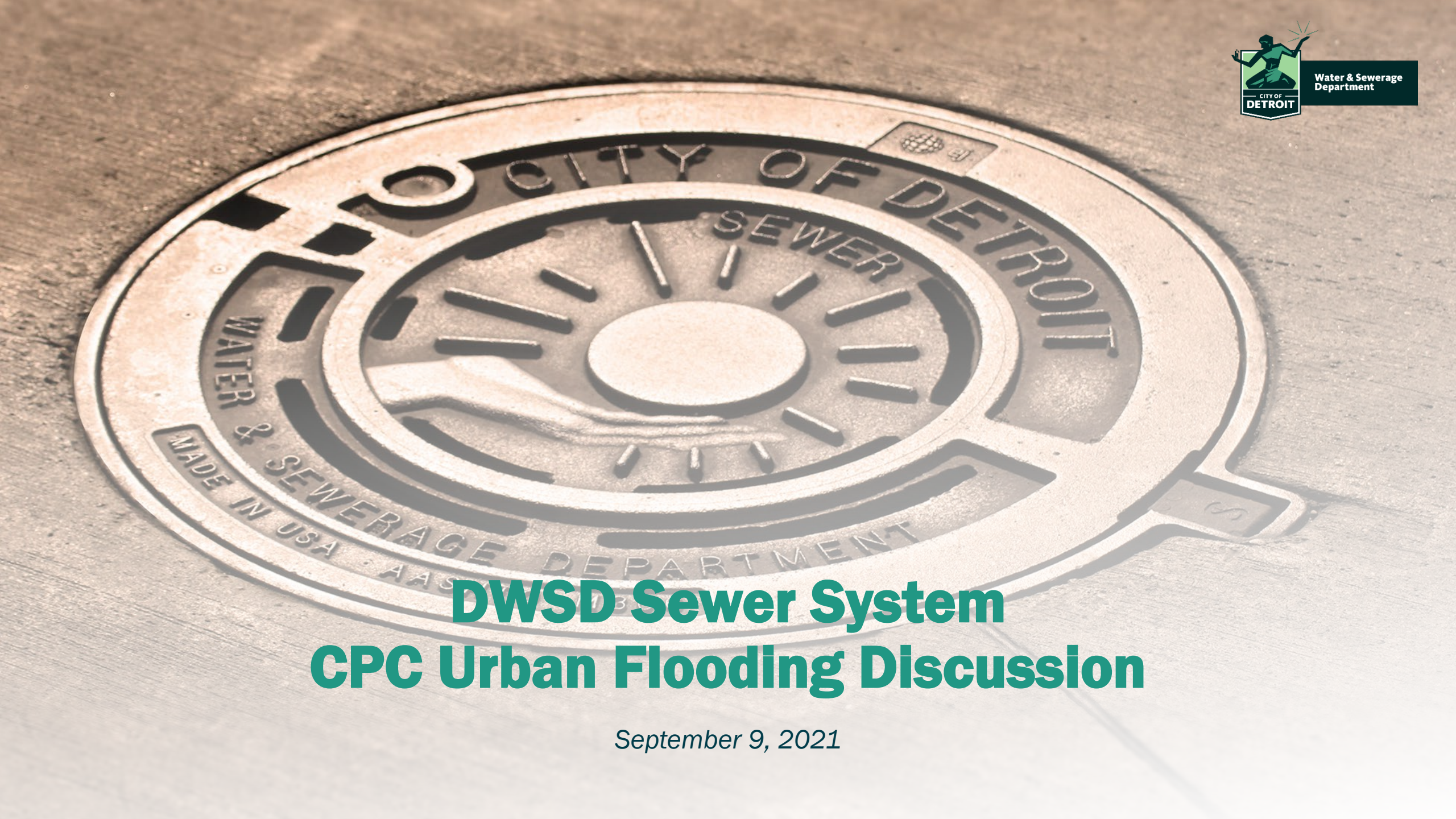

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