

CITY OF ANN ARBOR
PUBLIC SERVICES

Stormwater Utility Program



Overview

STORMWATER SYSTEM OVERVIEW

WHAT IS THE STORMWATER UTILITY?

COUNCIL PRIORITY: REBUILD THE FORESTRY PROGRAM

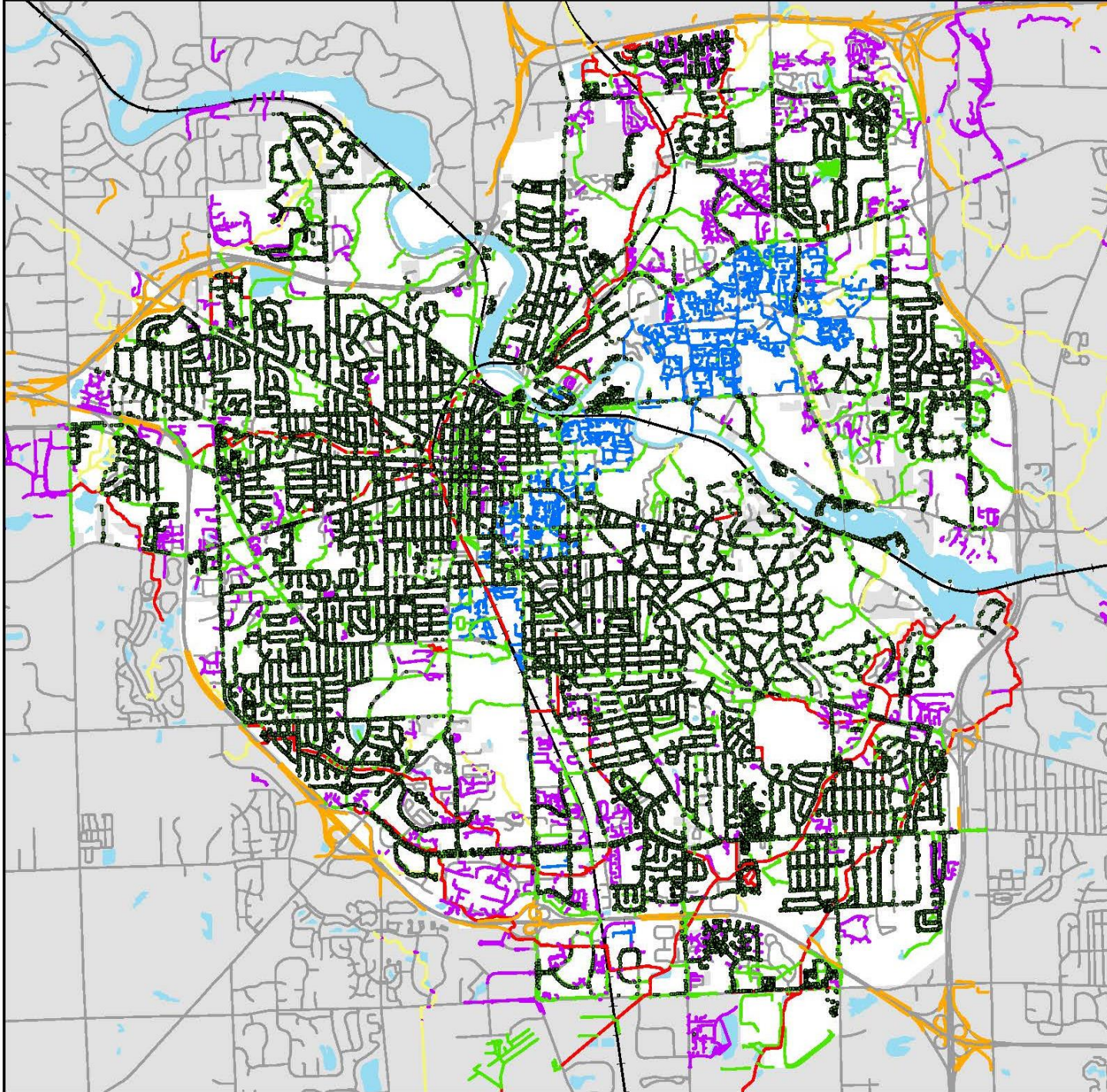
STORMWATER RATE ANALYSIS PROJECT UPDATE

Stormwater System Overview

SYSTEM STATS

TOOLS

STAFF



Storm Network Ownership

- City
- U of M
- County Drains
- State/Interstate Highways
- Water of the State
- Private
- Public Trees

How Old is That City-Owned Pipe?

5

Decade Constructed	Feet of Main	Miles of Main	Percent of Total
1900s	410	0.08	0.03%
1910s	52,545	9.95	4.29%
1920s	135,768	25.71	11.09%
1930s	40,451	7.66	3.30%
1940s	37,775	7.15	3.09%
1950s	197,359	37.38	16.12%
1960s	303,638	57.51	24.80%
1970s	149,789	28.37	12.24%
1980s	69,027	13.07	5.64%
1990s	114,035	21.60	9.32%
2000s	60,835	11.52	4.97%
2010s	6,689	1.27	0.55%
unknown	55,837	10.58	4.56%
TOTAL	1,224,158	231.85	

21.8%

53.2%

25%

System Overview

6

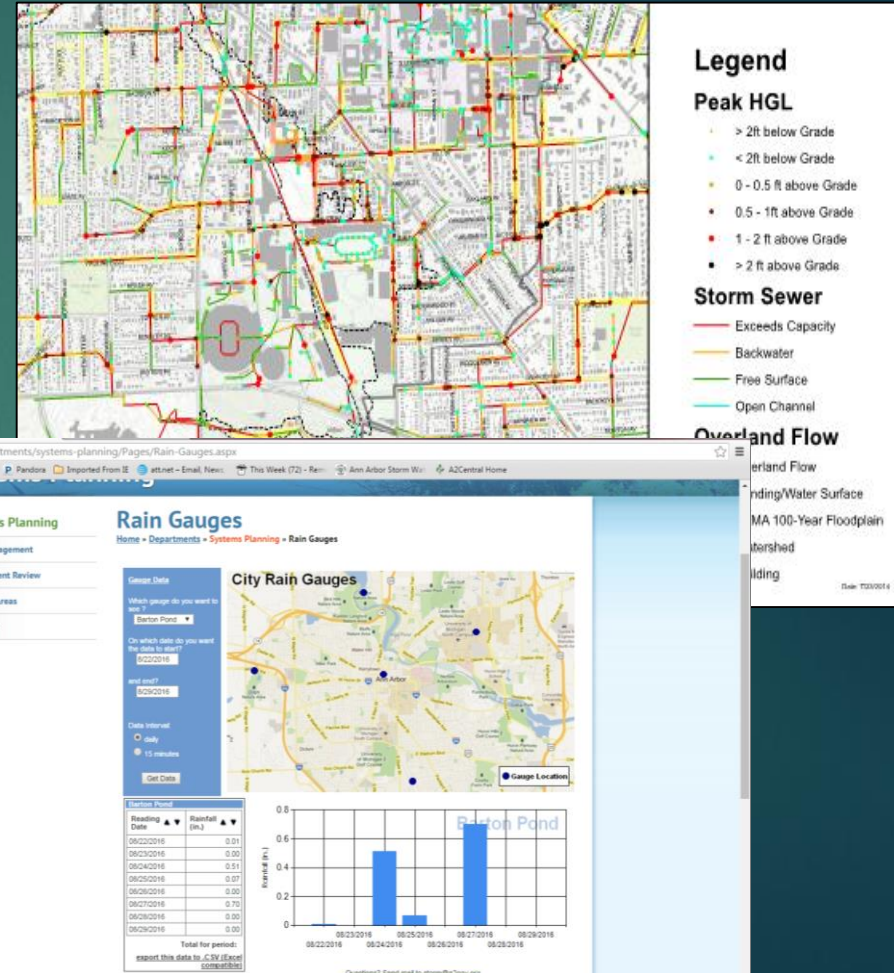
- ▶ Stormwater catch basins: 15,000
- ▶ Miles of stormwater conveyance: 541
 - ▶ including open water channels and ditches
- ▶ City owned Rain Gardens: ~70
- ▶ City owned Detention Basins: 36
- ▶ Privately-owned detention basins: 626
- ▶ City-managed Street Trees: 43,800
- ▶ Full-Time Employees: 19.83
 - ▶ Does not include part-time staff or interns



