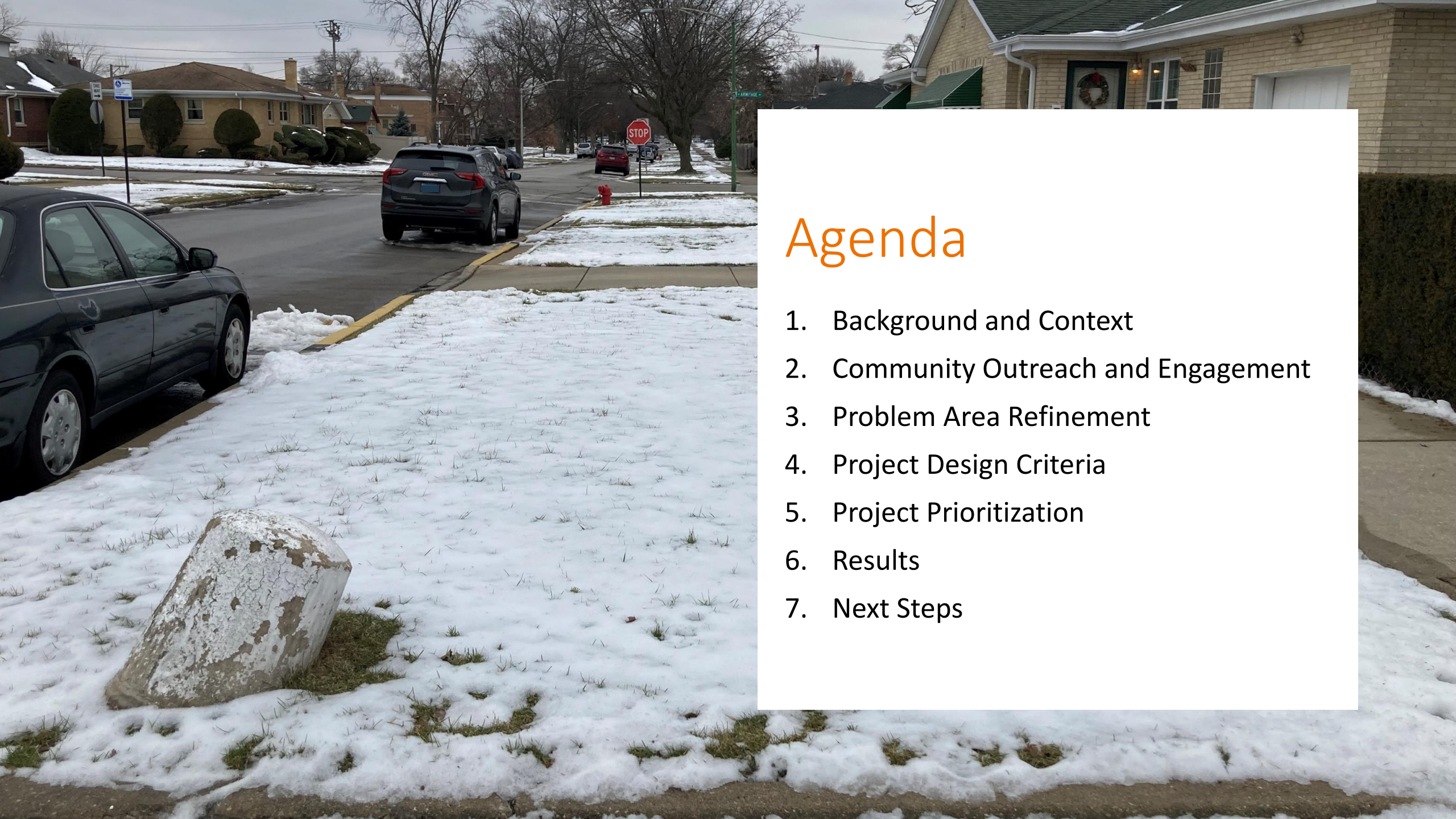
Chicago West Study Area

Finding Green and Gray Infrastructure Opportunities in Chicago's Austin, Humboldt Park, and West Garfield Park Neighborhoods

