GARY GREEN INFRASTRUCTURE TOOL & PLAN FINAL PRESENTATION

Calumet Stormwater Collaborative

July 12, 2019

delta institute

AGENDA

- Project Need
- Project Scoping & Design
- The Mapping Tool
- The Plan
  - Policy Framework Maps
  - Zoning Guidelines
  - Priority Projects
- Challenges & Limitations
- Lessons Learned

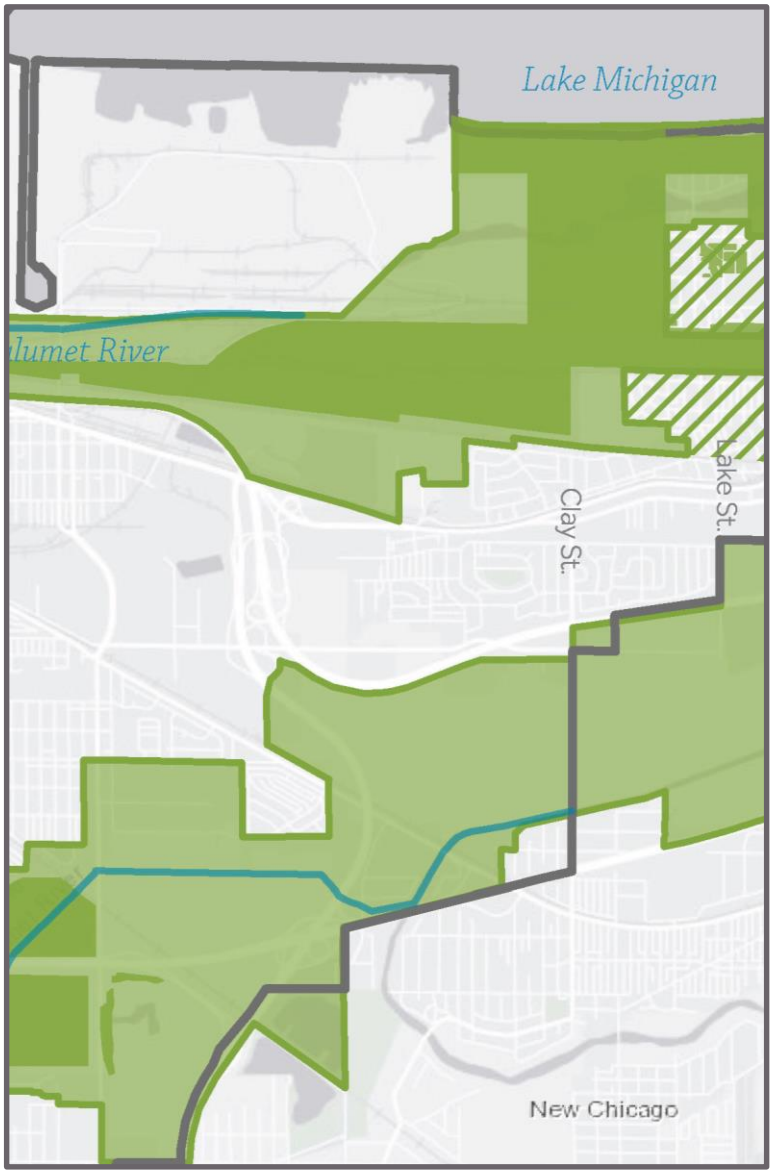
IVANHOE PRESERVE - BRUNSWICK

delta institute

PROJECT SCOPE

Develop citywide Green Infrastructure Plan, including:

- Data Modelling Tool
- Suitability Analysis
- Model Regulations
- Stormwater Impact Analysis
- Management Strategies



delta institute

PROJECT FUNDING

TOTAL: $80,000

$45,000

INDIANA LAKE MICHIGAN COASTAL PROGRAM

$35,000

PROJECT PARTNERS

dynamometrics

delta institute

PROJECT TEAM

Jack Eskin
Senior Programs Specialist
Former Deputy Director
of Redevelopment - City of Gary

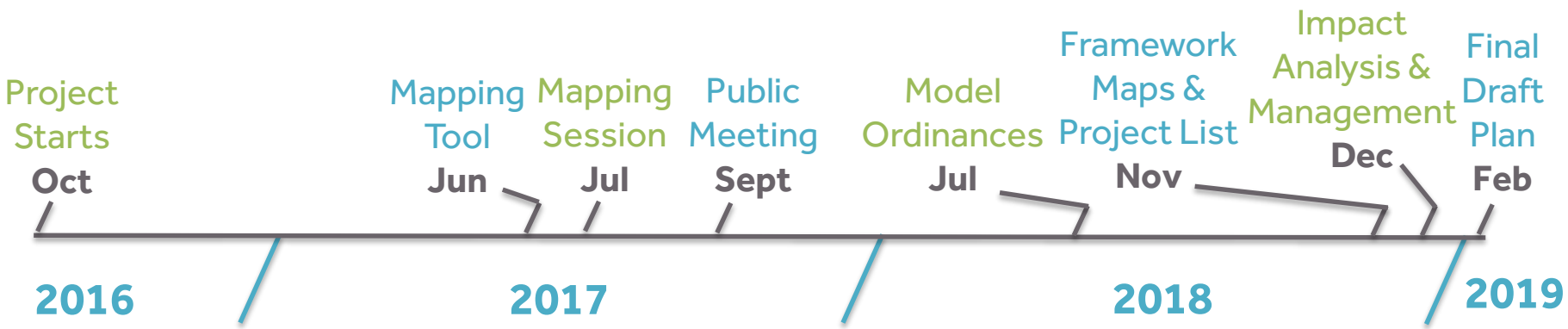
Project Role: Project Manager

Martin Brown
Programs Specialist

Project Role: GIS Analyst

delta institute

PROJECT SCOPE & TIMELINE



Professional & Public Input Engagement

Data Collection & Analysis

Policy & Project Identification

Plan Completion

delta institute

WHY WAS THIS PLAN NEEDED?

delta institute

EXISTING PROBLEMS

Blight on Corridors

What solutions support **beautification**, **economic development**, and **stormwater management** along key road corridors?

How can blighted corridors be better **gateways** to natural areas and neighborhoods?

MELTON ROAD
MILLER

EXISTING PROBLEMS

Blight in Neighborhoods

What solutions support **neighborhood stabilization** and **reduce flooding**?

VACANT PROPERTY
EMERSON

EXISTING PROBLEMS

Vacant Land Management

What solutions support **blight reduction** and are viable **interim land uses**?

VACANT PROPERTY
MIDTOWN

EXISTING PROBLEMS

Vacant Schools & Parks

What are solutions for repurposing vacant public land that **enhance the environment** and **improve quality of life**?

