Tremé Urban Flooding Investigation

Technical Memorandum

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GreenPoint
ENGINEERING

NATIONAL ACADEMIES *Sciences Engineering Medicine*

GULF RESEARCH PROGRAM

NAS Treme Acknowledgement Statement

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1 Background

1.1 Flooding Challenges in New Orleans and Tremé

New Orleans continues to face chronic urban flooding challenges due to its low elevation, aging infrastructure, and increasingly intense rain events linked to climate change. The city's drainage system, much of which was designed over a century ago, struggles to accommodate today's rainfall volumes and runoff patterns. In neighborhoods like Tremé, one of the city's oldest and most culturally significant communities, these system limitations are more pronounced. Tremé's dense development, impervious surfaces, aging drainage infrastructure, and lack of routine maintenance make it particularly vulnerable to flooding.

Several drainage studies and capital improvement plans have identified widespread issues across the city, many of which directly impact Tremé. Notably, while citywide initiatives like the Resilient New Orleans Strategy and the Urban Water Plan have promoted integrated stormwater management in New Orleans, Tremé has often been left on the periphery of these efforts, despite sharing similar infrastructure and vulnerability concerns.

Recent flooding events, worsened by runoff from I-10 and Armstrong Park, aging infrastructure, and conveyance issues have taken a toll on both residents' property and well-being. According to the New Orleans Data Center, Tremé/Lafitte area a population of 4,682, of which nearly 40% of residents live below the poverty line. These statistics highlight the need for equitable infrastructure investments that directly support long-term resilience and quality of life in the neighborhood. Residents in the community have reported experiencing anxiety, stress, property loss, and daily disruptions during and after rain events. This persistent flooding not only threatens infrastructure but also the stability, economics and cultural identity of the neighborhood itself.

In response to this chronic flooding and resident concerns, Water Wise Gulf South, The Greater Tremé Consortium (GTC) and Healthy Community Services (HCS) engaged GreenPoint Engineering to lead a neighborhood-scale investigation into the causes of flooding in Tremé. GTC is a 501(c)(3) nonprofit organization founded in 1992 with a mission to support the development of affordable housing and small businesses in the Tremé neighborhood. Over the past two decades, GTC has expanded its focus to address a broad range of community development needs including health, education, environmental resilience, and preservation of Tremé's cultural heritage. GTC has launched initiatives such as community gardens, housing and credit counseling, youth employment programs, a community-run restaurant, and collaborations with national organizations. More recently, GTC has taken on water management as a priority, recognizing that unmanaged flooding threatens every other area of community progress.

1.2 Investigation Objectives

The primary objectives of this investigation are to:

Understand the Root Causes of Recurring Flooding in Tremé

This investigation aims to identify areas within Tremé that experience frequent flooding. GreenPoint's approach integrates data from city records and local resident reports to bridge the gap between technical infrastructure assessments and residents' experiences. By bringing together technical data, field observations, and community input, the team aims to create a more accurate picture of how Tremé's drainage system is functioning and where it's falling short.

The primary deliverables will be a detailed overview of our findings, as outlined in this report, and to recommend targeted next steps that can be implemented with support from the Sewerage and Water Board of New Orleans (SWBNO) and the City of New Orleans to improve drainage, public spaces and quality of life.

Evaluate Green Infrastructure and Grey Infrastructure concurrently

This investigation focuses on both ***grey infrastructure*** and ***green infrastructure.*** Grey infrastructure refers to the traditional engineered drainage network, including components such as pipes, culverts, catch basins, pump stations, and outfall canals that collect stormwater, convey it through the system, and ultimately discharge it to outfall points. Green infrastructure refers to nature-based solutions that manage stormwater where it falls, such as rain gardens, bioswales, permeable pavement, and vegetated storage areas. These features slow down runoff, promote infiltration, and help reduce the load on the grey system.

Like much of New Orleans, the Tremé system faces inherent maintenance challenges due to the city's low elevations and the need to pump stormwater long distances to its outfall points. This requires a tremendous maintenance effort from SWB and DPW. In recent years, Water Wise Tremé and Healthy Community Services have implemented small-scale green infrastructure interventions in the neighborhood, providing a total storage capacity of over 31,600 gallons. These initiatives are effective in managing frequent, smaller rainfalls and reducing pressure on the grey system. However, flooding remains a serious issue, highlighting the need for continued investigation and system-wide maintenance and upgrades.

This investigation aims to assess the condition of grey infrastructure in Tremé and explore green infrastructure opportunities that can complement and support the functionality of the existing grey system. A combined approach allows each system to strengthen the other. Green infrastructure can reduce the load on grey infrastructure and grey infrastructure provides the backbone for handling major storm events. Long-term solutions in Tremé will likely require a combination of both systems working together.

Support Ongoing Community Engagement and Incorporate Resident Knowledge

This investigation places a strong emphasis on education and empowerment of residents. By holding resident workshops and involving the community in the data collection process, GreenPoint aims to create opportunities for them to actively participate in the planning process and ensure that residents remain central to the conversation about infrastructure investment and climate resilience in Tremé.

2 Tremé Neighborhood

The flooding investigation spans from St Louis Street to Esplanade Avenue, and N. Claiborne Avenue to North Broad Street, as illustrated in Figure 1 below.