Thera Novotny, PE, MBA, PMP, CFM, ENV SP
Rebecca Connolly, EIT

Stantec

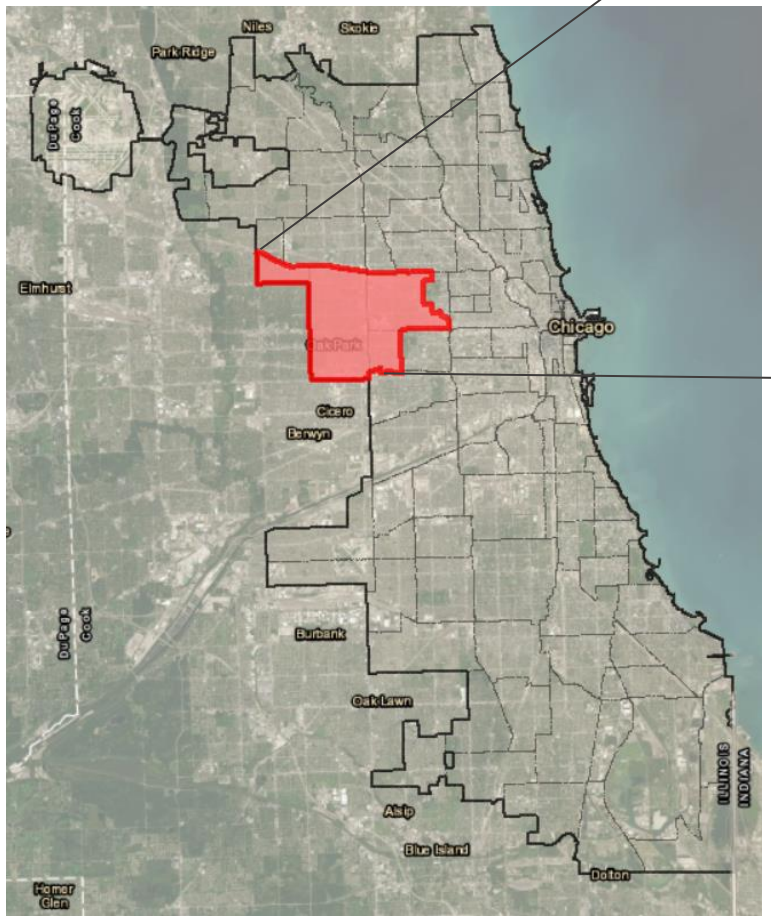


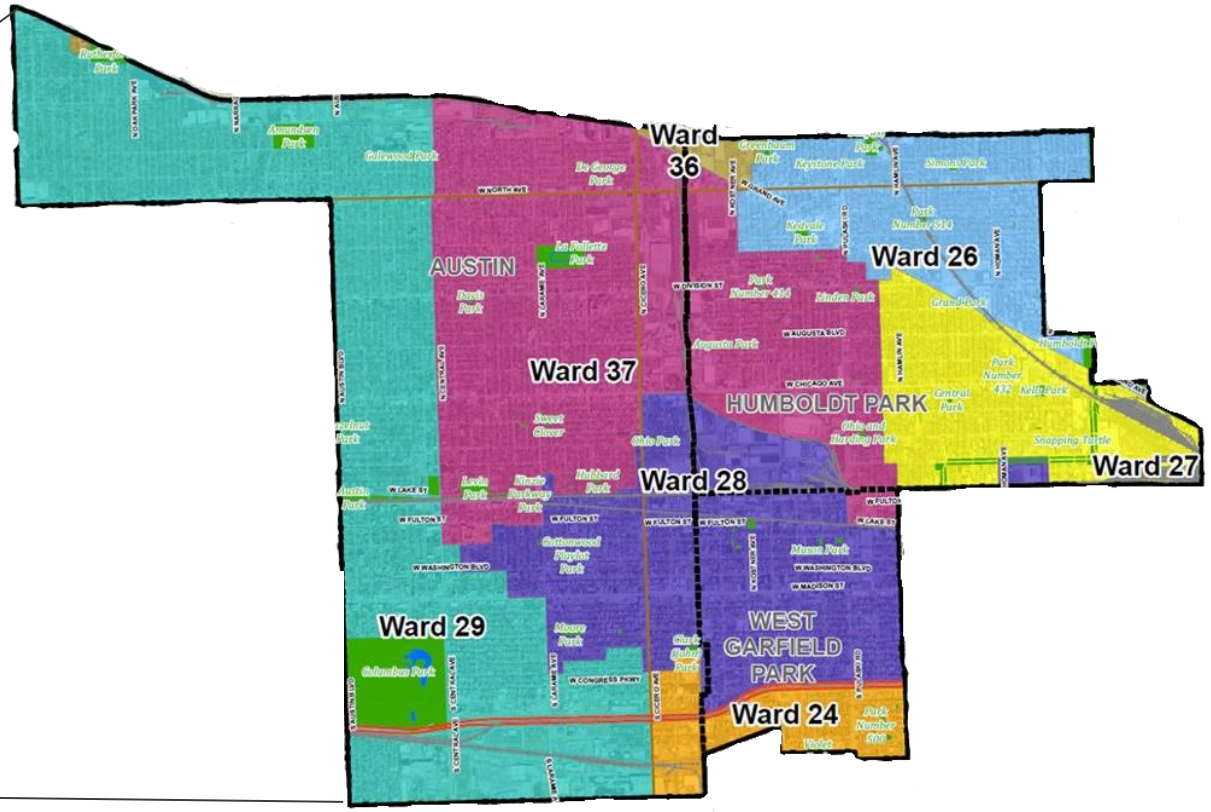
Agenda

1. Background and Context
2. Community Outreach and Engagement
3. Problem Area Refinement
4. Project Design Criteria
5. Project Prioritization
6. Results
7. Next Steps

Background and Context

Chicago West Study Area





Key Facts:

10 sq. Miles of Combined Sewer Area

- Total Residential (35%)
- **ROW (32%+)**
- Commerical, Mixed Use, and Industrial (17%)

No bodies of water

Drains to City Trunk Sewers ⟶ MWRDGC Interceptors ⟶ Tunnels And Reservoirs (TARP)

Client & Key Stakeholders

Client: Metropolitan Water Reclamation District of Greater Chicago (MWRDGC)

Key Stakeholders: City of Chicago

- Department of Transportation
- Department of Planning and Development
- Department of Water Management

Chicago West Study Area SMP Goals

- Identify **neighborhood** projects
  - Complement the City's current CIP
  - Eligible for funding through MWRDGC Stormwater Partnership Program
- Reduce flooding with focus on **basement backups and street flooding**
- Improve community **resiliency** to rain events
- Prioritize outcomes that provide **co-benefits**
