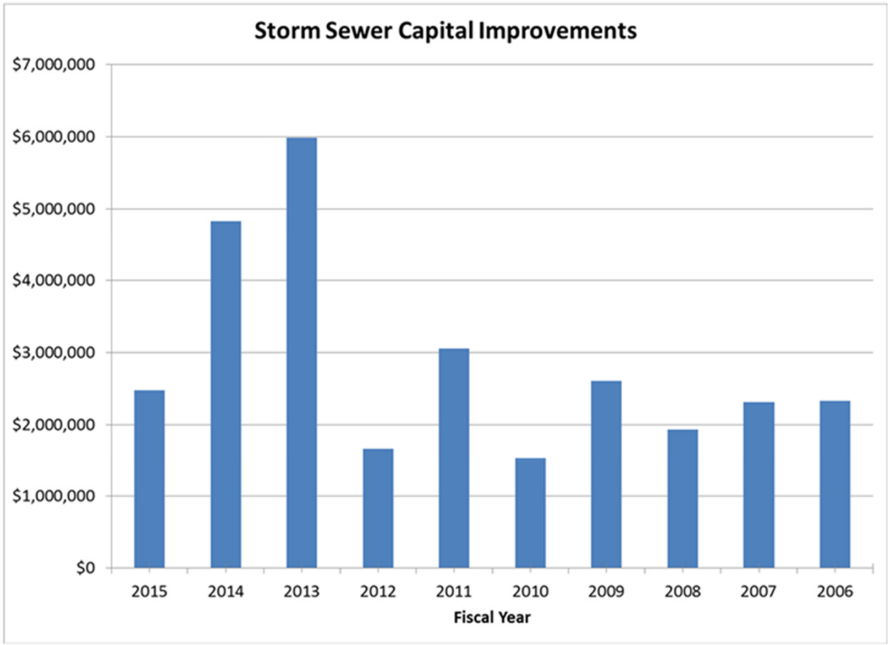
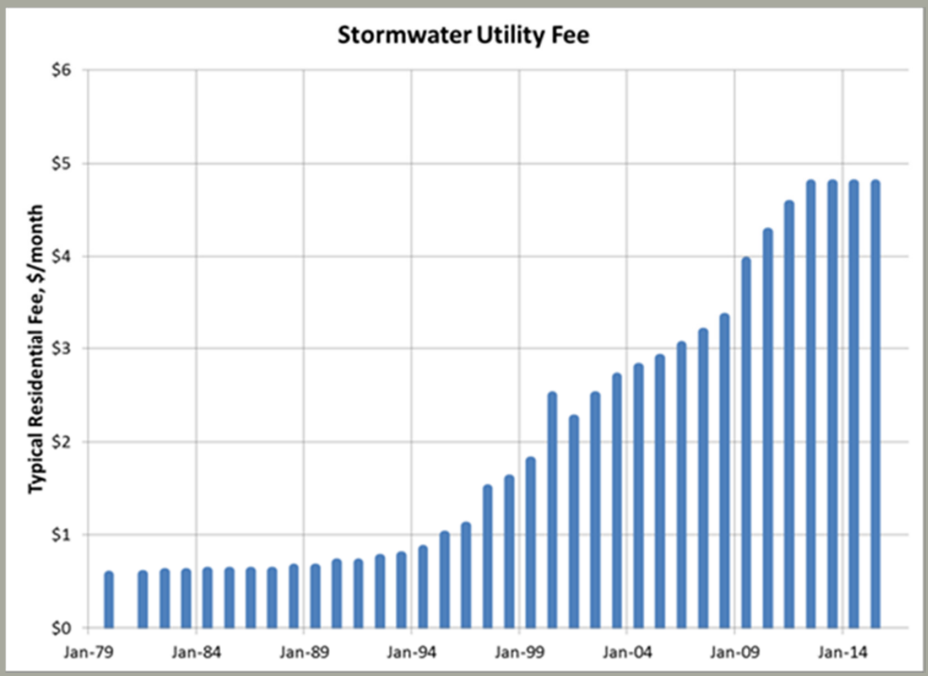