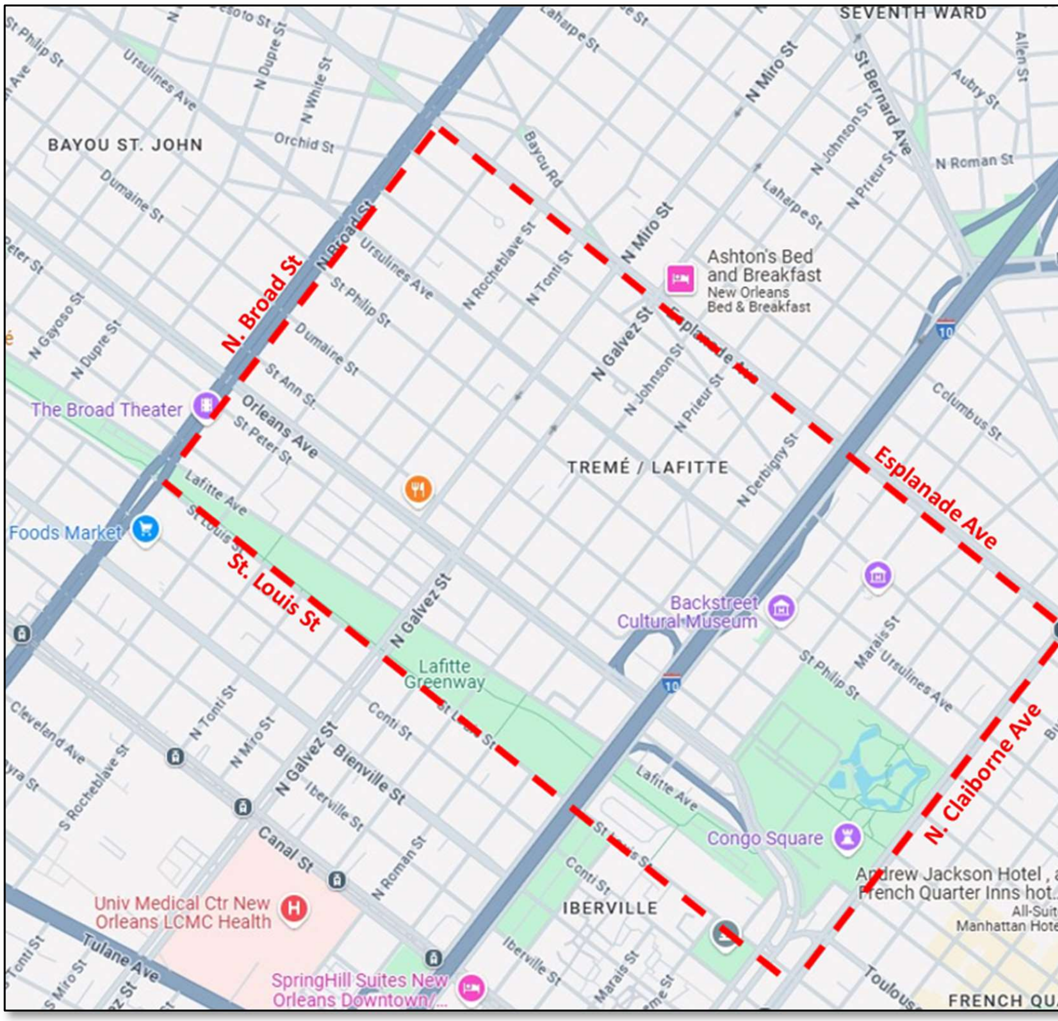

Figure 1: Investigation Vicinity

2.1 Network, Downstream Outfall and Pumping System

The Tremé neighborhood stormwater collection is part of the Orleans Metro Basin and is serviced by a network of underground pipes that convey rainwater to larger culverts. Since much of New Orleans is below sea-level, these culverts direct stormwater to drainage pumping stations, which lift and push the water out of the low-lying basin into outfall canals, primarily the London Avenue Canal in the case of stormwater from Tremé. This canal eventually delivers the storm water by gravity to the London Avenue discharge pumping station where it is released into Lake Pontchartrain. Figure 2 below is Orleans Parish

Drainage Map detailing the route that stormwater flows from its collection in Tremé to its outfall point in Lake Pontchartrain.

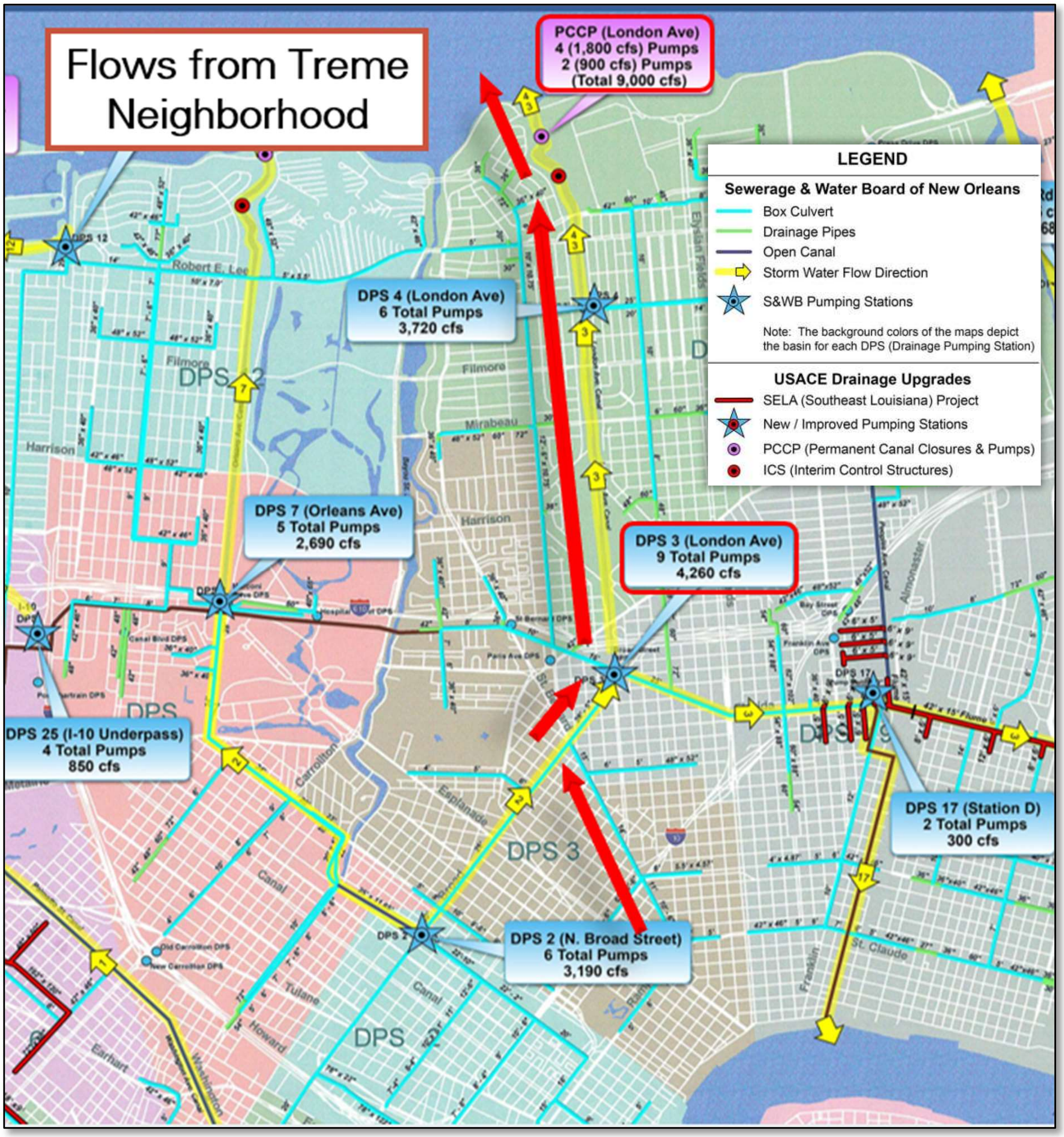

Figure 2: Orleans Parish Drainage Map

Pump Station #2 (DPS 2) has historically serviced the Tremé neighborhood, though much of the drainage has since been diverted and now flows through Pump Station #3 (DPS 3), located at the northern end of Broad Street near Florida Avenue. Originally constructed in the early 1900s, DPS 3 began with only two

550 cubic feet per second (cfs) pumps. Today, the facility houses nine pumps, including five storm-event pumps powered by 25-cycle electricity. These include two 550 cfs pumps (Pumps A and B) and three 1,000 cfs pumps (Pumps C, D, and E), giving the station a combined storm pumping capacity of 4,100 cfs. In addition, the station includes four smaller constant-duty pumps, each with a 40 cfs capacity, used to handle dry-weather flow and minor rainfall, totaling an additional 160 cfs (*Source: Ardurra Engineering Study*). DPS 3 indicated by the blue triangle In Figure 3 below.

