Lakeview N&S H&H Study Concept Design

City of New Orleans – DPW724

October 16, 2024

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1. Study Objective
2. Lakeview Existing Conditions Flood Risk (10-Year)
3. Concept Designs
4. Preliminary Flood Risk Analysis with Concepts
5. Concept Summaries – Cost and Scoring

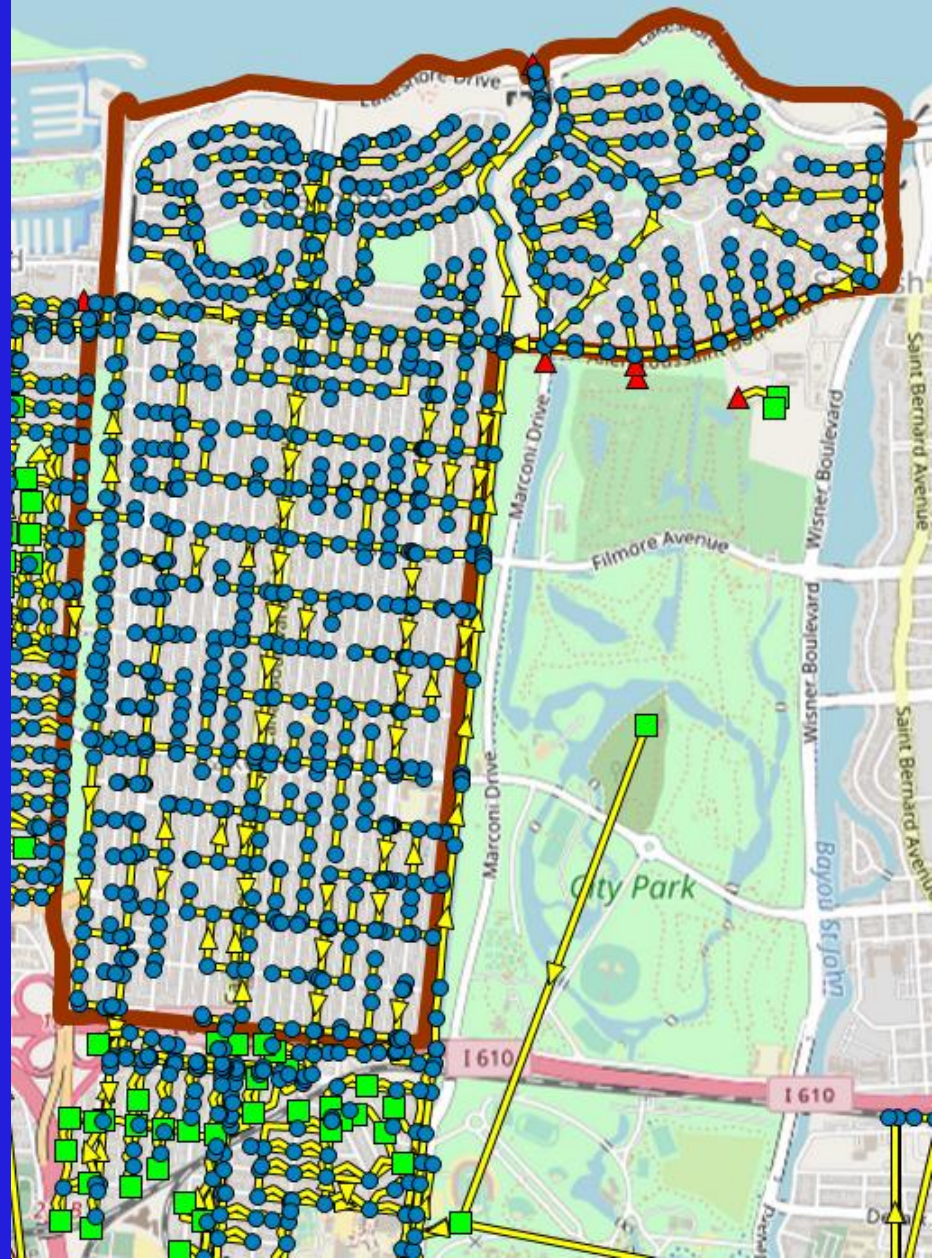
Study Objectives

Study Objectives

- Assess neighborhood flood risk and evaluate existing system.
- Integrate completed and designed JIRR projects to gain a better understanding of the system's functionality.
- Develop 9 – 12 concept designs and estimate flood risk reduction
- Evaluate and rank concept designs in terms of cost efficiency, flood risk and hydraulic benefit, proximity to existing or recent constructed projects, equity, cooling, and connecting.

*Note: Investigation does **not** provide recommendation for drainage pump stations (DPS), which were modeled based on existing SWBNO data*

Hydraulic & Hydrologic Model



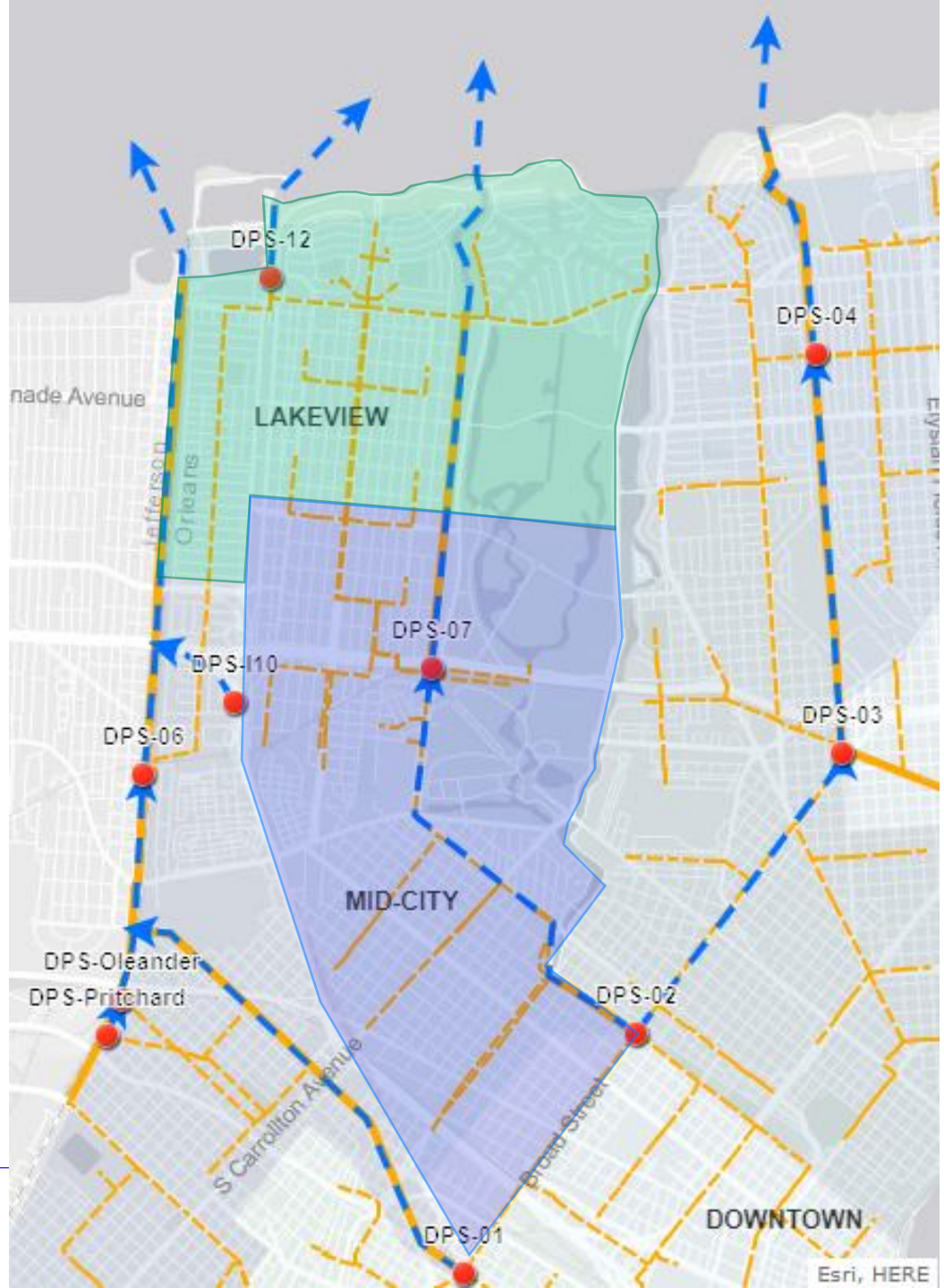
Lakeview Existing Conditions Flood Risk

Drainage Characteristics

- Project area is governed by DPS 007 and DPS 012
  - DPS 007 drains Lakeview South from Harrison into Mid City
  - DPS 012 drains Lakeview North, Lakeshore, Lake Vista & West End

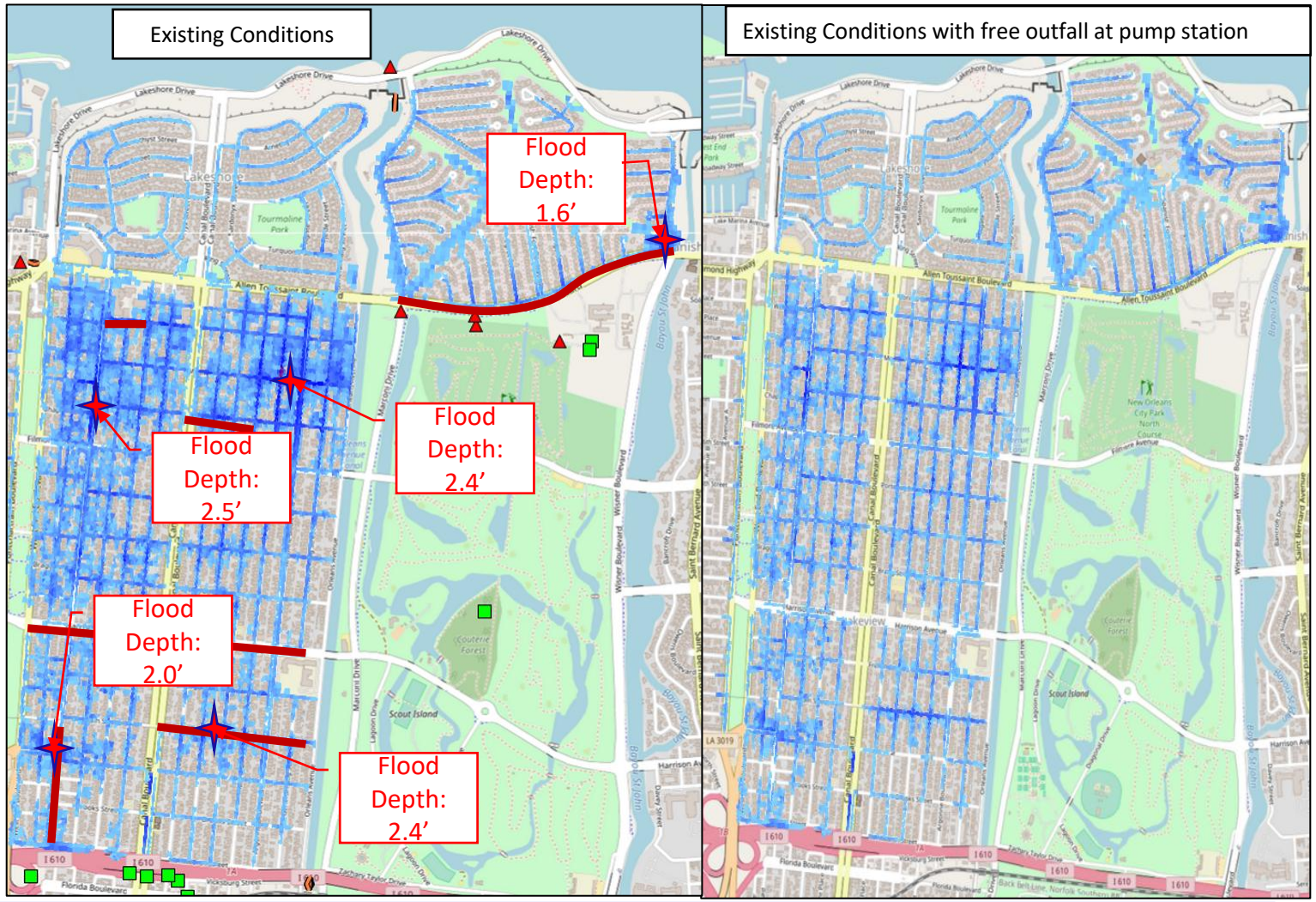
	DPS 7	DPS 12
Total Area Drained (sqmi)	8.46	1.63
Upstream Catchments Area includes:	DPS 2 & Project Area	West End & Project Area

- Minor system drains by gravity to major system along Canal St, Harrison St, and Allen Toussaint to DPS
- Reverse flow and ponding occur due to limited storage compared to pumping capacity, impacting both the major system and parts of the minor system
- For comparison: West End: 0.65 sq. mi vs Lakeview 2.57 sq. mi



Major Drivers of Flooding

- Modeling validates known areas of flooding.
- Limited pumping capacity of DPS 007 and DPS 012 are a cause of flooding in a10-year event
- Modeled free outfall scenario to evaluate "flow into space" DPS conditions
- While DPS is a driving factor of flooding, conveyance and storage issues remain free fall conditions at DPS (see highlighted conveyance capacity issues)
- Undersized drainage in several areas



112 MG Flooding

63 MG Flooding

Conveyance capacity issues

Solution Approach

- Lakeshore & Lake Vista
  - Problem: Flooding not as prevalent, however, opportunities for **storage** can reduce contribution to Lakeview North flooding.
  - **Proposed Solutions:** Fix reverse grade in box culvert along Allen Toussaint to address local flooding, target green spaces for **storage**

- Lakeview
  - Problems:
    - Downstream flood risk remains high without adequate storage solutions.
    - Surcharging in the major system (>36") persists, unrelated to pump capacity limitations.
    - Localized flooding "hot spots" lack sufficient conveyance and storage capacity.
  - **Proposed Solutions:**
    - Pair conveyance improvements with Blue-Green Stormwater Infrastructure (BGSI) to enhance storage and reduce flood risk
    - Implement conveyance and conveyance improvements to the major system to address surcharging and provide additional relief to hot spot areas

BGSI Solutions

Solutions Toolbox

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Modular Tank System

- Harlequin Park (Concept 1)
- Tourmaline Park (Concept 2)
- Upper West End (Concept 5)
- Hynes Elementary (Concept 8)
- Mouton Street (Concept 6)
- Germain Street (Concept 9)

Stormwater Ponds

- Tiara/ Peridot Park (Concept 3)
- Marconi Street (Concept 4)
- New Canal Basin (Concept 11)
- Kenilworth Street (Concept 12)

Sunken Garden

- Canal Street (Concept 10)
- Harrison Street – West (Concept 7)
- Hynes Elementary (Concept 8)

Permeable Pavement

Harrison Street – East (Concept 7)

Open Box Culvert

Canal Street (Concept 10)

Conveyance

- Tourmaline Park (Concept 2)
- Marconi Street (Concept 4)
- Upper West End (Concept 5)
- Mouton Street (Concept 6)
- Harrison Street (Concept 7)
- Germain Street (Concept 9)

Project Opportunities

- Lakeshore / Lake Shore
  - Harlequin Park (Concept 1)
  - Tourmaline Park (Concept 2)
  - Tiara/Peridot Park (Concept 3)
  - Marconi Levee (Concept 4)
- Blue-Green Infrastructure
  - Upper West End (Concept 5)
  - New Canal Basin Park (Concept 6)
  - Kenilworth Street (Concept 7)
  - Hynes Elementary (Concept 8)
- Major System
  - Canal Boulevard (Concept 9)
  - Harrison Avenue (Concept 10)
- Local Improvements
  - Mouton Street (Concept 11)
  - Germain Street (Concept 12)

