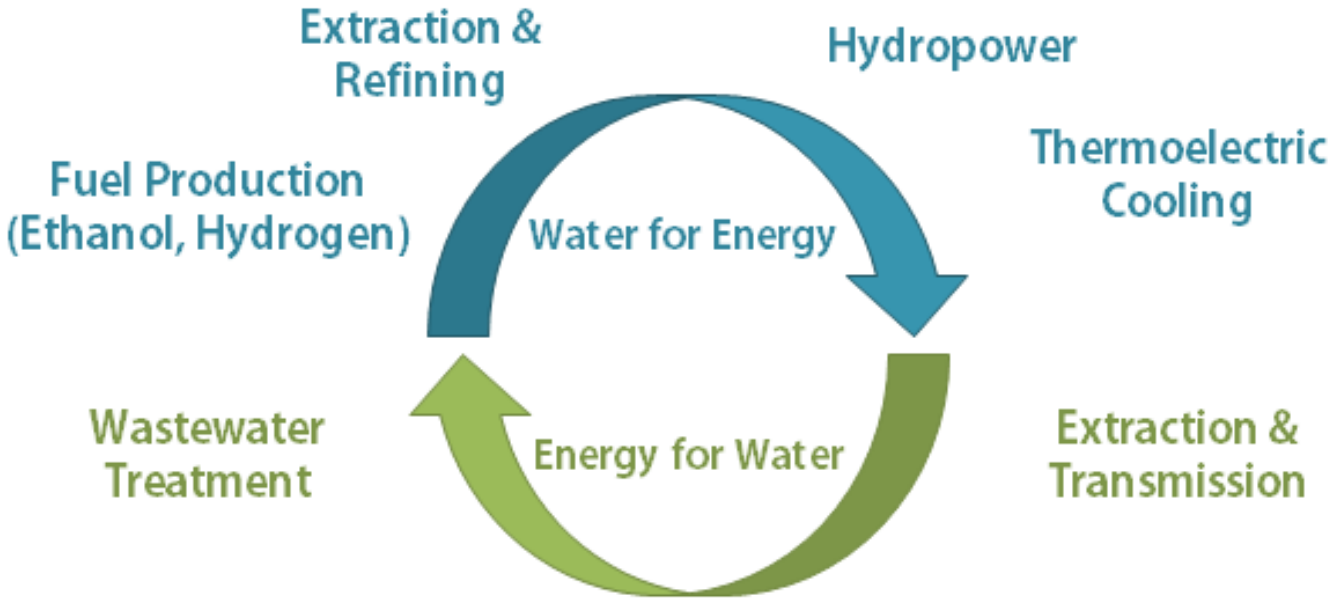
OHM Advancing Communities®

Oakland County Water – Energy Nexus: Sustainable Asset Management

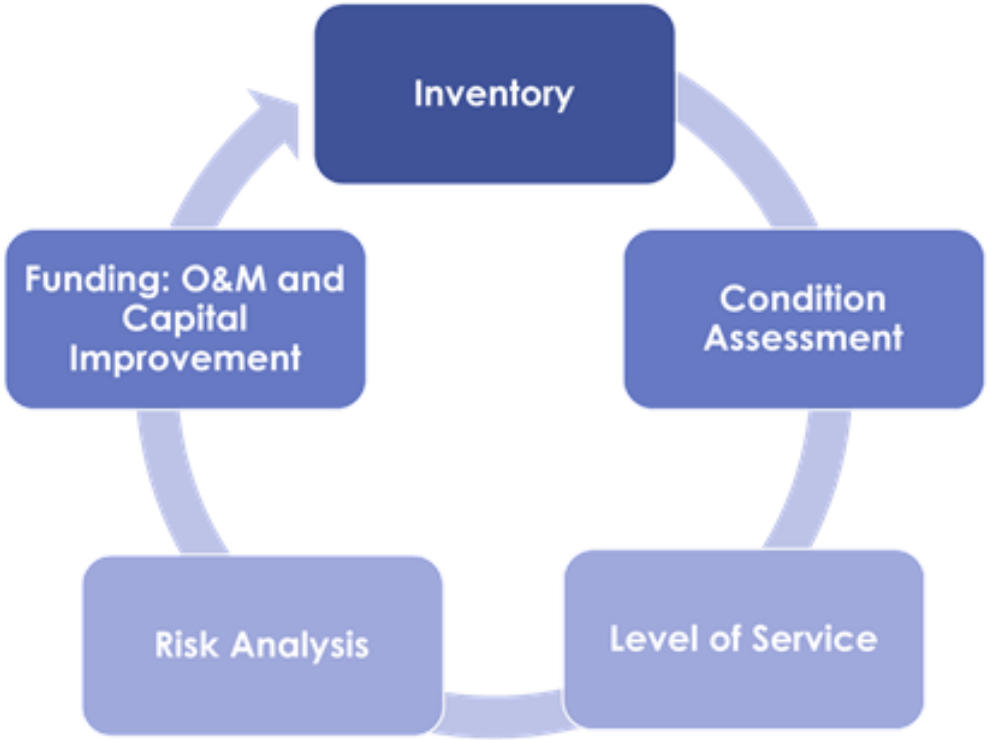
May 11, 2018