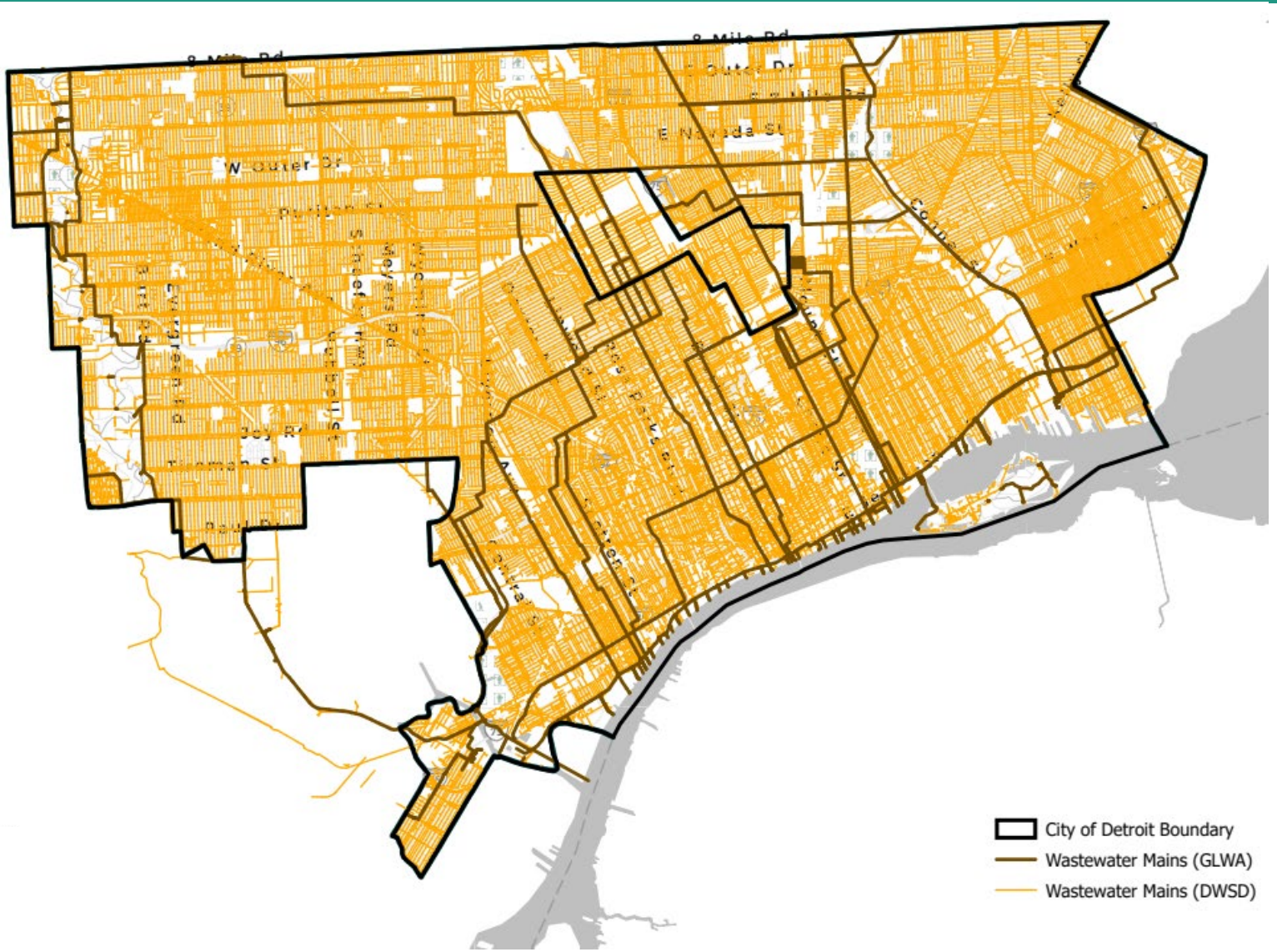
DWSD Sewer System
CPC Urban Flooding Discussion