Lakeshore/Lake Vista Storage and Conveyance

1. Harlequin Park

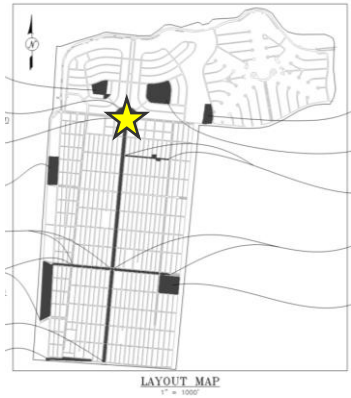
- Concept: Modular Tank System
- Considerations:
  - Space currently maintained as a passive park.
  - Opportunity to enhance community space.
  - Storage will reduce runoff from Lakeshore during peak storms, lowering the demand on DPS and reducing flood risk in areas impacted by overflow.
  - Large trees within project area to avoid
- **WSE Reduction Estimate:**
  - **0.2 in to 7 in**
- **Volume Stored: 2.2 MG**
- **Cost Estimate: $7,400,000**

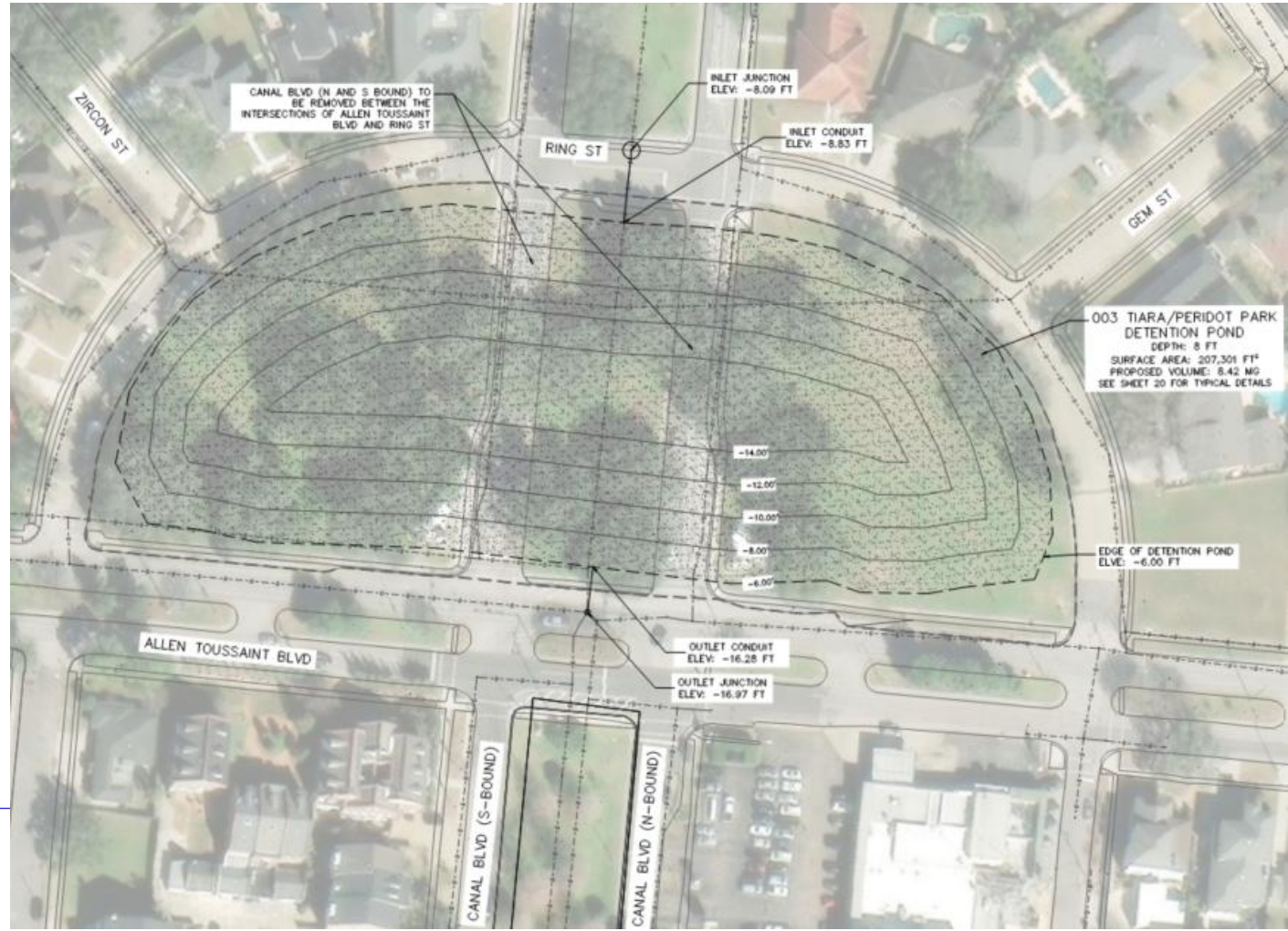
2. Tourmaline Park

- Concept: Modular Tank System with Pipe Rerouting
  - Rerouting pipe along Jewel St to optimize flow to storage system
- Considerations:
  - Space currently maintained as a passive park.
  - Opportunity to enhance community space.
  - Storage will reduce runoff from Lakeshore during peak storms, lowering the demand on DPS and reducing flood risk in areas impacted by overflow.
- **WSE Reduction Estimate:**
  - **0.1 in to 5 in**
- **Volume Stored: 4.4 MG**
- **Cost Estimate: $14,000,000**

3. Tiara & Peridot Park

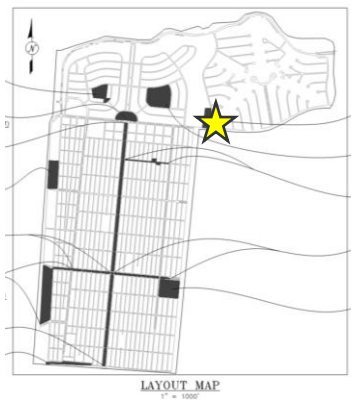
- Concept: Stormwater Park (SP)
  - SP with live detention pond and surrounding park space.
- Considerations:
  - Neighborhood traffic across Canal Blvd (Road diet options)
  - Can develop an option without removal of road, but would have less storage available
  - Utility locations within neutral ground
  - Storage will reduce runoff from Lakeshore during peak storms, lowering the demand on DPS and reducing flood risk in areas impacted by overflow.
- **WSE Reduction Estimate:**
  - **1.1 in to 6 in**
- **Volume Stored: 5.7 MG**
- **Cost Estimate: $21,700,000**



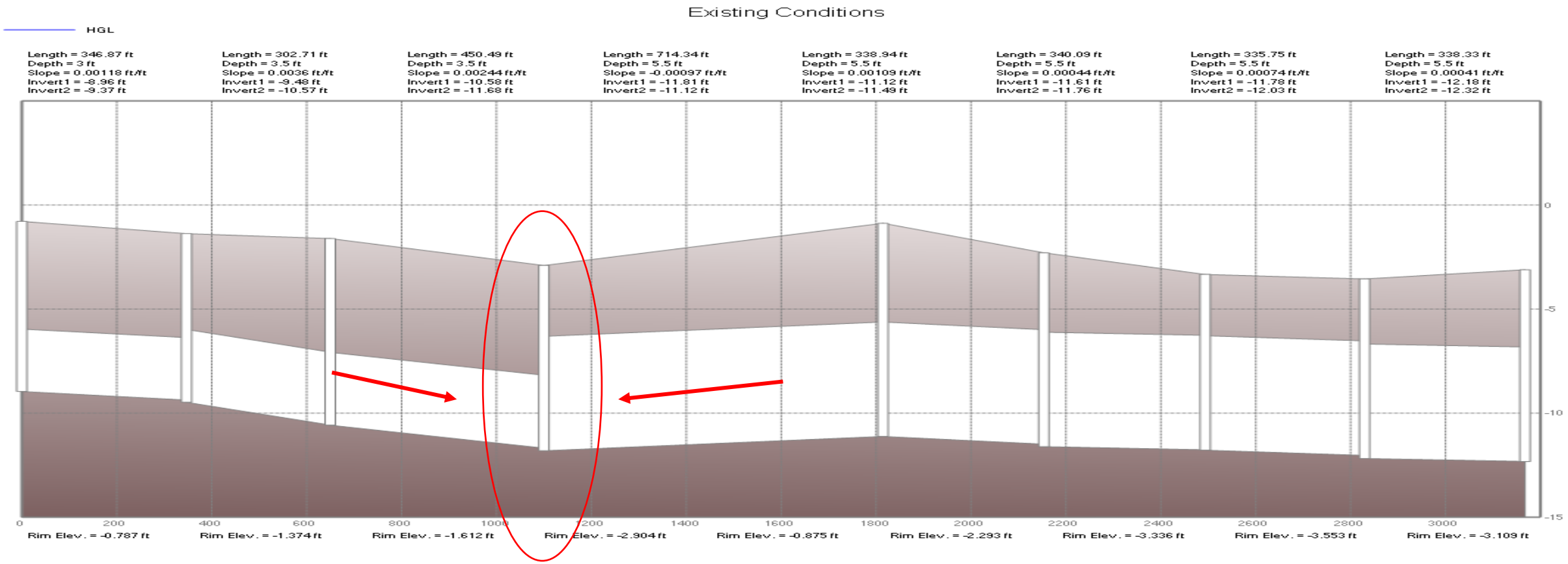


4. Marconi Levee

- Concept: Stormwater Park and Conveyance upgrades
  - SP with live detention pond and surrounding park space. Upgrades to conveyance
- Considerations:
  - Using currently unused space as floodable space.
  - Conveyance upgrades along Allen Toussaint to increase storage within conveyance system and improve issues of reverse slope
  - Construction limits next to Levee
  - Storage will reduce runoff from Lakeshore during peak storms, lowering the demand on DPS and reducing flood risk in areas impacted by overflow.
- **WSE Reduction Estimate:**
  - **1.6 in (hot spot) to 7 in (overall max)**
- **Volume Stored: 3 MG**
- **Cost Estimate: $11,500,000**



Lake Vista Profiles – Existing Conditions



Lakeview Green/Blue Storage

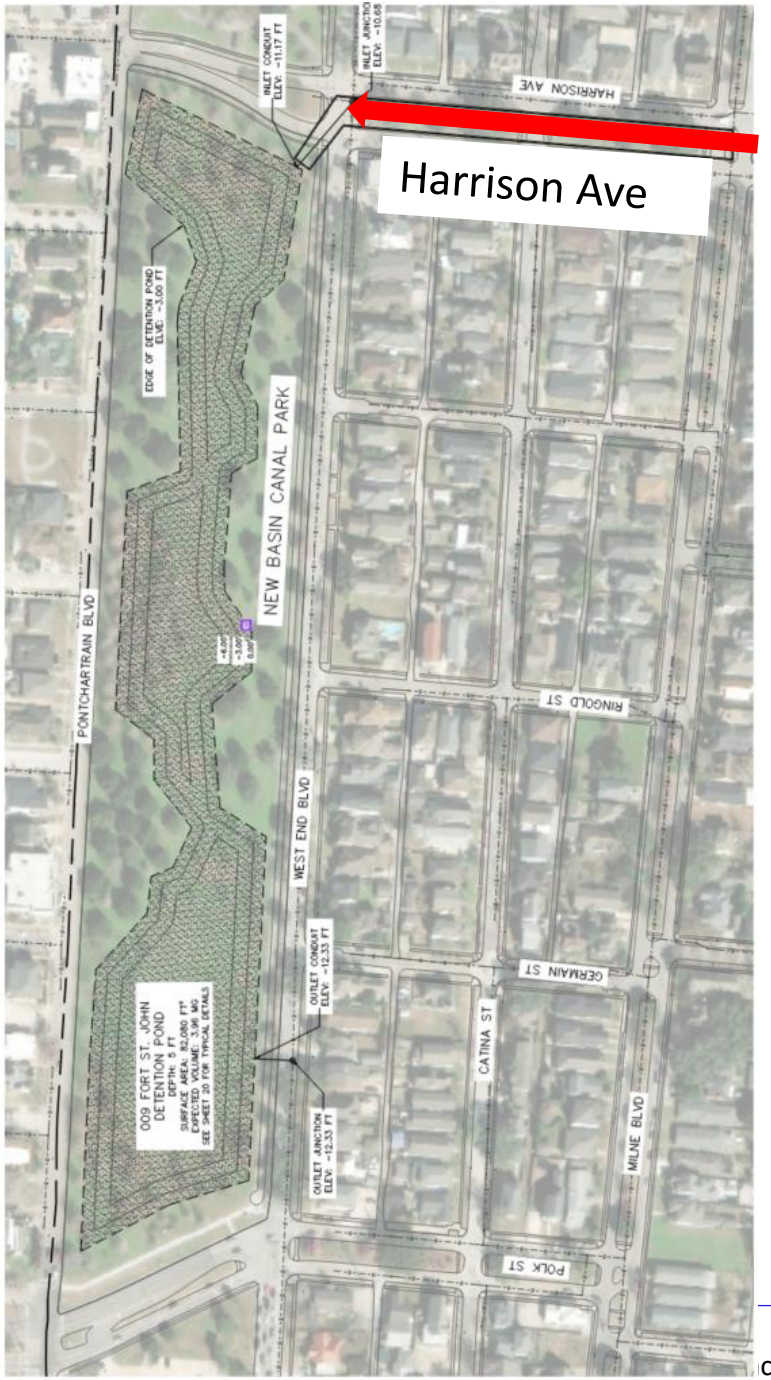
5. Upper West End Blvd

- Concept: Modular Tank System and Box Culvert Upgrades
  - Stormwater Park with live detention pond and surrounding park space, creating floodable space.
  - Realignment of pipe network from Milne to West End along Chapelle St
- Considerations:
  - Possible remediation from burial grounds

- **WSE Reduction Estimate:**
  - **Max: 0.2 in to 6 in**
- **Volume Stored: 9.8 MG**
- **Cost Estimate: $16,200,000**

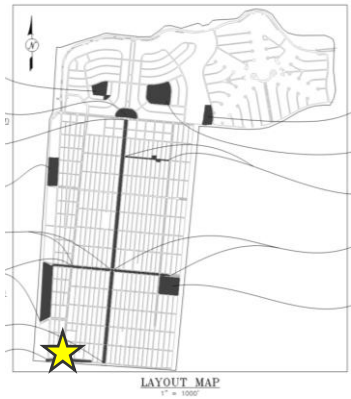
6. New Basin Canal Park

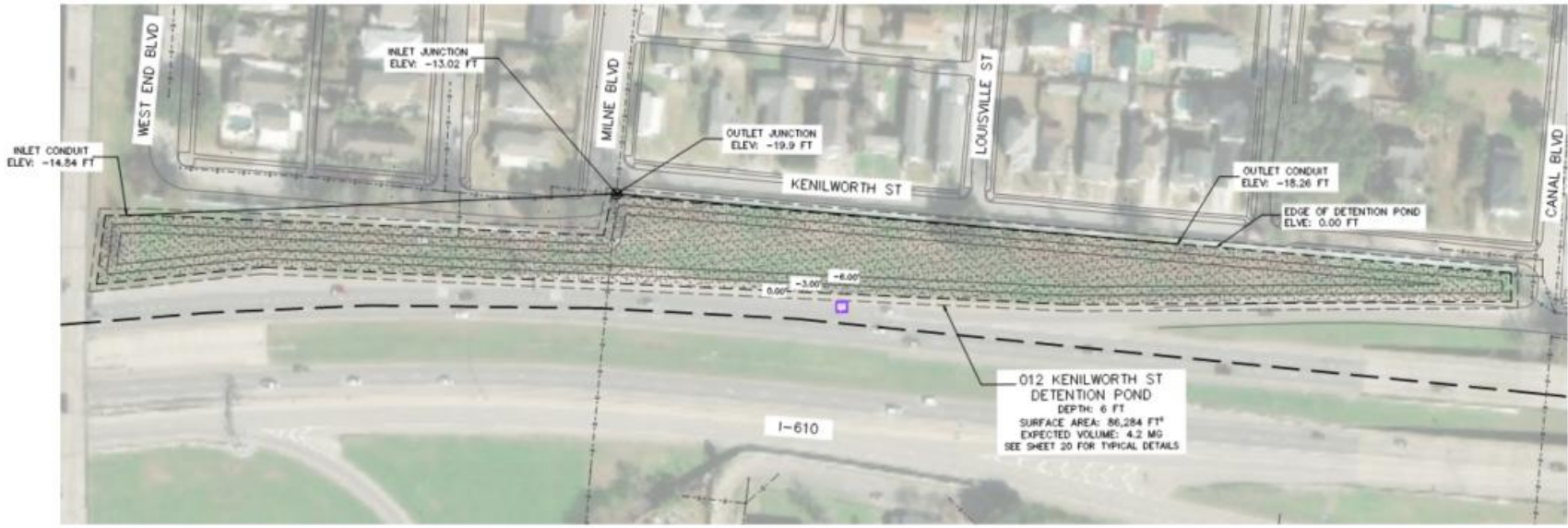
- Concept: Stormwater Park and Box Culvert
  - SP to detain water and provide relief along Harrison Ave
  - Box culvert upgrades along Harrison Ave to reroute flow from Milne toward West End Blvd
- Considerations:
  - Remediation within burial ground along West End
  - Provide relief to overutilized box culvert
  - Highly trafficked area
- **WSE Reduction Estimate:**
  - **0.7 in to 4 in**
- **Volume Stored: 3.9 MG**
- **Cost Estimate: $5,800,000**