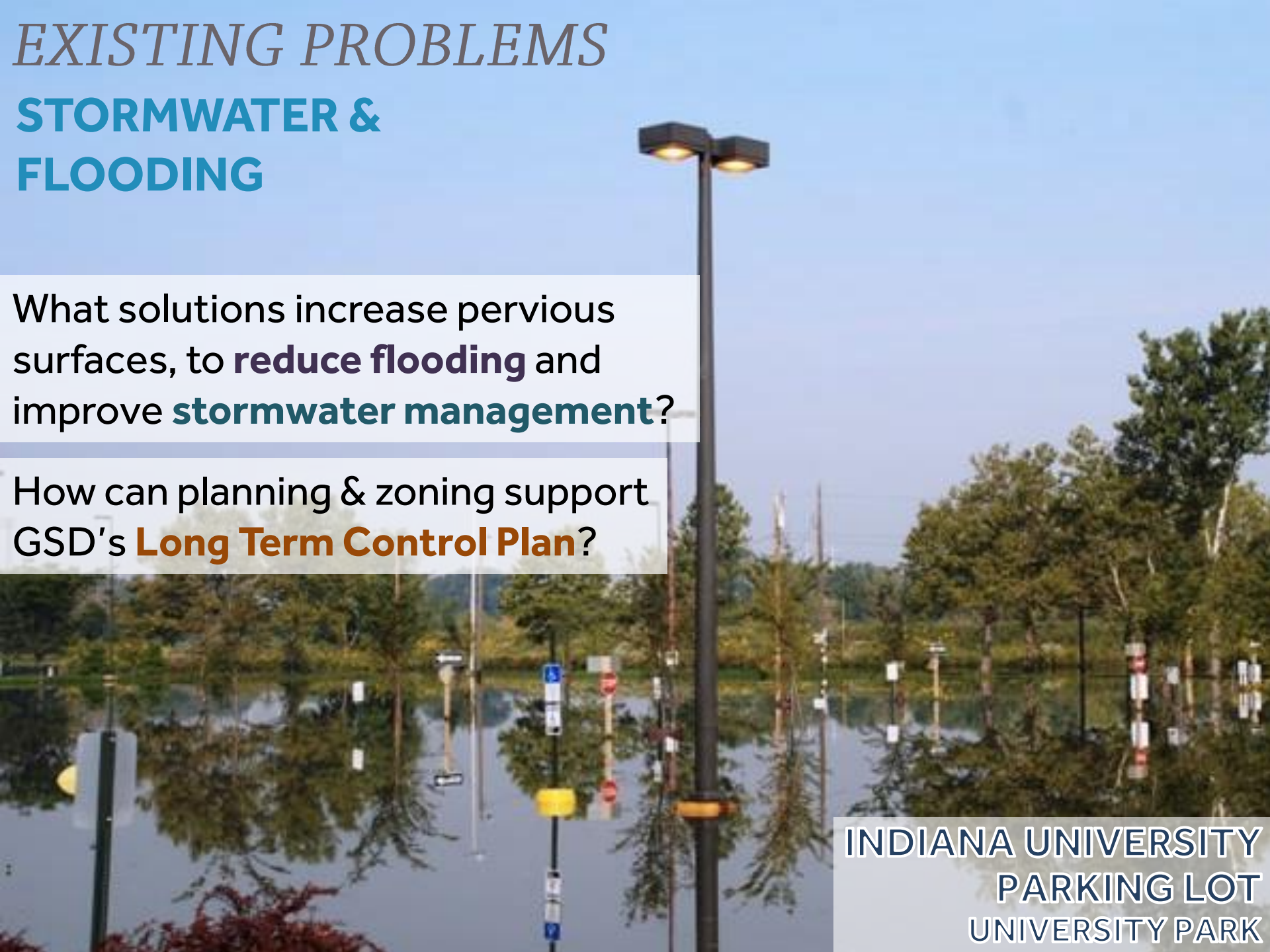
EDISON PARK
BRUNSWICK

EXISTING PROBLEMS

STORMWATER & FLOODING

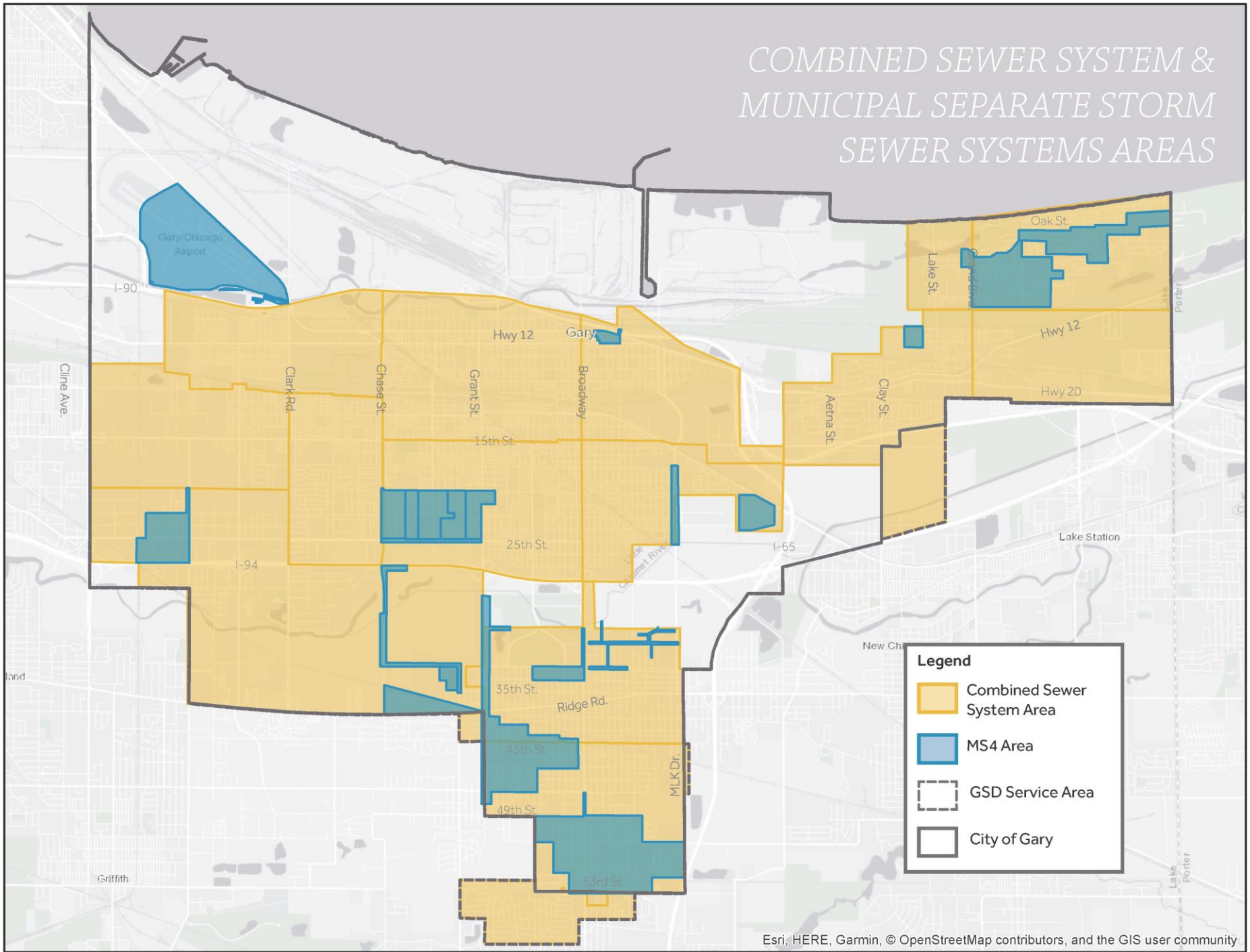
What solutions increase pervious surfaces, to **reduce flooding** and improve **stormwater management**?

How can planning & zoning support GSD's **Long Term Control Plan**?



INDIANA UNIVERSITY PARKING LOT
UNIVERSITY PARK

COMBINED SEWER SYSTEM & MUNICIPAL SEPARATE STORM SEWER SYSTEMS AREAS



EXISTING PROBLEMS

WETLANDS & ECONOMIC DEVELOPMENT

What solutions help balance **wetland protection and enhancement** with new **economic development projects**?

LITTLE CALUMET RIVER FLOODPLAIN
UNIVERSITY PARK

EXISTING ASSETS

HIGH VALUE CONSERVATION LAND

How do we **expand** and **showcase** this?

INDIANA DUNES NL
MILLER BEACH

EXISTING ASSETS

HIGH VALUE CONSERVATION LAND

How do we **expand** and **showcase** this?

MILLER WOODS
MILLER BEACH

EXISTING ASSETS

HIGH VALUE CONSERVATION LAND

How do we **expand** and **showcase** this?

CLARK & PINE PRESERVE
AIRPORT AREA

GREEN INFRASTRUCTURE AS A SOLUTION

DEFINITION 1

Strategically **planned and managed network** of wilderness, parks, greenways, conservation easements, and working **lands with conservation value**.

DEFINITION 2

Planned systems that use or mimic natural processes **to manage and reuse stormwater**, including green roofs, trees, rain gardens, vegetated swales, pocket wetlands, infiltration planters, vegetated median strips.

delta institute

INTEGRATED GREEN INFRASTRUCTURE

CITY OF THE CENTURY
GARY, INDIANA

delta institute

PROJECT GOALS & BENEFITS

Provide the City and its partners with the tools to better **plan, fund, regulate, and manage** green infrastructure, which will:

- Reduce blight and beautify community
- Expand and enhance conservation land
- Reduce flooding
- Improve water quality
- Balance contrasting land uses
- Improve public health

delta institute

GARY GREEN INFRASTRUCTURE PLAN MAPPING TOOL

dynamometrics
data.analytics.policy

CITY OF THE CENTURY
GARY, INDIANA

delta institute

PURPOSE

Create a decision framework for alternative green uses for vacant and underutilized lands.

dynamometrics
data.analytics.policy

delta institute

PROCESS

Converting Vacant and Blighted Properties too…

Managed Conservation Lands

To restore and expand existing natural areas

STORMWATER Green Infrastructure Installations

To manage excess storm water

"Beautified" Community Areas

To stabilize neighborhoods and provide recreation opportunities

dynamometrics
data.analytics.policy

delta institute

PROCESS: CREATING INDICES

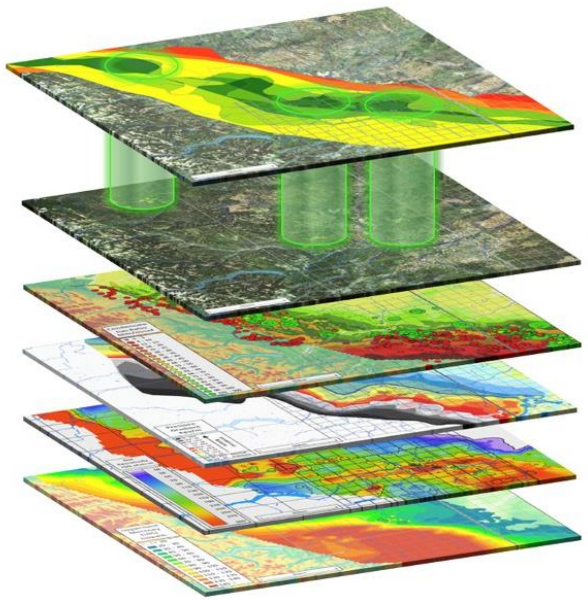
Ownership status
Parcel structure status
IDNR managed lands
Shirley Heinz managed lands
"Priority Areas"
Restoration priority areas
Ecological flood control value
Green Link corridor
Green Link trail
Density of Vacancies
Residential flood complains
Land cover
Future land use
Floodplains

Soil type
Soil drainage classification
Land cover permeability
Parks
Trails
Gateways points
Community gardens
Existing GI
Phytoremediation
Schools
Churches
Public transit
Commercial corridors
Block clubs

dynamometrics
data.analytics.policy

delta institute

PROCESS: CREATING INDICES



Distance Factors

- A relevant distance is defined that purposefully constrains density measurements of each variable in each index.

Site Readiness Factors

- A density measurement of parcel-level site readiness variables with respect to the distance factor.