- Develop projects with strong **support** from the community

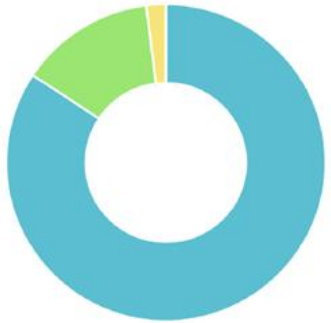
Community Outreach and Engagement

Community Outreach and Engagement

How we engaged...

- Virtual Environment
- Community Survey
- Outreach Leave Behinds

6 How concerned are you about future flooding in your neighborhood or on your property?



84% (43) Extremely Concerned

14% (7) Somewhat Concerned

2% (1) Not Concerned

18.55 Standard Deviation

51 Responses

11 When would you like to see these kinds of improvements implemented? (Select only one)

75% (39) As soon as possible

12% (6) Within the next 5 years

13% (7) Coordinated with broader infrastructure improvements such as roadway improvements or utility upgrades

0% (0) It's a long-term goal, but not an urgent priority

What we heard...

- Community is extremely concerned about future flooding
  - **96%** respondents identified as having experienced flooding within their neighborhood or on their property
  - **66%** responded as having experienced basement flooding
- Supportive of Green Stormwater Infrastructure
  - Safety (ADA/Screening/Attractive Nuisance)
  - Operations and Maintenance
- Would like to see improvements implemented ASAP