7. Kenilworth St

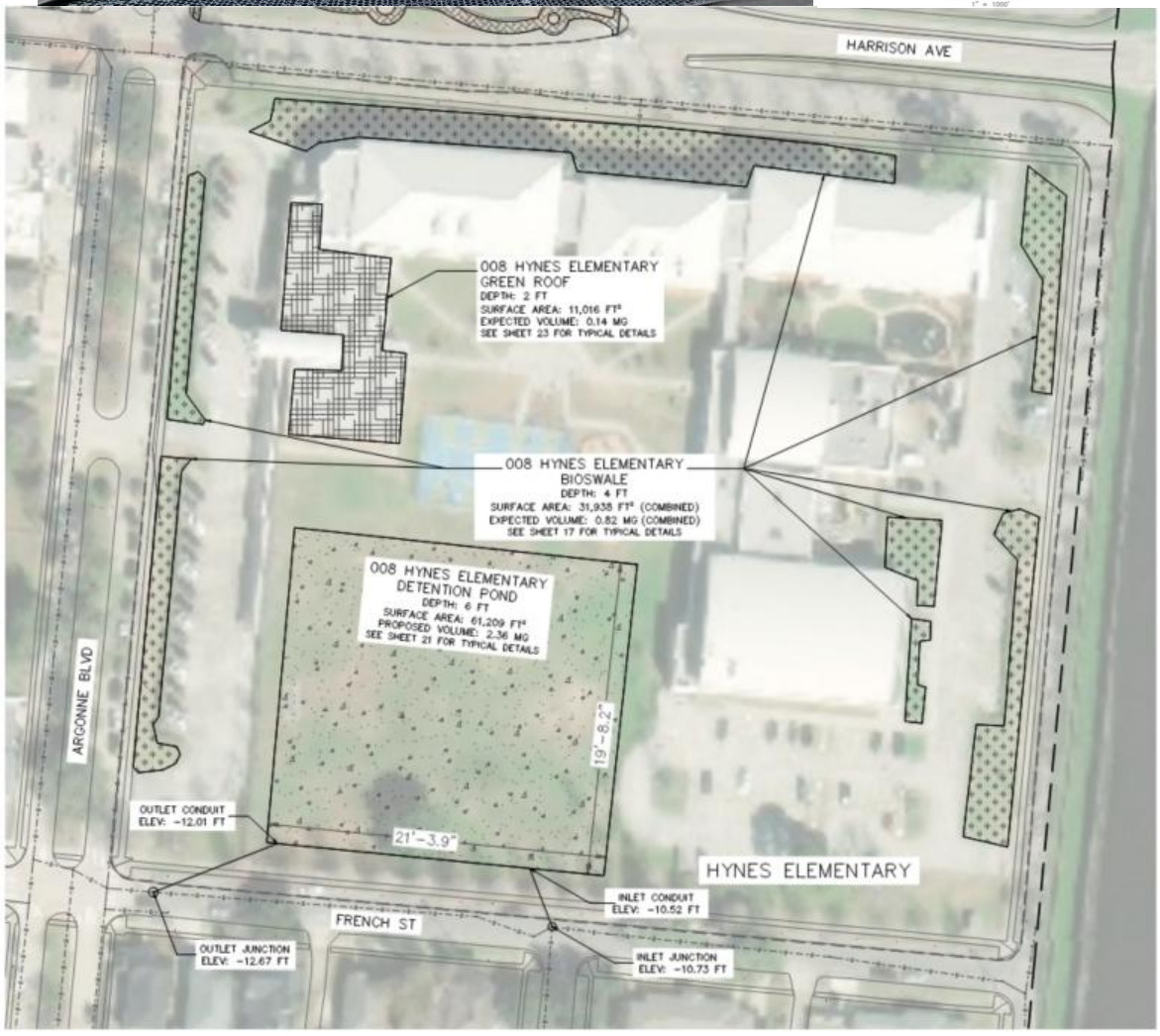
- Concept: Stormwater Park
  - SP to detain water and provide relief to flow trying to get to DPS 007 through Mid City
- Considerations:
  - Retain flow from Lakeview overwhelming DPS 007
  - Highly trafficked area
- **WSE Reduction Estimate:**
  - **0.7 in to 4 in**
- **Volume Stored: 4.8 MG**
- **Cost Estimate: $7,600,000**





8. Hynes Elementary

- Concept: Modular Tank System, Bioswales & Green Roof
  - DV under soccer field along French St
  - Bioswales within greenspace along wide sidewalks
  - Green roof on flat buildings along Argonne Blvd and Orleans Ave
- Considerations:
  - Possible partnership with Hynes Elementary – outreach required
  - Highly trafficked area
- **WSE Reduction Estimate:**
  - **0.1 in to 1 in**
- **Volume Stored: 2.75 MG**
- **Cost Estimate: $8,400,000**



Lakeview – Improvements to Major System

9. Canal Boulevard (Allen Toussaint – Brooks)

- Concept: Open Box Culvert
  - Open up box culvert along Canal Street
- Considerations:
  - Highly trafficked area
  - Provide additional capacity to box culvert
  - Safety Concerns
  - Alternate configuration of buried box culvert expansion and sunken gardens
- **WSE Reduction Estimate:**
  - **0.7 in to 8 in**
- **Volume Stored: 3.3 MG**
- **Cost Estimate: 47,200,000**

10. Harrison Avenue (Canal Blvd to Argonne)

- Concept: Box Culvert with GSI improvements and Tree Planting
  - Upsizing box culvert below Harrison Ave to increase subsurface storage and improve conveyance
  - Repaving of parking with permeable pavement
  - Planting trees and implementing sunken garden to reduce heat
- Considerations:
  - Located within area of reoccurring flood
  - Highly trafficked area
- **WSE Reduction Estimate:**
  - **0.4 in to 6 in**
- **Volume Stored: 2.3 MG**

- **Cost Estimate: $8,600,000**

Lakeview Local Conveyance Improvements

11. Mouton Street

- Concept: Modular Tank System and Box Culvert Upgrades
  - Modular tank system in empty lots along Mouton.
  - Pipe network upgrades from Argonne St to Canal Blvd
- Considerations:
  - Hot spot area
  - Construction with neighborhood
  - Land acquisition required
- **WSE Reduction Estimate:**
  - **1.1 in to 6 in**
- **Volume Stored: 0.58 MG**
- **Cost Estimate: $4,100,000**

12. Germain Street

- Concept: Modular Tank System and Box Culvert Upgrades
  - Modular tank system in empty lots along Canal and Germain
  - Upgrade pipe network along Germain St
- Considerations:
  - Hot spot area
  - Construction with neighborhood
  - Land acquisition required
- **WSE Reduction Estimate:**
  - **0 in to 2 in**
- **Volume Stored: <0.5 MG**
- **Cost Estimate: $3-4M**

Combined Approach

Combined Approach

- **WSE Reduction Estimate:**

- **Volume Stored:**
- **Cost Estimate:**
  $172,150,000

Concept Review

Cost and Scoring

Project Summary

No	Project Name	Volume Stored (MG)	Flood Reduction (Max)	Soft Cost (Design)	Construction Cost	Total Cost
1	Harlequin Park	2.2	7in	$ 740,000.00	$ 7,400,000.00	$8,140,000.00
2	Tourmaline Park	4.4	5in	$ 1,400,000.00	$ 14,000,000.00	$15,400,000.00
3	Tiara/Peridot Park	5.7	6in	$ 2,170,000.00	$ 21,700,000.00	$23,870,000.00
4	Marconi Street	3	7in	$ 1,150,000.00	$ 11,500,000.00	$12,650,000.00
5	Upper West End Blvd	9.8	6in	$ 1,620,000.00	$ 16,200,000.00	$17,820,000.00
6	New Basin Canal Park	3.9	4in	$ 580,000.00	$ 58,000,000.00	$58,580,000.00
7	Kenilworth Street	4.8	4in	$ 760,000.00	$ 7,600,000.00	$8,360,000.00
8	Hynes Elementary	2.75	1in	$ 840,000.00	$ 8,400,000.00	$9,240,000.00
9	Canal Boulevard	3.3	8in	$ 472,000.00	$ 47,200,000.00	$47,672,000.00
10	Harrison Avenue	2.3	6in	$ 860,000.00	$ 8,600,000.00	$9,460,000.00
11	Mouton Street	0.58	6 in	$ 410,000.00	$ 4,100,000.00	$4,510,000.00
12	Germain Street	0.5	2 in	$ 400,000.00	$ 4,000,000.00	$4,400,000.00
13	Combined	43.23	62 in	15,650,000.00	$ 156,500,000.00	$172,150,000.00

Project Scoring

Project Name	1 Cost Efficiency	2 O&M	3 Hydraulic Benefit	4 Connect	5 Equity	6 Proximity	7 Cooling	Total Score	Rank
6. New Basin Canal Park	4.5	5	2.5	4	3	5	2	26	1
3. Tiara/Peridot Park	3.5	5	3	3	3	5	1	24	2
9. Canal Boulevard	4	5	3	5	3	1	2	23	3
10. Harrison Ave	4	4	2	5	2	2	1	20	4
11. Mouton Street	5	4	4	1	2	2	2	20	4
4. Marconi Levee	1.5	5	3.5	4	3	2	1	20	4
1. Harlequin Park	2.5	5	2	3	3	2	1	19	7
7. Kenilworth Street	3	5	2.5	1	3	2	1	17.5	8
5. Upper West End Blvd	2	4	2	3	2	2	1	16	9
8. Hynes Elementary	1	4	1	4	2	2	1	15	10
2. Tourmaline Park	0.5	4	1	3	2	2	1	14	11
12. Germain Street	1.5	4	0.5	1	2	2	2	13.0	12