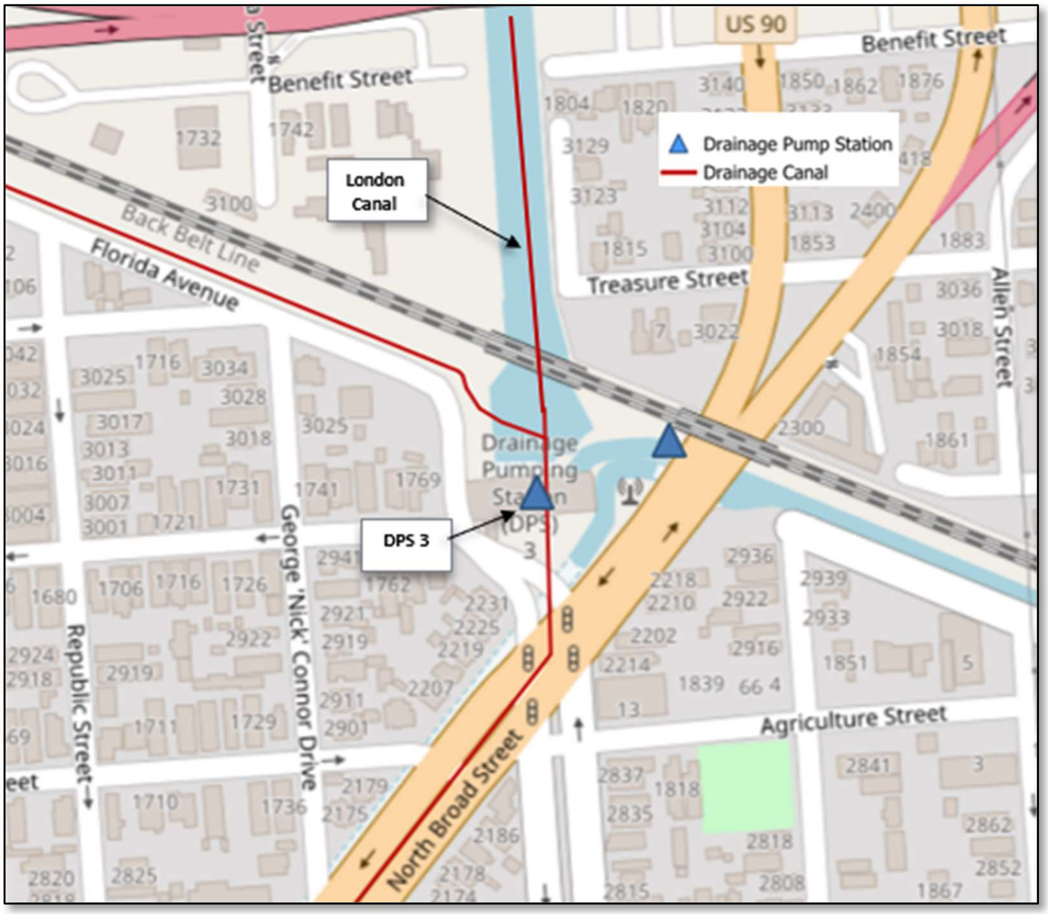

Figure 3: Drainage Pump Station 3 Location

3 Data Analysis

The preliminary step in this flooding investigation involved compiling and reviewing existing data to understand the layout of drainage network in the Tremé neighborhood and identify where targeted improvements could provide the most immediate benefit. Several previous reports have recommended upgrades to increase pipe capacity, however our investigation placed particular emphasis on identifying areas where cleaning and maintenance could address problems in a more immediate and cost-effective way. These initial data collection efforts were documented in the **Data Collection Memorandum** submitted previously to the Greater Tremé Consortium as a part of this investigation, which summarized the collection process of as-built drawings, existing drainage reports, Geographic Information System (GIS) shapefiles, 311 records, pump station data, and community input gathered through workshops and resident feedback.

In this section, GreenPoint built upon those findings by organizing and analyzing the information such as previous projects in the Tremé neighborhood, the investigation methodology used in this study, the organization of raw data, GIS data integration, and a review of supporting technical reports. Throughout this analysis, GreenPoint evaluated how each dataset contributed to our understanding of the drainage system, and identify which sources were most helpful, which were limited, and where additional investigation may still be needed to fill data gaps. This sets the foundation for the assumptions and system performance conclusions outlined in the following section.

3.1 Investigation Methodology

This section outlines the approach used to evaluate drainage conditions and flooding behavior in the Tremé neighborhood. The methodology combined field observations, city-supplied data, and resident feedback into a comprehensive analysis of system performance.

The process began with data collection from the City of New Orleans and Tremé residents, outlined in the **Data Collection Memorandum,** as mentioned in the previous section. In parallel, GreenPoint and Water Wise led community engagement efforts through technical workshops, neighborhood walkthroughs, and a digital flooding questionnaire to gather localized knowledge.

All findings were compiled into a centralized Data Collection Log spreadsheet, organized by blocks. Each entry listed the available data types such as photos, as-builts, GIS records, and resident reports, and included a 1–5 flood severity rating (increasing with severity) to help prioritize areas for follow-up.

GIS served as the primary tool for spatial analysis, allowing mapping of flood severity ratings, drainage infrastructure, and field observations. Color-coded ratings provided a visual summary of neighborhood hotspots, while layers representing catch basins and flow direction helped identify gaps and potential system failures.

Several field visits were conducted during both dry days and multiple rain events that helped verify reported problem areas and revealed issues not captured in official records, such as clogged drains, ineffective flow paths, or topographic barriers. Historical Google Street View imagery was also used to cross-reference conditions over time and observe changes in drainage infrastructure.

This multi-layered approach helped identify patterns, validate data across sources, and the development of a Project Summary to guide recommendations and next steps.

3.2 Data Collection

3.2.1 Resident Data Collection

The Tremé community has long observed consistent flooding patterns across specific blocks, offering valuable insight into chronic drainage issues. A key part of this investigation involved collecting data directly from residents of the Tremé neighborhood. Their firsthand experiences provided valuable insight into where flooding regularly occurs and helped confirm or challenge the information available in official city records and helped identify areas where flooding is persistent but under-reported. GreenPoint and Water Wise worked closely with local residents to document these conditions through educational workshops, listening sessions and resident data questionnaires.

Resident Workshops

To initiate the community engagement process, GreenPoint and Water Wise met with the Visioning Session Committee- a group of engaged Tremé residents who have played a long-standing role in voicing neighborhood concerns- to hold workshops and perform walk throughs of the neighborhood. These workshops served two purposes: to listen to residents' observations and concerns about local flooding and to educate participants on how the drainage system works.