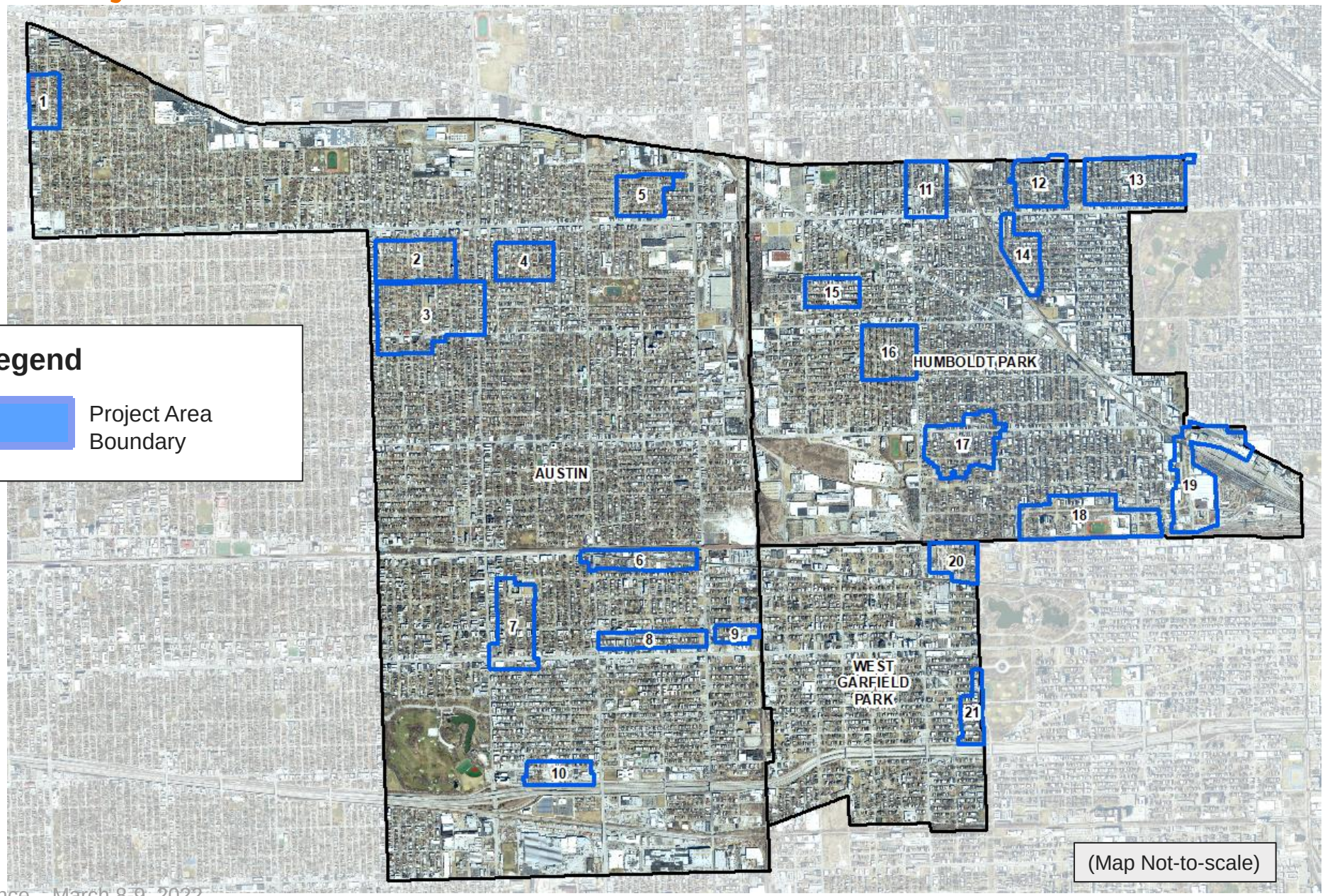
Problem Area Refinement

InfoWorks ICM Model

- Identify locations with greater likelihood for basement backups
- Identify block-level local projects
- Free discharge conditions to eliminate capacity restrictions
- Bulletin 75 1-year event selected for identification of conveyance and green infrastructure projects