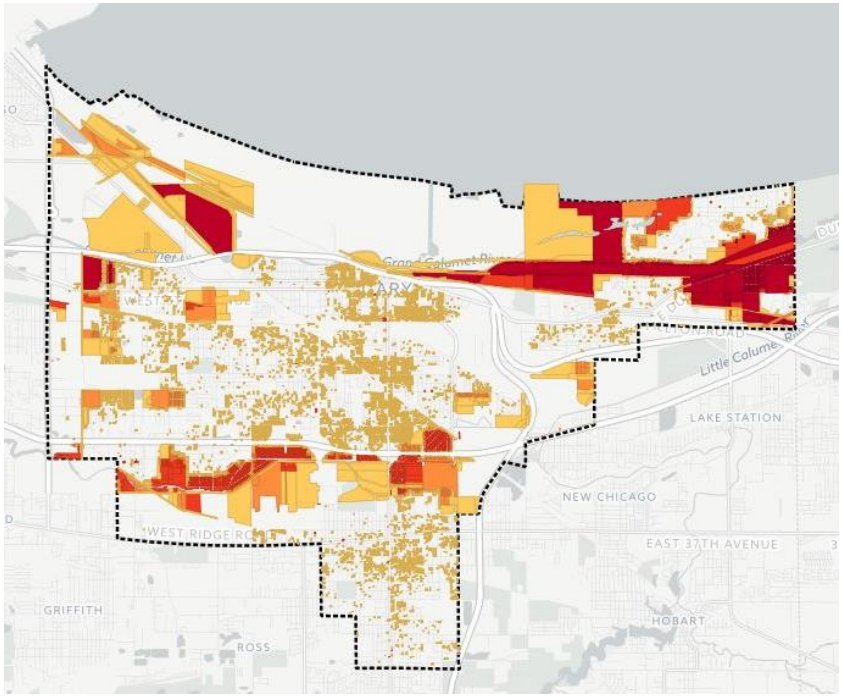
External Factors

- A density measurement of variables uniquely relevant to each index with respect to the distance factor.

dynamometrics
data.analytics.policy

delta institute

RESULTS: CONSERVATION



Distance Factors:

- 150′ in 50′ increments

Site Readiness Factors

- Vacant structure, public ownership
- Vacant lot, public ownership
- Vacant structure, tax sale
- Vacant lot, tax sale

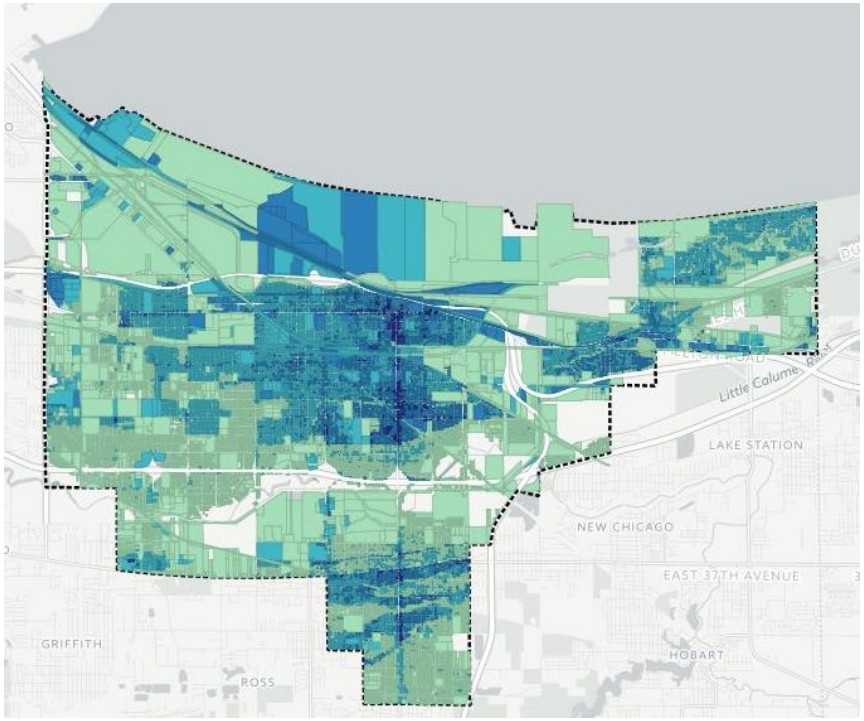
External Factors

- Nature Preserves and National Parks
- Other existing managed conservation land
- Restoration priority areas

dynamometrics
data.analytics.policy

delta institute

RESULTS: STORMWATER



Distance Factors:

- 550'

Site Readiness Factors

- Vacant structure, public ownership
- Vacant lot, public ownership
- Vacant structure, tax sale
- Vacant lot, tax sale

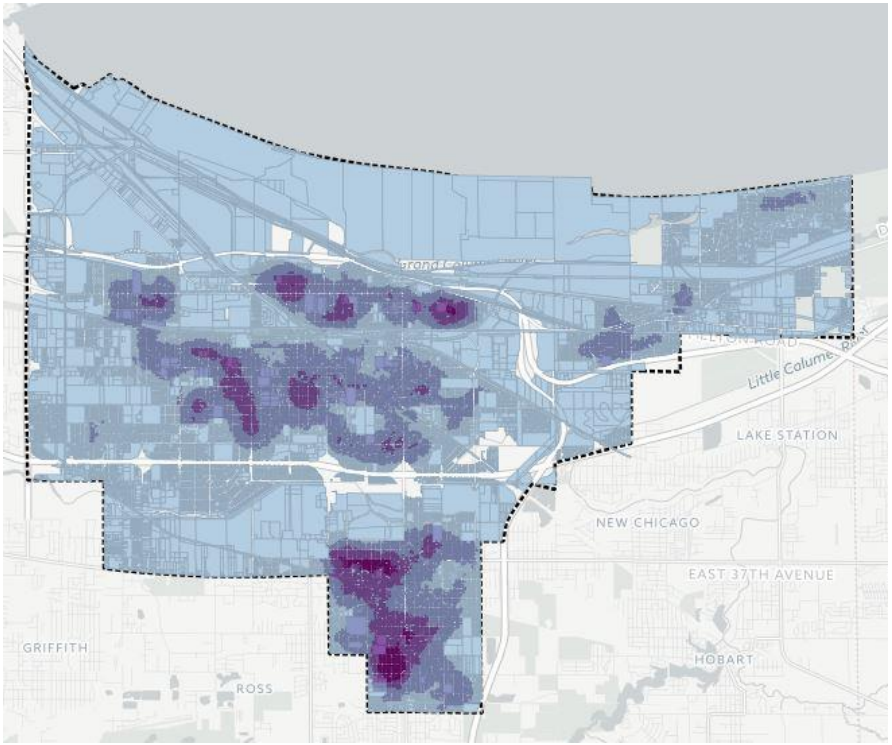
External Factors

- Impervious surfaces
- Soil drainage classification
- Residential flood complaints

dynamometrics
data.analytics.policy

delta institute

RESULTS: BEAUTIFICATION



Distance Factors

- .25 miles increments

Site Readiness Factors

- Vacant structure, public ownership
- Vacant lot, public ownership
- Vacant structure, tax sale
- Vacant lot, tax sale

External Factors

- Community anchors
- Business anchors
- Population density
- Public green space deficit

dynamometrics
data.analytics.policy

delta institute

RESULTS: THE TOOL

Website: http://garycounts.org/tools/

dynamometrics
data.analytics.policy

delta institute

GARY GREEN INFRASTRUCTURE PLAN
FRAMEWORK MAPS

delta institute

FRAMEWORK MAPS & PRIORITY PROJECTS ENGAGEMENT & INPUT

Engaging Professionals:

33 organizations

- Mapping Workshop (July 2017)
- Follow-Up Interviews

Engaging the Public: 65 residents

- 3 Public Meetings: July 2017, September 2017, March 2018

Data Collection Methods

- Interviews
- Mapping charrette
- Written surveys
- Keypad polling

CITY OF THE CENTURY GARY, INDIANA

delta institute

CITYWIDE FRAMEWORK MAP

Purpose:

- Displays every green infrastructure classification zone across the city
- Distinguishes between restoration areas, and areas where green infrastructure should be included as part of developed land
- Does not show specific projects, but rather zones where types of projects should be prioritized
- Connects with model ordinance policies

delta institute

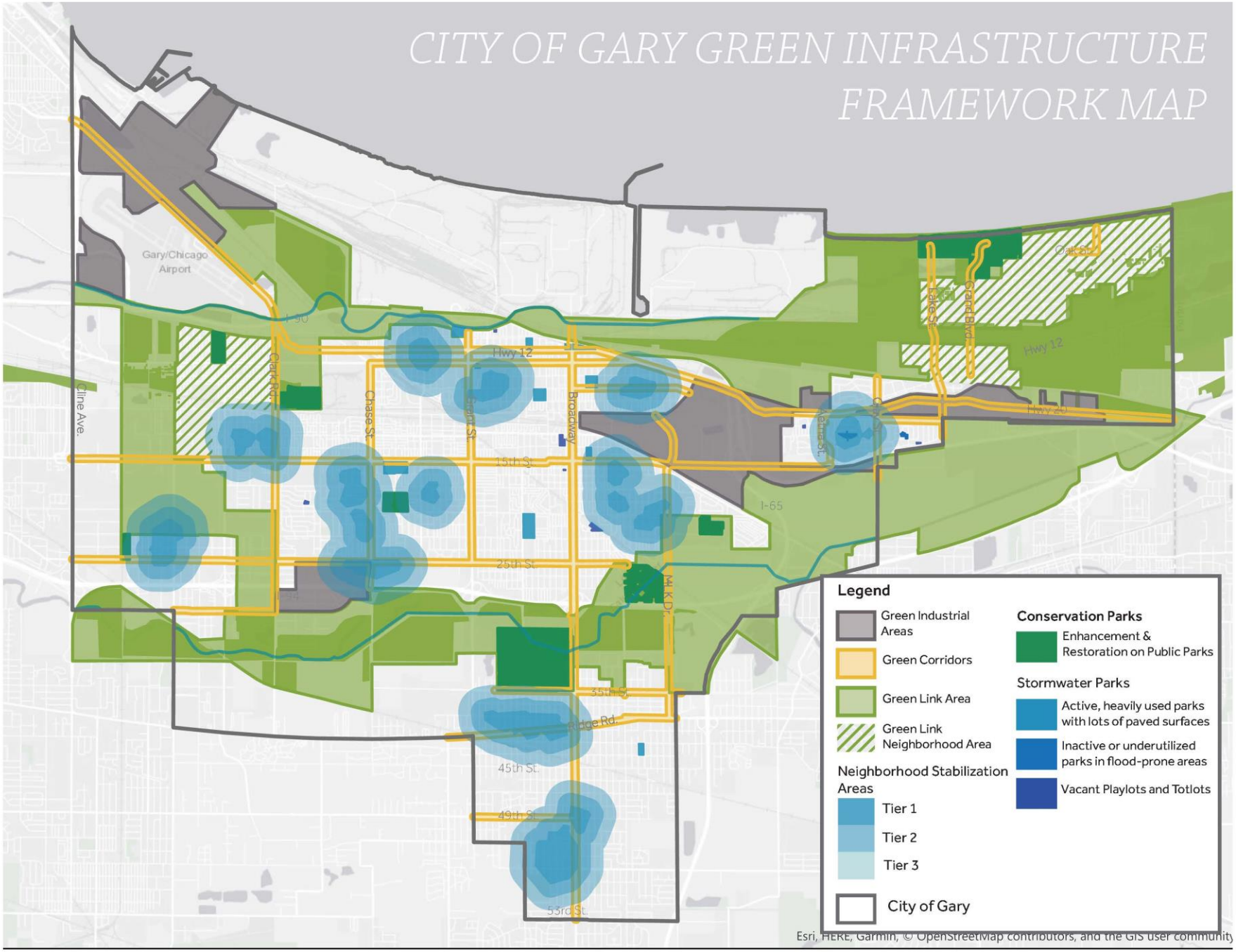
CITYWIDE FRAMEWORK MAP

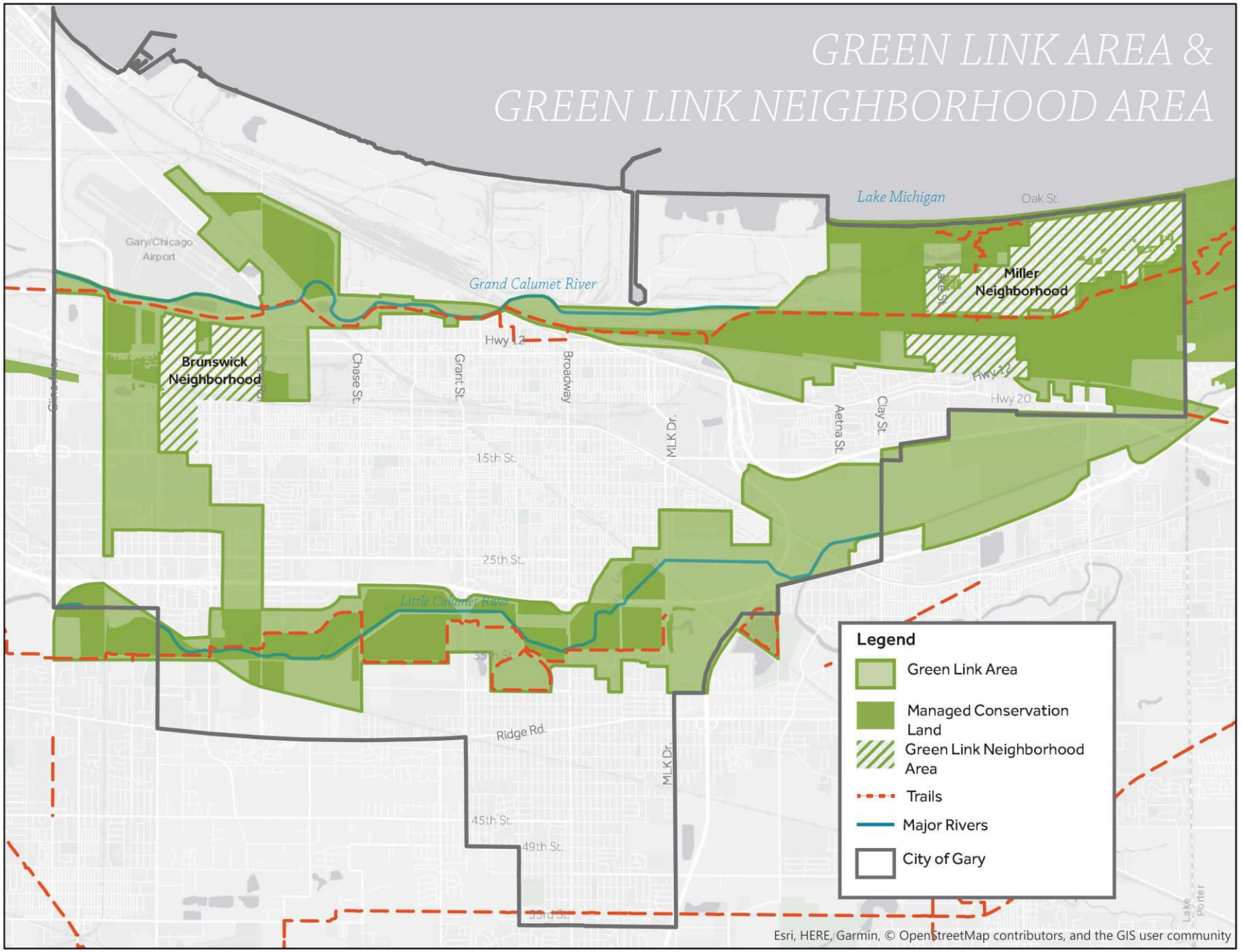
Classifications:

- **Green Link Area:** New and future conservation land
- **Green Link Neighborhood Area:** Residential areas integrated with conservation land
- **Green Corridors:** Green infrastructure priority roads
- **Green Industrial Zones:** Industrial redevelopment areas with green infrastructure and stormwater BMPs
- **Neighborhood Stabilization Areas:** Vacant residential lot green infrastructure
- **Conservation Parks:** To prioritize natural restoration
- **Stormwater Parks:** To prioritize for stormwater BMPs