September 9, 2021

3,000 Miles of Sewer Pipes Built Over 150 Years



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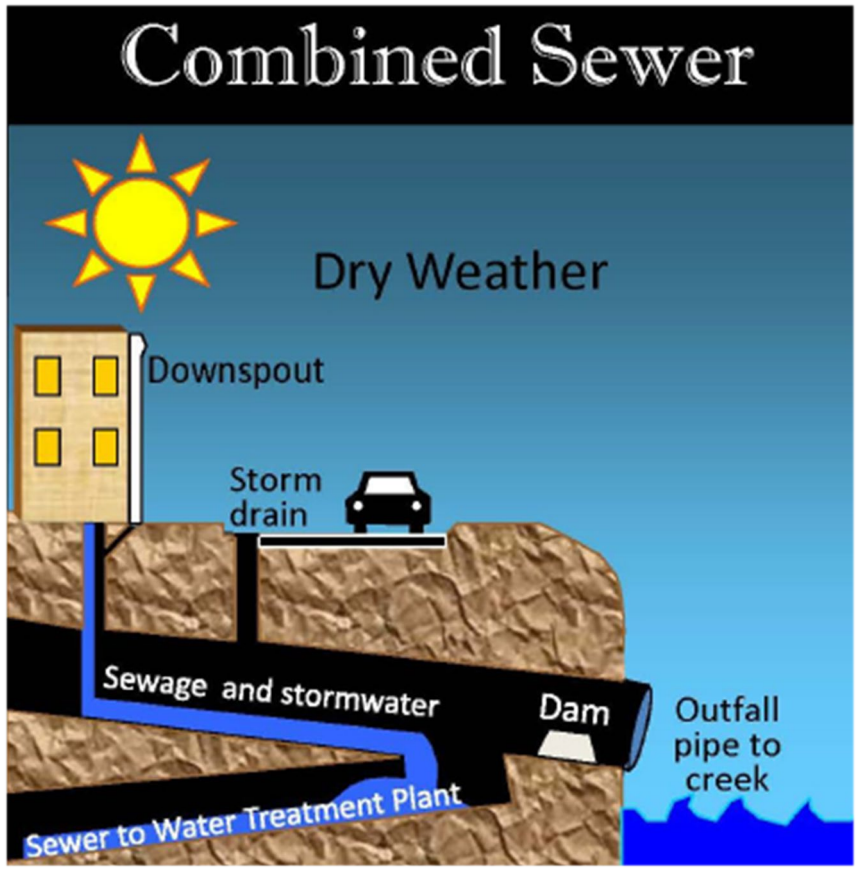
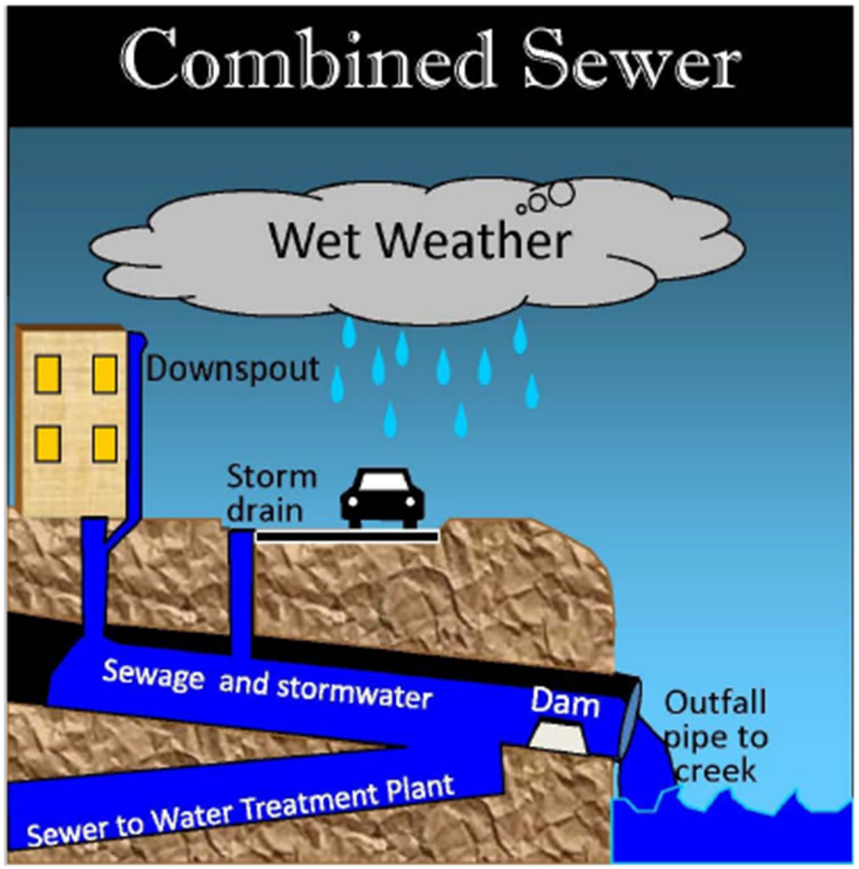
Detroit has a Combined Sewer System