System Overview – Tools & Technology

7

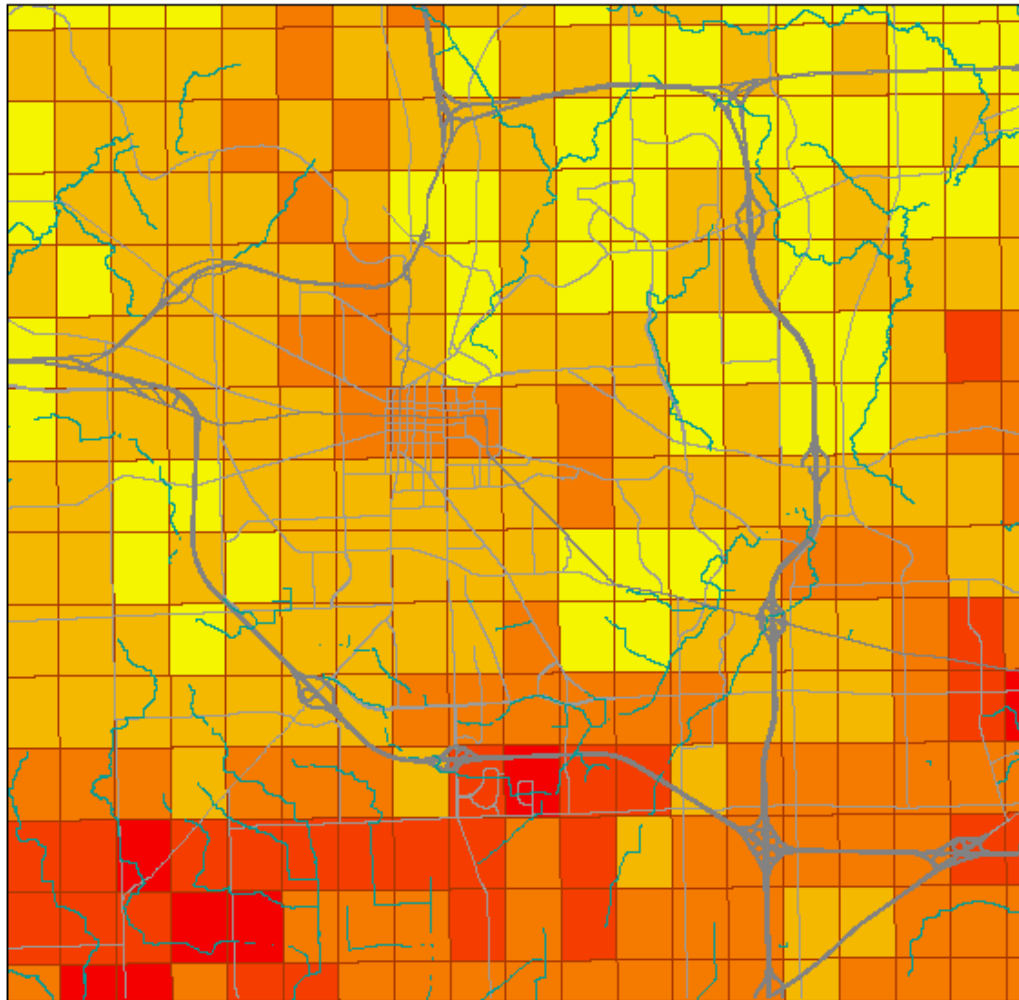
- ▶ Geographic Information System (GIS)
- ▶ Stormwater Management Model (SWMM)
- ▶ Cityworks
- ▶ Aerial Photography
 - ▶ Impervious Cover
- ▶ Drainage Studies
- ▶ Online Data
 - ▶ Stream Gauges
 - ▶ Rain Gauges



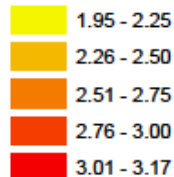
June 5-6, 2010 Storm Event Radar Rainfall Data*

8

Radar Rainfall Data



Rainfall Total (in)



* Rainfall Total Shown is for Duration of
Storm Event (5:00 p.m. to 2:30 a.m.)

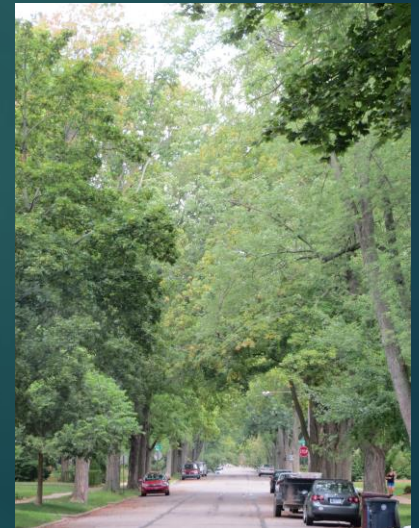
Radar Data Obtained From OneRain, Inc.
1 km x 1 km Pixel Data

What is the Stormwater Utility?

What is a Stormwater Utility?

10

A dedicated funding source to support an administrative organization that plans, designs, constructs and maintains a stormwater management system, sediment and flood control programs and projects, and provides stormwater education.



Stormwater Utility

11

A Stormwater Utility must:

- ▶ Be regulatory
- ▶ Be proportionate to cost of service
- ▶ Allow property owners to limit use of service
 - ▶ Rain gardens
 - ▶ Rain barrels
 - ▶ Porous pavement/reduce impervious areas

City of Ann Arbor's Stormwater Utility

12

- ▶ Formed in the early 1980's; updated 2007
 - ▶ 2016: Stormwater Rate Analysis in progress
- ▶ Rates based on impervious area
- ▶ Cannot be used for initial installation of conveyance or storage system
- ▶ Revenue only can be used for Stormwater Projects, Programming and Operations & Maintenance



Stormwater Utility- What does it pay for?

13

- ▶ Asset Management
 - ▶ Operations/Maintenance Scheduling/Work Orders
 - ▶ Asset Inventory
- ▶ Capital Investments (not expansion)
 - ▶ Green Infrastructure
 - ▶ System Improvements
- ▶ Regulatory Programming
 - ▶ State & Federal Permitting
 - ▶ National Flood Insurance Program Implementation
- ▶ Forestry (Street Trees)