Ranked by Hydraulic Benefit then Cost

Thank you!
Questions

Gaea Consultants and Engineers

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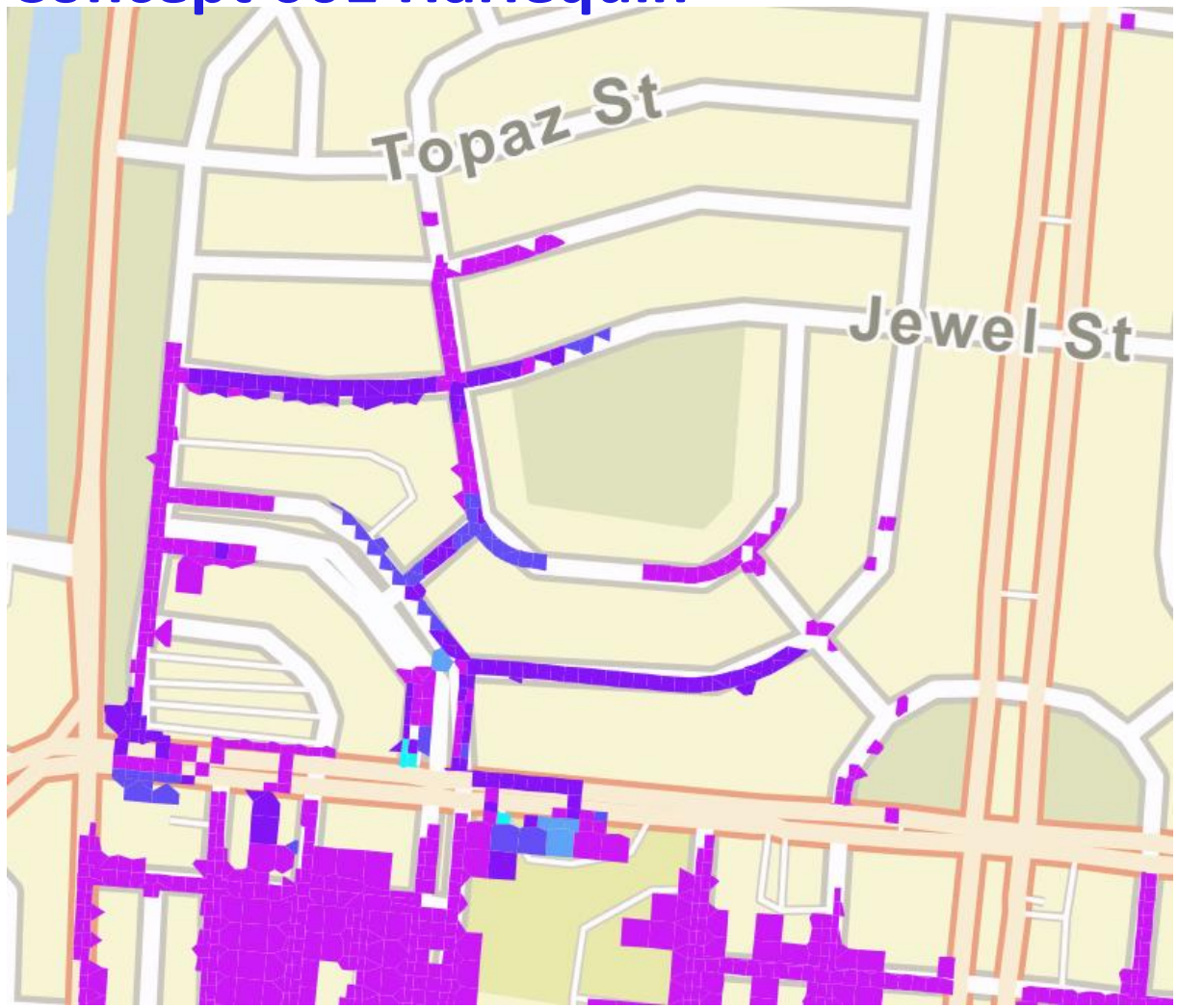
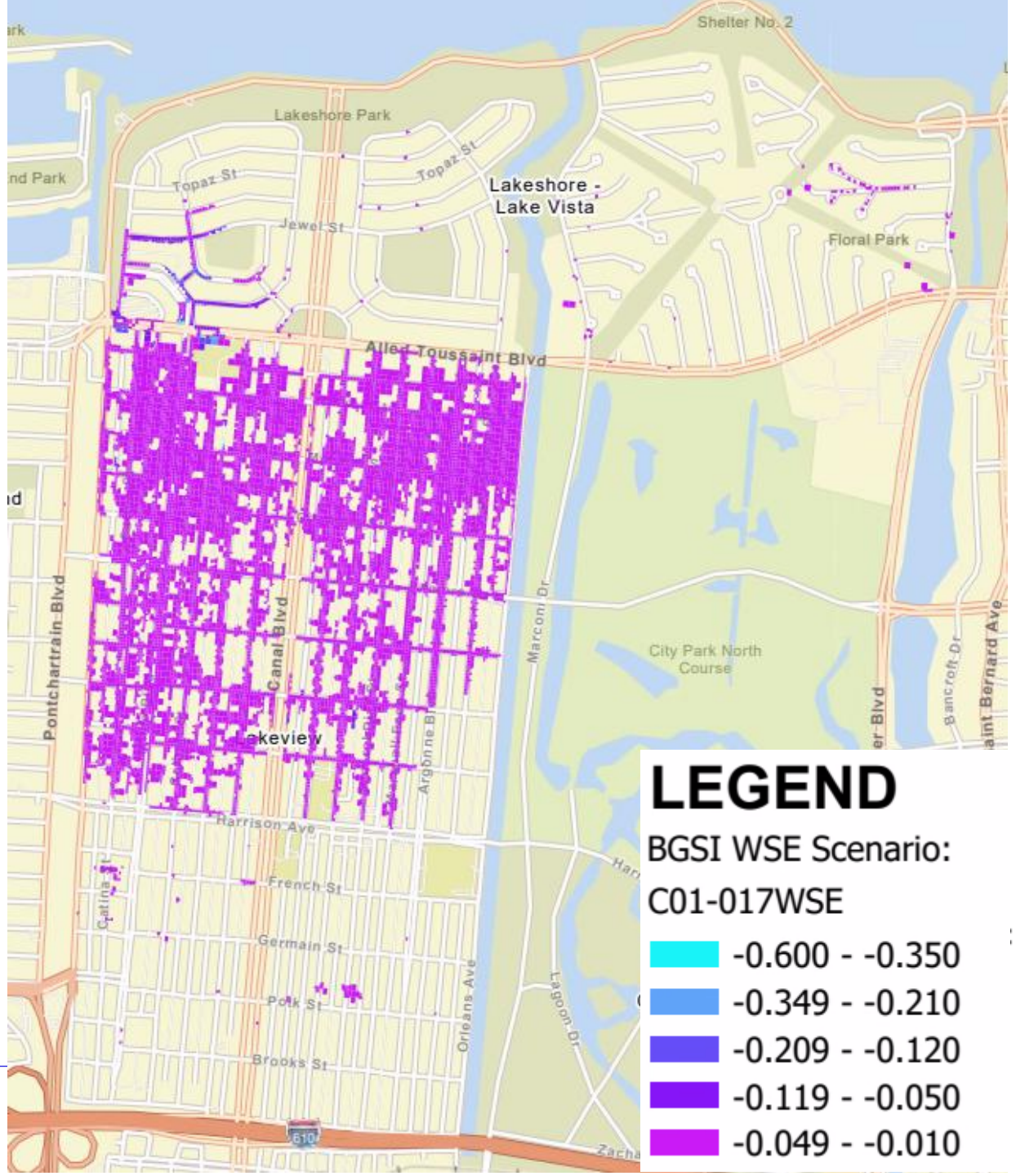
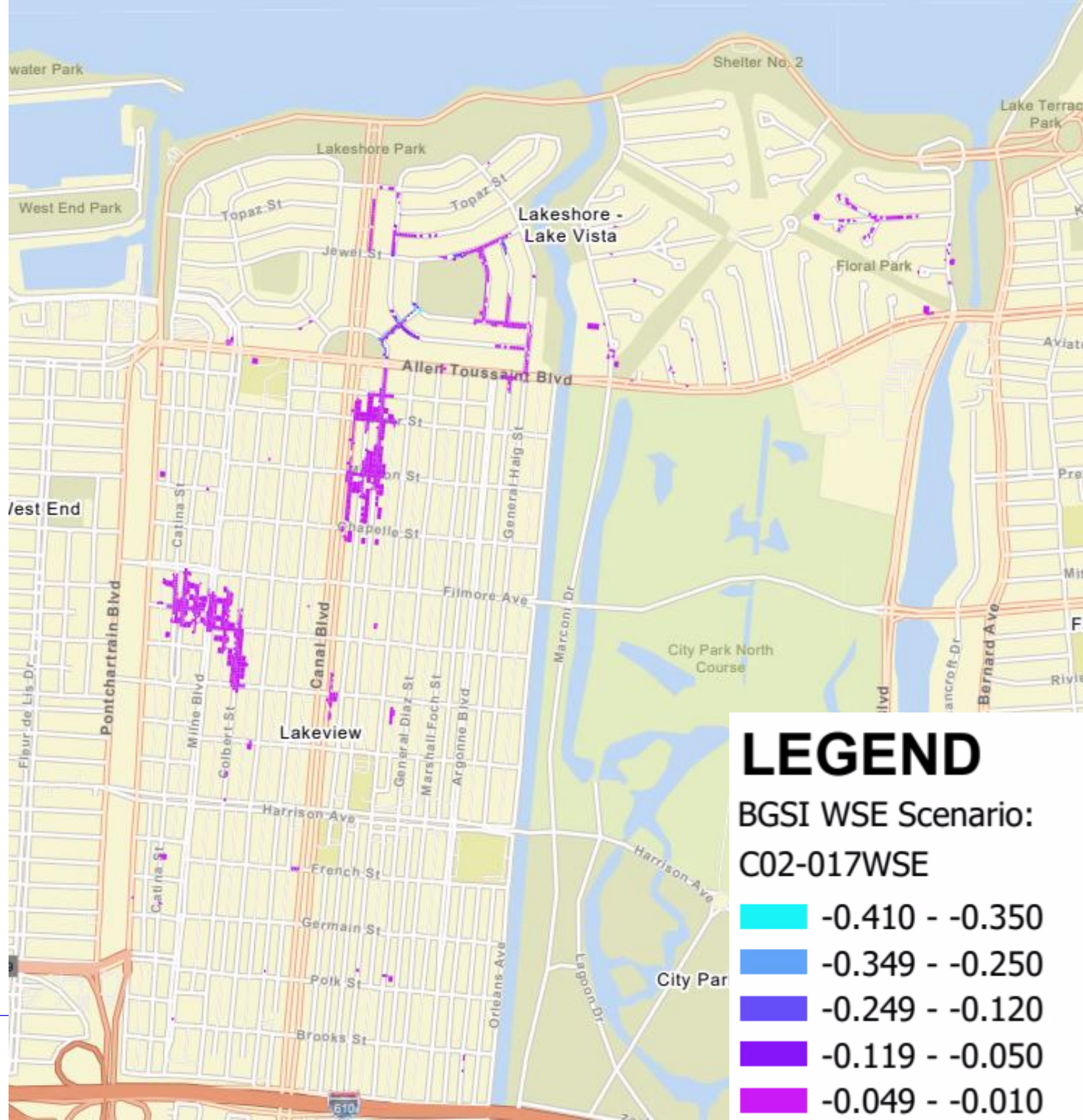
WSE Difference Map
Concept 001 Harlequin





WSE Difference Map
Concept 002 Tourmaline



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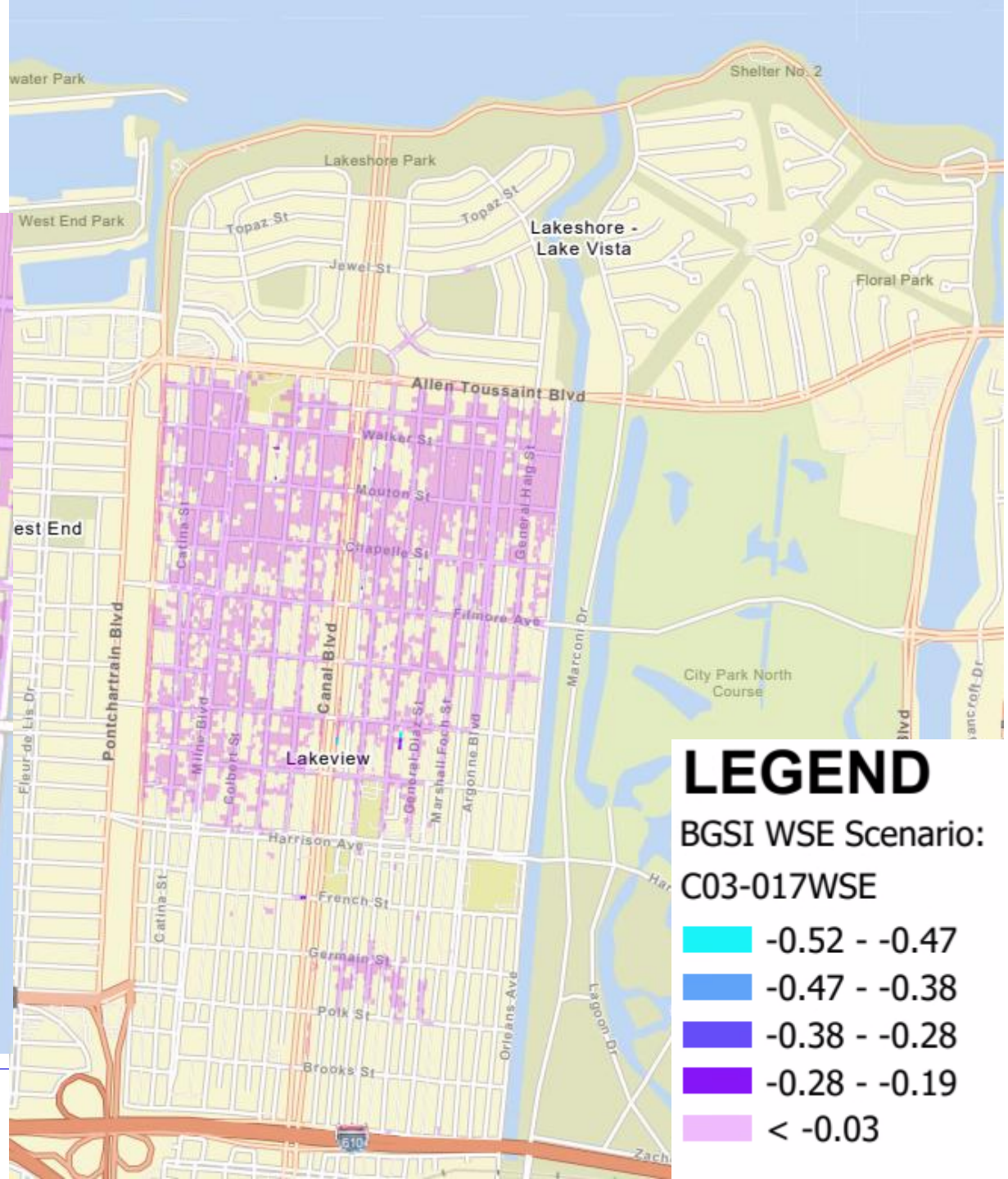
Concept 003 Tiara/Peridot



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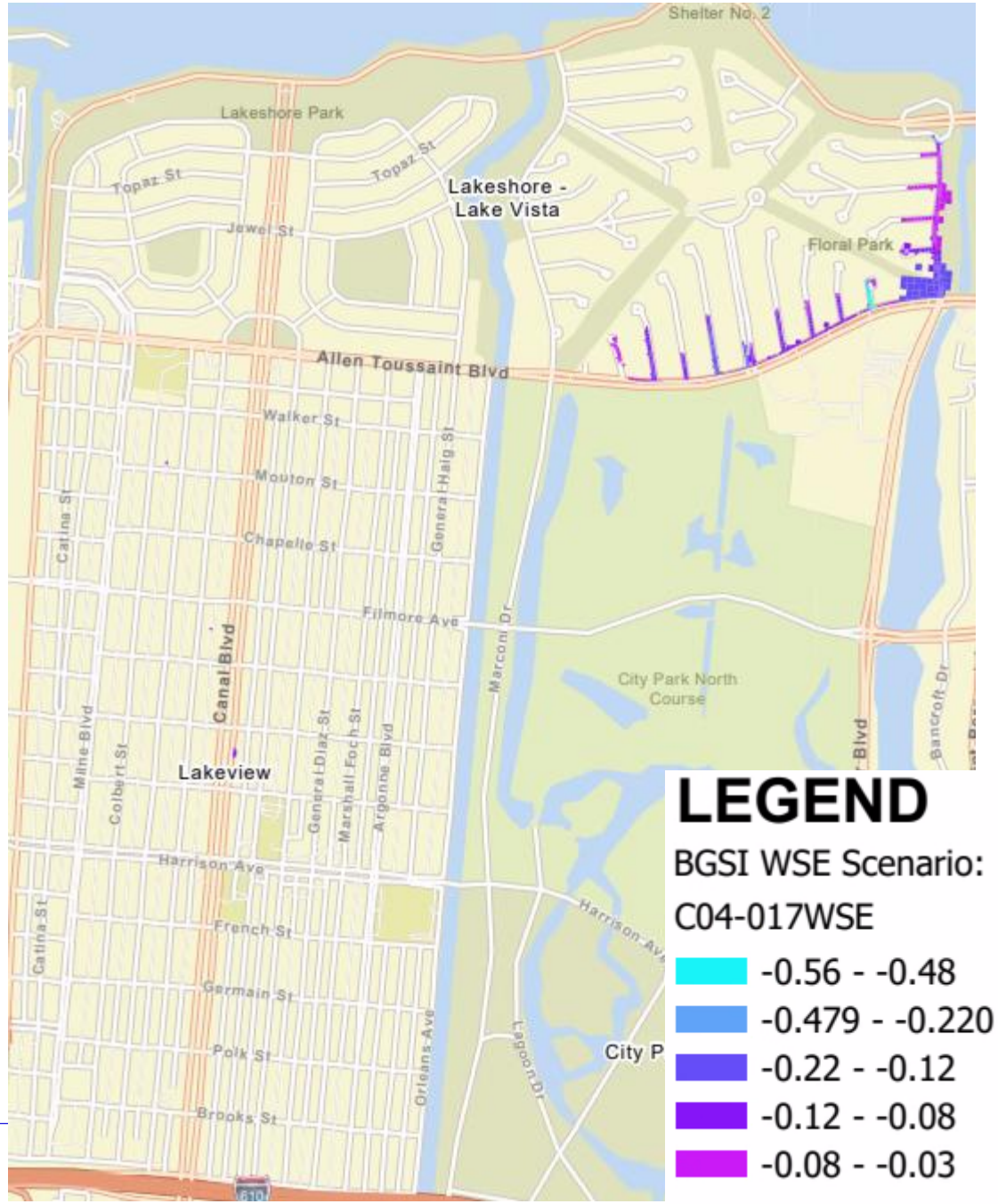
Concept 004 Marconi