Wet Weather Conditions Exceed Capacity of Sewer Systems





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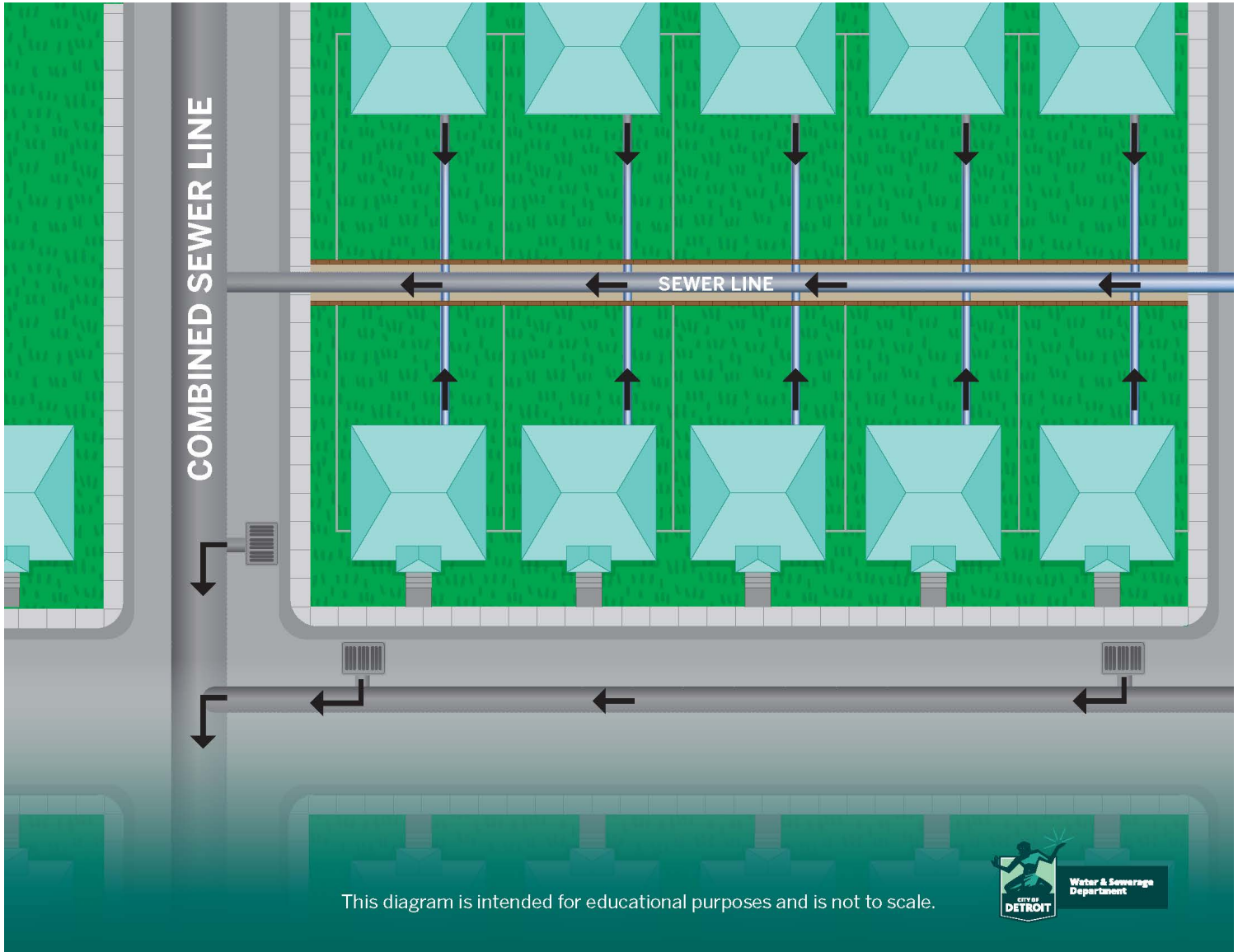
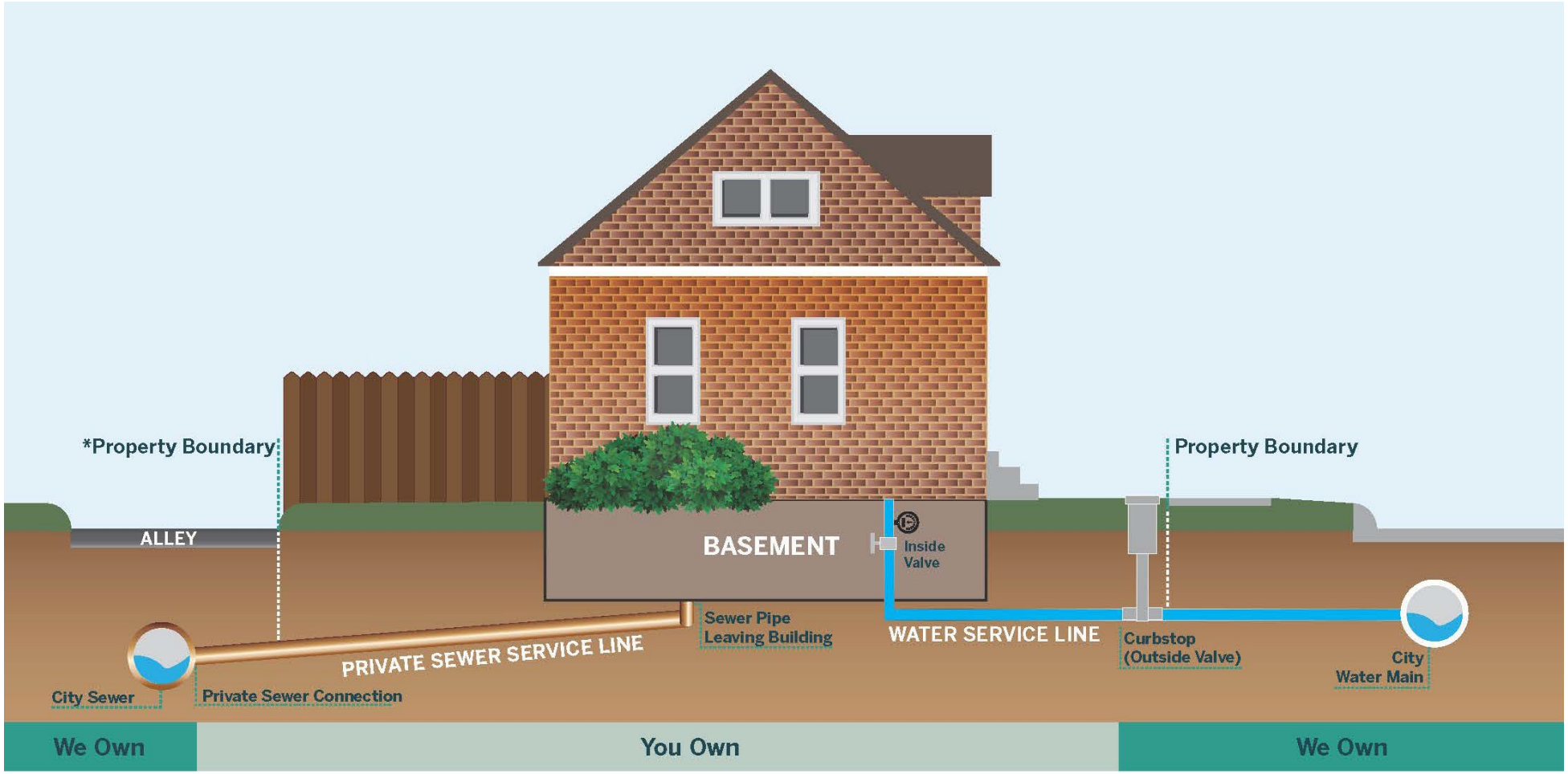
How Combined Sewer Flows from Neighborhoods