Water-Energy Nexus

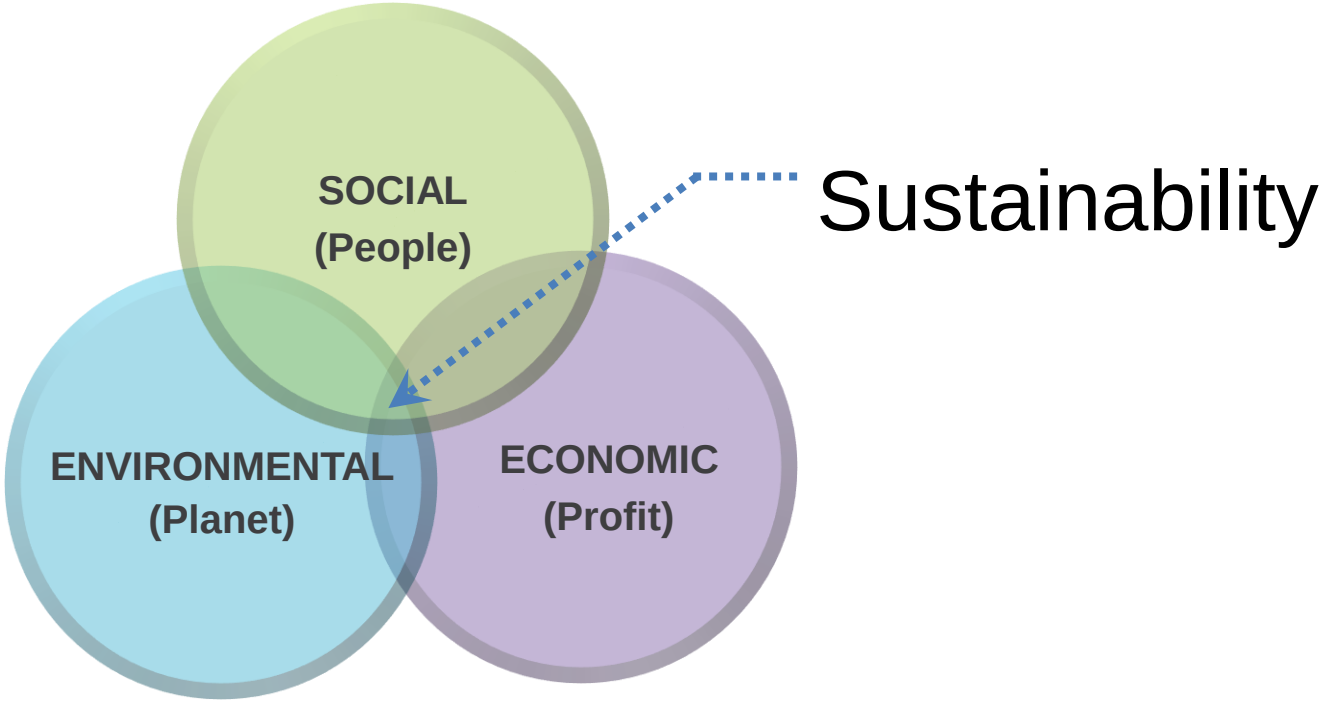


Asset Management

(System Health Check-Up)



What is a Sustainability Assessment?



Triple Bottom Line

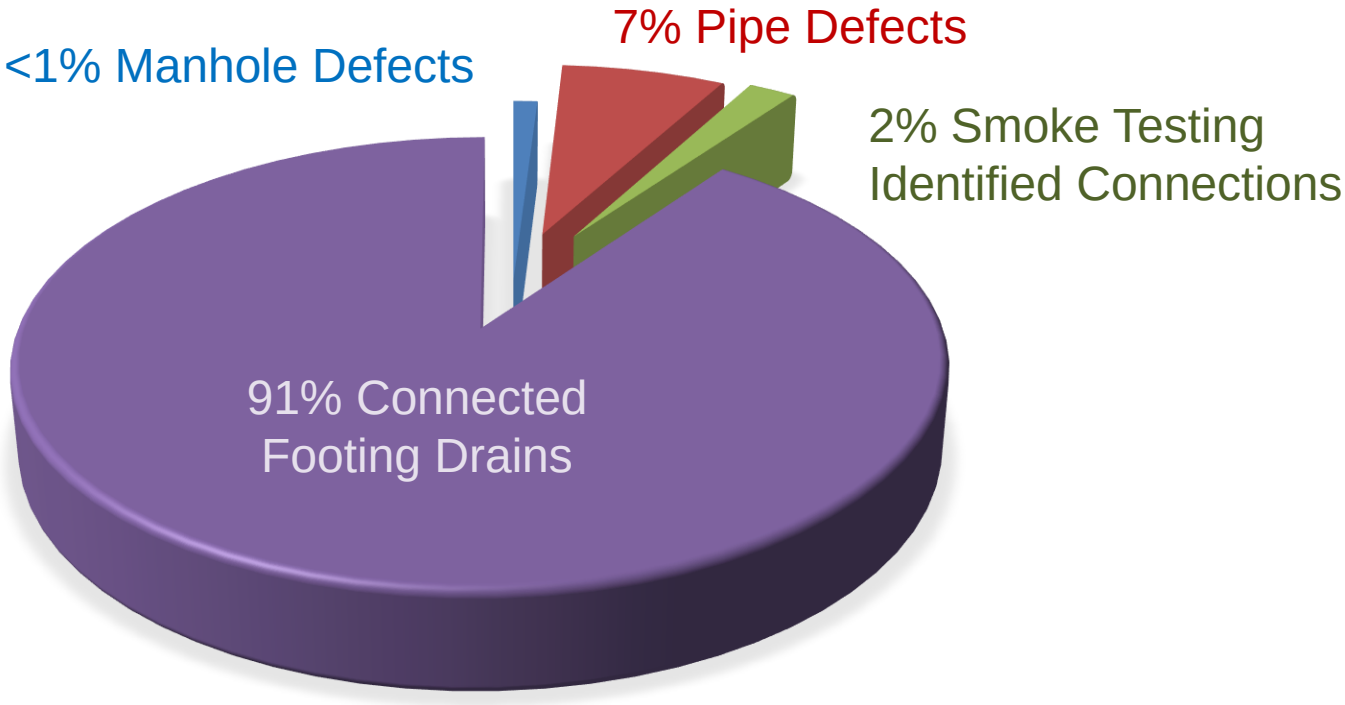
Economic Analysis

- Construction Cost
- Return on Investment

Environment

- SSO’s are caused by infiltration and inflow (I&I)
- I&I is “clean” water that we are paying to store, pump, and treat