The workshop provided a simplified explanation of New Orleans' drainage infrastructure and potential causes of flooding in an urban environment like Tremé; similar to the overview detailed later in **Section 4** of this report. The objective was to help the residents better understand what factors might be contributing to their flooding and use this knowledge to help prevent or report future flooding issues. A neighborhood walkthrough was conducted to point out roadway elements like manholes, catch basins, and nearby trees and how they're laid out and connected. Many participants reported that they had never previously noticed certain drainage structures or understood their function. This understanding allowed residents to better recognize the deeper causes of flooding and help identify problem areas on their block. Several participants expressed feeling of being empowered by this new knowledge and more confident to take action knowing that their concerns would be heard and taken seriously. Overall, the workshops helped residents to build trust with the City and encouraged them to take a more active role in addressing flooding in their community.

Resident Data Collection

Following the technical workshops, a digital Flooding Questionnaire was distributed online and throughout the neighborhood with support from Water Wise. The goal of the questionnaire was to gather detailed, location-based accounts of flooding and surface drainage issues. Even residents who had not experienced flooding were encouraged to respond to help build a complete picture of conditions across the neighborhood.

The questionnaire included the following types of questions:

- Resident ratings of flooding severity and frequency on a scale from 1 to 5 (1 being no issue and 5 being extreme)
- Whether flooding occurs across the entire block or at specific low points or intersections

- Descriptions of flooding conditions or causes, and resident assumptions of what could be occurring (e.g., blocked drains, poor grading, low elevation)
- Reports of deficient or inactive catch basins, including those suspected of being filled with concrete or clogged with debris
- Observations of contractor malpractice or changes in flooding following recent construction
- Dates of specific flood events, especially those that matched known storm events
- Descriptions of stormwater behavior (where water accumulates, what type of rain triggers flooding)

In addition to structural issues, the questionnaire asked for personal accounts of how flooding has impacted daily life, property, and mental health. Many residents shared the personal toll of stress and anxiety of recurring flooding. Common themes included:

- Vehicle damage and the financial burden of repairs or replacement
- Missed work or appointments due to impassable streets
- Difficulty leaving or returning home during rain events
- Anxiety, stress, and fear associated with routine rainfall
- Loss of trash bins and yard damage from standing water
- Ongoing financial strain and housing-related stress
- Nighttime stress from waking to check flood levels or moving vehicles

Residents were also encouraged to share their own insights into potential causes of flooding. Several noted that flooding on their block began or worsened after Hurricane Katrina, especially in areas where street or infrastructure repairs were performed. The impact of debris and structural integrity from the hurricane could likely still be a factor contributing to flooding in the neighborhood today. In some cases, residents raised concerns about possible contractor malpractice. Others pointed to pump station performance as a potential factor. Overall, clogged catch basins and recurring intersection flooding were among the most common themes. Reports of concrete or foreign material inside basins helps to prioritize CCTV inspections over general cleaning to assess the condition of subsurface infrastructure.

As a part of the data collection, residents were encouraged to upload photo and video evidence documenting flood conditions on their block during or after storms. These submissions were especially valuable, capturing water conditions during storm events and showing where water remains for days without draining. These materials helped verify the severity and extent of flooding and allowed us to assess whether issues were localized, such as in front of a specific catch basin, or spread across an entire block.

3.2.2 ASLA Legacy Project

American Society of Landscape Architects (ASLA) and Water Wise are partnering to explore green infrastructure opportunities along N. Claiborne Avenue and the I-10 corridor in Tremé, with a focus on Joint Use Agreements (JUA) shared between DOTD, the City, and local organizations. Their effort builds on the Vision to Reality model previously implemented by Healthy Community Services and Water Wise Gulf South and aims to install a small, maintainable project while identifying long-term opportunities for water management and community benefit.

GreenPoint joined ASLA, Water Wise, and residents for a walkthrough of Claiborne to assess potential GI implementation locations. A listening session with the residents was held prior to the site visit that provided insightful information on the issues the residents are facing with accessing Claiborne during storms and their emotions and anxieties tied to the historical street. The walkthrough provided valuable insight into local flooding issues, revealed large underused green spaces, and helped GreenPoint collect additional data on flood-prone areas and possible contributing factors along the corridor, that will be discussed more in **Section 4.7** of this report.

3.2.3 DPW/SWBNO Data Collection Process

Data received from the Department of Public Works (DPW) and Sewerage and Water Board of New Orleans (SWBNO) varied in its usefulness for this investigation. While some records provided valuable insights, others offered limited relevance to drainage conditions or were incomplete in terms of detail and scope.

GreenPoint received two sets of as-built drawings reflecting prior construction projects completed under the Joint Infrastructure Recovery Request (JIRR) program. The first set, the most relevant was RR183: Tremé, Lafitte Group B, designed by Meyer Engineers in 2016 and completed in 2024. This project included full street and drainage reconstruction on several blocks, specifically:

- 700 N. Prieur Street – new 30” RCP drain line and catch basins
- 1900 St. Ann – new 15” RCP drain line and catch basins
- 1800 St. Ann – new 15” RCP drain line and combination manhole-catch basins
- 1600 St. Peter – new 24” RCP drain line and catch basins
- 1500 St. Peter – new 21” RCP drain line and catch basins
- 700 N. Villere – new 15” drain lines and catch basins

These records were helpful for understanding recent drainage upgrades and comparing updated infrastructure against field observations and community-reported flooding.

The second set of as-built drawings, RR182: Tremé, Lafitte Group A, consisted primarily of road work, sidewalk and driveway repairs, and sanitary sewer repairs. No drainage improvements were documented in the as-builts, so this set was not useful for drainage analysis.

The GIS data provided by the City was one of the most helpful resources received. It served as a foundation for mapping existing conditions and understanding the system layout. GreenPoint used this GIS information alongside unit maps and field visits to cross-reference known infrastructure and identify recent upgrades, system gaps, or inconsistencies. It also provided a basis for recommendations and observations on GIS interface to add onto the existing conditions that were provided by the City.

Survey data, while useful to have for background reference, played a more limited role at this stage of the investigation. These documents generally confirmed layout and elevations but did not contribute significantly to understanding performance issues or areas of concern.

GreenPoint also reviewed 311 complaint data provided by DPW. This dataset included locations, dates, and categories of concern; however, the detailed descriptions of resident complaints were not accessible from the City database. As a result, the data was limited to broad identifiers such as "flooding" or "clogged catch basin" without specific context. This information was still useful in flagging locations where drainage concerns had been reported and determine areas that likely need to be cleaned or addressed further, with the assumption and likelihood that many of these complaints have never been addressed.

3.3 Neighborhood Areas

For organizational purposes, the Tremé neighborhood was divided into eight distinct areas. These boundaries were created to group blocks based on geographic proximity and shared drainage characteristics, such as flow direction, outfall connection, or alignment with major streets. These neighborhood areas will be referenced throughout this report. This list of blocks in each area is presented in Table 1 below.