Pipe Responsibility



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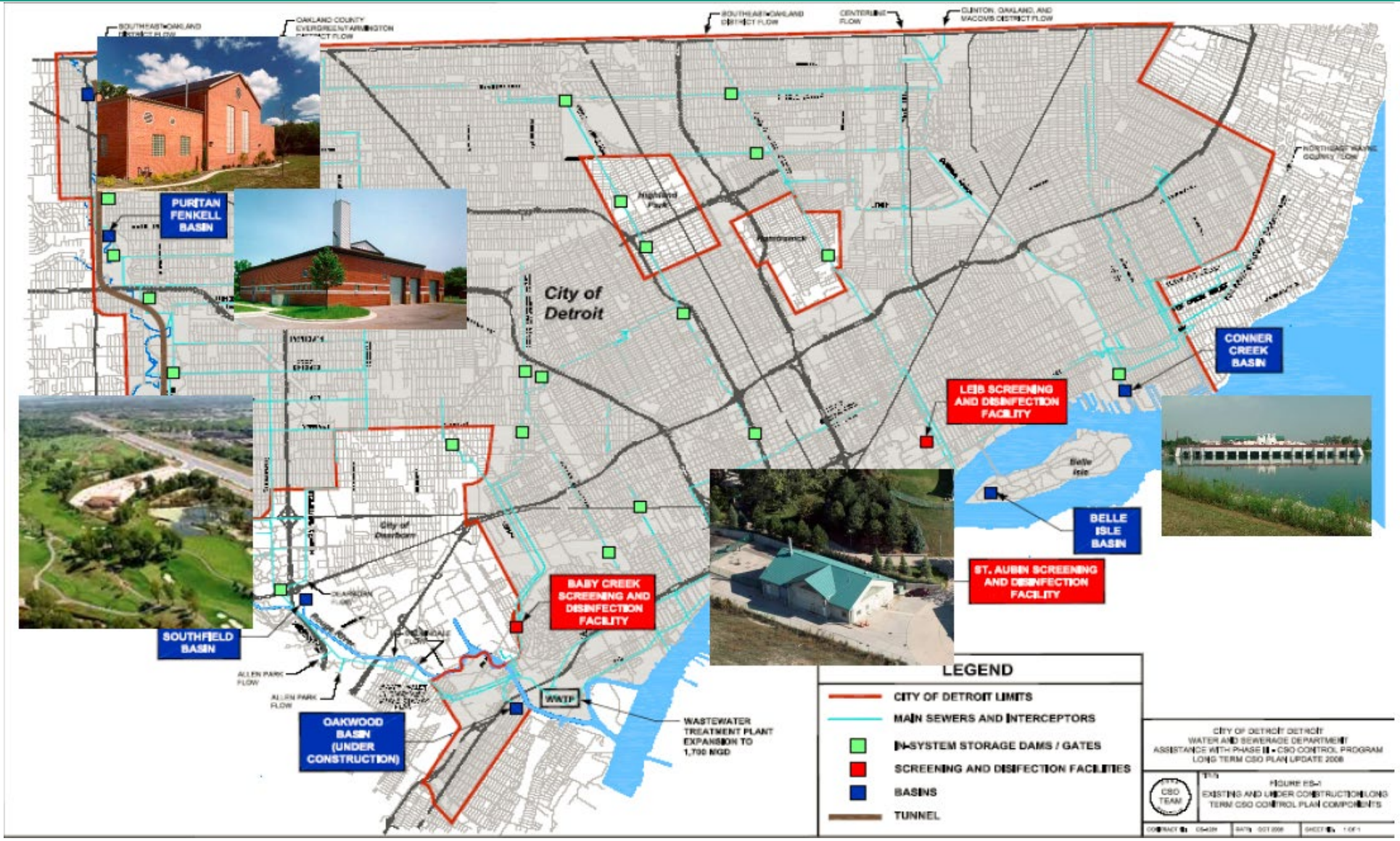
$1.5B Invested in Wet Weather Treatment Facilities Along Both Rivers



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Nine Retention Basins Manage 170 MG of Combined Sewerage during Wet Weather Events