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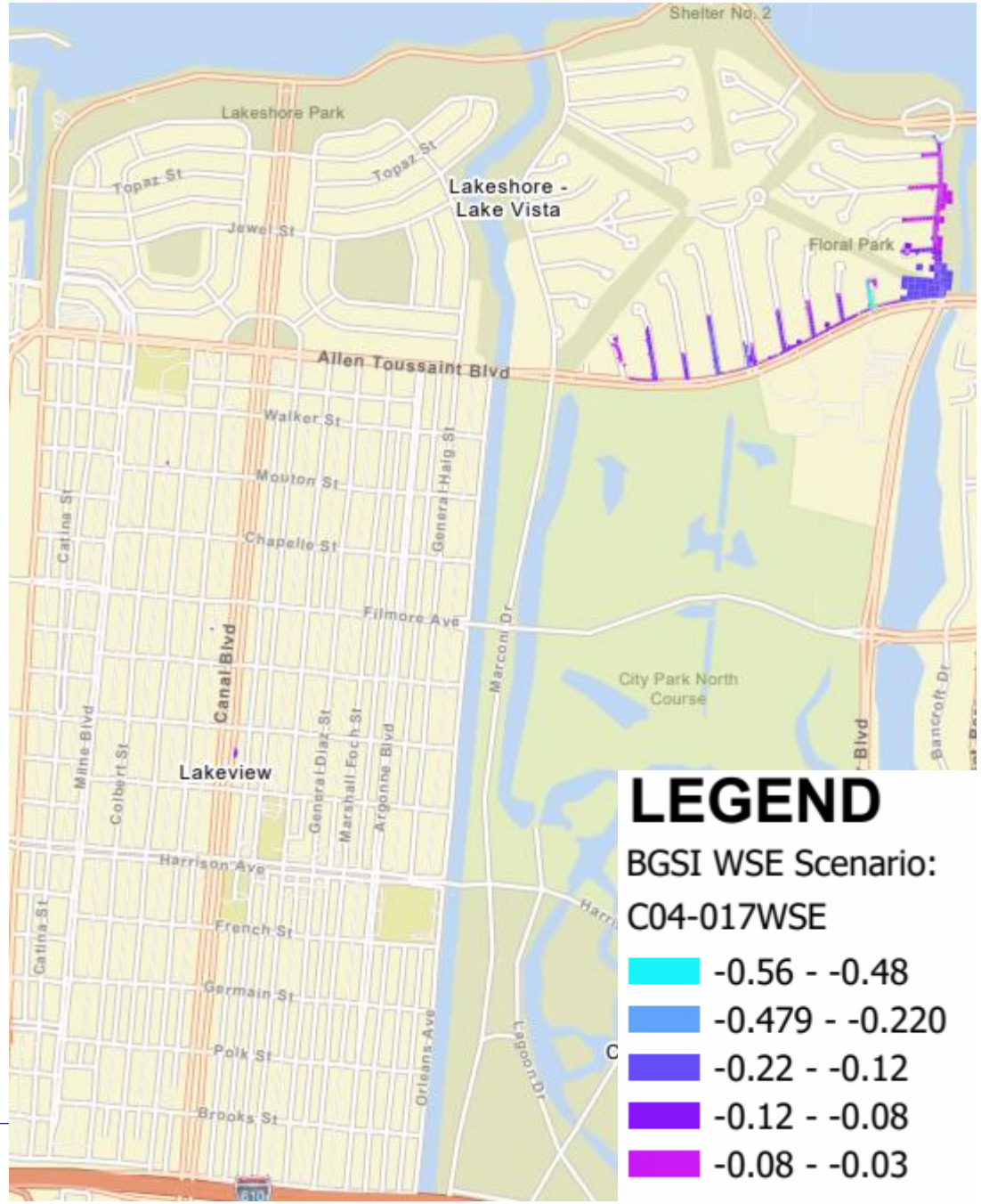
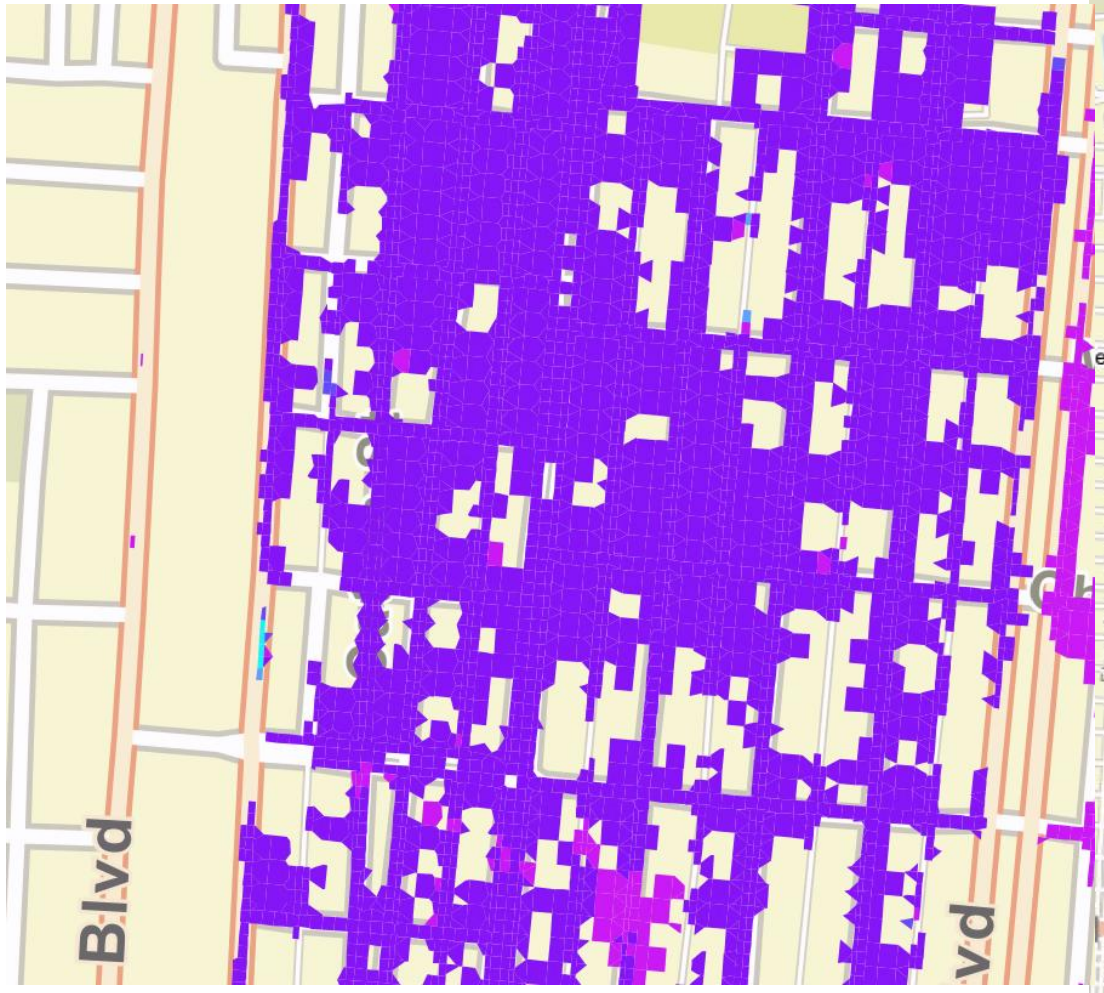
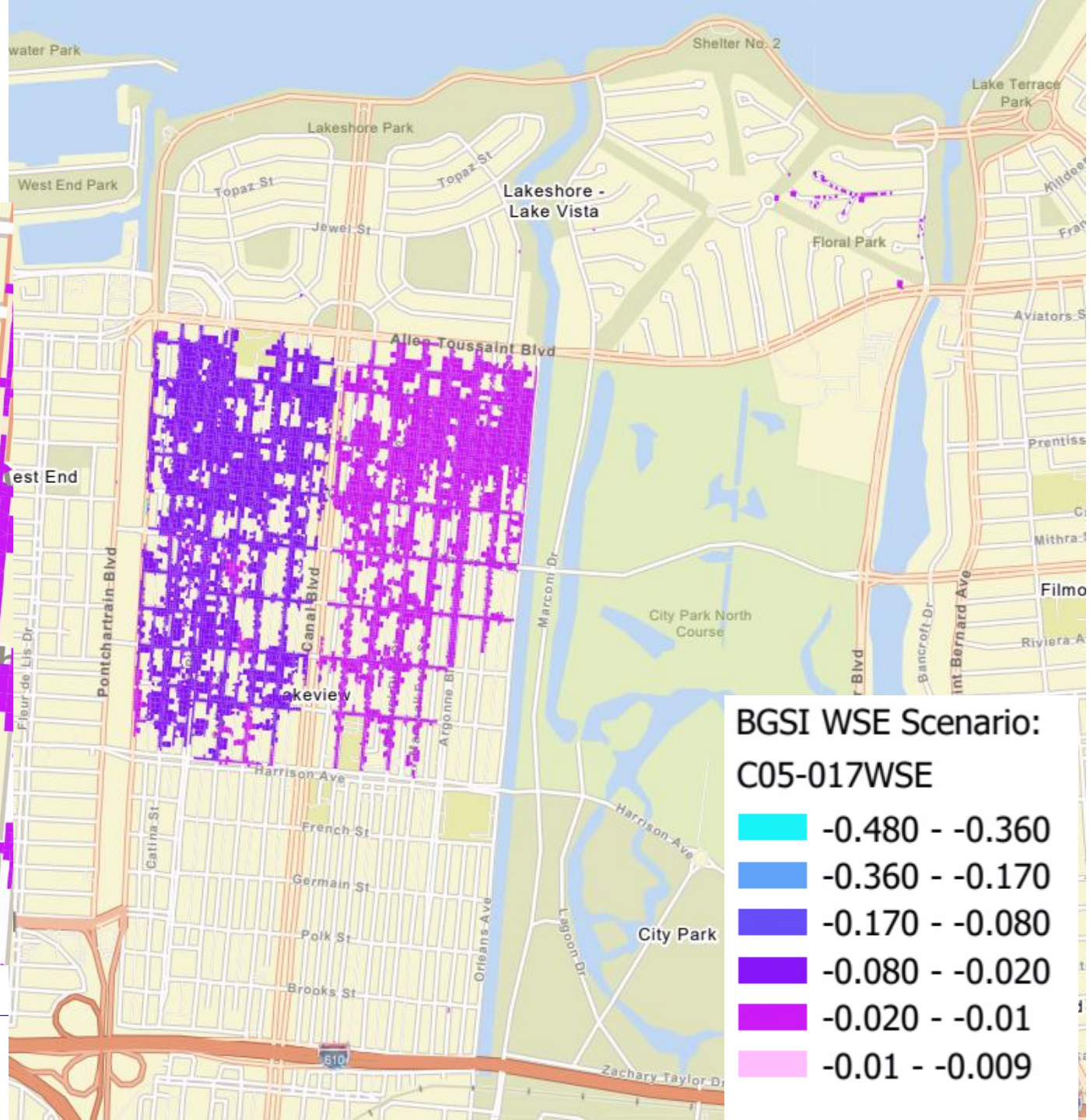
Concept 004 Marconi

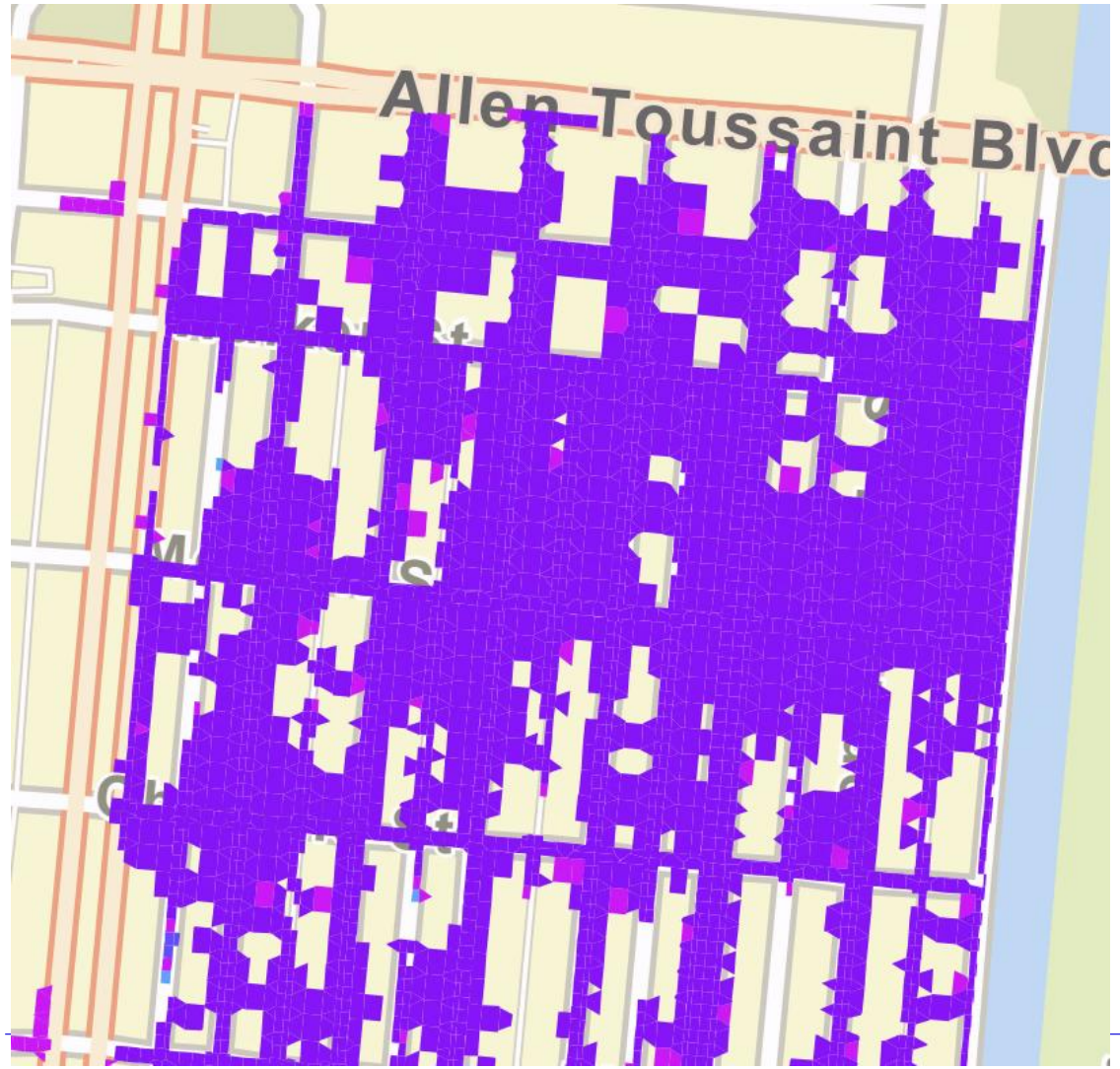


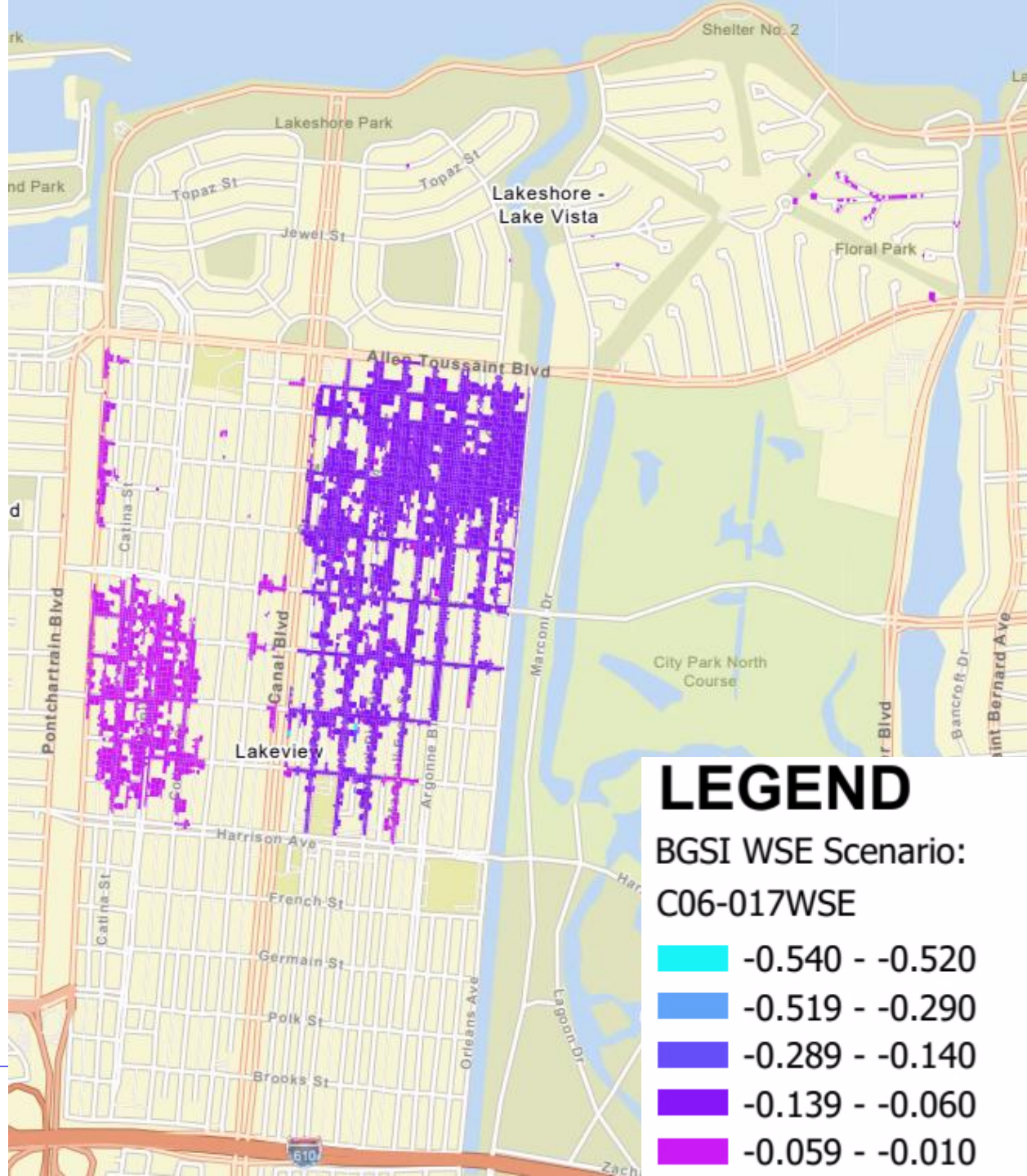
WSE Difference Map Concept
005 Upper West