Single/Two-Family Residential Rates

14

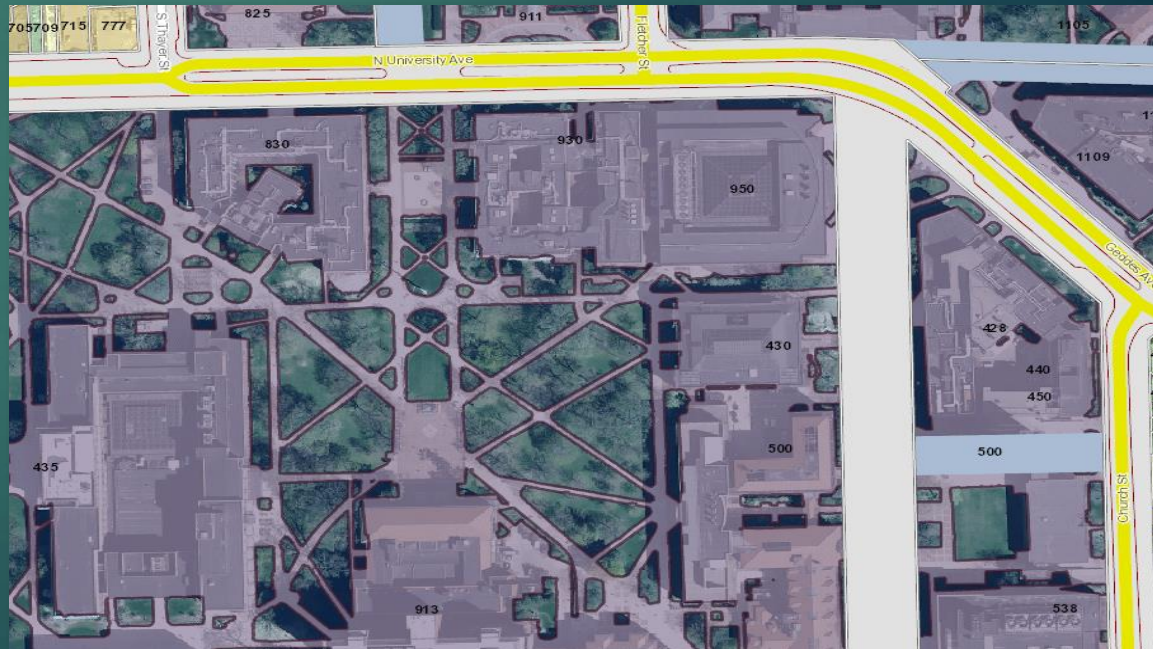
Tier	Impervious Area	Quarterly Charge + \$6.77 customer charge
1	Less than or equal to 2,187 square feet	\$17.00
2	Greater than 2,187 square feet to less than or equal to 4,175 square feet	\$29.75
3	Greater than 4, 175 square feet to less than or equal to 7,110 square feet	\$51.00
4	Greater than 7,110 square feet	\$89.25



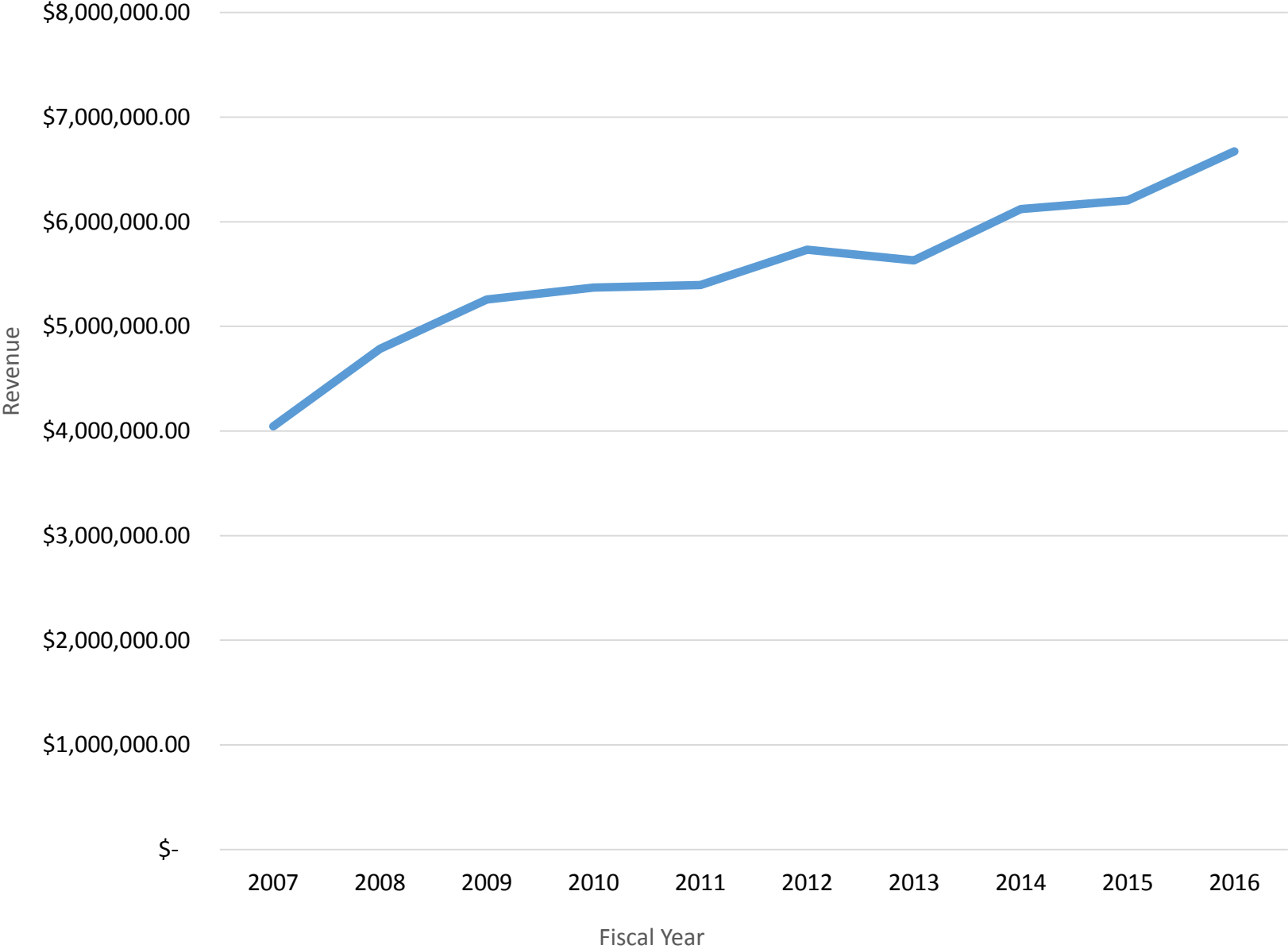
Non-Residential Rate

16

- ▶ **\$425.00** per impervious acre per quarter, plus **\$6.77** customer charge per quarter.
- ▶ Non-residential rate payers include customers in the following land uses:
 - ▶ Commercial
 - ▶ Multi-family
 - ▶ Office
 - ▶ Institutional/University
 - ▶ Industrial



Stormwater Utility Revenue



Forestry Program

Council Priority: Rebuild the Forestry Program

CITY OF ANN ARBOR – PUBLIC SERVICES

Overview

ANN ARBOR'S URBAN AND COMMUNITY FOREST
TOOLS

COUNCIL PRIORITY STATUS UPDATE: *REBUILD THE
FORESTRY PROGRAM*

THE URBAN & COMMUNITY FOREST

20

- ▶ Estimated **1.45 million trees*** in Ann Arbor's urban & community forest
 - ▶ ~**25%** on public property
 - ▶ **43,800 street trees**
 - ▶ **7,000** of trees in mowed areas of **parks**
 - ▶ **Thousands** of trees in city **natural areas**
 - ▶ ~**75%** on private property
- ▶ The city's **urban tree canopy is 33%**

Urban tree canopy = the layer of leaves, branches and stems of trees that cover the ground when viewed from above.



BENEFITS

21

STORMWATER

City-managed trees **intercept 65 million gallons*** of rainwater per year improving the quality and quantity of stormwater entering rivers, lakes and streams.

ENERGY

By shading buildings trees conserve energy use and reduce energy costs during summer months.

AIR QUALITY

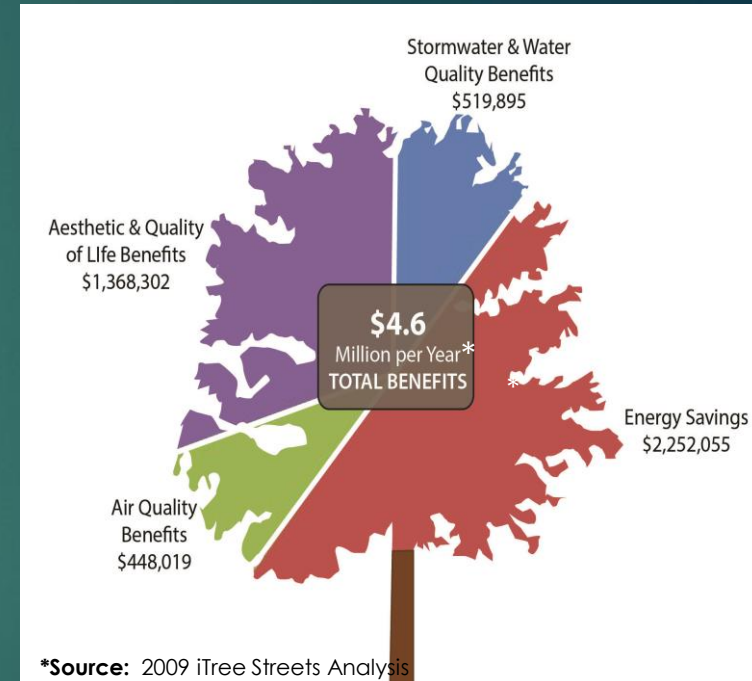
Trees filter particulates and other pollutants out of the air mitigating the health effects of air pollution.