Figure 2 - Storm Sewer Related Capital Expenditures

Historical Stormwater Utility Fees



Historical 671 Storm Sewer Operations Actuals

	Fiscal Year 2014	Fiscal Year 2013	Fiscal Year 2012	Fiscal Year 2011	Fiscal Year 2010	Fiscal Year 2009	Fiscal Year 2008
Revenues	$3,679,014	$2,646,960	$2,457,416	$2,269,668	$2,689,032	$1,340,460	$1,663,349
Personal Services	$0	$36,488	$67,524	$61,519	$512,365	$419,401	$332,804
Non-personal Services Expenditures	$1,927,816	$937,809	$467,073	$315,418	$648,829	$629,311	$671,850
Total Expenditures	$1,927,816	$974,297	$534,598	$376,937	$1,161,194	$1,048,712	$1,004,654
Net Revenues Over Expenditures	$1,751,197	$1,672,663	$1,922,819	$1,892,731	$1,527,837	$291,749	$658,695

Largest Non CIP Expenditures

		FY15 Actual*	FY08-15 Average
1	Admin Charges - Cty Mgr depts	$1,141,296	$348,517
2	Operating Transfer Out-Inter	$723,416	$146,593
3	Contribution-Other Agency	$176,000	$144,010
4	Regular Employees		$100,276
5	Street/Sewer Mat & Supplies	$49,108	$42,888
6	Op Transfer Out-Intra		$37,316
7	Group Insurance		$25,083
8	City Fleet Services	$27,336	$19,999
9	City Rental Charges - Fleet	$33,139	$16,063
10	Other Professional Services	$7,862	$14,437
11	Veh&Roll Stk-Parts & Materials	$121	$10,820
12	City Accounting Services	$19,741	$10,546
13	City IT Services	$26,432	$9,709
14	Equip/Furniture/Fixtures	$14,868	$9,208
15	Rental of Land & Bldgs	$528	$7,949
	Sum	$2,219,846	

* Total Non CIP Expenditures = $2,329,788

304 Revenues FY08-15

		FY 2015	FY 08-15
	Account	ACTUALS	ACTUALS
Federal Capital	421003	$385,504	$9,069,256
Capital Contributions	481003	$188,810	$6,164,567
GO Bond Proceeds	485001	$0	$4,617,292
Operating Transfer In - Inter	483001	$1,556,269	$2,919,161
Zoning & Subdivision Fees	431004	$54,187	$542,637
State Capital	422002	$0	$540,904
Interest/Div - Nonproprietary	451000	$3,719	$331,211
Admin Charges - City Mgr Depts	431007	$0	$109,947
Developer Cost Sharing	431009	$0	$55,101
Premiums on Bonds Sold	485005	$0	$46,881
TIF GO Bond Proceeds	485008	$0	$37,967
Contributions & Donations	471002	$0	$28,768
Federal Operating	421001	$0	$20,259
Damage Recoveries	471004	$0	$16,960
Gain (Loss) on Sale of Invest	451002	$0	$11,383
Other Miscellaneous Revenue	471005	$0	$1,322
Special Assessment Charges	471008	$0	$1,214
Sales Tax Refunds	471000	$0	$225
Revenues		$2,188,489	$24,515,053

671 Storm Sewer Operations FY 2016 Budget

- **Total Revenue:** **$3.8 million**
  - $3.8 million from utility fees (proposed rate increase : 2.4%)
- **Total Expenditures:** **$3.6 million**
  - ***Personnel Services:*** ***None***
  - ***Discretionary:*** ***$0.4 million***
  - ***Non-discretionary – Fleet and Facilities:*** ***$0.2 million***
  - ***Non-discretionary – Other:*** ***$1.6 million***
    - $0.5 million for street sweeping
    - $0.4 million for five stormwater positions
    - $0.2 million for CC&B admin charges
    - $0.2 million for CIP services
    - $0.1 million for PW project engineer II
  - ***Non-discretionary – Capital:*** ***$0.1 million***
  - ***Transfers Out:*** ***$1.5 million***
    - $0.2 million transfer to CC&B updates CIP
    - $1.3 million to Storm CIP (304 Fund)
- **Net:** **+$0.2 million**