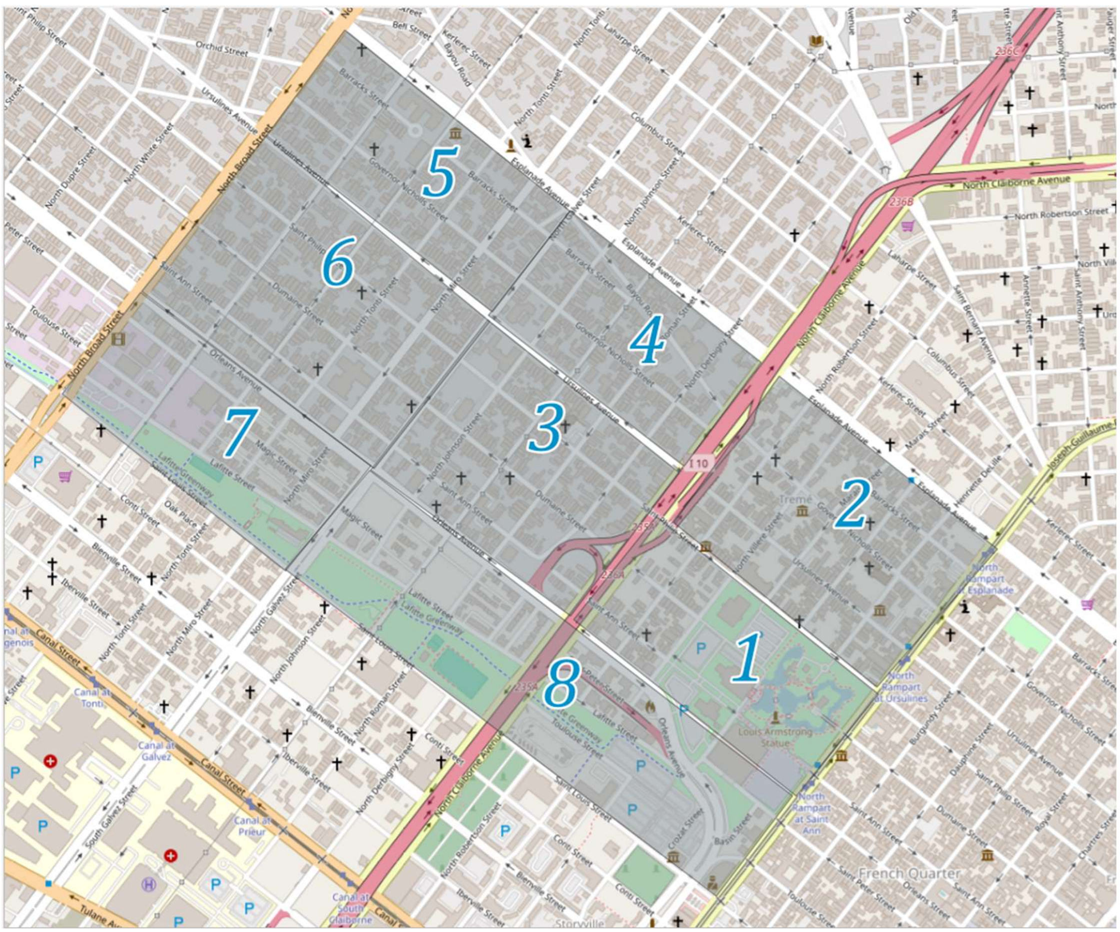

Figure 4: Tremé Neighborhood Divided into Areas

Table 1: Tremé Study Areas

Area	Horizontal blocks	Vertical blocks
1	1500 – 1600 Orleans Ave 1500 – 1600 St. Ann St	700 – 900 N. Rampart St 700 – 900 N. Villere St

	1500 – 1600 Dumaine St 1100 – 1600 St. Philip St	700 – 900 N. Robertson St 700 – 900 N. Claiborne Ave (Riverside)
2	1100 – 1600 Ursulines Ave 1100 – 1600 Governor Nicholls St 1100 – 1300 Barracks St 1100 – 1500 Esplanade Ave	1000 – 1300 N. Rampart St 1000 – 1300 Henriette Delile St 1000 – 1300 Tremé St 1000 – 1300 Marias St 1000 – 1200 N. Villere St 1000 – 1200 N. Robertson St 1000 – 1200 N. Claiborne Ave (Riverside)
3	1700 – 2100 Orleans Ave 1700 – 2100 St. Ann St 1700 – 2100 Dumaine St 1700 – 2100 St. Philip St	700 – 1000 N. Claiborne Ave (Lakeside) 700 – 1000 N. Derbigny St 700 – 1000 N. Roman St 700 – 1000 N. Prieur St 700 – 1000 N. Johnson St 700 – 1000 N. Galvez St
4	1700 – 2200 Ursulines Ave 1700 – 2200 Governor Nicholls St 2000 – 2100 Barracks St 1700 – 2100 Bayou Rd 1600 – 2000 Esplanade Ave	1000 – 1200 N. Claiborne Ave (Lakeside) 1100 – 1300 N. Derbigny St 1100 – 1400 N. Roman St 1100 – 1300 N. Prieur St 1100 – 1400 N. Johnson St 1100 – 1300 N. Galvez St
5	2200 – 2600 Ursulines Ave 2200 – 2600 Governor Nicholls St 2200 – 2600 Barracks St 2100 – 2500 Esplanade Ave	1100 – 1300 N. Miro St 1100 – 1300 N. Tonti St 1100 – 1300 N. Rocheblave St 1100 – 1300 N. Dorgenois St 1100 – 1300 N Broad St
6	2200 – 2600 Orleans Ave 2200 – 2600 St. Ann St 2200 – 2600 Dumaine St 2200 – 2600 St. Philip St	700 – 1000 N. Miro St 700 – 1000 N. Tonti St 700 – 1000 N. Rocheblave St 700 – 1000 N. Dorgenois St 700 – 1000 N Broad St
7	2200 – 2600 St. Peter St 2200 – 2400 Magic St 2600 Toulouse St 2200 – 2600 Lafitte Ave 2200 – 2600 St Louis St	500 – 700 N. Miro St 500 – 700 N. Tonti St 500 – 700 N. Rocheblave St 500 – 700 N. Dorgenois St 500 – 700 N Broad St
8	2100 Magic St 2100 – 1400 Lafitte Ave 2100 – 1100 St Louis St 1600 – 1400 St. Peter St 2100 – 1500 Orleans Ave	500 – 700 N. Galvez St 600 – 700 N. Johnson St 600 – 700 N. Prieur 500 – 600 N. Roman St 500 – 600 N. Derbigny St 500 – 600 N. Claiborne St (Riverside) 600 – 700 N. Robertson St 700 N. Villere St 500 - 600 Marais St

		700 Tremé St 500 Crozat St 600 Basin St 500 – 700 N. Rampart St

3.4 Organization of Data

A Geographical Information System (GIS) database served as the primary organizational tool throughout this investigation. The use of a GIS database to organize the data allows observation of the area as a whole, and analysis of flooding patterns across the Tremé neighborhood spatially. Using the existing conditions geodata provided by the City, shown in Figure 5 below, GreenPoint developed a base map to layer additional data collected during the investigation. This included resident ratings, deficient catch basins, drainage infrastructure details, and recommendations for new infrastructure.