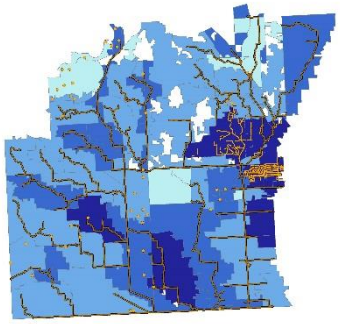
Sources of Inflow & Infiltration



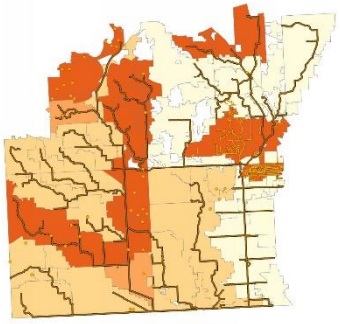

OAKLAND COUNTY
3 BILLION GALLONS OF GROUNDWATER DIVERTED TO THE DETROIT RIVER PER YEAR
APPROXIMATELY 200,000 OAKLAND COUNTY HOMES WITH CONNECTED FOOTING DRAINS
WATER TRANSPORTED OVER 50 MILES
DETROIT WWTP
TO LAKE ERIE
Oakland County Groundwater Displacement

That’s equivalent to *draining* Walnut Lake

System Evaluation

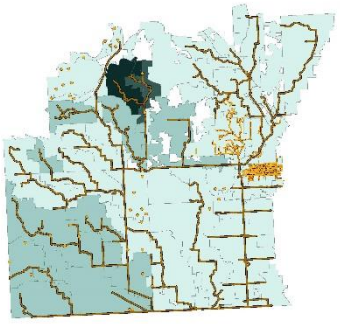


Rainfall Dependent Inflow & Infiltration