QUALITY OF LIFE/AESTHETICS

“Tree Town”

Enhance properties

Improve customer’s retail experience



Urban & Community Forest Management Plan

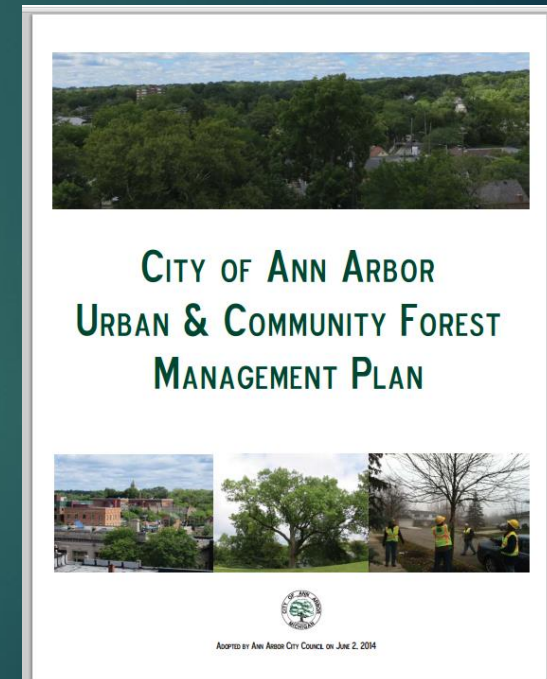
22

In June 2014 the city's **first** Urban and Community Forest Management Plan (UCFMP) was adopted.

The **Vision** of the UCFMP is to sustainably manage the urban and community forest using sound policies and practices, to ensure that it provides environmental, social and economic benefits today and into the future.

To achieve the UCFMP Vision, the plan identifies:

- ▶ 8 Goals
- ▶ 6 Targets
- ▶ 17 Recommendations



a2gov.org/urbanforestry

PRIORITY FOR CITY RESOURCES:

TOP 5 RECOMMENDATIONS

23

#	Recommendation
1	Implement a proactive tree maintenance program emphasizing routine pruning, removals and care to improve the health and sustainability of the canopy.
2	Develop and strengthen tree planting and young tree maintenance programs.
3	Develop and implement program to monitor and address threats to the urban and community forest,
4	Increase preservation and protection of landmark trees and native forest fragments on public and private lands.
5	Secure sustainable city funding to support an increased level of service for urban forestry programs.

Street Tree Management Needs

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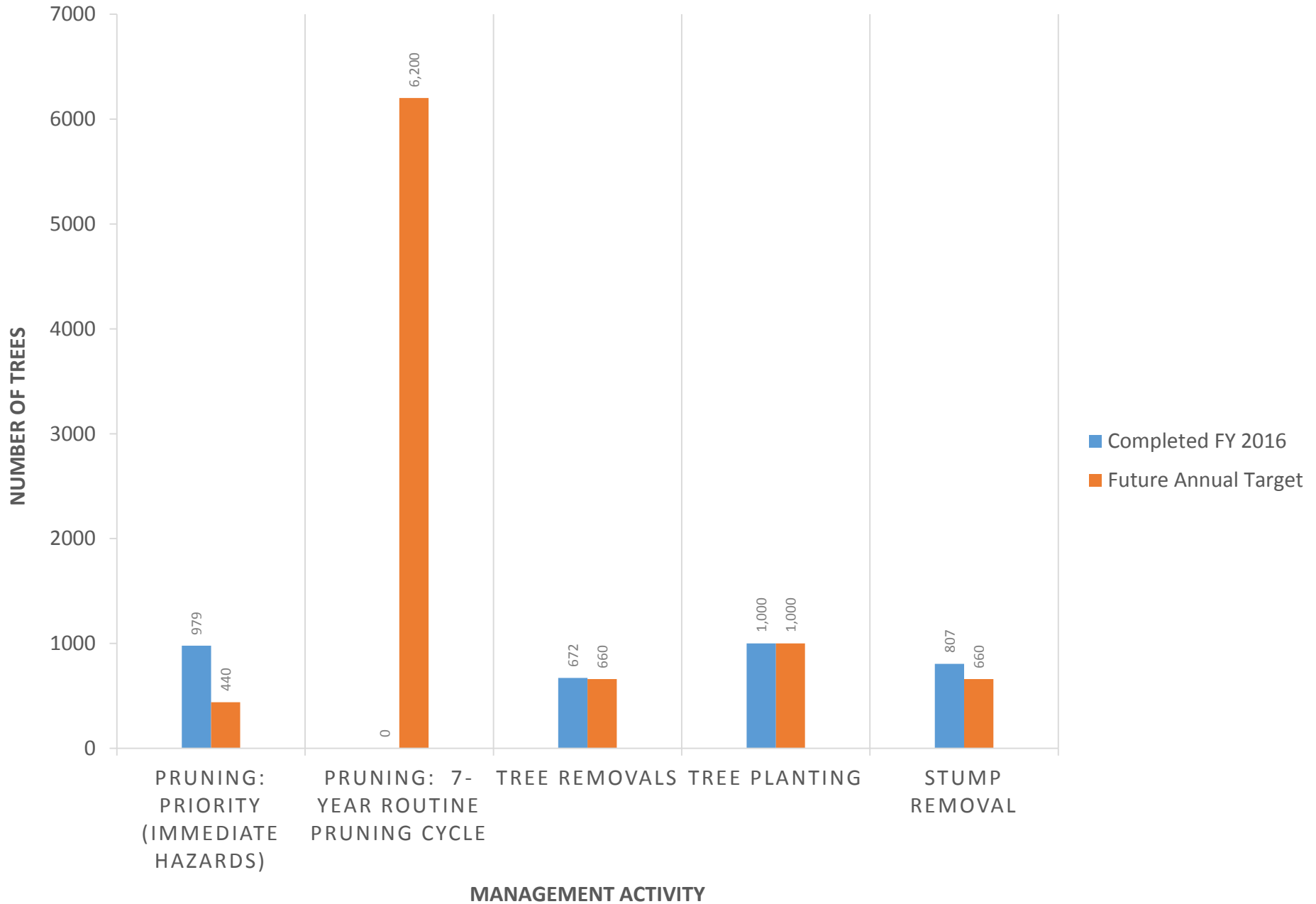
Recommendation #1 of the UCFMP:

Implement a proactive tree maintenance program for Ann Arbor's publicly managed trees, emphasizing routine pruning, removals and care to improve the health and sustainability of the canopy.