Problem Area Refinement

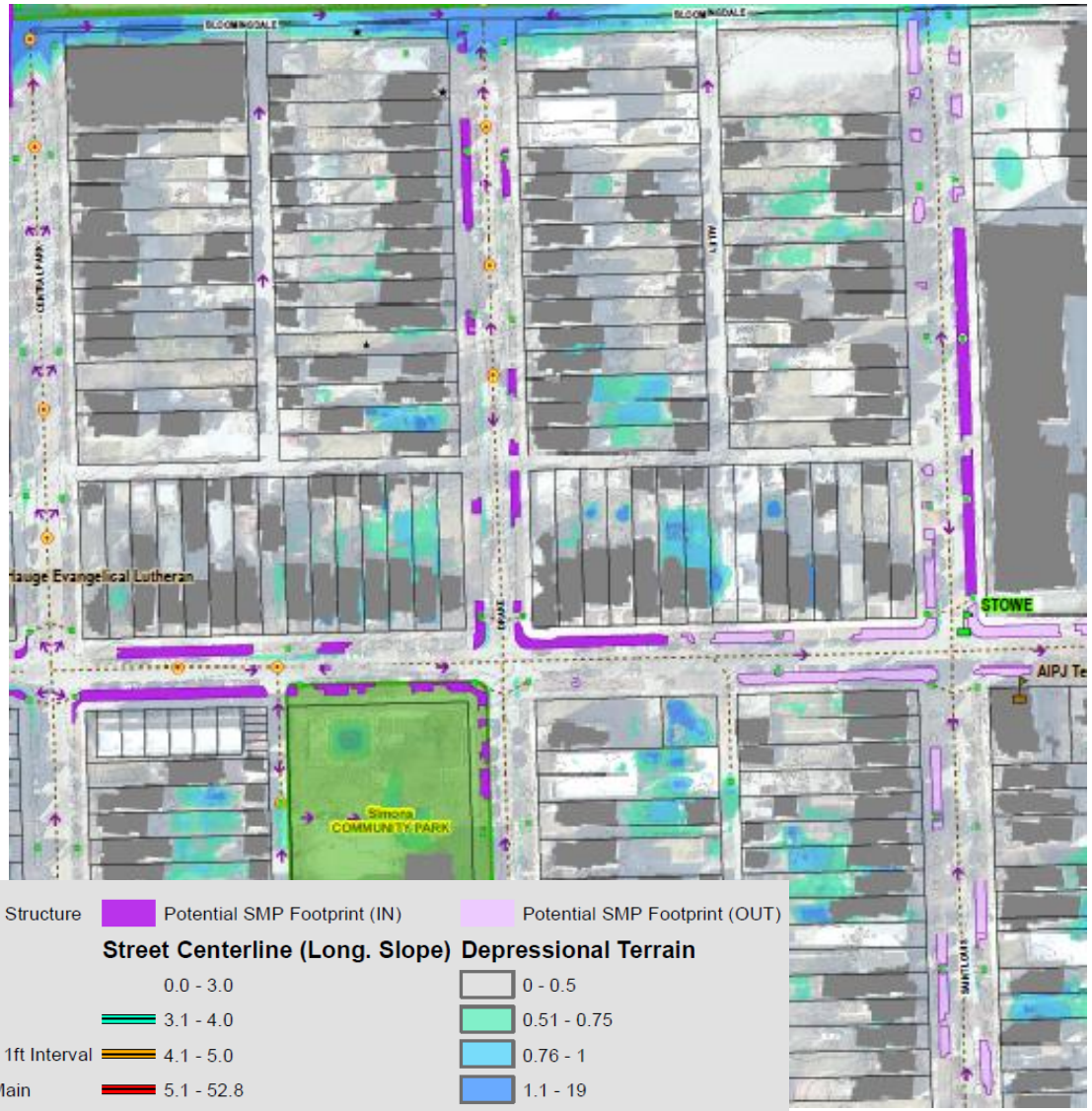
Project Area Definition



Project Design Criteria

Project Design Criteria

Design and Siting Criteria



Green Infrastructure

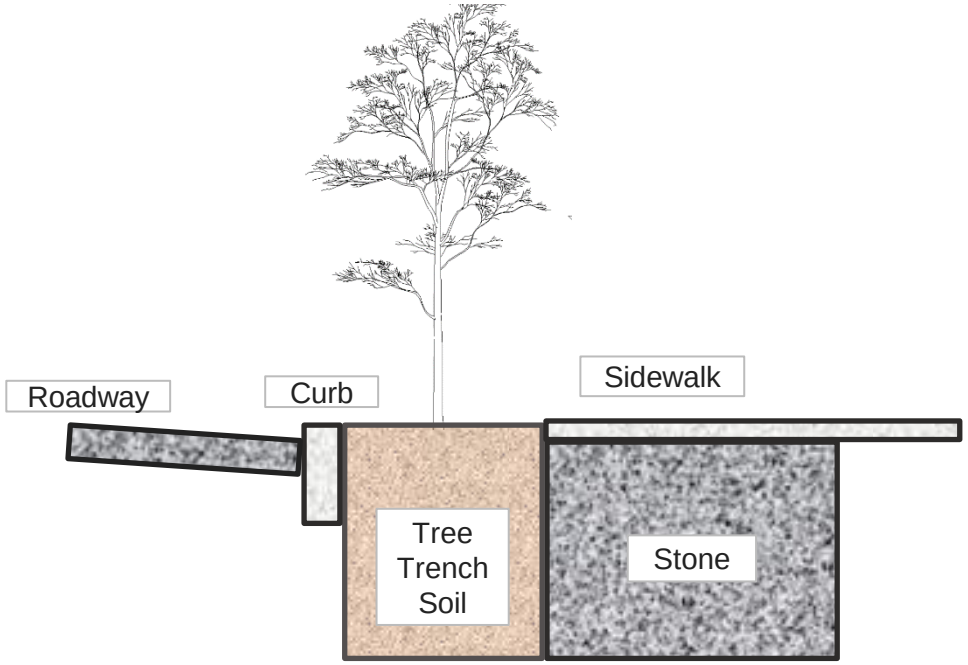
- ✓ Inside ROW and curb
- ✓ Outside tree canopy
- ✓ Buffer from:
  - Sewer and water mains
  - Structures (manholes, catch basins)
  - Buildings
- ✓ Available width > 5’

Conveyance

- ✓ Replace existing sewer with larger-diameter pipe
- ✓ Complement planned projects