Pump Station Energy Consumption

Footing Drain Contribution

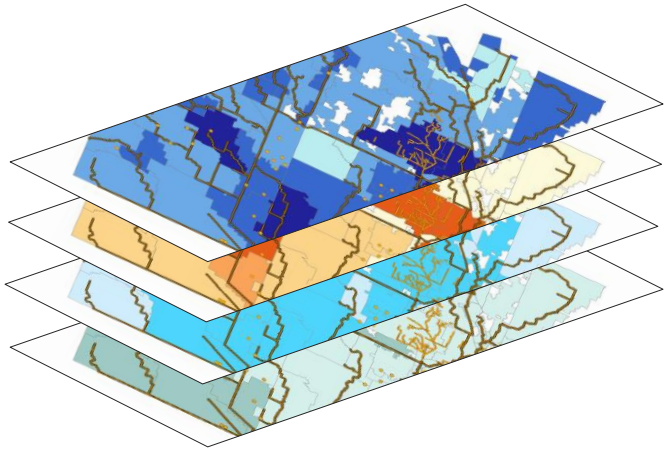


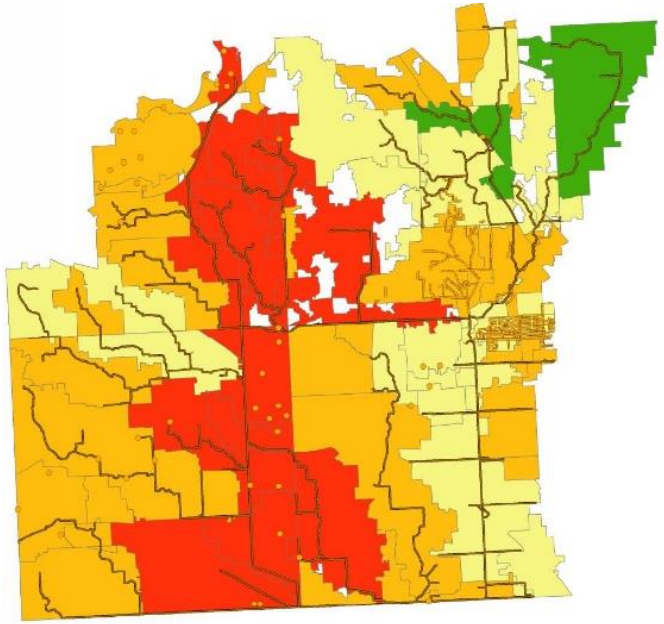
Downstream LTCAPs

System Evaluation and Prioritization

Sustainable Solution Indicators

System Prioritization

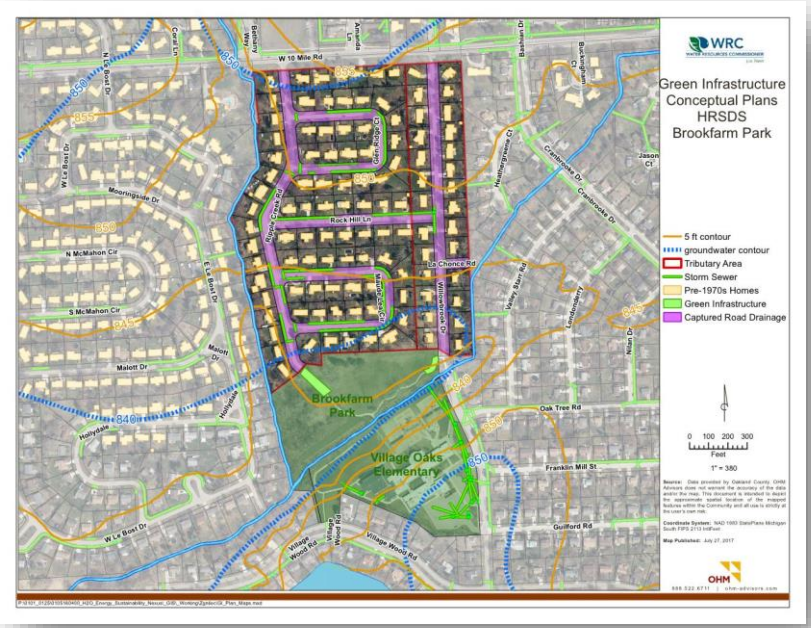




System Evaluation and Prioritization

Scoring of Sustainable Solution Indicators

Footing Drain Disconnection



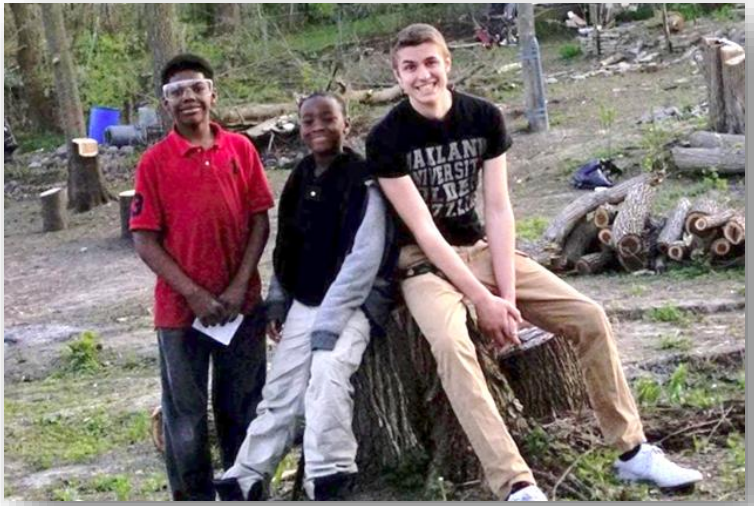
Ditch Enclosure & Green Inf.