651 Sanitary Sewer Operations Challenges

- Projected storm CIP expenditures relating to the Flash Flood 2014 recovery efforts are estimated at $20 million. The storm sewer utility is on average able to support $1 to $1.5 million in CIP expenditures annually. If able to support $1.2 million in CIP annually and only expend half of the CIP budget on recurring programs, the total timeline for all Flash Flood 2014 projects would be 30 years. Again this is a funding challenge that will take more than percentage rate increases, but a mixture of approaches including grants and a storm sewer utility rate restructuring.
- Adapting to all of the Matrix report recommendations will also be a challenge. The total monetary impact of the report is yet unknown. Possible large fiscal items are: increased FTE's, capital equipment (Energov, storm line cleaning), and professional development (a focus on training, certification, and SOPs).

Other Stormwater Utilities

- Black & Veatch 2014 Stormwater Utility Survey
- 78 participants from 25 states
- Populations from 9,785 to 1.5 million
- Serving areas from 3 to 1,020 square miles
- Annual CIP budgets from $30,000 to $72 million (average ~$7 million)
- Just over half under / just under half over 100,000 population (MS4 Permitting)

2014 Stormwater Utility Survey

- Average monthly SF rates - $0.24 to $26.58 in 2014 (44 above CR)
- 62% do not have adequate funding to meet most of their utility needs
- 17% do not have adequate funding to meet even their “most urgent” needs.
- 85% cash financing as primary source of capital
- Stormwater user fees account for more than all other sources combined for cash financing
- Grants, permitting and other taxes, special tax districts, new development impact fees, sales taxes, and ad valorem taxes in that order.
- Stormwater user fees account for more than all other sources combined for debt financing
- General obligation bonds, sales tax bonds, and stormwater/other bonds in that order.

2014 Stormwater Utility Survey (Cont)

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2014 Stormwater Utility Survey (Cont)

- 90% base fees on some form of parcel area
- 79% of those have impervious area component.
- For SF residential parcels: 67% uniform flat fee, 28% tiered rates, 6% individually calculated fees.
- ERU from 2,105 to 22,500 sq ft (median 8,000) for property area based charges
- ERU from 794 to 7,500 sq ft (median 2,368) for impervious area based charges
- 6% vary fees by service area, zone, or watershed for service level differences
- 15% apply one time impact/capital recovery fees to new customers or developments.

2014 Stormwater Utility Survey (Cont)

- 78% do not offer discounts (others offer low-income, elderly/senior citizen, educational institutions, disabled, and/or or other discounts)
- 44% offer stormwater credit program & 15 to 18 % offer incentives.
  - Just over half of credit programs apply to nonresidential customers only
  - Just under half of credit programs apply to both residential & nonresidential.
- Volume & peak flow reduction, & water quality control credits most common
- Direct discharge to a surface water, good housekeeping practices, education, NPDES compliance, and other credits also identified
- Site assessment assistance, stormwater grants, cost sharing, BMP cost rebates were most common incentives
- Where credits are offered, only ~4% of parcels seek credits

Other Stormwater Utilities

- 2015 Southeast Stormwater Utility Survey
- 76 respondents in eight EPA Region 4 states
- Populations from 1,150 to 800,000 (average 103,535)
- Aeas from 7 to 803,200 acres (median of 86,200)
- Annual fee revenues from $137,000 to $59 million (average ~ $4.5 million)
- All were stormwater utilities
  - Half combined with Public Works Department
  - Others were separate department, combined with another department, or separate authority or district.

2015 Southeast Stormwater Utility Survey

- Ave monthly rates from $0.12 to over $9.60 in 2015 (average of $3.77)
  - 48% invoice fees on the bill for other utility services
  - 40% percent invoice as part of the annual property tax bill
  - 6% bill separately
- 18 had rates at or above CR
- Adequacy of Stormwater Utility Fee Revenue
  - 72% not adequate or adequate only for most urgent capital needs
  - 39% not adequate or adequate only for most urgent O&M needs
  - 9% not adequate or adequate only for most urgent administrative needs
- 96% indicate user fees comprise basic methodology for revenue generation
  - 1 cited non-ad valorem or special assessments & 2 cited other