To achieve recommendation:

- ▶ Re-establish a 7-Year Routine Pruning Cycle (**currently not funded**)
 - ▶ 6,200 street trees pruned each year
- ▶ To avoid future tree maintenance backlogs, complete tree removals, stump removals and priority prunes within 6 months of their change in condition/maintenance.
 - ▶ Average annual street tree mortality rate is 1.5% or 660 trees
 - ▶ Each year ~1% or 440 trees maintenance will change from routine prune to priority prune (immediate pruning)
- ▶ Continue annual tree planting program

FORESTRY MANAGEMENT ACTIVITIES



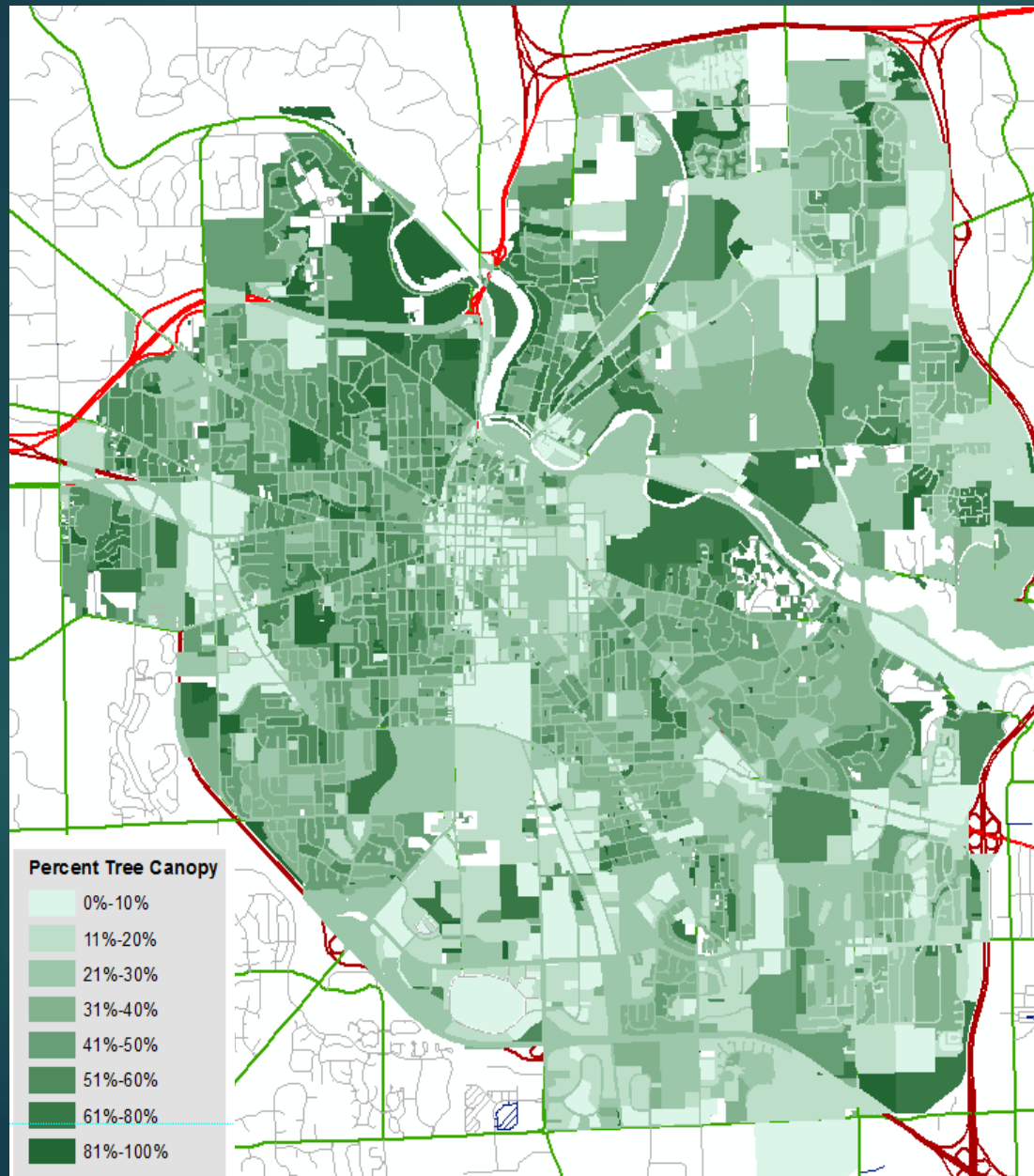
TOOLS

URBAN TREE CANOPY ANALYSIS

GEOGRAPHIC INFORMATION SYSTEM (GIS)/TREE INVENTORY/CITYWORKS

Tools – Urban Tree Canopy Analysis

27



2010 Urban Tree Canopy Analysis (UTC)

Tools – GIS, Tree Inventory & Cityworks

28

The screenshot displays the Cityworks GIS interface, showing a map of a residential area with tree inventory data. The map is overlaid with a grid of lot numbers. A green line highlights a specific tree location on the map, which is linked to a detailed record view on the right. The record view includes fields for Description, Category, Status, Priority, and various dates. The map view on the left shows a list of tree inventory data, including fields like Field, Value, CommonGenus, and BotanicalGenus. A green circle highlights the 'Maintenance' field in the tree inventory list, which is linked to the 'Priority 1 Prune' status in the record view.

Tree Inventory List (Left Panel):

Field	Value
FACILITYID	11-005777
CommonGenus	maple
CommonName	maple, sugar
BotanicalGenus	acer
Cultivar	Acer saccharum
OnStreet	SECOND ST
Side	Front
Site	2
ROW	99
Assigned	No
AddressNumber	508
Street	SECOND ST
Location	Street
X_COORD	13289603.6541
Y_COORD	283255.9625
WarrantyDate	<null>
Ownership	<null>
Maintenance	Priority 1 Prune
ConditionTreeHealth	Good
ConditionDate	2/12/2009
DBH2009	31
DBH	31 - 35
DBHDate	2/12/2009
Height	GT70
HeightDate	2/12/2009
TreePlantDate	<null>
TreeProgram	<null>
ManagementArea	<null>
InstalledBy	<null>

Record View (Right Panel):

Work Order

Description: Priority 1 Pruning
Number: 499410
Entry Type: TREE
Category: Forestry Operations
Initiated By: Gray, Kerry
Status: In Progress
Requested By:
Assigned To:
Projected Start: 08/4/2016 9:39 PM
Opened By:
Closed By:
Completed By:
Actual Start:
Actual Finish:
Stage: Actual
Expense Type: Maintenance
Add Comments:
Existing Comments: Priority 1 Pruning—Trees in this category need pruning to remove hazardous deadwood limbs greater than four inches in diameter and/or have broken, hanging, or diseased limbs and for vehicular and sign clearance. By Gray, Kerry: 8/4/2016 9:39:34 PM Priority 1 Pruning—Trees in this category need pruning to remove hazardous deadwood limbs greater than four inches in diameter and/or have broken, hanging, or diseased limbs and for vehicular and sign clearance.

Location Information

WO Address: 508 - 512 Second St.
Location Details: 508 - 512 Second St.
Shop: No Shop Info
CogsID/Other:
X Location: 13,289,603.71
Y Location: 283,226.12

Assets

Asset	Asset Id	Asset Uid	Location	Warranty Date	Work Completed	Feature
TREE	5777	11-005777	Street			TREE
TREE	5778	11-005778	Street			TREE

Map Layer Fields

Reset

Work Cycle

Repeat: Never
Interval: 6 Months
From: Actual Finish Date
Date Printed:
Next Print Date: 8/4/2016

Related Work Activities

Add Request:
Add Inspection:
Parent:
Create Child Work Order

Permits

Create

Attachments

+ Add attachments... Remove all attachments

Drag and drop files here to attach them.