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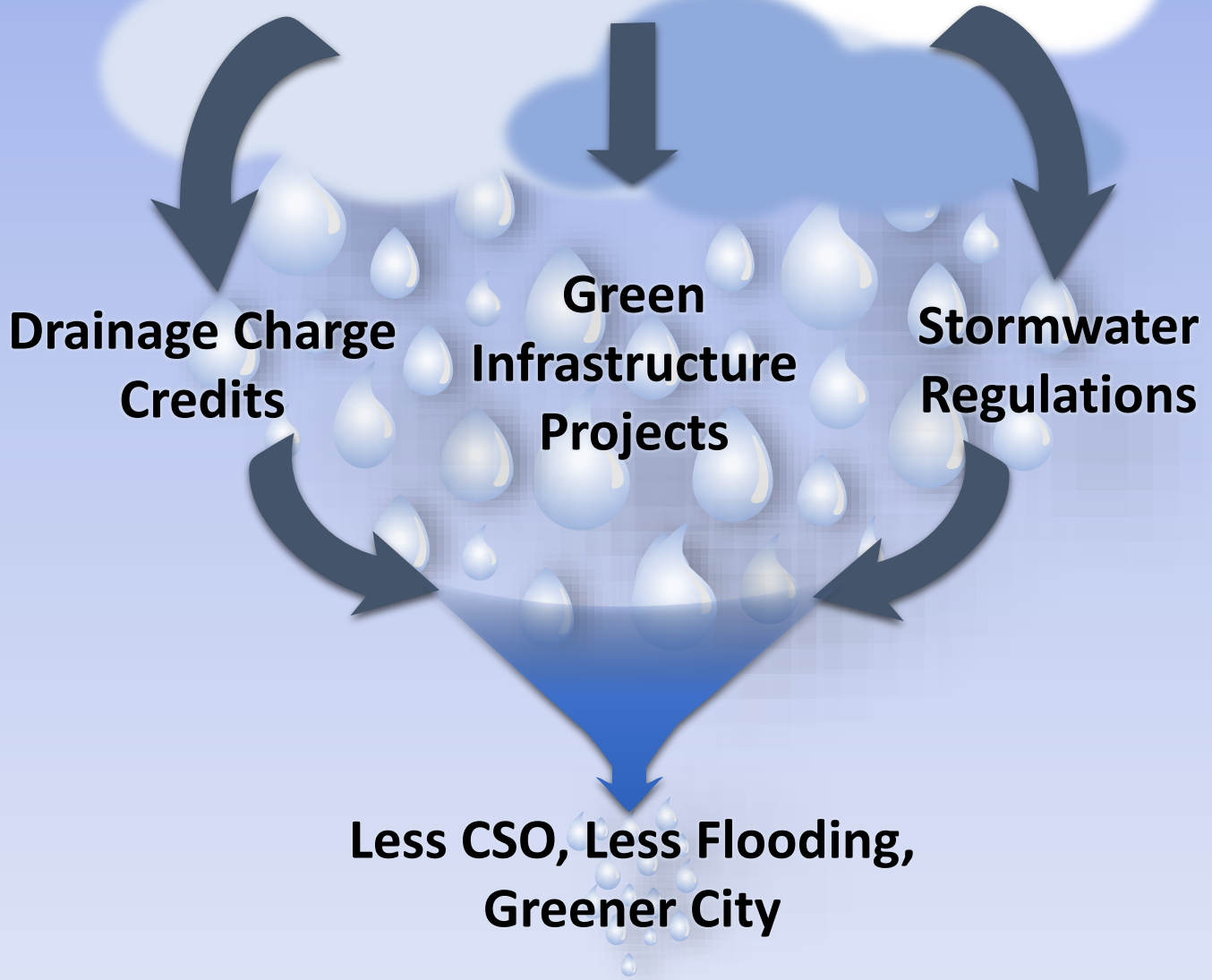
- *Ordinance compliance results in a drainage charge credit*
- *Credits are good for 3-years then must be reapproved*
- *Approval contingent on functioning and maintained stormwater management practices*