2015 Southeast Stormwater Utility Survey (Cont)

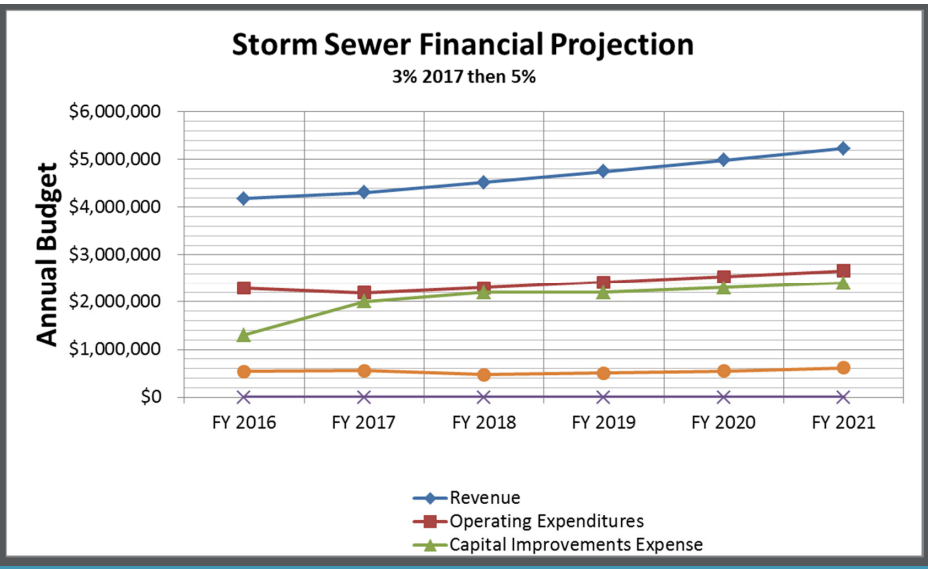
- 57% (43) funds other than stormwater fees for capital
  - 24 grants, 16 sales tax, 8 ad-valorem, 7 loans, 6 gas tax, 16 still other sources
- 21% (16) funds other than stormwater fee revenues for operating budget
  - 11 general fund, 3 ad-valorem tax, 1 sales tax, four other sources
- 15% have modified fee structure considering new water quality requirements
- 15% indicate that they are considering such modifications
- 3/4 base fees on impervious area
  - A few note gross area & impervious area
  - A few note gross area with intensity of development factor
  - A few note other means.
- None indicate a different fee within a "zone of benefit" for specific projects
- Only one reported that fees varied by watershed.

2015 Southeast Stormwater Utility Survey (Cont)

- ERUfrom <1,000 to 5,900 sq ft (average of 2,852)
- 43% charge for site plan review
- 28% charge for stormwater management permits
- 21% charge for stormwater inspection during construction
- 8% charge for stormwater inspection after construction
- ½ to 2.3 bill federal, state, county, city, school district properties
- Only 2.15 percent of accounts receive credits
- Range of credits vary from 0 to 100 percent (median of 52 percent)