Council Priority Status Update:

REBUILD THE FORESTRY PROGRAM

CHALLENGES

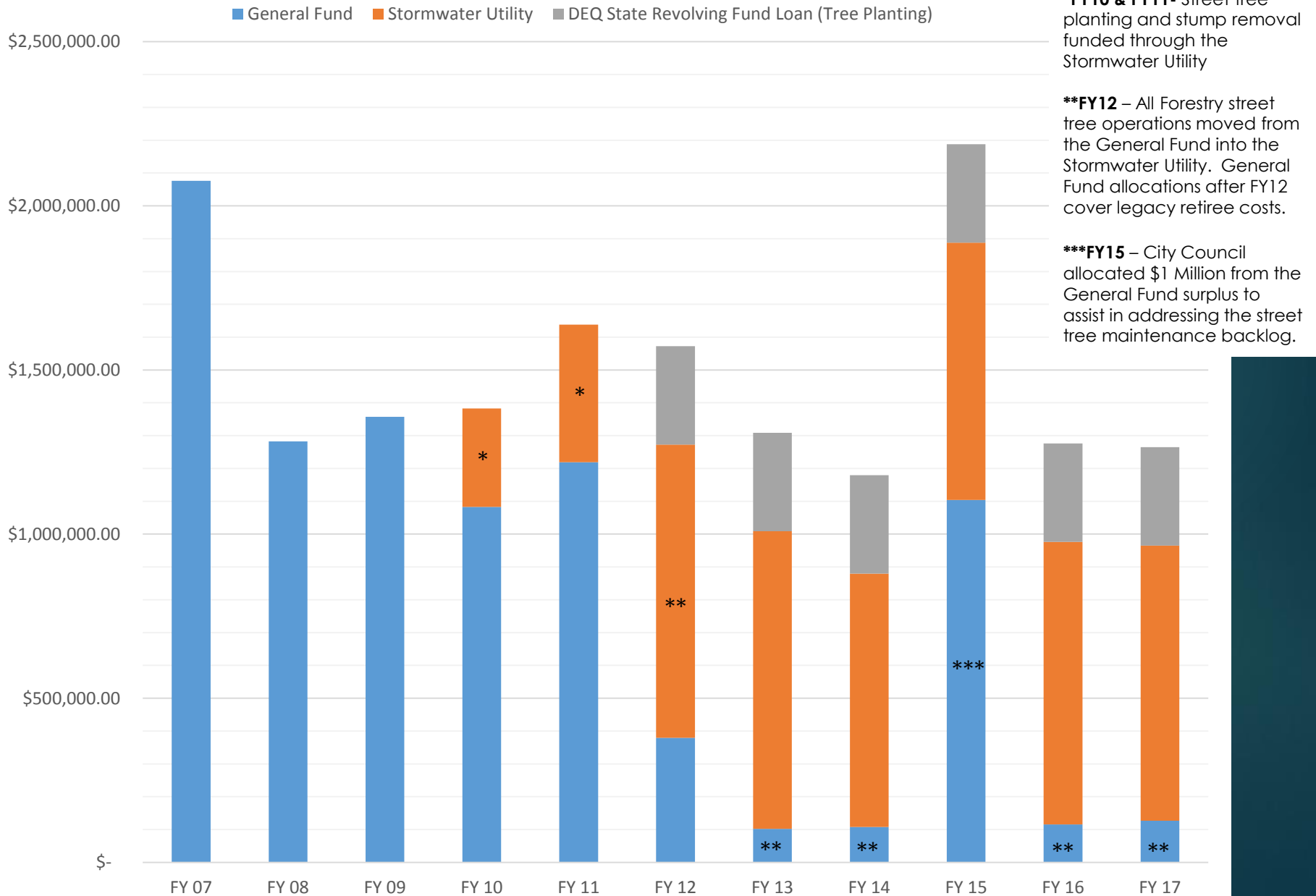
30

Two serious challenges over the last decade impacted the city-managed urban and community forest:

- **Emerald Ash Borer**
- **Street Tree Funding Mechanism Shift/
Reduction**



Street Tree Budget Fiscal Years (FY) 2007-2017



CHALLENGES

32

These challenges led to a deferment in street tree maintenance...

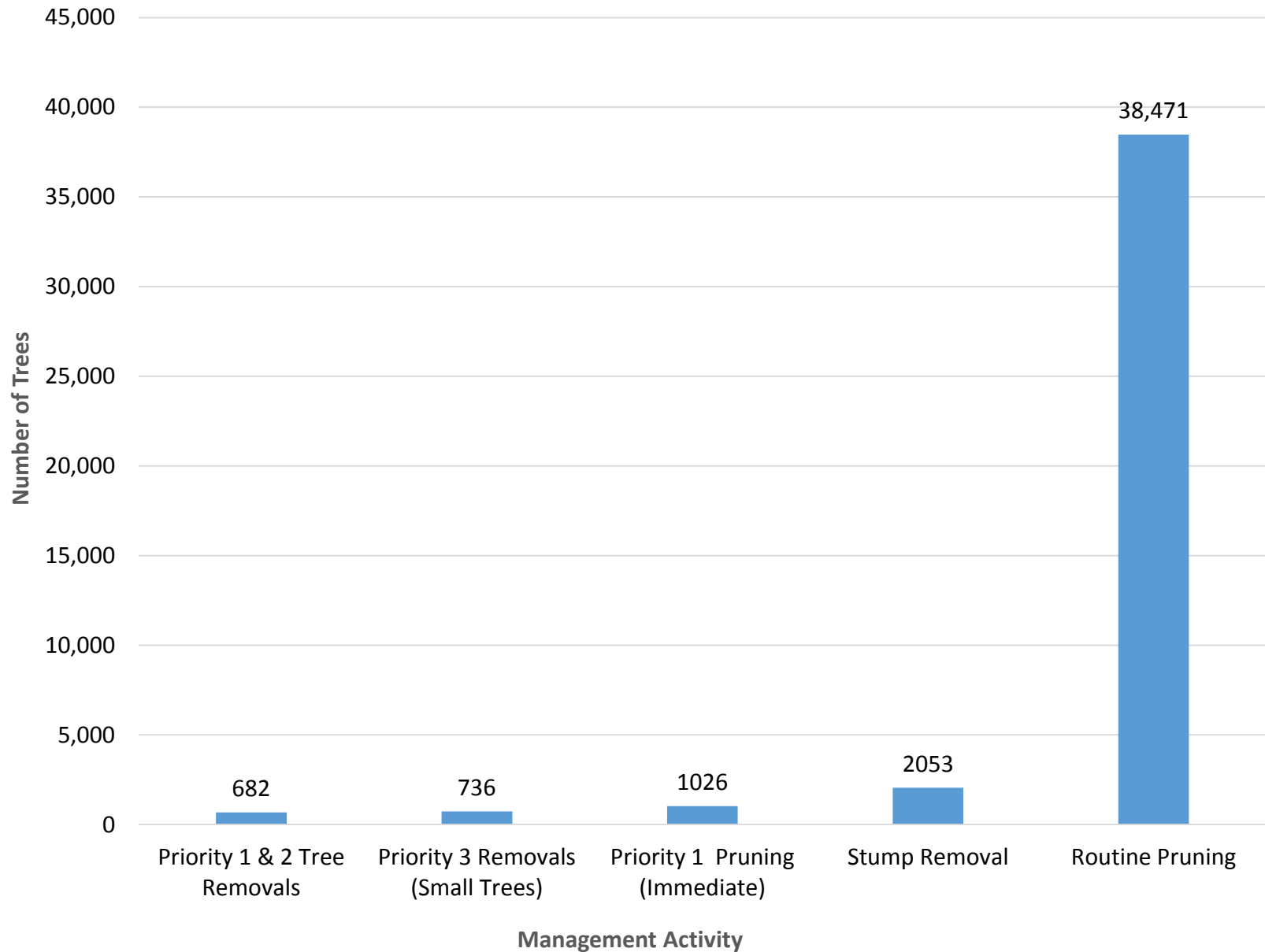
- ▶ causing a backlog in street tree maintenance; and
- ▶ placing the health and condition of the city-managed tree canopy at serious risk.