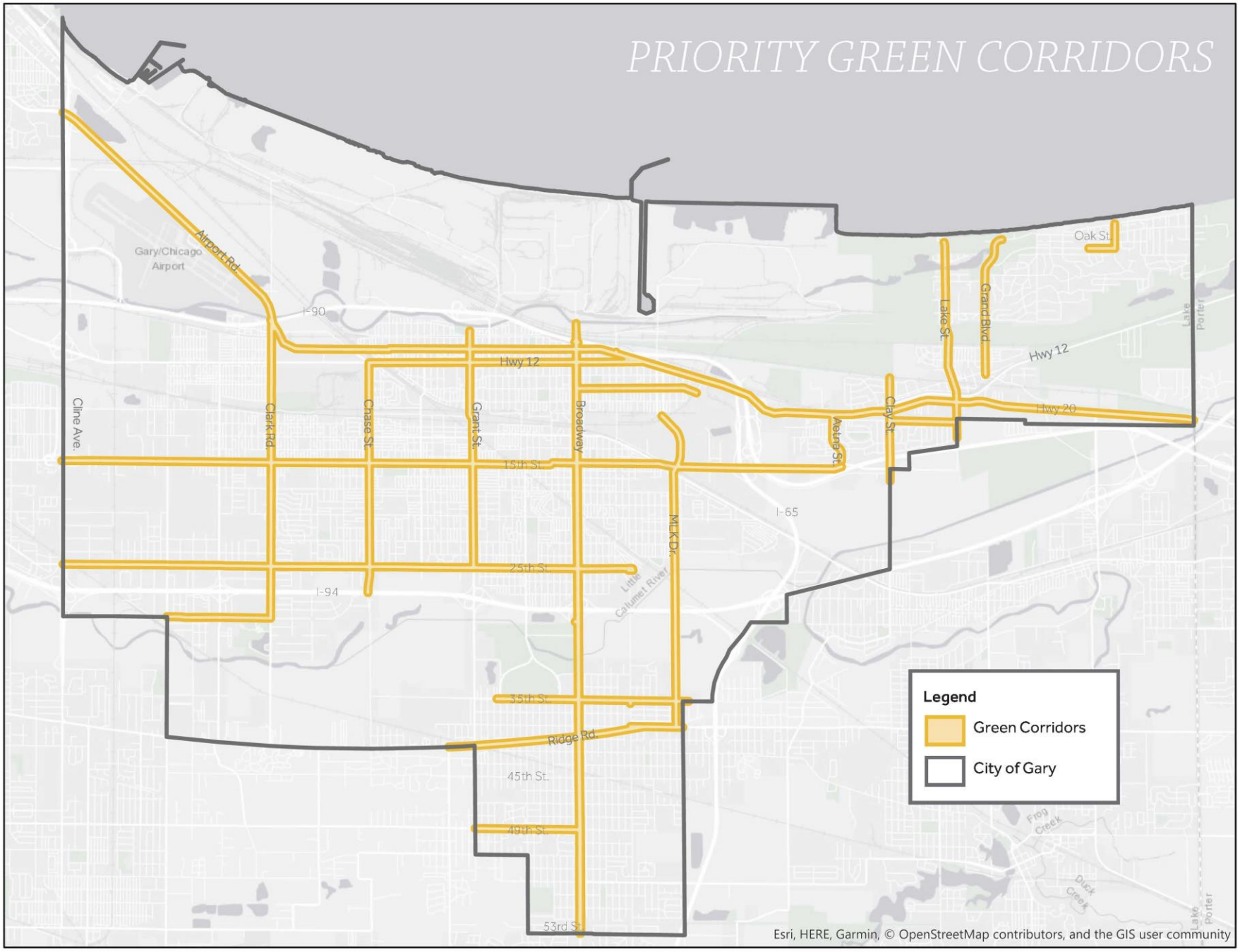
delta institute

CITY OF GARY GREEN INFRASTRUCTURE FRAMEWORK MAP

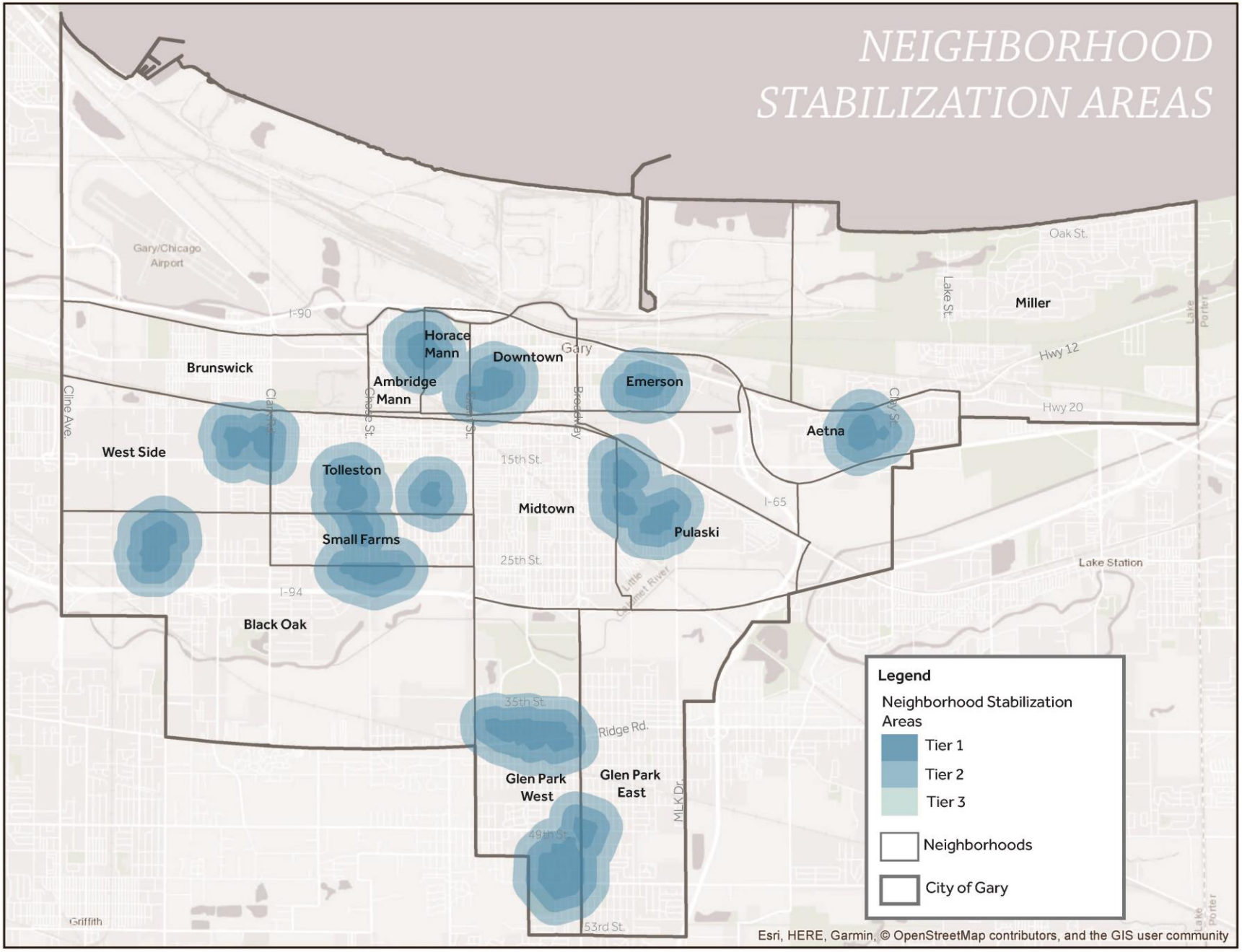


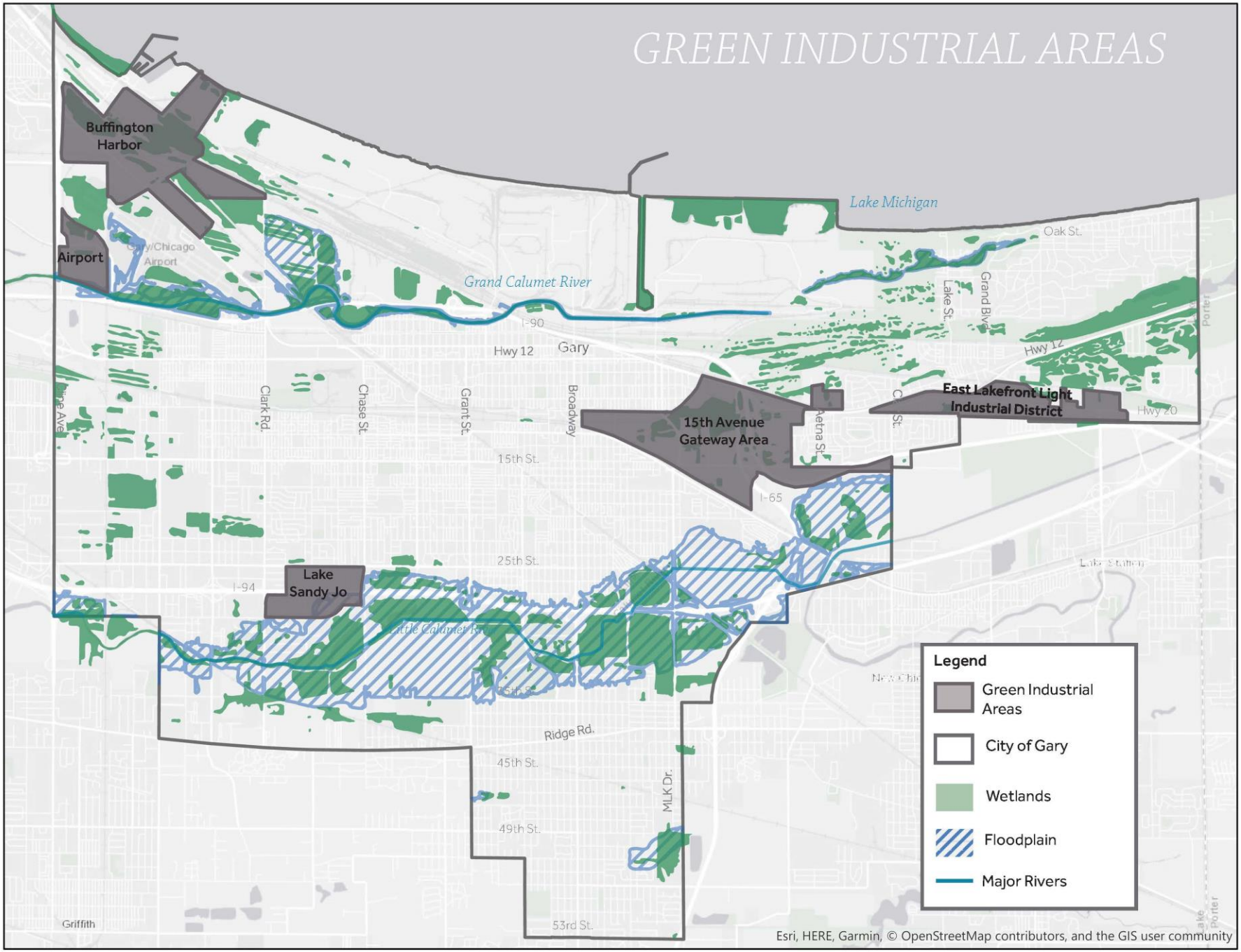

GREEN LINK AREA &
GREEN LINK NEIGHBORHOOD AREA
Lake Michigan
Oak St.
Gary/Chicago Airport
Grand Calumet River
Miller Neighborhood
Brunswick Neighborhood
Hwy 12
Chase St.
Grant St.
Broadway
Hwy 12
Hwy 20
MLK Dr.
Aetna St.
Clay St.
15th St.
25th St.
Little Calumet River
Ridge Rd.
MLK Dr.
45th St.
49th St.
Legend
Green Link Area
Managed Conservation Land
Green Link Neighborhood Area
Trails
Major Rivers
City of Gary
Esri, HERE, Garmin, © OpenStreetMap contributors, and the GIS user community