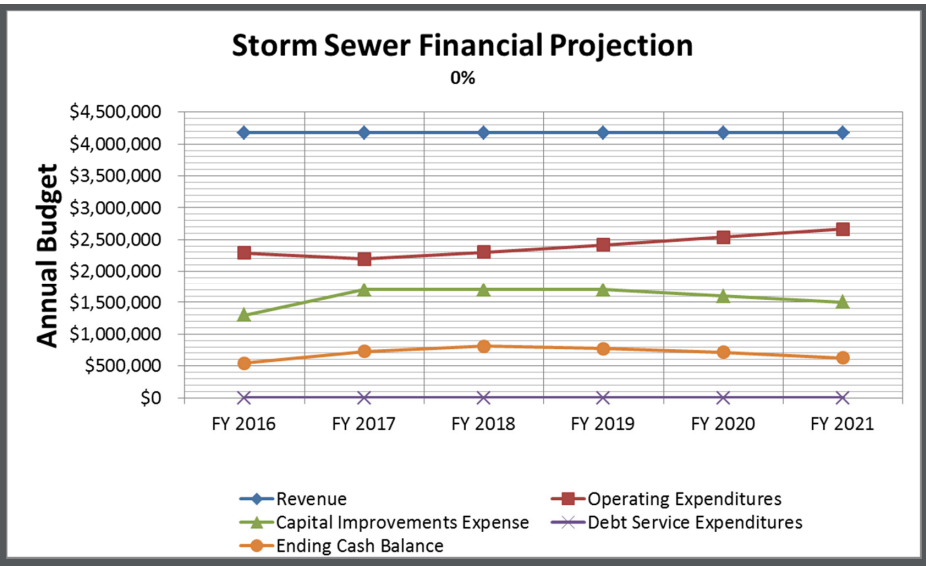
Financial Projection – Scenario 1

- 3% FY17 & 5% FY18-FY21 Revenue Increase
- 5% Cost Increase FY17-21
- $200k to Water for CCB Upgrade ends FY16



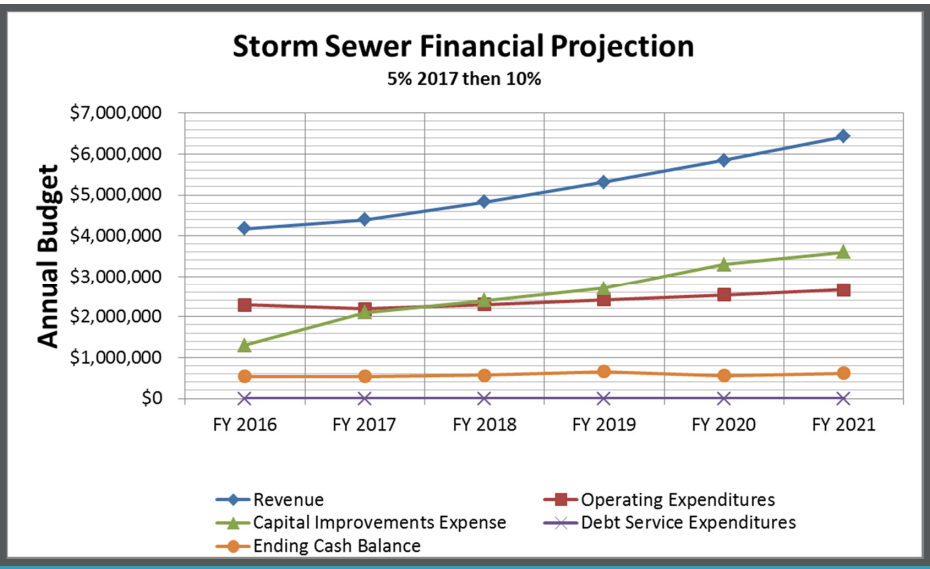
Financial Projection – Scenario 2

- 0% FY17 -FY21 Revenue Increase
- 5% Cost Increase FY17-21
- $200k to Water for CCB Upgrade ends FY16



Financial Projection – Scenario 1

- 5% FY17 & 10% FY18-FY21 Revenue Increase
- 5% Cost Increase FY17-21
- $200k to Water for CCB Upgrade ends FY16