Forestry management activities prior to the adoption of the UCFMP:

- ▶ Tree Removals -- **reactive**
- ▶ Tree Pruning only to address immediate hazards -- **reactive**
- ▶ Citizen Requests -- **reactive**
- ▶ Tree Planting -- **proactive**
- ▶ **No** routine pruning cycle or proactive maintenance



STREET TREE MAINTENANCE BACKLOG AS OF JULY 1, 2014



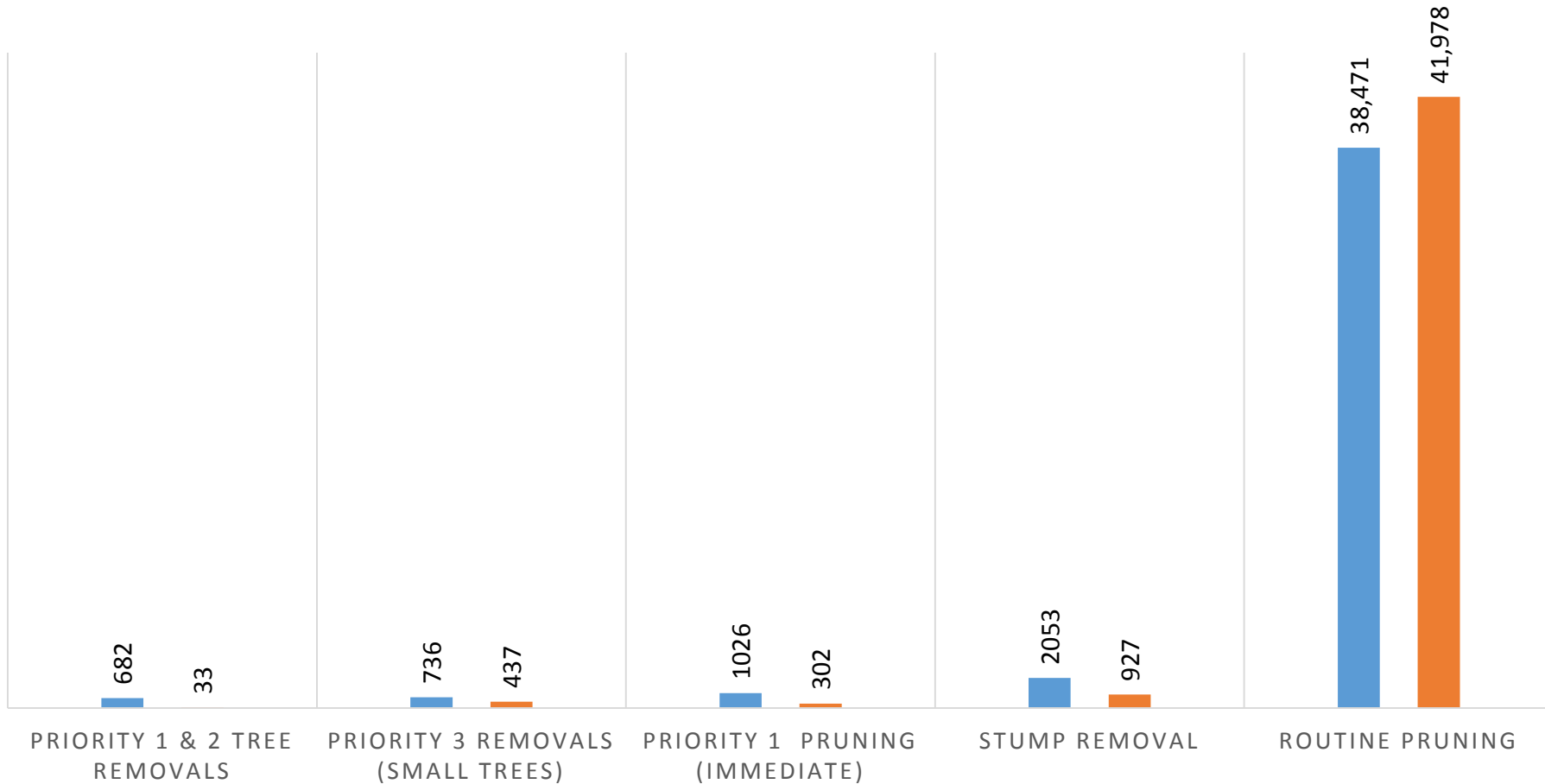
Street Tree Management Activities Today

34

- ▶ Eliminating Street Tree backlog (REACTIVE)
(\$1M General Fund allocation from City Council)
 - ▶ Tree Removals
 - ▶ Priority 1 Pruning
 - ▶ Stump Removal
- ▶ Investigating Citizen Requests (REACTIVE)
 - ▶ Since May 1, 2016 Forestry has received over 900 tree-related service requests
- ▶ Tree Planting (PROACTIVE)
 - ▶ FY 2016 over 1,000 street trees planted
- ▶ No routine tree pruning cycle (PROACTIVE)



STREET TREE MAINTENANCE BACKLOG



■ Street Tree Backlog as of 7/1/2014

■ Street Tree Backlog as of 7/1/2016

Forestry – Staffing

36

	Staffing Recommendation UCFMP	2014	2016
Public Works Technician (Forestry)	12 FTEs 8 of 12 FTEs have technical skills to aerially prune and remove trees	8 FTEs 3 of 8 FTEs had technical skills to aerially prune and remove trees	9 FTEs 7 of 9 FTEs have technical skills to aerially prune and remove trees

Questions?

Stormwater Rate Analysis Project

PROJECT UPDATE

Why conduct a Stormwater Rate Analysis?

39

Funding vs. Need

- ▶ Current rate does not fully support current or future programs
- ▶ Current funding level
 - ▶ \$6M: annual revenue
 - ▶ \$56M: existing Capital Improvement Plan projects
 - ▶ \$160M: needs identified in Stormwater Management Model (SWMM) Project
 - ▶ Forestry Street Tree operations were not included in the 2007 stormwater rate analysis study
- ▶ Asset Management
- ▶ Operations and Maintenance

Managing Expectations

40

- ▶ Design capacity vs. perceived/desired level of service
 - ▶ 1 inch/1-hour
 - ▶ 1 inch/24-hour
- ▶ Educating the public on the role of the stormwater system



Level of Service and Rate Analysis Project

41

- ▶ Evaluate:
 - ▶ needs of the stormwater system;
 - ▶ needs of the community;
 - ▶ expectations of the ratepayers

- ▶ Develop a comprehensive plan including recommendations regarding the City's stormwater utility and rate adjustments.
 - ▶ Recommendations by late fall 2016

Level of Service Principles*

42

- ▶ Protect public health, safety, and welfare
- ▶ Protect ecological health
 - ▶ Utilize green infrastructure when feasible
- ▶ Conduct comprehensive planning to determine priorities
 - ▶ Consider climate change and resiliency
- ▶ Encourage shared responsibility
- ▶ Offer incentives to guide desired behaviors
- ▶ Educate stormwater system users
- ▶ Provide an understandable, equitable rate structure

*Developed by Storm Water Citizens Advisory Task Force (2007)

Public Engagement

43

▶ Advisory Group

- ▶ 25 member group provides guidance and input into the project
 - ▶ Members from the 2007 Stormwater Citizens Advisory Taskforce
 - ▶ Residents
 - ▶ Local interest groups
 - ▶ Downtown Development Authority
 - ▶ Ann Arbor Public Schools
 - ▶ University of Michigan
 - ▶ Office of the Washtenaw County Water Resources Commissioner
 - ▶ Apartment Association
 - ▶ Huron River Watershed Council

Public Engagement

44

- ▶ August 2016: A2 Open City Hall Survey
 - ▶ 109 responses received
 - ▶ 11 multiple choice questions
 - ▶ Comment section



Results of A2 Open City Hall

45

Question #3: Indicate which areas funded by the stormwater utility are most important? (Ranked by importance)

- #1: O&M of Infrastructure
- #2: Capital Improvements to Utility
- #3: Urban Forestry and Street Tree Programs
- #4: Regulatory Compliance
- #5: Green Streets Policy
- #6: Stormwater Utility Education and Outreach

Results of A2 Open City Hall

46

Question #6: Indicate which of the following principles of stormwater management are most important to you?