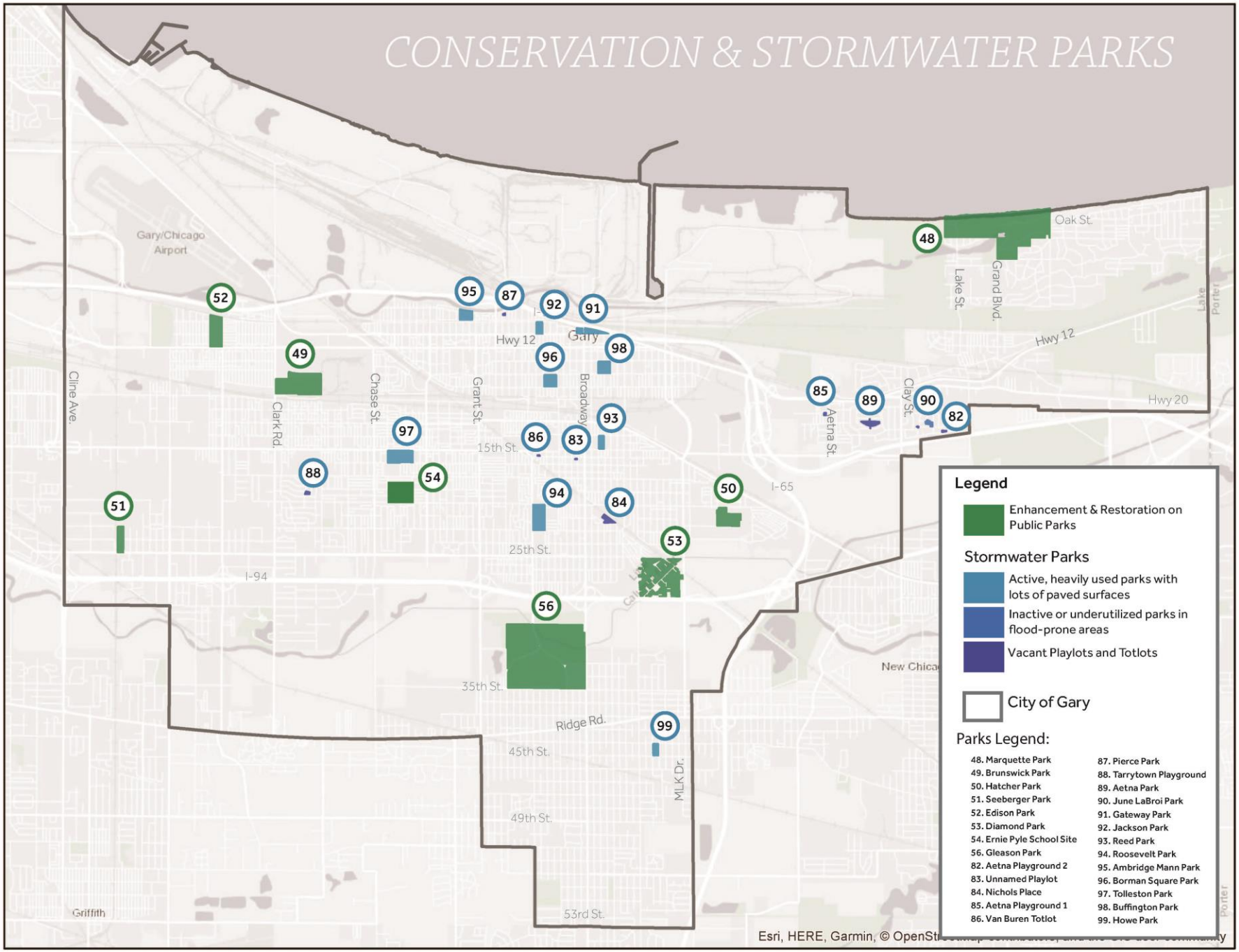
PRIORITY GREEN CORRIDORS



NEIGHBORHOOD STABILIZATION AREAS




GREEN INDUSTRIAL AREAS
Buffington Harbor
Airport
Gary/Chicago Airport
Lake Michigan
Grand Calumet River
Oak St.
Lake St.
Grand Blvd
Hwy 12
I-90
Gary
Clark Rd.
Chase St.
Grant St.
Broadway
15th Avenue Gateway Area
East Lakefront Light Industrial District
Hwy 20
15th St.
I-65
25th St.
Lake Sandy Jo
I-94
Little Calumet River
Ridge Rd.
45th St.
MLK Dr.
49th St.
53rd St.
Griffith
Legend
Green Industrial Areas
City of Gary
Wetlands
Floodplain
Major Rivers
Esri, HERE, Garmin, © OpenStreetMap contributors, and the GIS user community


CONSERVATION & STORMWATER PARKS
Gary/Chicago Airport
Oak St.
Lake St.
Grand Blvd.
Lake Porter
Hwy 12
Gary
Hwy 20
Cline Ave.
Clark Rd.
Chase St.
Grant St.
Broadway
Clay St.
Aetna St.
15th St.
I-65
25th St.
I-94
35th St.
Ridge Rd.
45th St.
MLK Dr.
49th St.
53rd St.
Griffith
New Chica
Esri, HERE, Garmin, © OpenStr
Legend
Enhancement & Restoration on Public Parks
Stormwater Parks
Active, heavily used parks with lots of paved surfaces
Inactive or underutilized parks in flood-prone areas
Vacant Playlots and Totlots
City of Gary
Parks Legend:
48. Marquette Park
49. Brunswick Park
50. Hatcher Park
51. Seeberger Park
52. Edison Park
53. Diamond Park
54. Ernie Pyle School Site
56. Gleason Park
82. Aetna Playground 2
83. Unnamed Playlot
84. Nichols Place
85. Aetna Playground 1
86. Van Buren Totlot
87. Pierce Park
88. Tarrytown Playground
89. Aetna Park
90. June LaBroi Park
91. Gateway Park
92. Jackson Park
93. Reed Park
94. Roosevelt Park
95. Ambridge Mann Park
96. Borman Square Park
97. Tolleston Park
98. Buffington Park
99. Howe Park

DISCUSSION

delta institute

GARY GREEN INFRASTRUCTURE PLAN

MODEL ZONING GUIDELINES

delta institute

MODEL ZONING ORDINANCE

Why Was This Needed:

- Gary's ordinances had not been fully updated since the 1960's
- Current regulations do not reflect 21st century stormwater concerns, climate change issues, or conservation goals
- Gary's permitting departments needed clear, established standards for "on-site improvements"
- Existing demand for a clear but flexible system that protects land and water, but facilitates redevelopment of vacant sites

delta institute

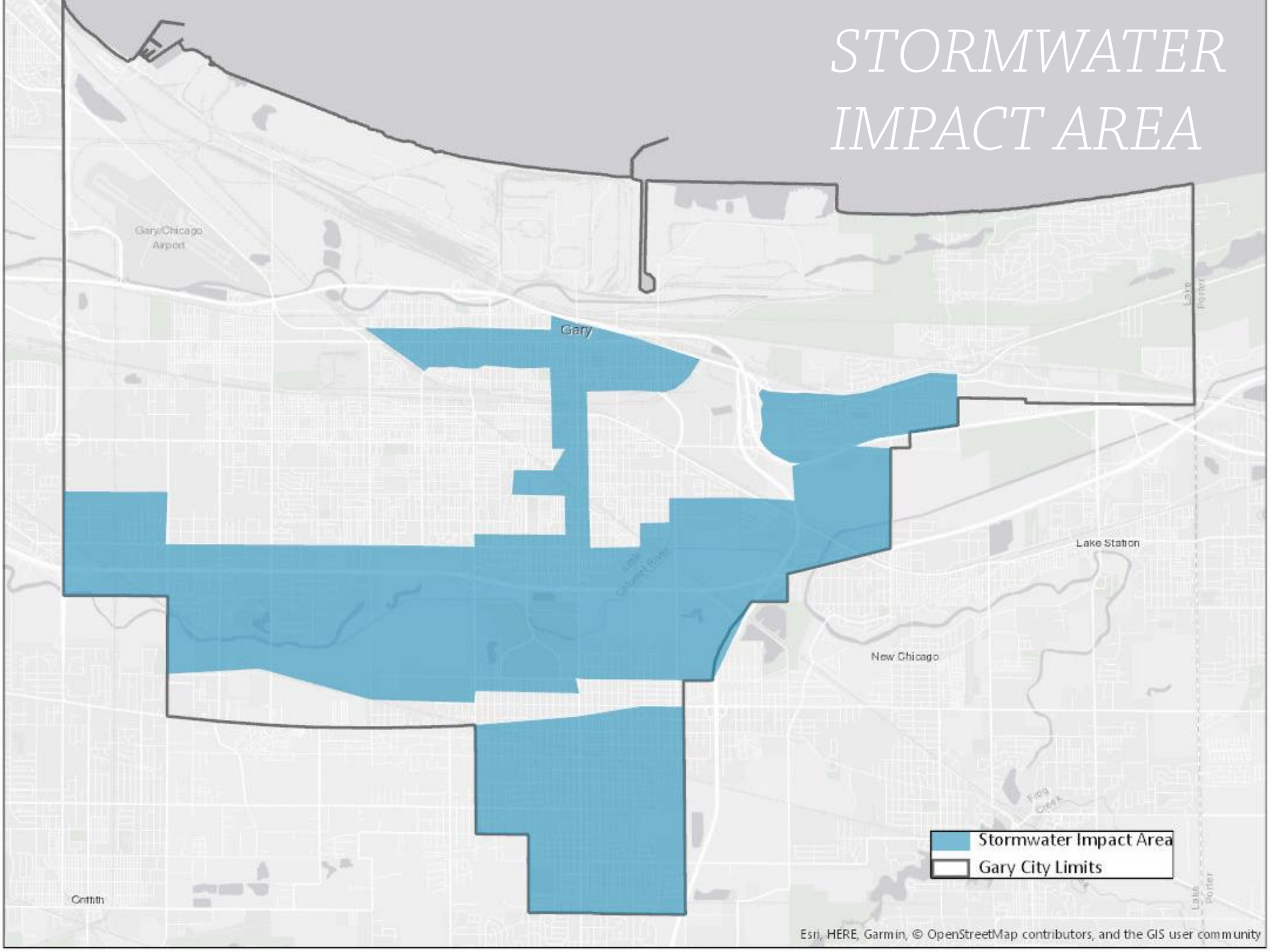
MODEL ZONING ORDINANCE

Goals:

- Connect policies of the frame workmaps with regulations
- Guide development to reduce stormwater runoff
- Increase green infrastructure practices throughout the city
- Protect Gary's significant water and ecological resources
- Create guidelines that can be adapted to a broader zoning update
- Produce better development, but not barriers to development

delta institute

STORMWATER IMPACT AREA



STORMWATER PERFORMANCE STANDARDS

City-Wide Standard

- Properties manage first 1" of rainfall (over 24 hour period)

Stormwater Impact Area Standard

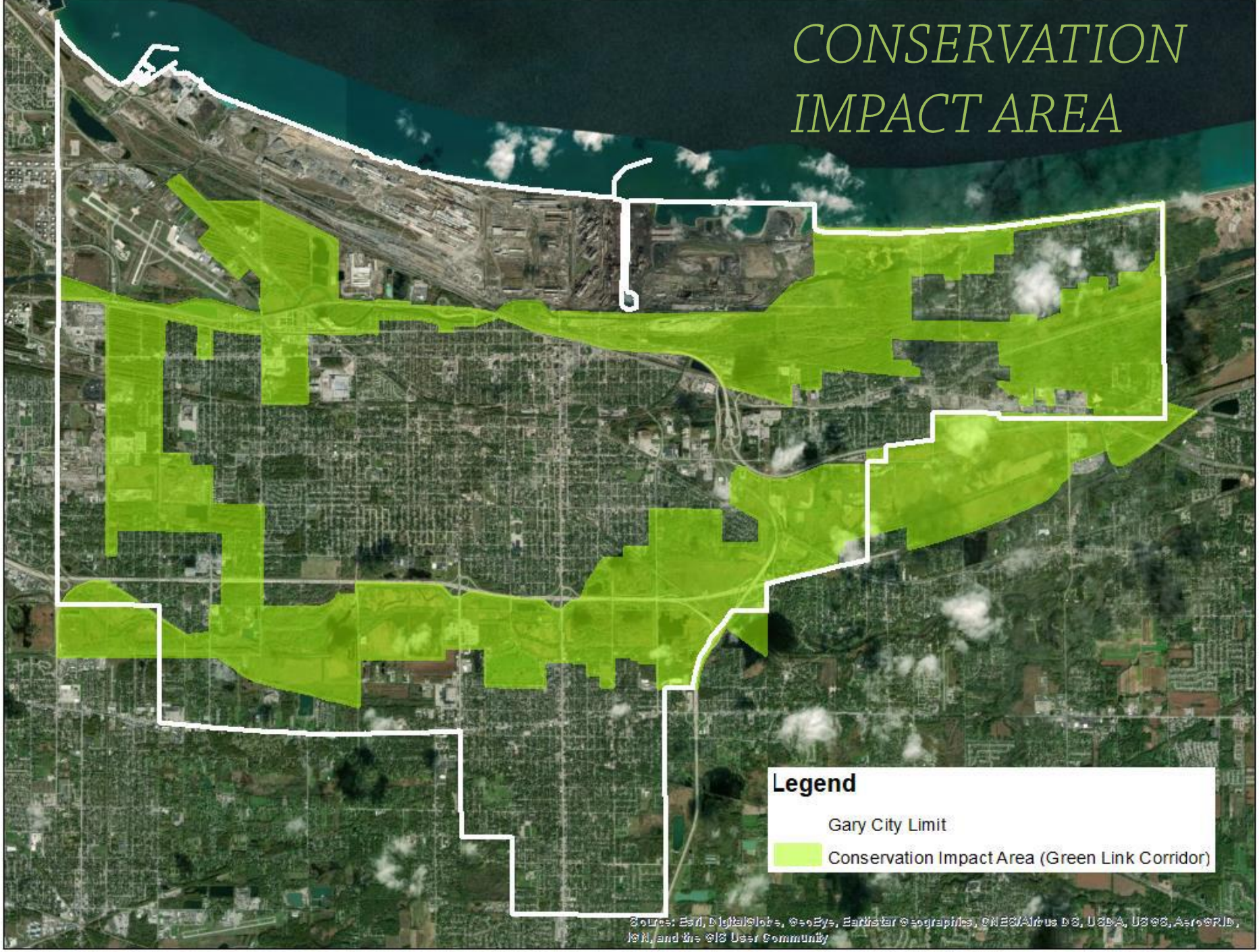
- Manage first 1.5" of rainfall (over 24 hour period)

Standards Informed by:

- Municipal input
- Review of Peer Cities
  - Grand Rapids: First 0.5"
  - Philadelphia: First 1.5"

delta institute

CONSERVATION IMPACT AREA



SUITE OF BUFFERS

	Vegetated Buffer Widths			
	Heavy Industrial	Light Industrial	Commercial	Residential
Riverine Buffer From river, stream, tributary, or Lake Michigan edge. Extends either from within same or adjacent parcel.	100 ft	50 ft	50 ft	25 ft
Wetland Buffer From wetland, pond, or lagoon edge. Extends either from within same or adjacent parcel.	35 ft			
Conservation Buffer When adjacent parcel is conserved (no street between). Also applies from edge of high quality ecosystem present within to-be-developed parcel.	50 ft	25 ft	25 ft	10 ft

delta institute

INTRODUCING FLEXIBLE STANDARDS

	Buffer	Wetland Vegetated Buffer Widths			
		Heavy Industrial	Light Industrial	Commercial	Residential
	Wetland Buffer From wetland edge. Both within same or adjacent parcel.	35 ft			
Allowed Buffer Reductions	**Revegetation: Native Prairie/Understory** Where impervious surface within the buffer is revegetated utilizing native prairie or understory herbaceous species, the required wetland buffer width can be reduced by five (5) feet to thirty (30) feet. *Developer must sign a maintenance agreement to maintain the native revegetated buffer for at least five years.	30 ft (5 ft width reduction)			
	Revegetation: Native Reforestation Where impervious surface within the buffer is revegetated utilizing native species reforestation (i.e. appropriate native tree and understory herbaceous species), the required wetland buffer width can be reduced by ten (10) feet to twenty-five (25) feet. *Developer must sign a maintenance agreement to maintain the native revegetated buffer for at least five years.	25 ft (10 ft width reduction)			
	Wetland Restoration The buffer can be reduced in area by the equivalent acreage of wetlands restored or enhanced by the developer up to a maximum reduction of fifteen (15) feet to twenty (20) feet width. *The reduction is applied uniformly, meaning that all wetland buffer must be the same width. Applies only to the wetlands protected by the buffer. Developer must sign a maintenance agreement to maintain the wetland for at least five years.	35 ft - 20 ft (Potential of up to 15 ft width reduction)			

TESTING THE BUFFERS

1000-1100 N Clark: Wetland Buffer

Case Study Feature	Area (SF)	Area (Ac)	%
Total Parcel	1,667,919	38.3	100
Wetlands on Parcel	631,187	14.5	37.9
Wetland Buffer (35 ft)	124,146	2.9	7.4
Buildable Area (isolated)	123,891	2.8	7.4
Buildable Area (contiguous)	788,695	18.1	47.3

TESTING THE BUFFERS

Edison School Parcel: Conservation Buffer

Case Study Feature	Area (SF)	Area (Ac)	%
Total Parcel	910,843	20.9	100
High Quality Habitat	177,290	4.1	19.5
Conservation Buffer (10 feet)	19,602	0.5	2.2
Buildable Area (isolated)	69,261	1.6	7.6
Buildable Area (contiguous)	644,691	14.8	70.8

STRATEGIES BY LAND USE

Strategy	Compatible Land Uses				Information
	Heavy Industrial	Light Industrial	Commercial	Residential	
Cisterns	x				Definition Required Maintenance Tasks Suggested Maintenance Tasks Initial Responsible Parties Long Term Responsible Parties Placement Preferences
Constructed Wetlands	x	x			
Bioswales		x	x		
Parking Lot Bioretention Islands		x	x		
Rain Gardens		x	x	x	
Stormwater Trees		x	x	x	
Non-Living Permeable Surfaces			x	x	
Downspout Disconnection				x	
Rain Barrels				x	