System Evaluation and Prioritization

Identifying Neighborhoods with High Score

Social

Engage in the sustainability discussion to make connections with people who are making an impact in the communities we serve.



REROOT PONTIAC'S HENDERSON ST. DEVELOPMENTS

- Funded by Akzo-Nobel
- In partnership with Leaders of the Future

Layout of Orchard Site

1-inch rainfall event

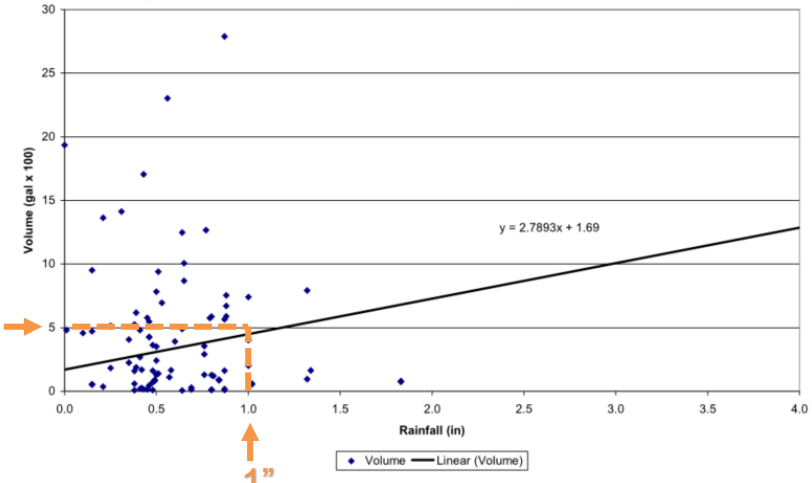
- Disconnection of 25 Footing Drains
- 1,675 ft^3 of Footing Drain Volume Removed from Sanitary Sewer
- Capturing 4,000 ft^3 of Surface Runoff

Volume Calculation

FOOTING DRAIN

67 ft³ x 25 FDD

Figure 21. Volume of Flow From Footing Drains – All Sites.