(Ranked by % of responses)

#1: Protect public health, safety, welfare, and environment

#2: Utilize green infrastructure when feasible (tied for #2)

#2T: Consider climate change and resiliency (tied for #2)

#4: Educate and inform the public about stormwater management

#5: Provide an understandable, equitable rate structure

#6: Cross-collaborate with other agencies and leverage all available resources

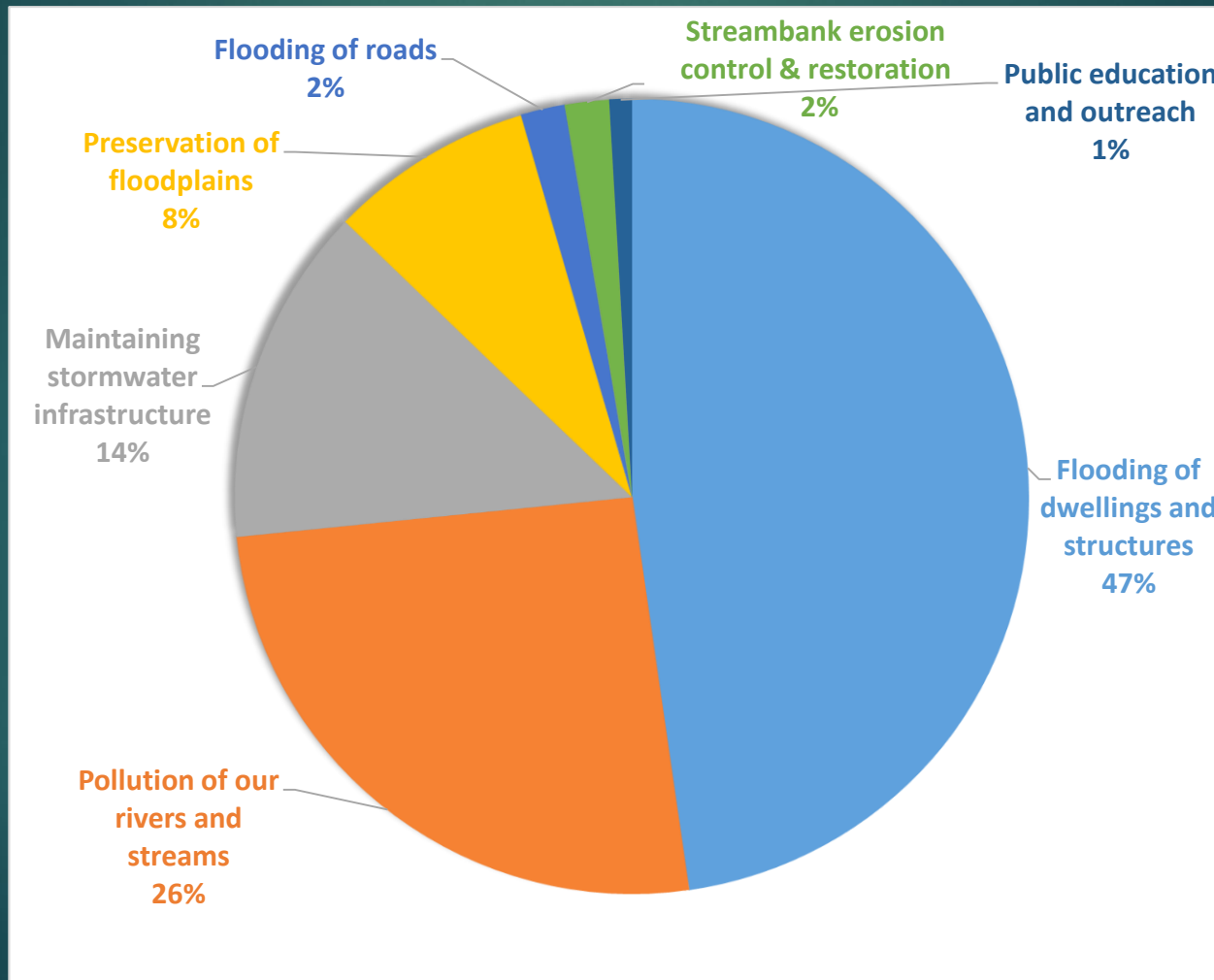
#7: Use incentives to guide desired behaviors

#8: Encourage shared responsibility

Results of A2 Open City Hall

47

Question #9: Indicate the number one concern that you have regarding stormwater.



Stormwater Rate Analysis: Financial Model

48

- ▶ Operations and Maintenance Needs
- ▶ Staffing recommendations
- ▶ Capital Improvements Funding Needs
- ▶ Debt Payments
- ▶ Financing Options

SAVE CALC ROLL

FINANCIAL ANALYSIS AND MANAGEMENT SYSTEM (FAMS) SUMMARY

The City of Ann Arbor

RESET

Zoom

10/20

FY 2017 FY 2018 FY 2019 FY 2020 FY 2021 FY 2022 FY 2023 FY 2024 FY 2025 FY 2026

Cumulative Change

Override ▶

Last Plan

Override ▶

Last Plan

Last Plan

Option Start Year

Non-LOS Options

BMP maint/ins

Fleet Exp.

CCTV Freq.

Field Ops. CS

LOS Options

Admin

Public Eng.

Capital

Operations

Impervious Area Charges

Administrative Charges

Rate Covenant

CIP Execution % ▶

Net CIP Funding % ▶

Operating Reserve Mo ▶

Base Rate

2,187 - 4,175 ft2

Average Bill

0.00% 0.00% 37.16% 16.19% 13.56% 15.62% 15.11% 14.39% 14.39% 14.08%

0.00% 0.00% 37.16% 16.19% 13.56% 15.62% 15.11% 14.39% 14.39% 14.08%

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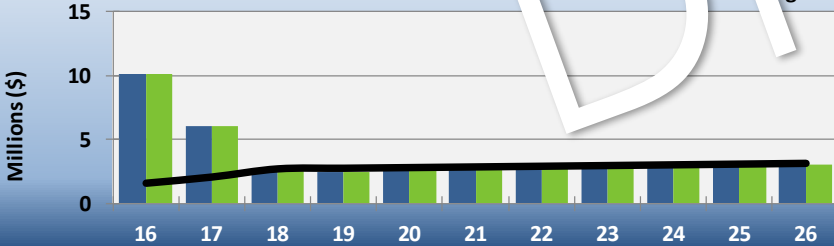
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Operating Fund

Current Plan Last Plan Target



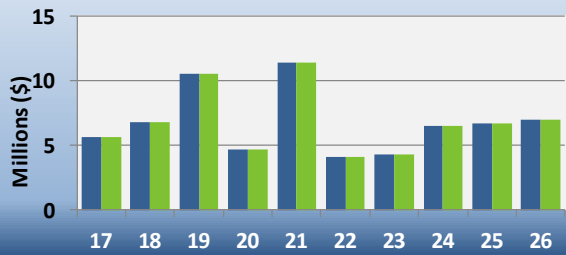
Revs. vs. Exp

Cash In Cash Out Cash Out Excl. CIP



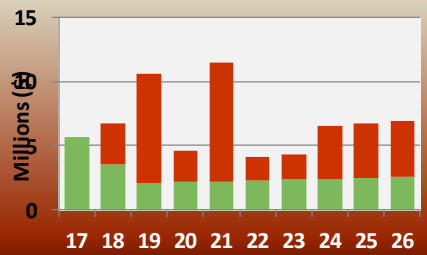
CIP Spending

Current Plan Last Plan



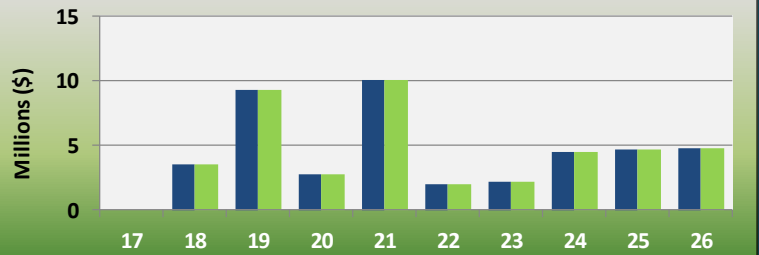
CIP Funding

GRANT FUNDING Operating Debt



Long-Term Borrowing

Current Plan Last Plan



Stormwater Rate Analysis: Next Steps

50

- ▶ Preliminary rate results
- ▶ Validate recommendations
- ▶ Propose rate adjustments for budget
- ▶ Public Engagement - Outreach Strategy

Questions?

