Green Returns on Blue Investments

Investment in the Grand River

City of Grand Rapids
Mayor George K. Heartwell
Outline

**Blue Investments:**
- Combined Sewer Overflow (CSO) Improvement Program
- Joe Taylor Park & Rain Gardens
- Smart Growth Master Plan
- Sustainable Community Development Initiative
- Grand Valley State University’s Impact
- Vegetative Roofs
Combined Sewer Overflow (CSO) Improvements

**Combined Sewer System**

Combined sewer overflow (CSO) occurs when a single collection pipe is used to convey both storm runoff and sanitary wastes. During heavy rains or snow melts, the overflow, which includes sewage, is discharged into a nearby river or lake.

**Separate Sewer System**

Recognizing that combined sewer overflows are sources of pollution, state and federal legislation and guidelines have been adopted to reduce or eliminate them by various means, including separation of combined sewers.
CSO Improvement: Background

- Grand Rapids’ combined sewers date back to the turn of the nineteenth century.
- In 1929, the City of Grand Rapids instituted a program to separate the combined sewers as funding permitted.
- In 1965, CSO volumes reached their peak of 12.6 billion gallons/year.
- In the early 1990s, there were 640 miles of separate sewers, 81 miles of combined sewer, and 59 CSO locations.
In April of 1989, the City of Grand Rapids developed a strategy to eliminate combined sewer overflows.

- Committed to eliminating the in-system overflows by 2019.

Implementation began in 1992

- Phase I: 1992-1999
- Phase II: 1999-2019
CSO Improvement Phase I: Major Activities

- Market Avenue Retention Basin (MARB) - 30.4 million gallon facility
- Combined sewer separation in an area of 2,000 acres
- Construction of 34.5 miles of storm sewer pipes
## CSO Improvement Phase I: Activities and Costs

<table>
<thead>
<tr>
<th>Activity</th>
<th>Cost</th>
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<tbody>
<tr>
<td>Market Avenue Retention Basin</td>
<td>$30,000,000</td>
</tr>
<tr>
<td>Sewer Separation and Relief Sewers</td>
<td>$85,400,000</td>
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<tr>
<td>Stormwater Pumping Stations (2)</td>
<td>$9,837,000</td>
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<tr>
<td>River Crossing (new and re-lining)</td>
<td>$4,063,000</td>
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<tr>
<td>Sanitary Sewer Rehab- West Side</td>
<td>$27,000,000</td>
</tr>
<tr>
<td>Sewer Improvements on East Side (2)</td>
<td>$3,700,000</td>
</tr>
<tr>
<td><strong>Phase I Total</strong></td>
<td><strong>$160,000,000</strong></td>
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</table>
CSO Improvements Phase I: Results

CSO Discharge Volumes (in billions of gallons)
## CSO Improvements Phase II: Activities and Costs

<table>
<thead>
<tr>
<th>Project Details</th>
<th>Cost</th>
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</thead>
<tbody>
<tr>
<td>F-10 (2014)</td>
<td>$30,200,000</td>
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<tr>
<td>F-04 (2016)</td>
<td>$34,000,000</td>
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<tr>
<td>MAPS, F-01, F-03, W-19, W-21 (2019)</td>
<td>$27,300,000</td>
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<tr>
<td><strong>Phase II Total</strong></td>
<td><strong>$145,800,000</strong></td>
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CSO Improvements: Environmental Impacts

2009 CSO Discharge to the Grand River (% of Volume)
- Other Communities: 94.5%
- Grand Rapids: 5.5%

2009 CSO Discharge Volume in Michigan (% of Volume)
- Other Communities: 99.89%
- Grand Rapids: 0.11%

Source: MDNRE
CSO Improvements: Social Impacts

- Neighborhoods have seen new and improved infrastructure.
- The high water quality of the Grand River has allowed for increased recreation.
- No beach closings due to CSO discharge.
Joe Taylor Park

- Built in 2010
- Cost $290,000 and has a 50 year life
- 270,000 gallon stormwater treatment facility
- Treats storm water runoff from 40 acres of residential and commercial property
  - 40,190,000 gallons of runoff water per year.
Rain Gardens: River of Dreams

- 75’ by 75’ garden at the Wastewater Treatment Plant
- Divided into five large, “industrial-strength” rain gardens
- Processes more than 12 million gallons of rainwater per year.
Rain Gardens: River of Stars

- 25’ by 35’ garden at WWTP
- Diverts an average of 250,000 gallons of untreated storm water every year.
- Serves as a habitat for local wildlife and a useful educational tool
Grand Rapids Water and Environmental Services Building

- First public works facility in the Midwest to attain LEED® certification.
- The site contains many stormwater management techniques:
  - A grass swale was established to absorb storm water and pollutants from the north parking lot.
  - Porous pavers were used on the west parking lot to minimize runoff and heat island effects.
  - A swirl concentrator was also placed in this location to capture sediment, debris, and floatable oil.
Smart Growth Master Plan

CITY OF GRAND RAPIDS
MASTER PLAN
2002

PLAN
GRAND RAPIDS

[Images of various developments and landscapes]
Smart Growth Master Plan

- No more than 33 percent of any single plant species
- Invasive species are not allowed
- 70 percent native species
- Minimum green space requirement
- Green roofs
- Porous pavement
- 100% stormwater mitigation
Smart Growth Master Plan

- Reduce stormwater runoff and increase infiltration
- Connect the ecological framework
Sustainable Community Development Initiative

• A partnership between Grand Valley State University and the City of Grand Rapids
• Leveraging resources to produce sustainable outcomes
GVSU LEED Certified Buildings

- 12 completed LEED projects
- Approximately 20% of the total square footage is LEED certified.

When compared to traditional buildings, GVSU’s LEED Buildings:
- use 25% less energy
- produce 35% less CO2e emissions, use 40% less water,
- produce 70% less solid waste
GVSU Stormwater Initiative

Overall Objective: Restore the campus storm water runoff to pre-development conditions and patterns
Since 2008, GVSU has:

- Designed a 44-acre storm water treatment wetland complex to divert 50.3 campus acres of runoff
- Constructed 18-acre south wetland and re-routed 10-acres of runoff away from the ravines.
- Installed 20,000 square feet of porous concrete sidewalk.
- Constructed rain garden fed storage pond, redirected 22 acres of parking lot runoff to the storage pond
City-Wide Vegetative Roofs

- 21 buildings with vegetative roofs
  - Totaling 246,251 square feet
  - Captures approximately 5,650,000 gallons of water per year.
Conclusion

- Economic Impacts
- Ecological Impacts
- Social Impacts

Clean Grand River
Thank you!