500 Gal or 67 ft³

1" rainfall

DWSD Wastewater Master Plan
Summary of Footing Drain Flow Studies
2003

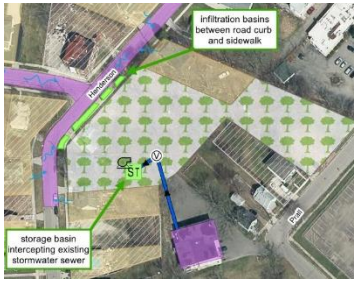
+

SURFACE RUNOFF

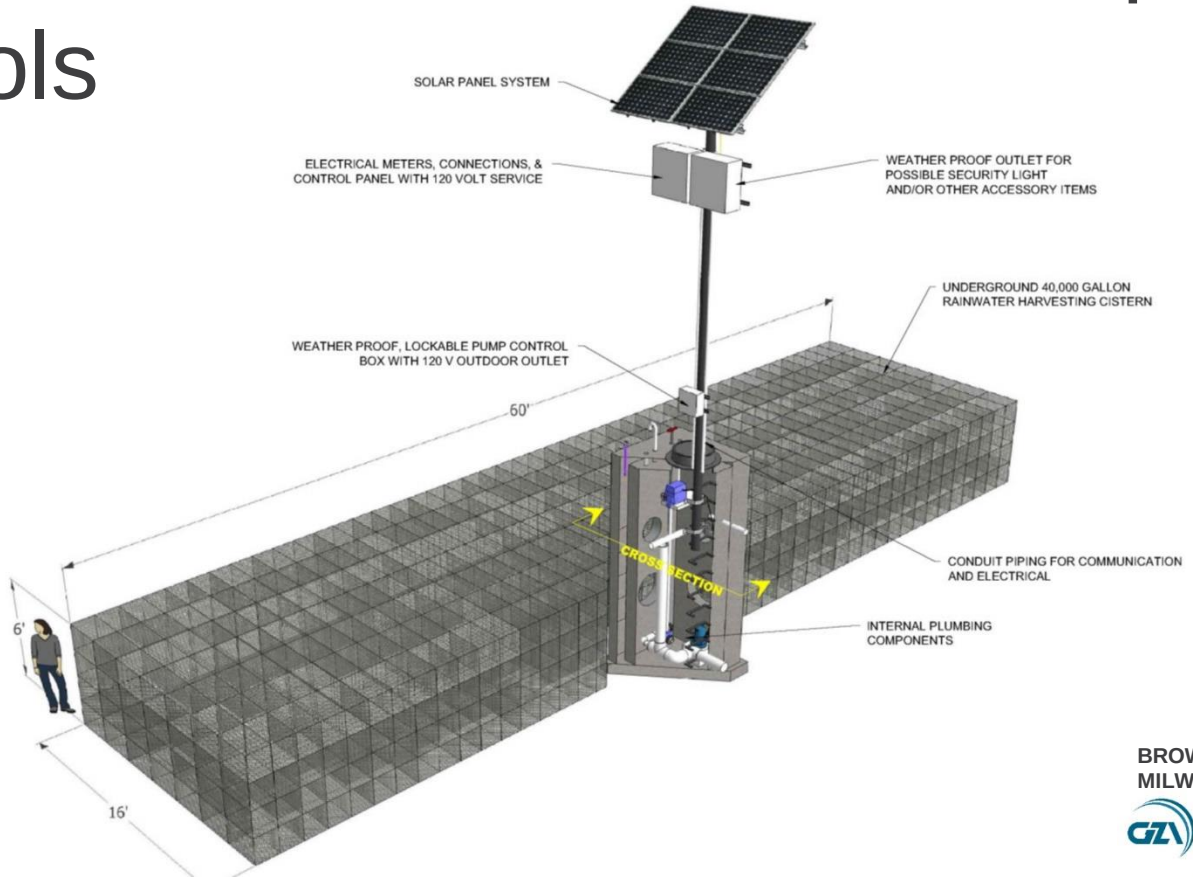
Area x CN x 1" rainfall

=

5,680 ft³ of storage and infiltration



Cistern with Solar Powered Pump & Controls



BROWNFIELD REDEVELOPMENT, MILWAUKEE WISCONSIN

GZA GeoEnvironmental, Inc.
Engineers/Scientists


Henderson St.
Before


Curb Cut
Bioswale
Henderson St.
After
REROOT
Apple Orchard

Social Benefits

- Food Industry Jobs
- Community Building
- Internships for students at Oakland University
- Training on green infrastructure design and maintenance

Environmental Benefits

- Remove clean water from the sanitary sewer system
- Capture and reuse clean water for the Orchard
- Recharge the groundwater

Economic- Natural Capital

Determine all the Natural Capital benefits using proven assessment tools.

Image courtesy of:
Dorothy Maxwell

Annual Benefits of Natural Capital

Neighborhoods	Energy	Air Quality	Climate Change	Groundwater	Trees & Food Production	20-Year Total
Bloomfield Hills	$1,925	$58	$27	$552	-	$51,228
Kenbrook	$2,281	$92	$42	$834	-	$64,985
Brookfarm	$2,772	$68	$34	$589	-	$69,244
Meadowbrook	$1,950	$22	$15	$168	-	$43,090
Walton Heights	$1,771	$64	$29	$623	-	$49,742
ReRoot Orchard	$1,129	$15	$8	$187	$20,482	$267,423
Total	**$11,828**	**$320**	**$154**	**$2,953**	**$20,482**	**$545,713**

Sustainable Return on Investment (ROI)

Lifecycle cost analysis

+

Natural capital benefits

Reality Check

The life cycle cost analysis show that the ROI is not there and it is cheaper to continue the non-sustainable project.

Sustainable Solution Funding

- Find the partners who's **mission** is the **natural capital benefits** of the project.