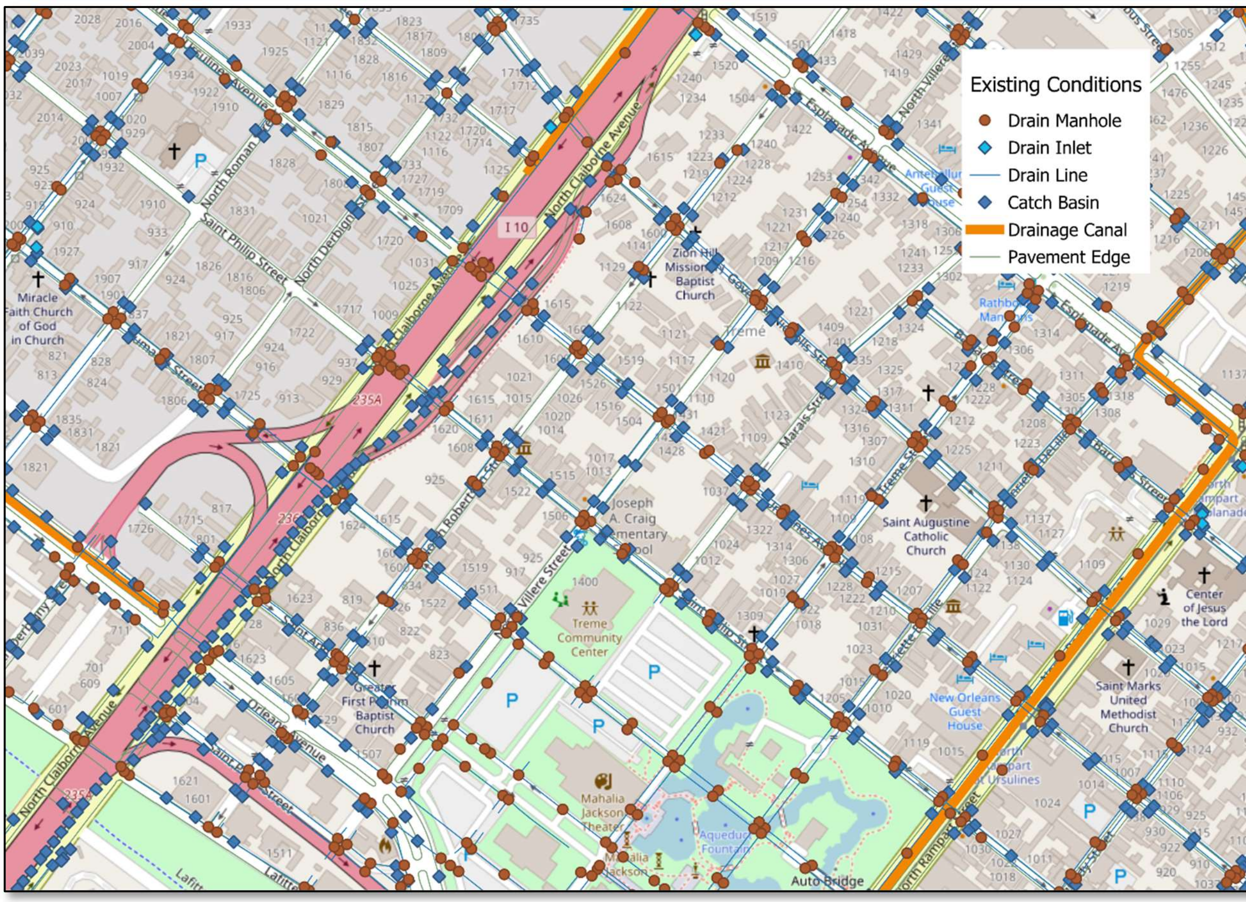

Figure 5: GIS of Existing Conditions

To better understand how the drainage system functions, the as-built drawings were cross-referenced and the direction of flow was input with arrows for each drain line. These arrows were essential in identifying how water moves through the system and where bottlenecks or backups might originate. Understanding the upstream and downstream relationships of drain lines is critical in identifying potential causes of upstream flooding in relation to data relevant to the downstream lines.