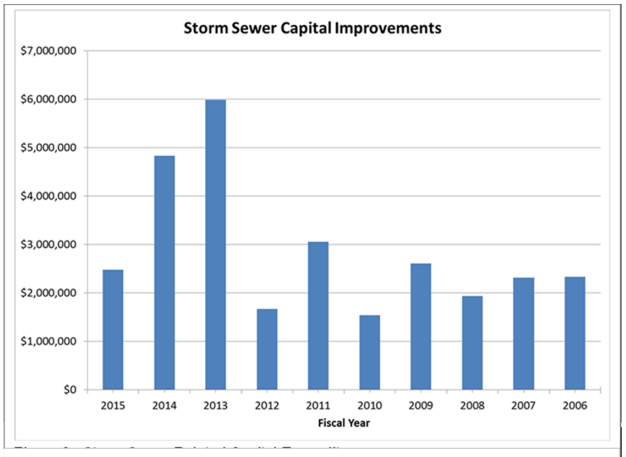


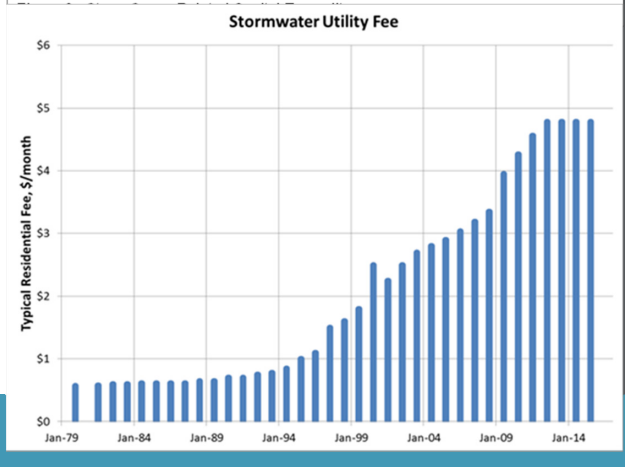
Other Funding Sources

- Cash Financing
  - Taxes
  - Grants
  - Permitting and other taxes
  - Special tax districts
  - New development impact fees
  - Sales taxes
  - Other fees.
- Debt Financing
  - General obligation bonds
  - Sales tax bonds
  - Revenue bonds
  - Clean water state revolving fund loan

Recommendations

- Stormwater utility fees & other user charges need to increase significantly.
  - Nearly $50 million in identified CIP
  - Probable increased operating costs fo future regulatory requirements & Flood Control System
- Monitor and aggressively seek other grant or other special funding opportunities.
- Consider other potential funding sources.



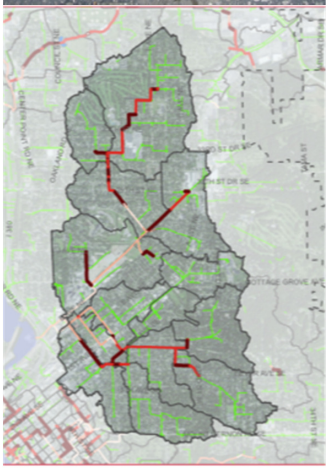


Recommendations (Cont)

- Continue to refine stormwater utility fee structure to better reflect stormwater to be managed.
- Focus user fee revenue on administrative, operations and maintenance, and current trunk sewer related capital needs
- Set aside a small amount for cost sharing to continually capitalize on multipurpose projects
- Shift street sweeping costs to solid waste.
- Sunset billing system related capital payment to Water.
- Prepare plans and establish fees to pay for stormwater needs in the growth areas
- Work with Streets to identify opportunities to use sales tax revenue.
- Work with Water to identify additional CWSRF & Sponsored Project Funding Opportunities\
- Work with Others to identify multipurpose projects for cost sharing
- Work with a neighborhood to implement a pilot special assessment / benefits district project for a localized stormwater problem
- Work a large impervious property(ies) upstream to implement a pilot cost share project for modifications to reduce the contribution to downstream problems

Stormwater - Roles & Responsibilities

- Field Maintenance
  - Investigate and Respond to Public Feedback
  - Clean, Televise, Inventory, Locate, and Make Minor Repair *(and Otherwise Maintain System?)*
  - Perform Compliance Inspections and Outreach
  - *Prepare Budget and Manage Associated Costs?*
  - Identify Need for Capital Projects
- Engineering
  - Manage the Capital Improvements Plan
  - *Prepare & Implement the Stormwater Master Plan*
  - *Prepare Budget and Manage Overall Revenues and Costs?*
  - *Seek Outside Funding?*
  - Identify and Propose Policy Changes
  - *Identify and Propose Rate Changes?*
  - Interface with Elected & Appointed Officials to Enable Informed Decisions
- Elected & Appointed
  - Approve Budgets & Rates
  - Set and Approve Policy
- *Stormwater Commission?, Other?*



Updates

- Annual
  - Capital Improvements Plan
  - Fiscal Year Plan
  - Modeling and Studies *(Basin? and Project?)*
  - Policy
  - Field and Reactive Inputs
- 5 Year
  - Master Plan
  - Financial Plan
  - *Macro Modeling?*