Green Infrastructure Design Criteria

Tree Trenches

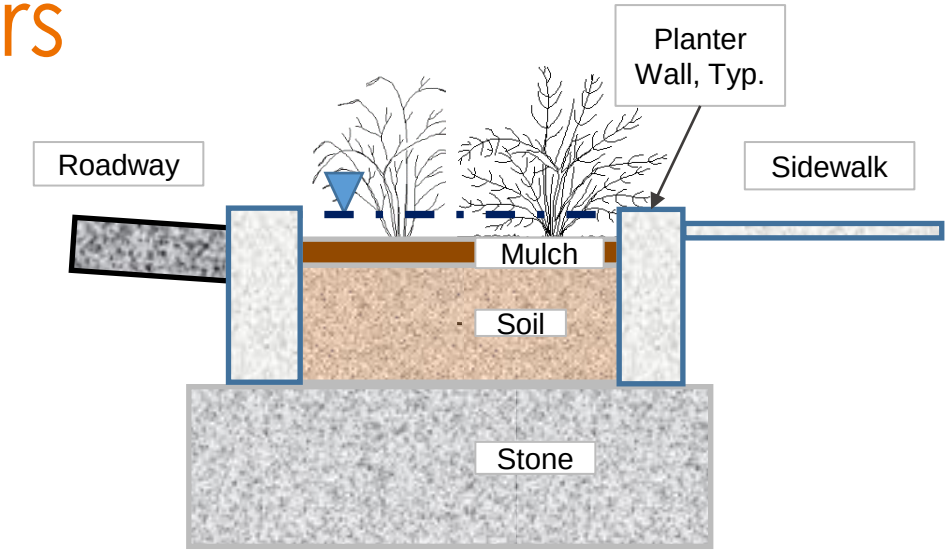


Tree Trench Section (Typ. At Tree Pit)
N.T.S.

Description	Design Depth (Feet)	Void Ratio	Percentage of Media Within System	Volume / SF of Practice (CF)
Tree Pit Soil Storage	3	25%	20%	0.15
Stone Storage	2.67	36%	80%	0.77
Volume / SF of Practice				**0.92**