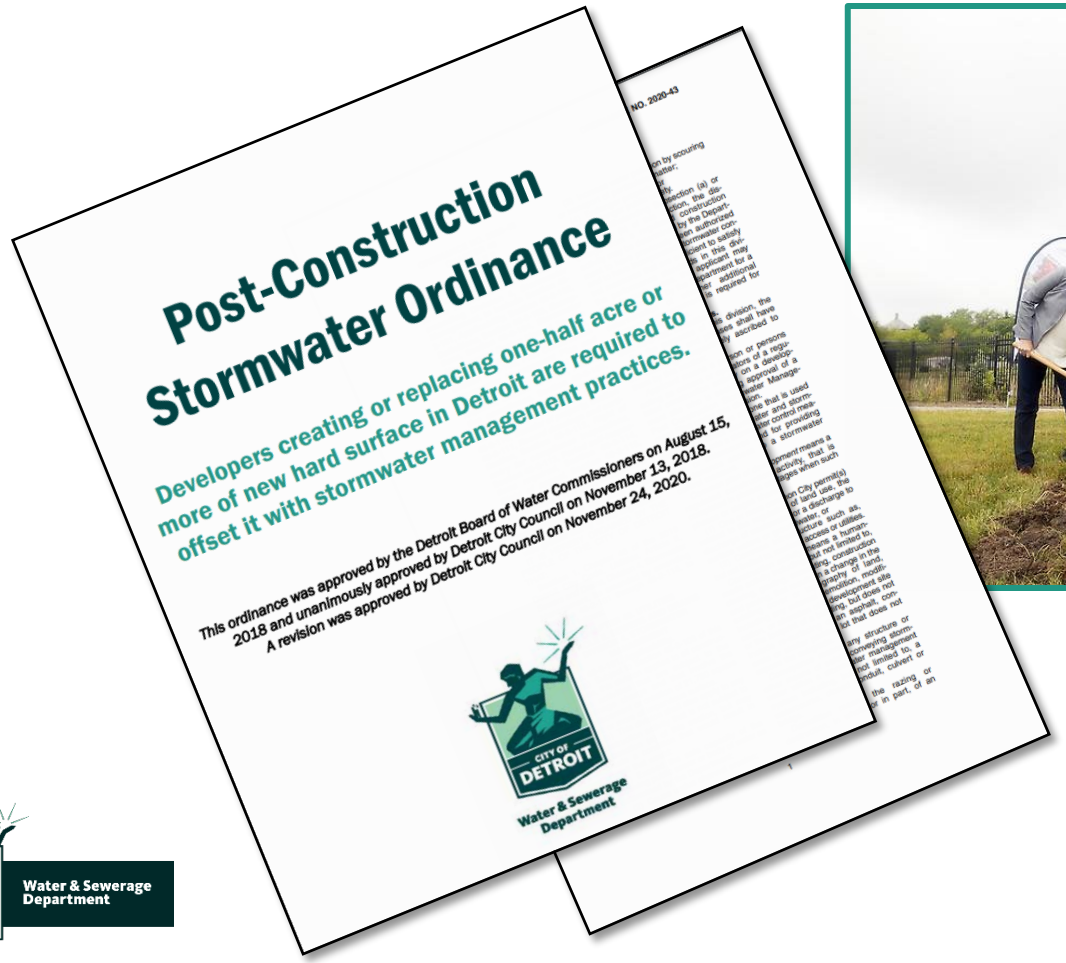
Programs for Better STORMWATER MANAGEMENT in DETROIT



LESS TREATMENT • CLEANER WATER • SHARED INVESTMENTS

City Council unanimously approves Detroit's first Stormwater Ordinance

Requirement to manage stormwater onsite for developments or redevelopments of at lease one-half acre



Stellantis Stormwater Park at expanded assembly operations for Jeep and Dodge SUV production

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Far West Stormwater Improvement Project to be largest GSI investment in Detroit to date

DRAINAGE IMPROVEMENTS

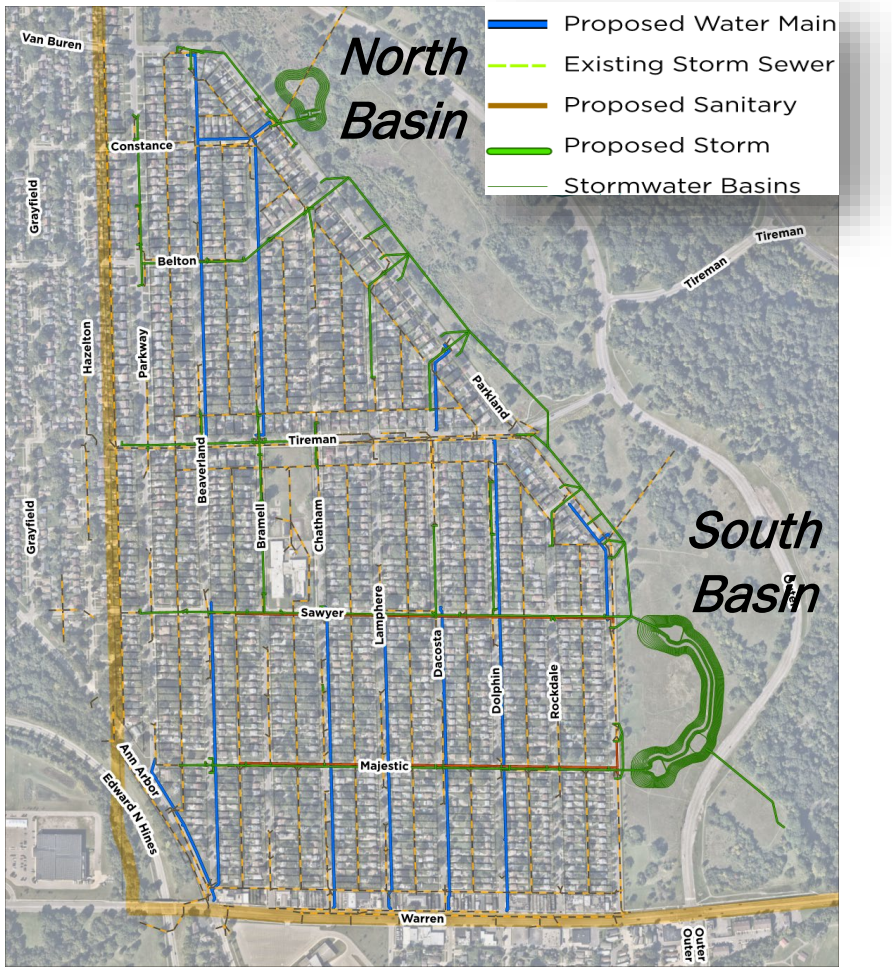
- 25,000 feet of new drainage piping
- 2 Water Quality Basins
- 1000+ residential downspout disconnections