DISCUSSION

delta institute

GARY GREEN INFRASTRUCTURE PLAN

PRIORITY PROJECTS

delta institute

101 PRIORITY PROJECTS

Roadway Green Infrastructure Projects: 24 projects

- Sidewalk projects
- Non-Sidewalk projects
- Perforated Pipe projects

Beautification & Blight Elimination Projects: 23 projects

- Vacant Lots
- Active Sites
- Gateways

Stormwater Parks: 18 projects

- Inactive Parks
- Active Parks

Conservation Projects: 34 projects

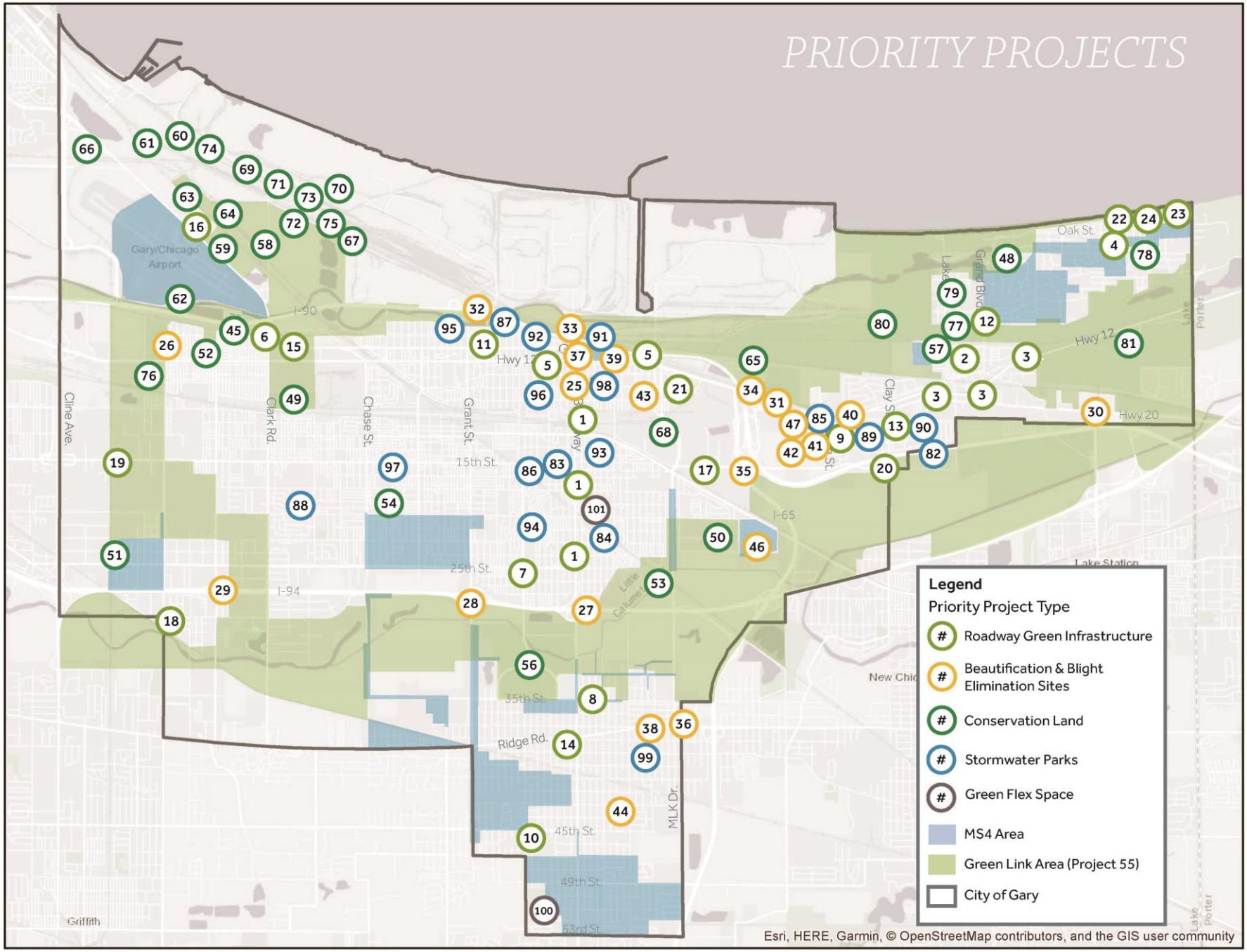
- Parks & Schools
- Public Lands
- Private Lands & Utilities

Green Flex Sites: 2 projects

- Phytoremediation Farms

delta institute

PRIORITY PROJECTS



PROJECT EXAMPLE: AIRPORT ROAD

Extent: 2.8 miles

Cline Ave to Clark Rd

Concept:

Bioswales/hybrid ditches running along this heavy trucking corridor, serving to beautify the primary access point to the Gary Airport, and buffering the adjacent airport and wetlands from runoff

Projected Cost: $250,000

Ave. Annual Reduction:

1,007,021 gal

delta institute

PROJECT EXAMPLE: VACANT TO VIBRANT

Phase 1: 1035 Oklahoma St, 1200 Oklahoma St, 1252 Dakota St

Phase 2: 743-53 Vermont St, 4261 Virginia St, 5210 W 3rd Ave, 2432 Marshalltown Ln, 3534 E 10th Ave

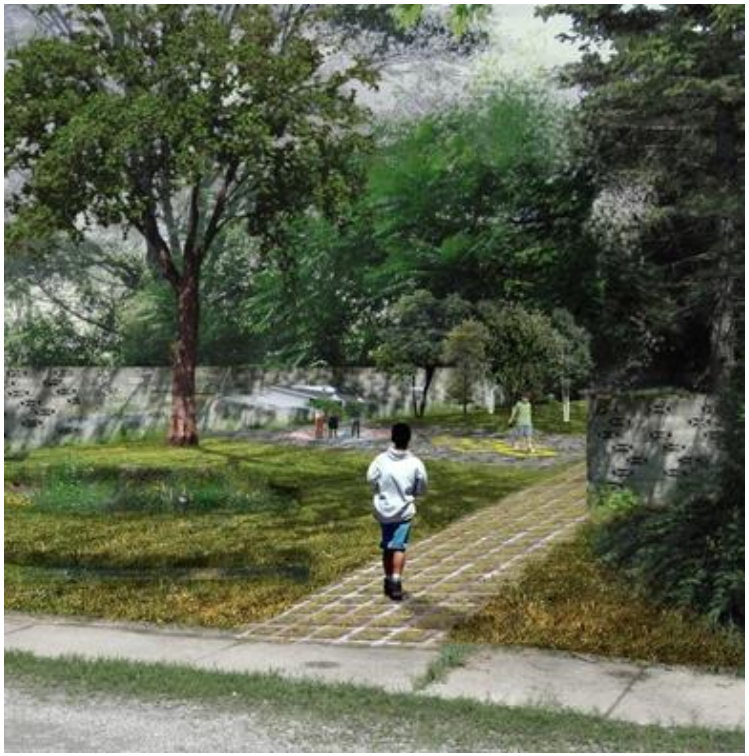
Concept:

Conversion of post-demolition residential lots through HHF into neighborhood rain gardens

Projected Cost: $7,000 - 20,000

Ave. Annual Reduction:

86,914 gal



1035 OKLAHOMA ST - AETNA

delta institute

PROJECT EXAMPLE: BROADWAY NORTH OF I-80

Concept:

- Convert vacant, overgrown lots at a key entrypoint in the city to include new signage and rain gardens that assist with stormwater management

Projected Cost: $100,000 - 145,000

Ave. Annual Reduction:

260,742 gal

delta institute

PROJECT EXAMPLE: JACKSON PARK

Neighborhood: Horace Mann

Extent: 4.4 acres

Existing Assets:

Recreational features, including 600 feet of the Green Link trail

Opportunities:

Development of rain gardens or bioswale features on existing green space, and by the trail

Projected Cost: $450,000

Ave. Annual Reduction:

473,410 gal

delta institute

PROJECT EXAMPLE: PIERCE PARK

Neighborhood: Ambridge Mann

Extent: .3 acres

Existing Conditions:

Vacant residential pocket park, covered in pavement, just south of Grand Calumet River and the planned Green Link corridor

Opportunities:

Development of rain garden features to be included in trail

Projected Cost: $72,910-90,970

Ave. Ann. Reduction:

173,828 gal

CITY OF THE CENTURY GARY, INDIANA

delta institute

PRIORITY PROJECTS

How to Use the List:

- Include as part of the Long Term Control Plan measures
- Stormwater Impact Modelling
- Capital Improvement Planning & Implementation
- Grant Procurement
  - Stormwater, Green Infrastructure, Transportation, Parks, Conservation
- Development agreements
- Land trust partnerships
- Wetland mitigation projects
- Public Private Partnerships for Green Infrastructure

delta institute

CHALLENGES & LIMITATIONS

- **This plan is 30,000 foot view, to implement specific projects, more technical studies would be needed:**
  - Topographical
  - Soil surveys
  - Hydrology surveys
  - Wetland delineation reports
- **Completed in advance of the Long Term Control Plan and:**
  - Creation of more comprehensive sewershed data
  - Specific stormwater control goals

delta institute

CHALLENGES & LIMITATIONS

- **Completed in advance of the Comprehensive Plan, which:**
  - Defines specific updates to the city's land use policy
  - Helps identifies when GI is a use, and when it is a design treatment
- **Fiscal constraints**

delta institute

LESSONS LEARNED

- Green infrastructure planning looks different in Gary than other communities
  - More driven by vacant land reuse opportunities
- Umbrella view of green infrastructure complicates the exercise
- Planning is an exercise in prioritization
- You can't simply replicate what the glaciers took thousands of years to produce, but you can help protect it

delta institute

DISCUSSION

delta institute