Green Infrastructure Design Criteria

Bumpouts and Planters

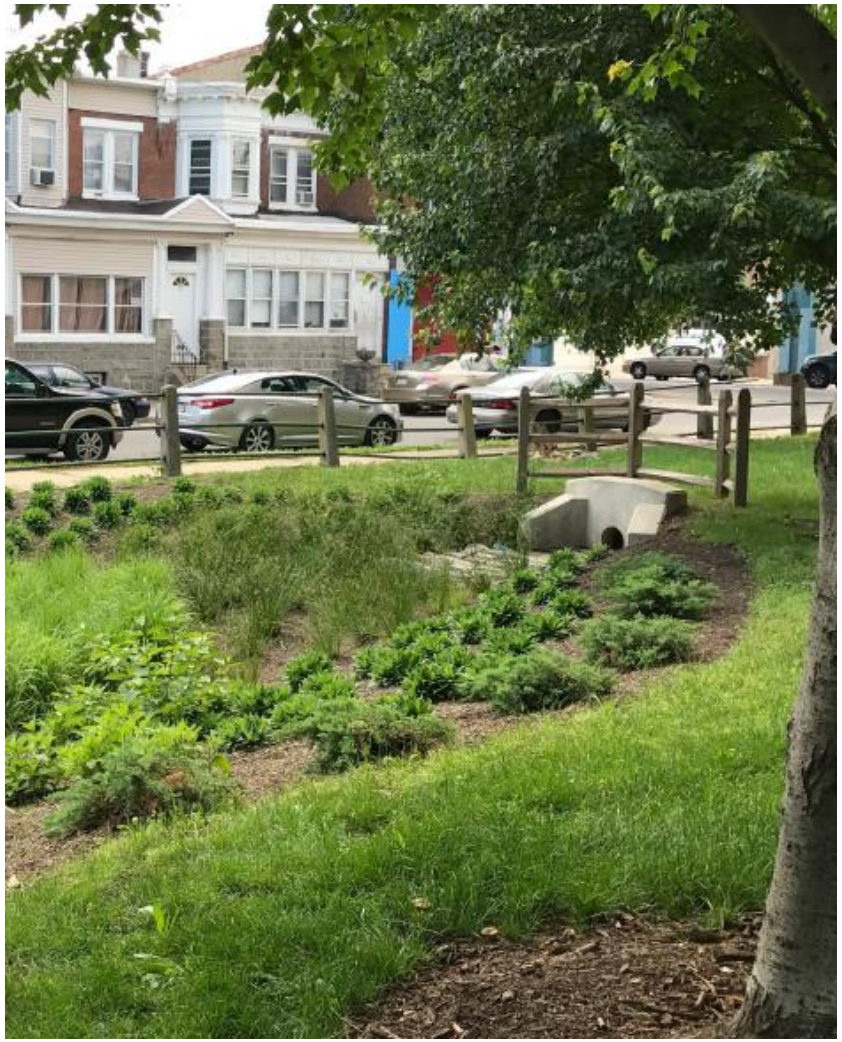


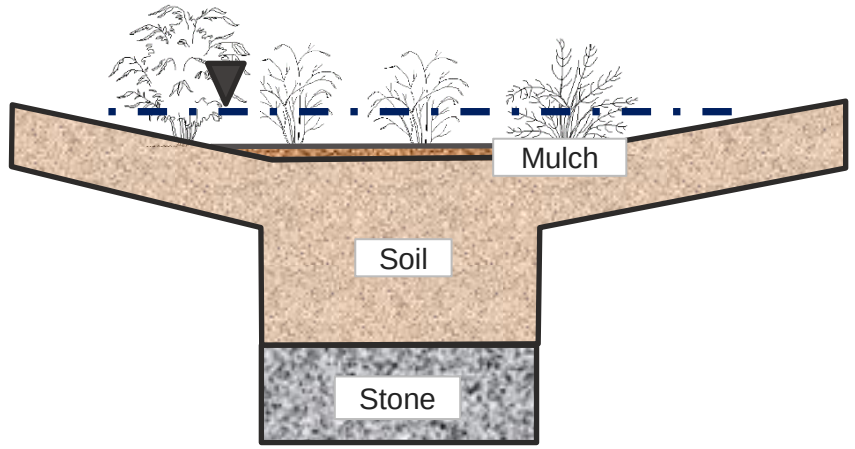
Bumpout or Planter Section
N.T.S.

Description	Design Depth (Feet)	Void Ratio	Volume / SF of Practice (CF)
Surface Storage	0.5	100%	0.50
Mulch	0.25	25%	0.06
Soil Media	2	25%	0.50
Stone Storage	1.5	36%	0.54
Volume / SF of Practice			**1.60**

Green Infrastructure Design Criteria

Rain Gardens





Rain Garden Section
N.T.S.

Description	Design Depth (Feet)	Void Ratio	Volume / SF of Practice (CF)
Surface Storage	0.75	100%	0.75
Mulch	0.25	25%	0.06
Soil Media	3	25%	0.75
Stone Storage	1.5	36%	0.54
Volume / SF of Practice			**2.10**

Project Prioritization

Project Prioritization

- Focus on green infrastructure
- Bundling projects based on scoring criteria
  - 500 GI systems sited → 126 bundled with conveyance improvements
- Method that could be adaptable to different priorities in future

Bundled Project Areas (No.)	Neighborhood	GSI Components (No.)	Conveyance Component (ft)
10	Austin	51	25,820
9	Humboldt Park	66	30,850
2	West Garfield Park	9	4,080
21	**-**	**126**	**60,750**

Project Prioritization

Green Infrastructure Scoring Criteria

Description	Scoring Weight	Priority Value = 0		Priority Value = 1			Priority Value = 2			Priority Value = 3	
		Not Recommended		Lowest Priority			Medium Priority			Highest Priority	
Drainage Area (SF)	20%	Less than	6,500	6,500	to	15,000	15,000	to	20,000	Greater than	20,000
Loading Ratio (Tree Trench)	5%	Greater than	35	20	to	35	15	to	20	Less than	15
Loading Ratio (Rain Garden, Planter Box, Bumpout)		Greater than	50	35	to	50	25	to	35	Less than	25
Sidewalk and/or Parking Lane Width (feet)	5%	Less than	5	5	to	8	9	to	12	Greater than	12
Volume Treated (Gallons)	25%	Less than	5,000	5,000	to	7,500	7,500	to	12,000	Greater than	12,000
Alignment with Sewer Improvements	35%	N/A		No			N/A			Yes	
Cost Per Drainage Area (Dollars/Acre)	10%	Greater than	300,000	250,000	to	300,000	200,000	to	250,000	Less than	200,000