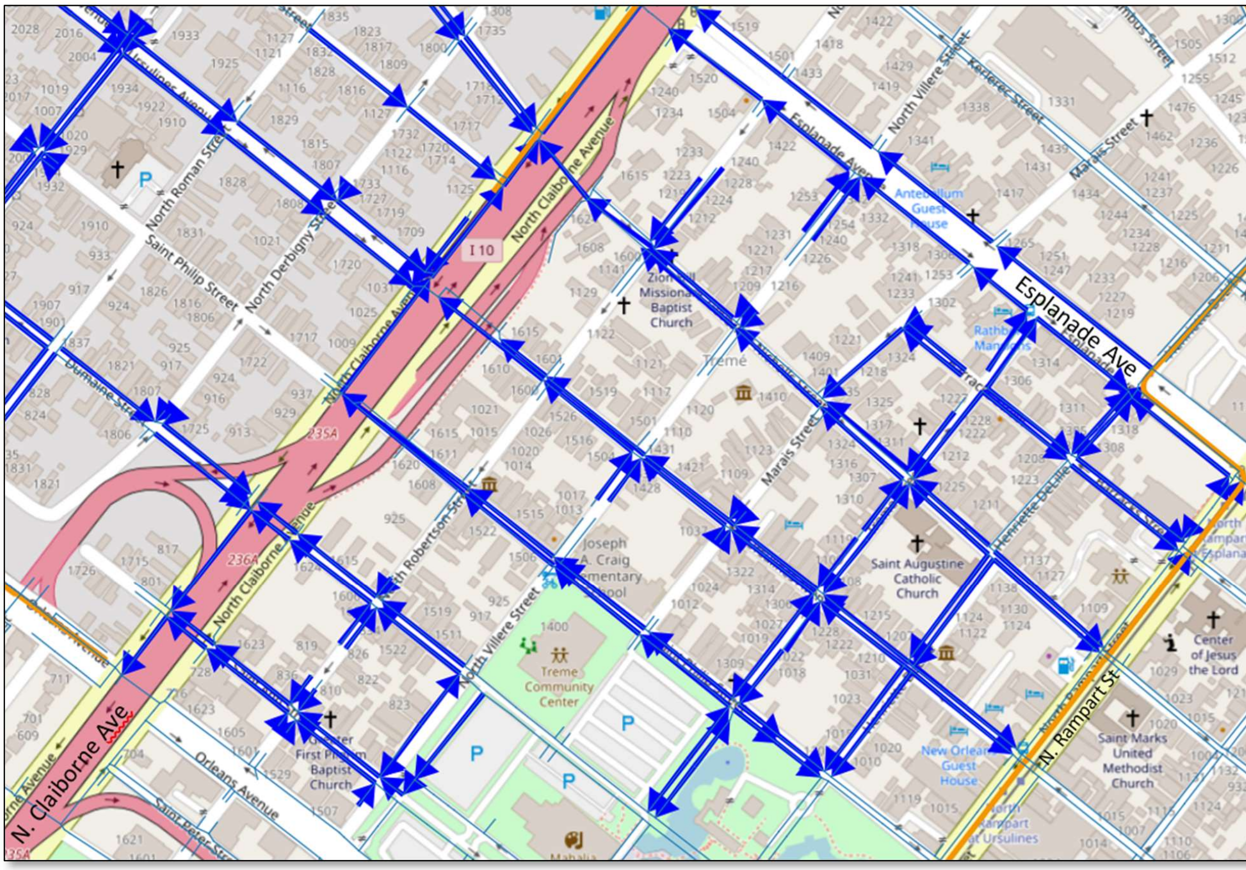

Figure 6: GIS with Drain Direction Arrows

3.4.1 Ratings

In addition to mapping drainage infrastructure, resident-provided flooding ratings were integrated into the GIS interface. Each block was color coded relative to the ratings listed in Section 3.2.1. as well as field observations. The color ratings are as follows:

- **1 – Green** (No or minimal flooding)
- **2 – Blue** (Minor flooding)
- **3 – Yellow** (Moderate flooding)
- **4 – Orange** (Frequent/severe flooding)
- **5 – Red** (Consistent and critical flooding)

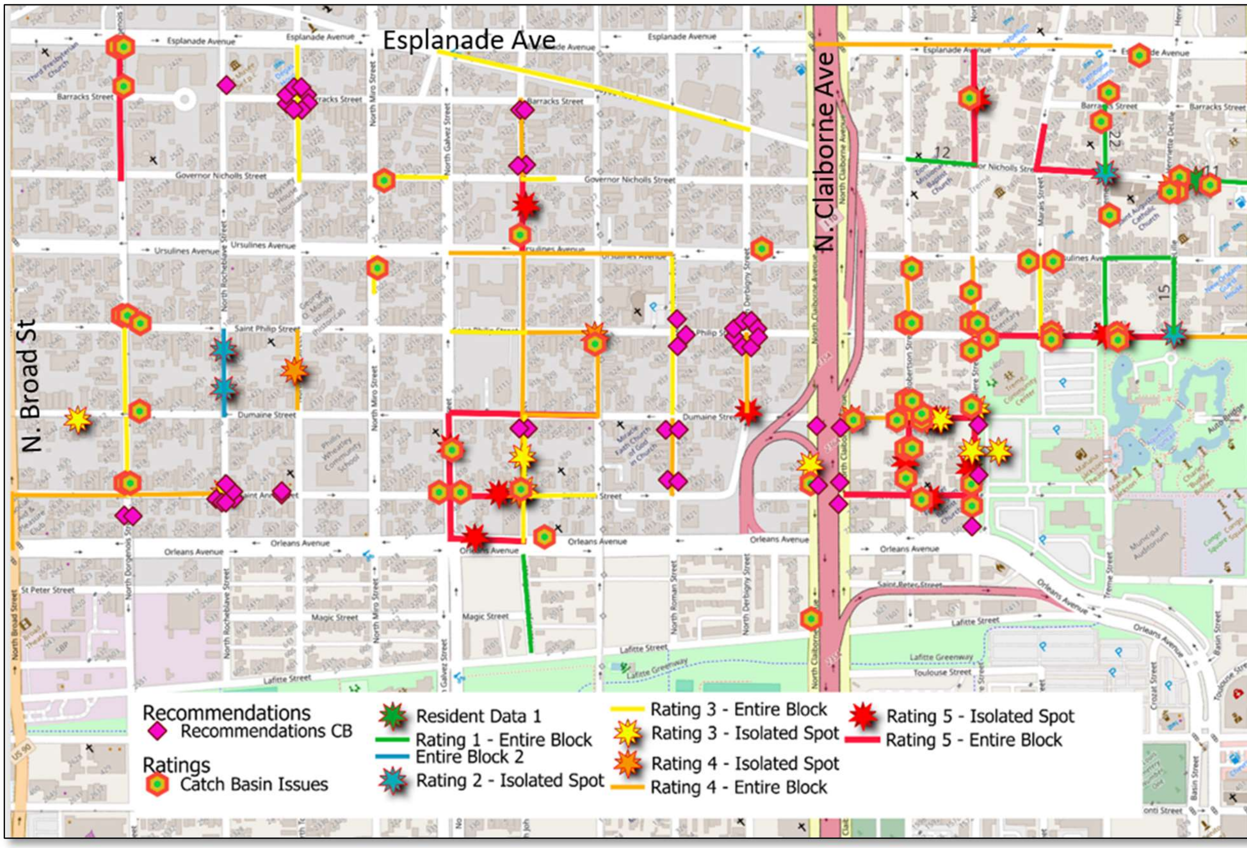

Figure 7: GIS with Resident Ratings

This rating criteria and visual approach made it easier to identify localized problem areas and compare them with topographic features, drainage infrastructure, and known system constraints. Areas with repeated high ratings often aligned with blocks lacking adequate drainage components or located at heavily lined tree areas. This GIS-integrated rating system helped prioritize areas for further field verification and informed subsequent recommendations for investigation and improvements.

3.5 Field Visits

Frequent field visits were conducted throughout the study period to observe how the drainage system in Tremé performed during both rain events and dry conditions. These visits were guided by prior knowledge and resident flooding ratings to verify reported problem areas and evaluate system behavior in the field.

During rain events, observations focused on where water flowed, where it failed to enter catch basins, and where it pooled. For example, at 700 N. Villere Street, water was seen bypassing a clogged catch basin and flowing around an ADA ramp toward St. Ann Street, increasing the burden on the drainage system on St. Ann. Indicators such as debris suction toward grates and accumulation of leaves helped confirm which catch basins were functioning and which were not.

Dry-weather visits were less revealing but still useful for assessing street slopes, low points, and debris trails left by stormwater. While catch basins couldn't be opened, visual inspections of street-level inlets showed several clogged or blocked drains. In several cases, inlets were visibly blocked with sediment or trash, confirming the need for cleaning and maintenance. Our observations verified reported deficiencies and identified new deficiencies in field. These findings will be discussed further in **Section 4.8.**

3.6 Review of Previous Drainage Reports

As part of this investigation, key reports from previous consultants were reviewed to better understand drainage behavior in Tremé and the surrounding Orleans Metro Basin. These included *the City of New Orleans Stormwater Drainage System Root Cause Analysis* by ABS Group (2018), the *Stormwater Master Plan* prepared by Ardurra and ILSI Engineering (2022), and additional capital planning documents prepared by CDM Smith. These reports provided valuable context about drainage system limitations and citywide modeling efforts.