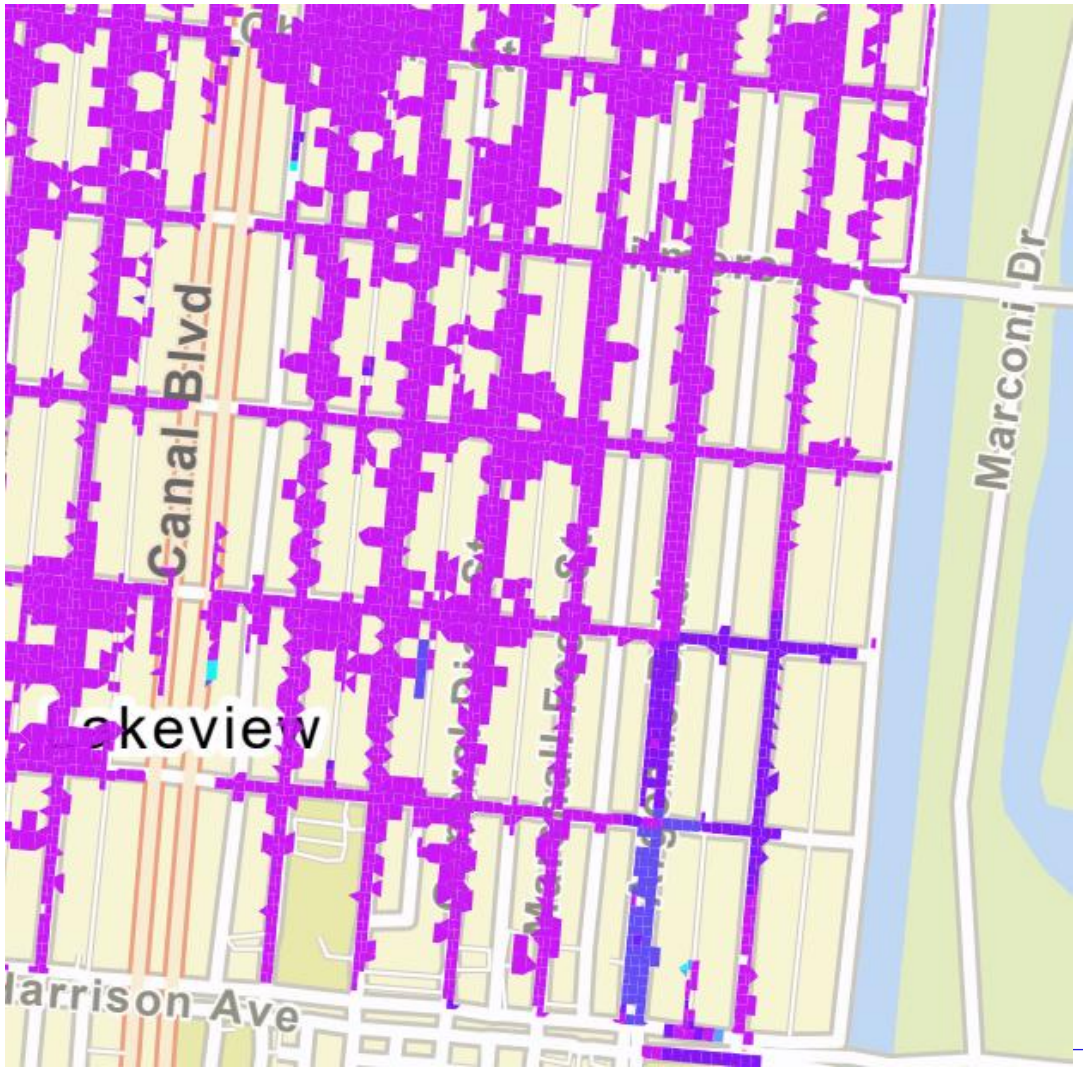


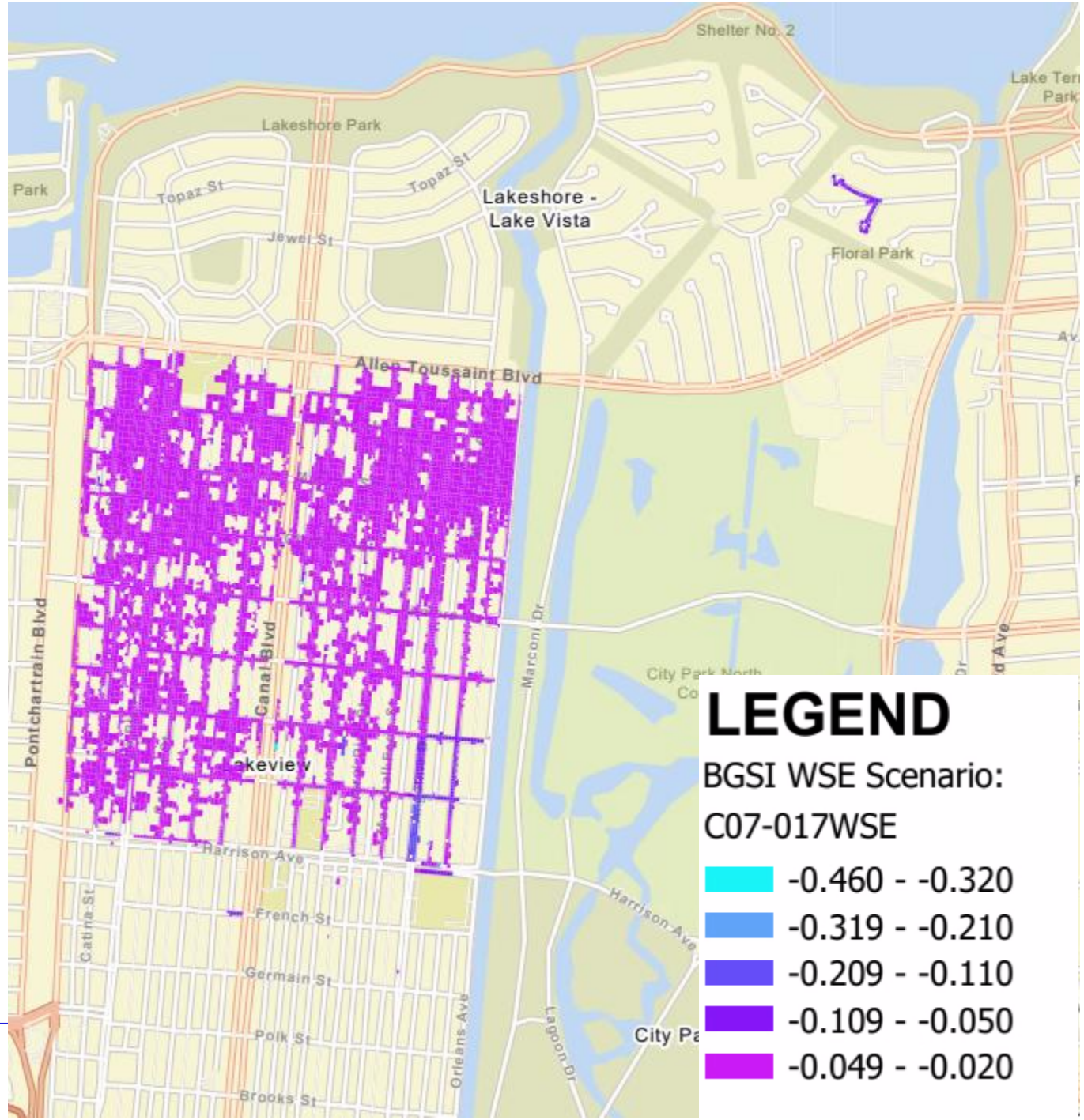
WSE Difference Map Concept
006 Mouton



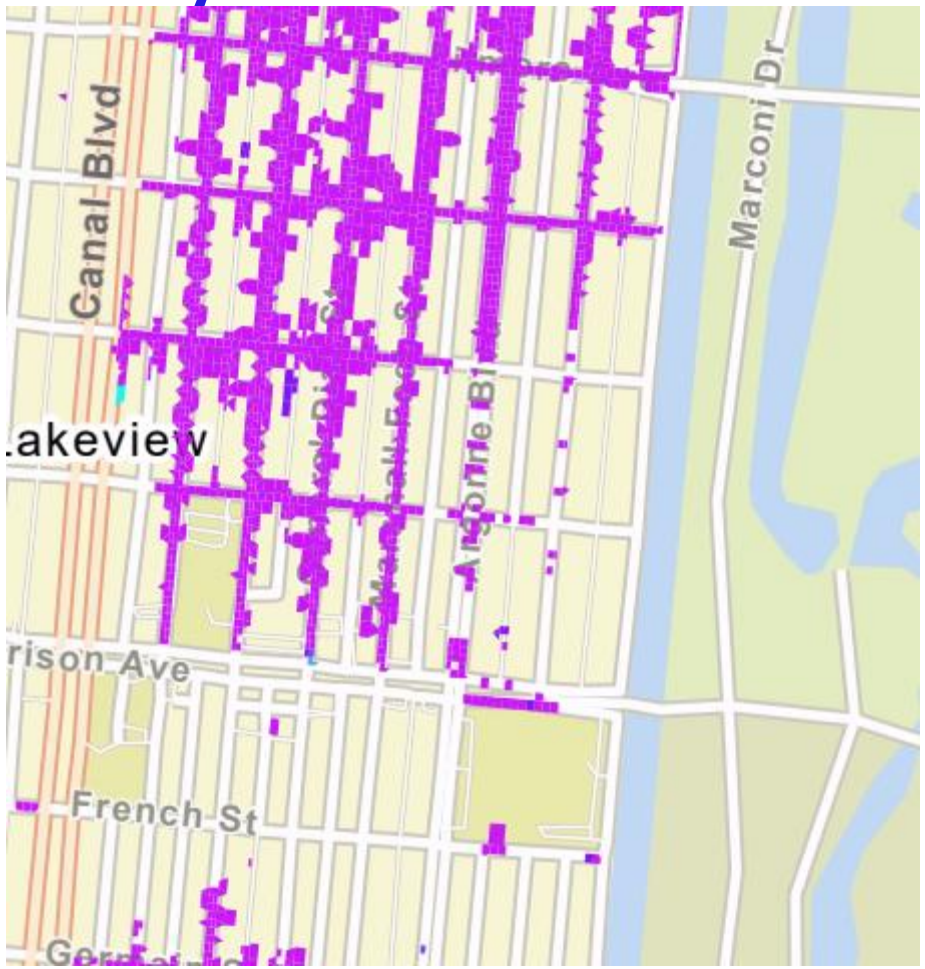


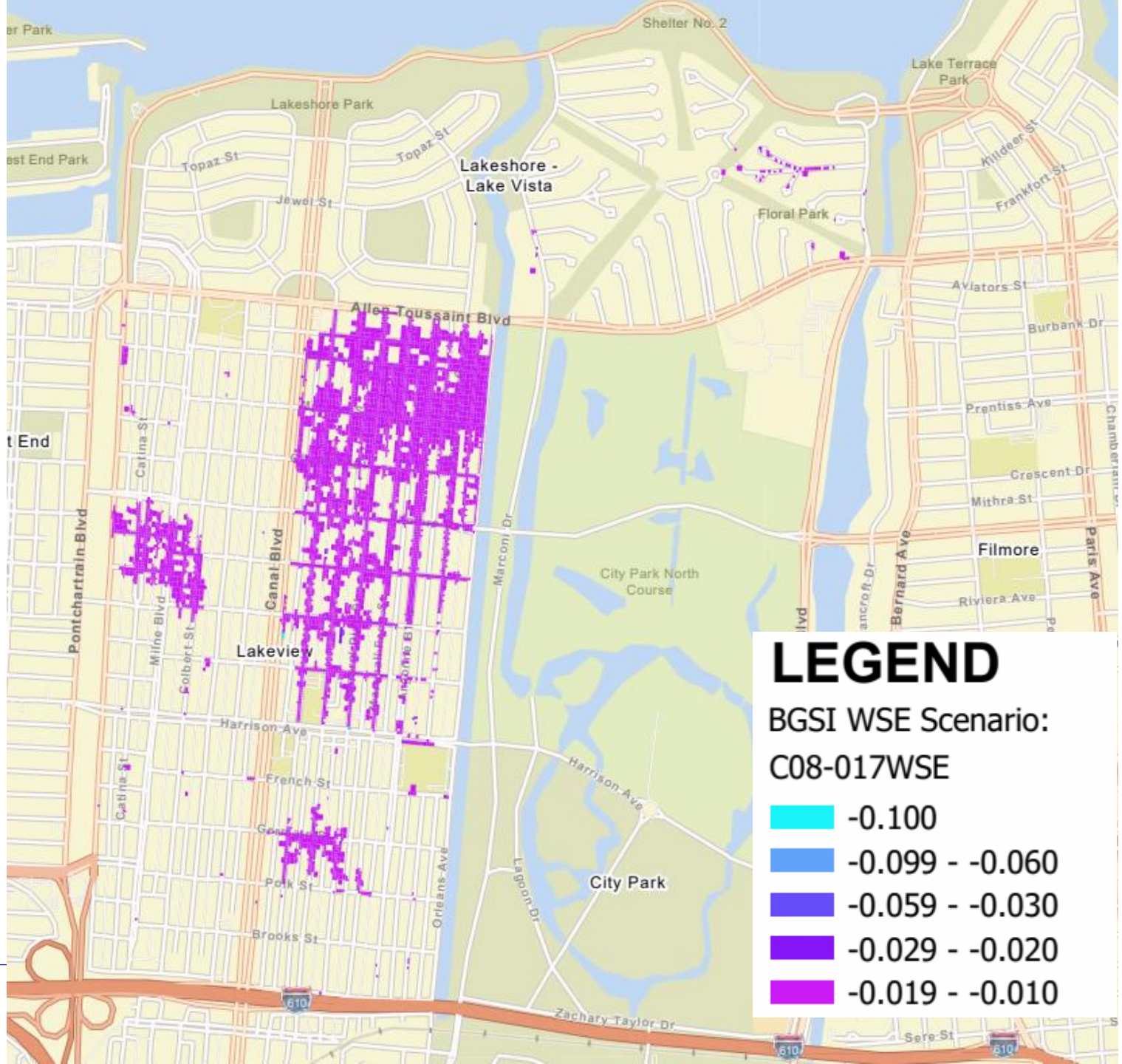
WSE Difference Map Concept
007 Harrison



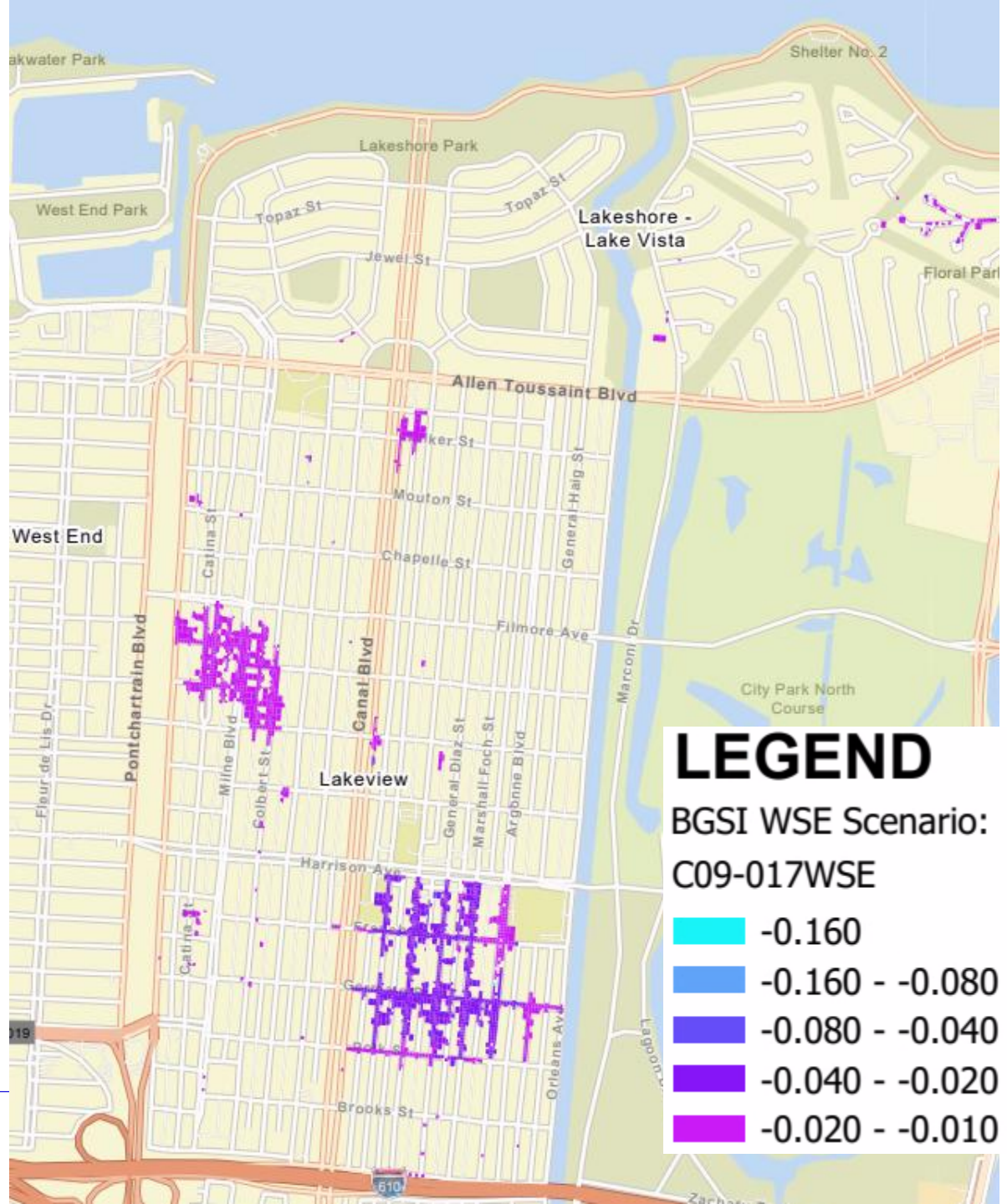


WSE Difference Map Concept 008 Hynes