Green Infrastructure Scoring Results

Sub-area ID	Location (streets)	Drainage Area Score	Available Width Score	Loading Ratio Score	Volume Score	Project Alignment Score	Cost Score	Composite Score
7-13	Lotus b/t West End and Washington	3	3	2	3	3	3	2.95
15-10	Kamerling b/t Kildare and Keeler	3	2	3	3	3	3	2.95
18-1	St. Louis b/t Ohio and Franklin	3	3	2	3	3	3	2.95
18-6	St. Louis b/t Franklin and Governors Pkwy	3	3	2	3	3	3	2.95
18-7	St. Louis b/t Franklin and Governors Pkwy	3	3	2	3	3	3	2.95
19-16	Sacramento b/t Ohio and Ferdinand	3	3	2	3	3	3	2.95
19-9	Sacramento b/t Chicago and Ohio	3	3	2	3	3	3	2.95
12-11	St Louis b/t Bloomingdale and Wabansia	3	2	2	3	3	3	2.90
14-22	Central Park b/t Hirsch and Evergreen	3	2	2	3	3	3	2.90
7-14	Pine b/t West End and Washington	3	3	2	3	3	2	2.85
6-2	Lake b/t Leamington and LeClaire	3	1	2	3	3	3	2.85
6-4	Lake b/t Lawler and Lavergne	3	1	2	3	3	3	2.85
20-1	Pulaski b/t Kinzie and Lake	3	1	2	3	3	3	2.85
19-10	Sacramento b/t Chicago and Ohio	2	3	3	3	3	3	2.80

Example Bundled Project

Results

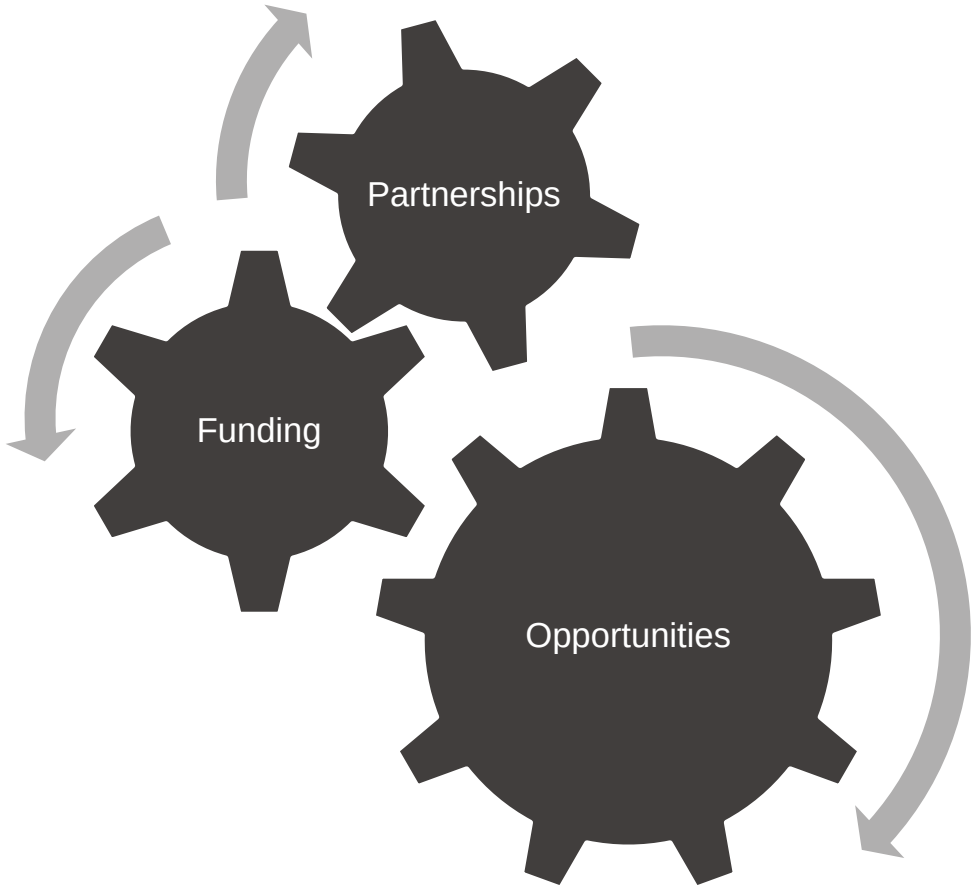
Results

Identified 21 recommended neighborhood projects

- New conveyance and green stormwater infrastructure
  - Total linear feet of conveyance = ~60,000 ft
  - Total GSI footprint area = ~135,000 sq ft
  - Total GSI volume managed = 4M gallons
- Complement the City's CIP
- Be eligible for funding through MWRDGC Stormwater Partnership Program

Next Steps

What's Next…



- Re-engage Project Champions
  - City stakeholder agencies (DWM, CDOT, DPD)
  - Aldermanic wards
- Finalize Master Planning Report

Questions?

Thera Novotny, PE, MBA, PMP, CFM, ENV SP
thera.novotny@stantec.com

Rebecca Connolly, EIT
rebecca.connolly@stantec.com