Water Main Improvements

- 15,000 feet trenchless water main replacement
- 500+ water service replacements

Sewer Rehabilitation

- 20,000 feet of sewer lining and repair
- Repairs to 100+ manholes and catch basins



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Far West GSI - Rouge Park before construction

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Far West GSI - Rouge Park after construction

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Far West GSI - Rouge Park south basin rendering

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Median Model Results

Future Rainfall Frequency Estimates

Total rainfall amounts (inches) for use with hydrograph routing
Upper line represents median value, lower line is the percent change

Stations	Channel Protection 2-year 24-hour			Flow Conveyance 10-year 24-hour			Flood Control 25-year 24-hour			Flood Control 100-year 24-hour		
	Baseline Atlas 14	Mid-Century	End-of-Century	Baseline Atlas 14	Mid-Century	End-of-Century	Baseline Atlas 14	Mid-Century	End-of-Century	Baseline Atlas 14	Mid-Century	End-of-Century
Ann Arbor UM 20-0230	2.35	3.50 49%	3.68 56%	3.26	5.08 56%	4.97 52%	3.93	6.16 57%	5.62 43%	5.11	8.64 69%	6.72 32%
Detroit City AP 20-2102	2.32	3.33 43%	3.66 58%	3.28	5.04 54%	5.72 74%	3.96	5.90 49%	7.14 80%	5.12	7.72 51%	8.85 73%
Detroit Metro AP 20-2103	2.35	3.70 57%	4.15 76%	3.31	6.04 82%	6.46 95%	3.98	6.86 72%	8.14 105%	5.15	8.04 56%	11.41 122%
Howell WWTP 20-3947	2.37	3.38 42%	3.32 40%	3.33	5.42 63%	5.05 52%	4.05	6.49 60%	6.98 72%	5.36	8.60 60%	8.57 60%
Milford GM 20-5452	2.39	2.61 9%	2.59 8%	3.35	4.81 43%	4.65 39%	4.06	6.82 68%	6.22 53%	5.33	11.04 107%	8.33 56%
Pontiac WWTP 20-6658	2.40	3.15 31%	3.63 51%	3.39	5.07 50%	5.96 76%	4.11	6.56 59%	8.17 99%	5.36	8.87 65%	11.12 107%
Wayne – Canton 76-0065	2.36	3.48 47%	3.91 66%	3.30	5.64 71%	6.02 82%	3.98	6.51 63%	7.61 91%	5.15	7.66 49%	10.82 110%
Ypsilanti EMU 20-9218	2.35	2.97 26%	3.15 34%	3.26	4.40 35%	4.12 26%	3.93	5.27 34%	4.55 16%	5.11	7.35 44%	5.71 12%

Great Lakes Integrated Sciences + Assessments GLISA

Climate Change in Great Lakes Region

- Since 1951, total **annual precipitation** has **increased by 13.6%** in the US Great Lakes region
- The **frequency and intensity** of severe storms **has increased**. This trend will likely continue as the effects of climate change become more pronounced.
- The amount of **precipitation** falling **in the heaviest 1% of storms increased by 35%** in the U.S. Great Lakes region from 1951 through 2017.
- More severe storms may have negative economic impact due to resulting damages and increased costs of preparation, clean up, and business disruption.
- Projected increases in droughts, severe storms, and flooding events may amplify the risk of erosion, sewage overflow, interference with transportation, and flood damage.
- https://glisa.umich.edu/climate-change-in-the-great-lakes-region-references/

Current Wet Weather Management Initiatives

- Since 2015, DWSD has installed 12 Green Stormwater Infrastructure projects that manage 61 million gallons annually
- Later this year, DWSD to start construction on a new 95 million gallon stormwater management system in the Far West neighborhood at Rouge Park
- GLWA 5-Year capital plan invests $750 million in regional sewer system improvement
- MDOT already working with the City of Detroit on freeway stormwater diversion plans
- All entities will have to re-evaluate infrastructure based on 21st Century climate realities
  - Hopeful the new federal infrastructure bill, the American Jobs Plan, will strongly boost that effort

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Questions?