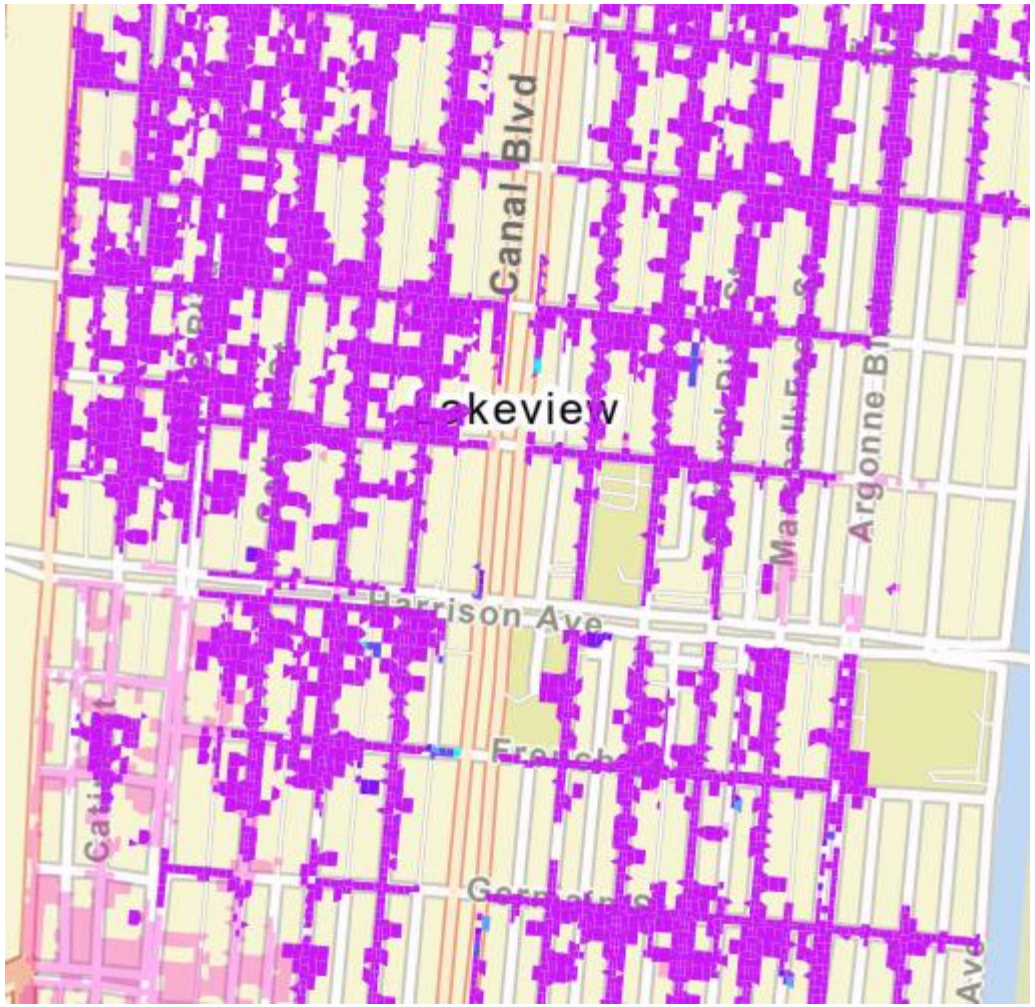


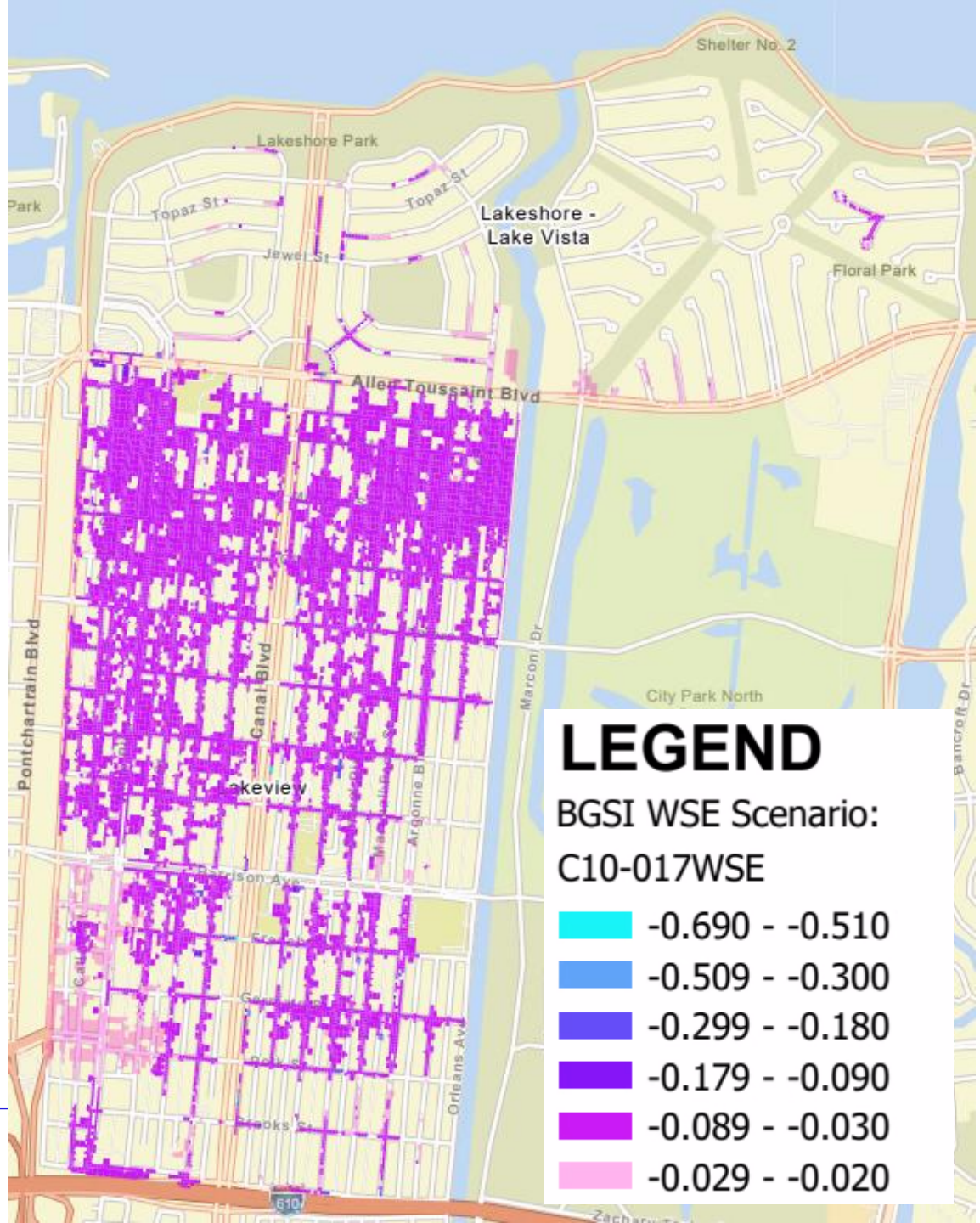


WSE Difference Map Concept
009 Germain

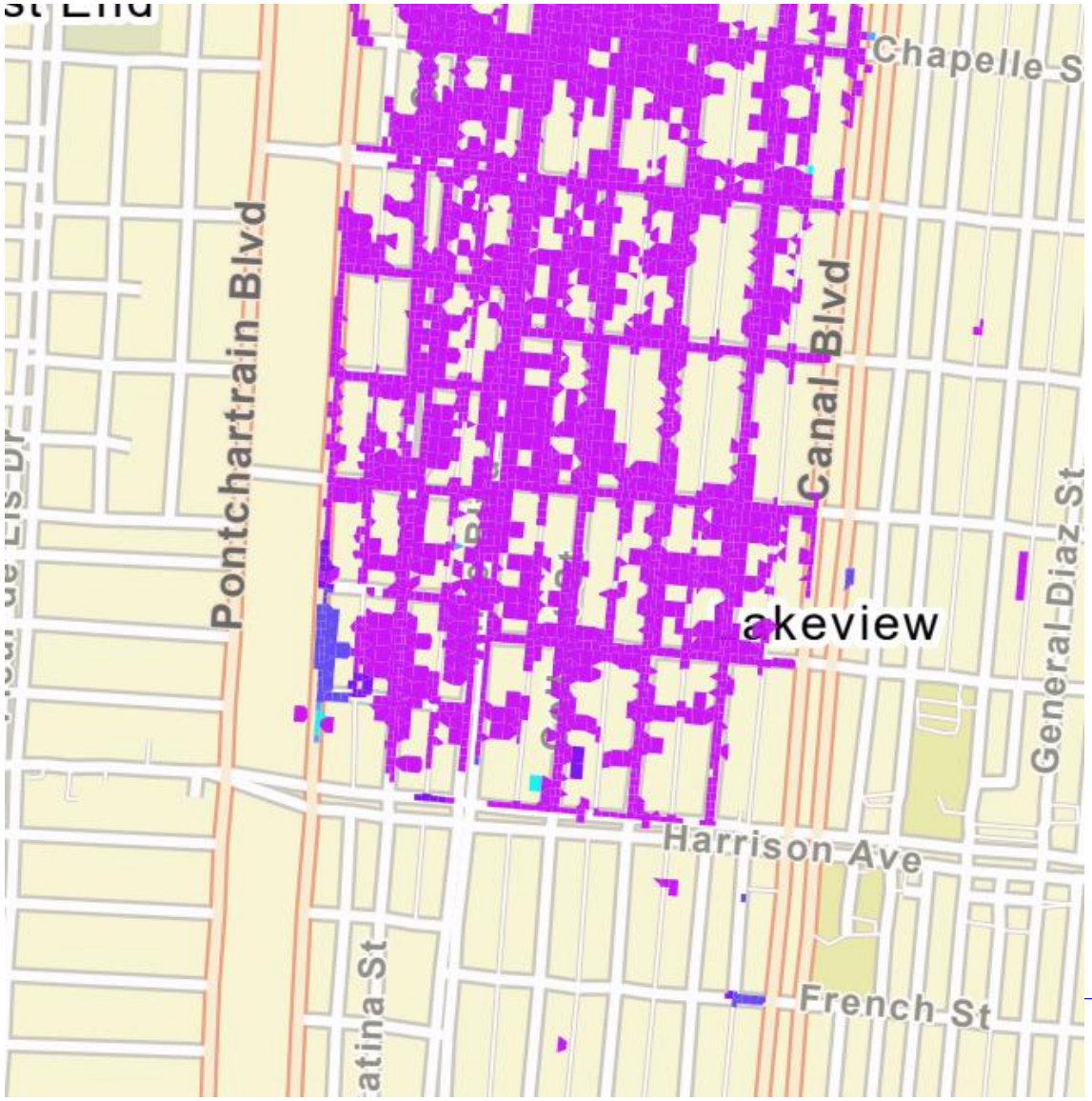


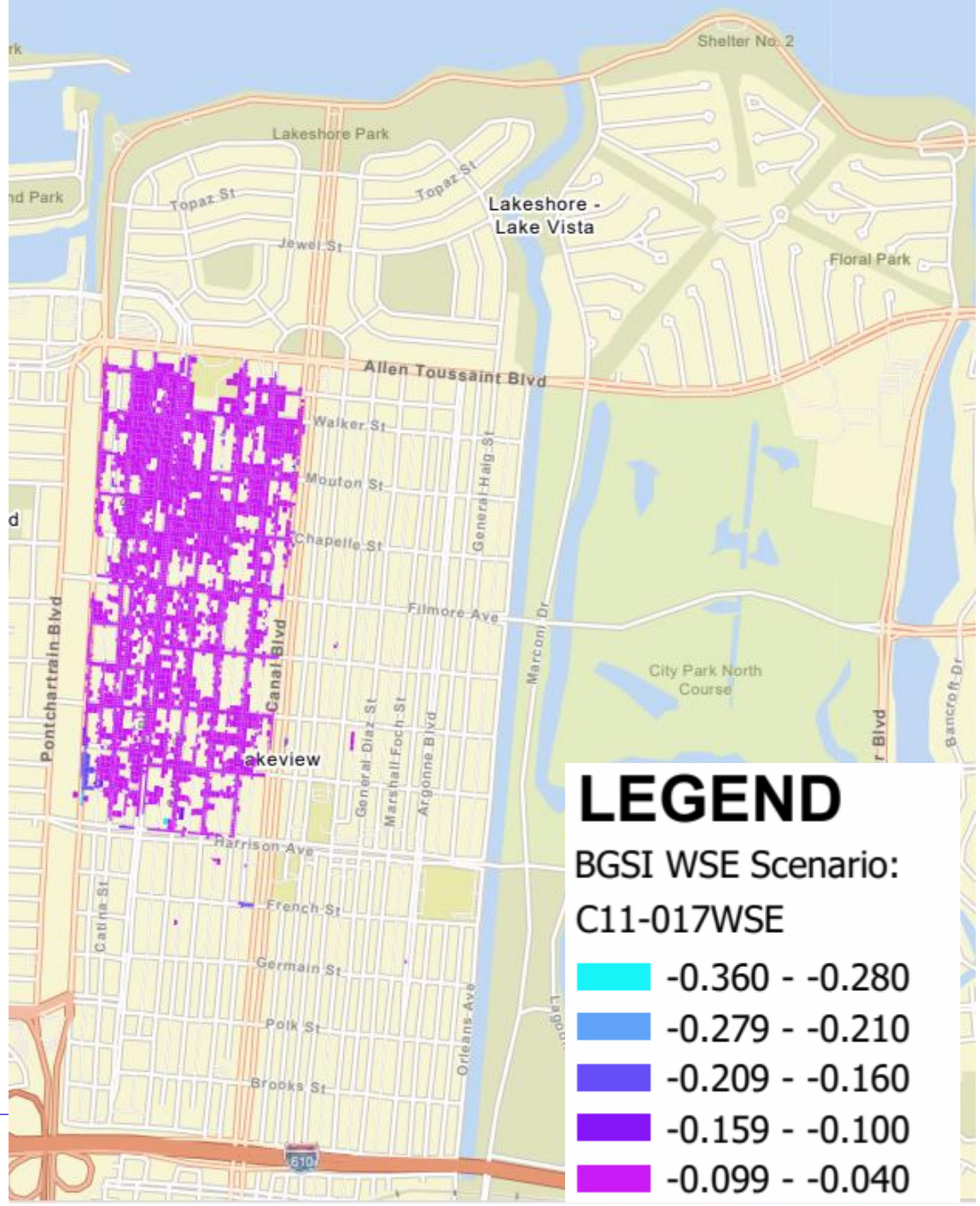
WSE Difference Map Concept
010 Canal Blvd



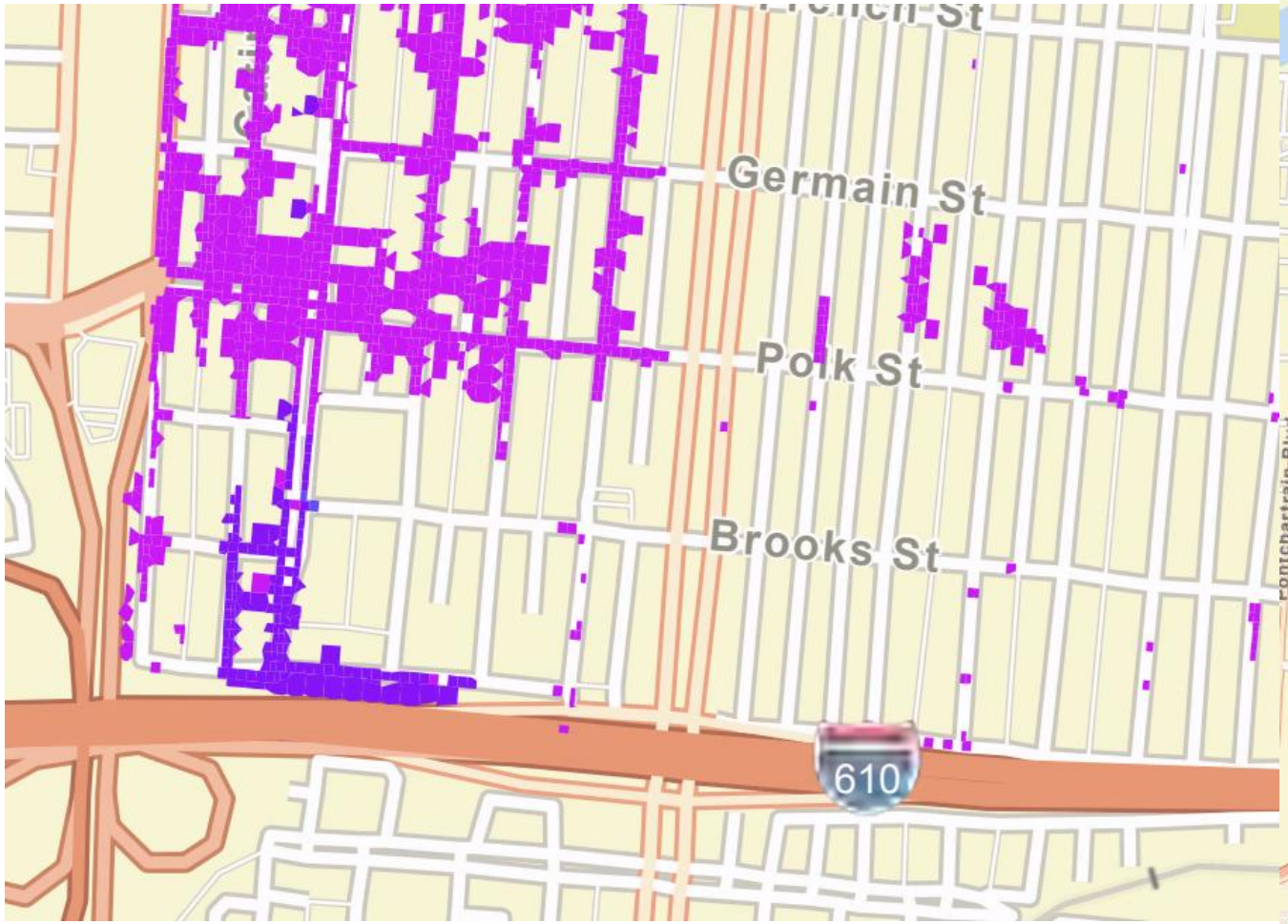


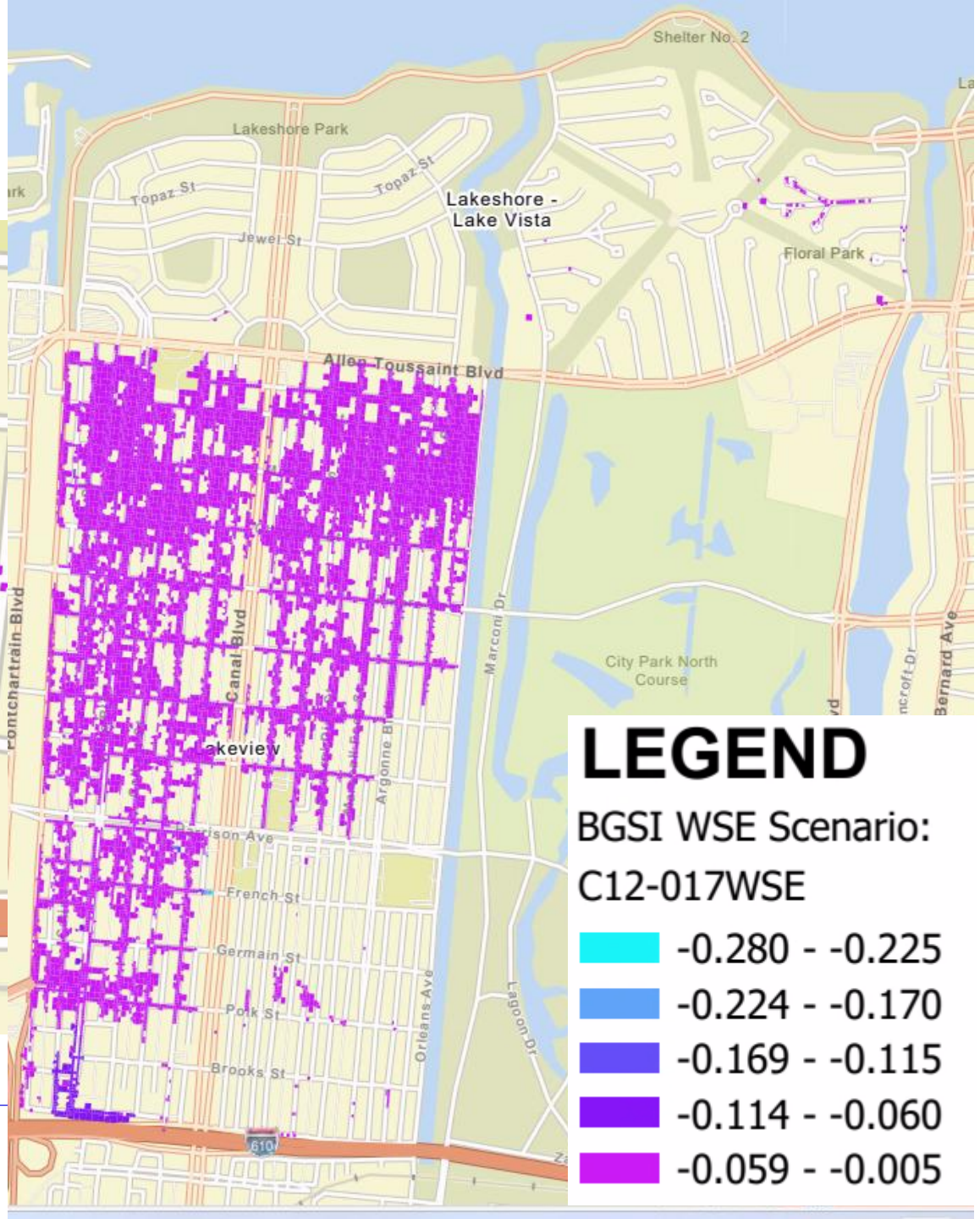
WSE Difference Map
Concept 011 New Basin Canal





WSE Difference Map
Concept 012 Kenilworth





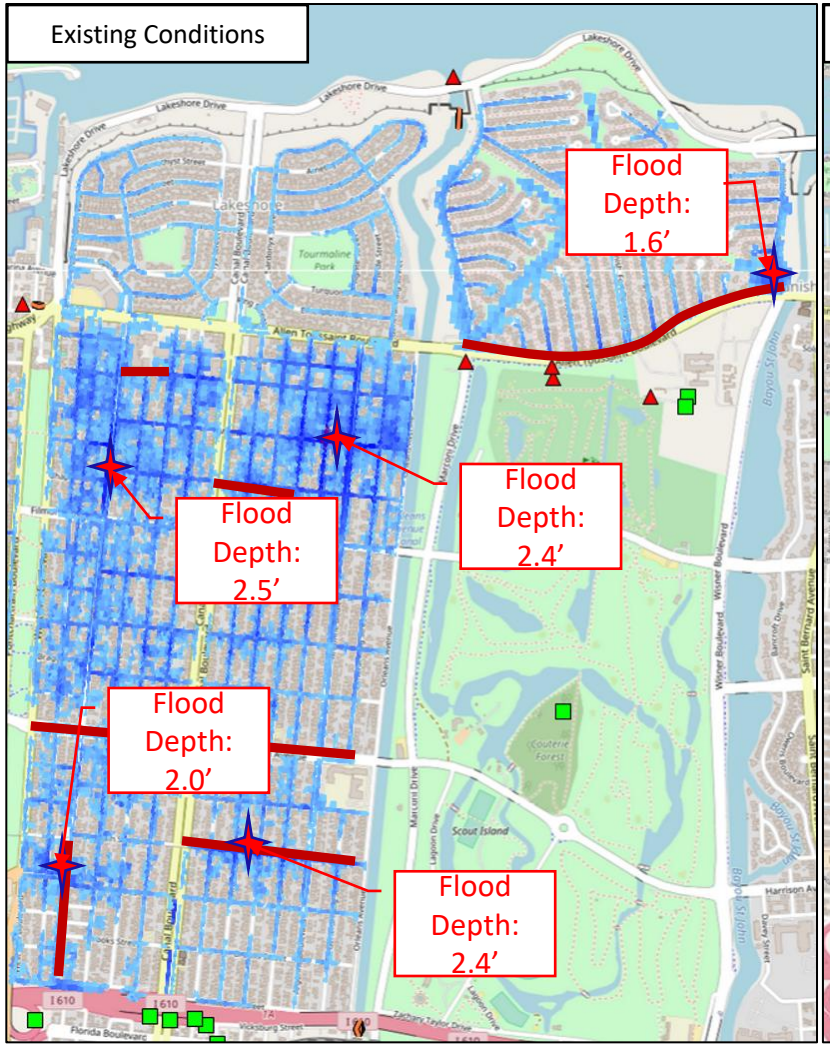
Reference Slides

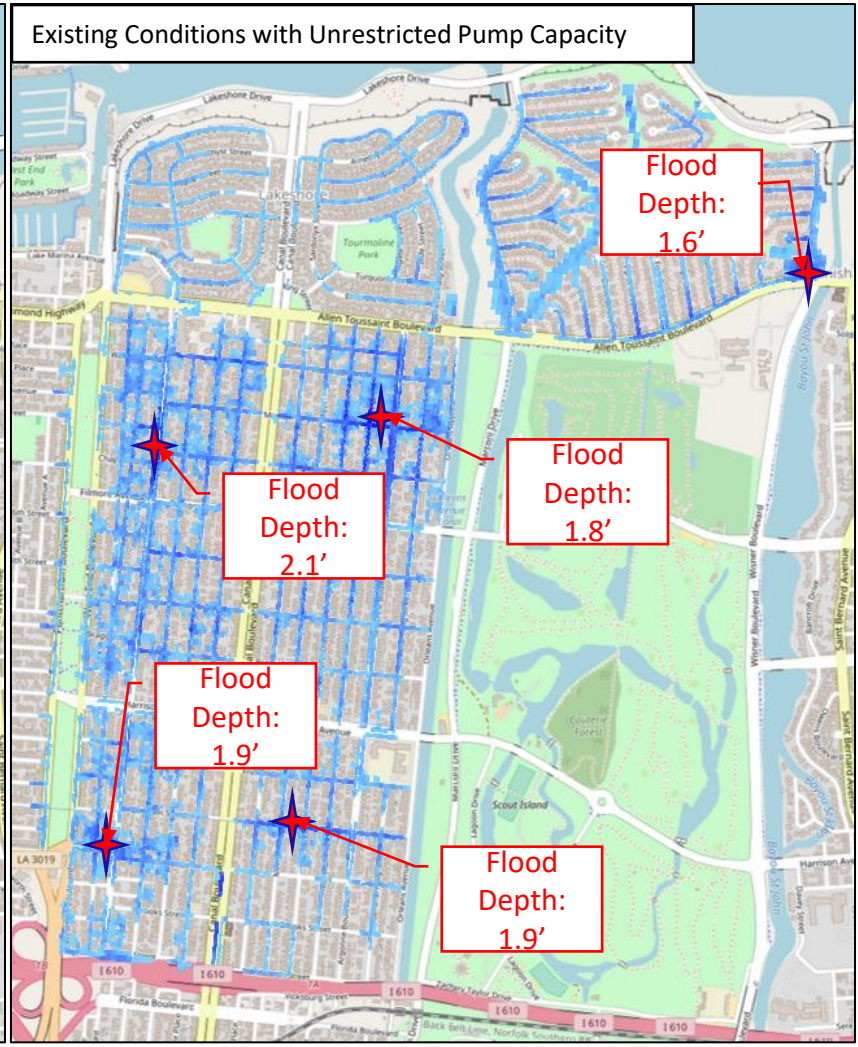
Jacobs

Challenging today.
Reinventing tomorrow.

Existing Flood Risk

Depths with unrestricted pump capacity





112 MG Flooding

63 MG Flooding

Conveyance capacity issues