The Stormwater Master Plan report identified systemic capacity constraints throughout the Downtown-Gentilly model area, which includes DPS 2, 3, 4, and 19. The plan emphasized the need for integrated modeling to combine minor (DPW) and major (SWBNO) drainage systems, which were previously evaluated in isolation. This modeling effort provided a clearer understanding of how individual neighborhoods, including Tremé, contribute to and are affected by systemwide bottlenecks.

The Root Cause Analysis report confirmed performance deficiencies at DPS 3 during past flood events, primarily due to mechanical failures and reactive maintenance practices. Although this report focused on system-wide operations, findings specific to DPS 3, including the lack of proactive inspection programs and inconsistent maintenance protocols, highlight concerns relevant to Tremé's drainage reliability.

While these reports were not Tremé-specific, their system-level findings helped validate several patterns observed through resident input and field visits. Their modeling outputs and capacity analyses also helped inform assumptions about possible drainage limitations, backflow risks, and upgrade recommendations that will be discussed in the following sections and can be found in Appendix A.

3.7 Drone Survey

As part of this investigation, GreenPoint conducted a comprehensive topographic survey using aerial drone technology across the Tremé neighborhood. The survey limits extended from North Rampart Street to North Broad Street, and from Lafitte Street to Ursulines Avenue, covering approximately 271 acres. Drone-based surveys offer several advantages over traditional methods: they provide a high-resolution digital surface model at significantly lower cost, faster turnaround time, and with greater precision in mapping subtle variations in elevation. This approach enabled us to identify slopes, grades, and low-lying areas that are particularly vulnerable to street flooding during heavy rain events.

The drone imagery was processed to generate a detailed surface model for analysis of water flow patterns, pinpointing problem areas and enhancing our understanding of how runoff moves through the neighborhood. The data also provides a valuable reference layer that complements other collected data within this investigation. In cases where no suitable topographic survey previously existed, the drone effort fills a critical gap in baseline data for Tremé.

There are limitations to using drones in dense urban environments. The presence of trees, buildings, and parked vehicles can obstruct line-of-sight measurements, reducing accuracy along gutter lines where detailed drainage conditions are most critical. In particular, the area north of N. Claiborne and east of St. Philip presents challenges due to heavy canopy and obstructions. However, centerline elevations remain reliable, and our processing platform “Propeller” can filter out obstructions such as parked cars by approximating the ground surface beneath them. For this reason, the dataset as a whole remains highly useful for identifying overall drainage patterns and confirming areas of concern.

3.8 Analysis

To consolidate all findings from data collection and our recommendations, GreenPoint developed a comprehensive ***Project Summary spreadsheet***. This spreadsheet serves as a final report of observed or reported flooding issues by block, incorporating notes from site visits, 311 data, resident questionnaires, and drainage infrastructure records.

Each entry includes the location, description of the complaint or issue, and a recommended next step, such as cleaning, CCTV inspection, or structural repair. This format allows for efficient tracking, prioritization, and coordination with City agencies or contractors for follow-up actions. The spreadsheet is included in **Appendix A** of this report.

4 Findings and Assumptions of Factors Contributing to Flooding in the Tremé Network

It is a common misconception that flooding in New Orleans is caused by pumps not being in service or not working properly. While pump performance is of critical importance, the reality is much more complex and involves a range of systemic and environmental factors. New Orleans’ unique topography, largely below sea level and surrounded by levees, requires that nearly all storm water be lifted and pumped out of the basin rather than draining naturally, as opposed to other cities with higher elevation gradients. Reports prepared by other consultants suggest that improvements to the collection system could help it better accommodate storm events that occur with greater frequency and intensity. For example, 10-year storm events are now occurring multiple times within a decade, largely attributed to climate change. This increasing volume of water places a heavy burden on an already aging and capacity-limited drainage network. Compounding the historic infrastructure of the Tremé neighborhood with shifting soils, undersized or deteriorating pipes, insufficient maintenance, and the city’s limited ability to regularly replace aging components, further diminishes drainage performance.

The following sections highlight some of the general causes of flooding in New Orleans and explain how these broader factors intersect with and influence the conditions specifically observed in the Tremé neighborhood. These sections present key findings and working assumptions based on data collection, resident input, field observations, and previous experience. Several reports and data suggest that flooding in Tremé results from a combination of aging infrastructure of the entire stormwater outfall system, maintenance challenges, topographic factors, runoff from surrounding areas, including major new structures like Armstrong Park and the I-10 corridor, and potential bottlenecks in the outfall system. While these findings reflect observed patterns and likely causes, many assumptions will require further verification through CCTV inspection and detailed hydraulic analysis.

4.1 Constraints from Topography of Tremé Neighborhood

The physical layout and surface conditions of the Tremé neighborhood significantly impact how stormwater moves and accumulates during rain events. As one of the oldest and most densely built neighborhoods in New Orleans, Tremé has limited green space, with much of the land covered by rooftops, asphalt streets, and concrete surfaces. This urbanized landscape leaves little opportunity for infiltration, forcing most rainwater to run off impervious surfaces and rely heavily on the neighborhood's subsurface drainage system.

Most of the neighborhood sits below sea-level, with poor-draining, clay-rich soils classified as "D-type" by the USDA. These soils limit infiltration and heighten the importance of well-maintained surface and subsurface infrastructure. Furthermore, in recent years, new residential construction and other developments have further reduced the amount of pervious surface, increasing the volume of stormwater runoff into the storm collection system. Though the neighborhood is abundant with trees, notably historical oak trees that provide shade and character, their roots and leaves compromise the system even further.

The layout of the roadways in Tremé further complicates drainage. Tremé's low elevation and flat terrain affect how water moves and where it accumulates. Some blocks are simply paved over with asphalt, with no curbs, clear gutter lines or storm inlets. In several locations, street elevations have been raised through repeated resurfacing, creating situations where the road sits higher than adjacent sidewalks and houses, allowing water to flow directly onto residential property and sidewalks.

Overall, the neighborhood's compact layout, aging infrastructure, and limited permeability amplify flood risks and increase dependence on a drainage system that is already under strain.

4.2 Condition of Drainage Components

One of the major contributors to poor drainage performance in Tremé is the age and condition of the subsurface infrastructure. Older pipes in the system were constructed from terracotta clay, which is highly susceptible to cracking, breaking, or collapsing under stress, as seen in Figure 8 below. Modern systems typically use reinforced concrete (RCP) or PVC pipes, which are more resilient. In Tremé, most visible infrastructure appears to be RCP, but pipe material has not been confirmed due to limited access and visibility.

Over time, the structural integrity of these pipes degrades, particularly in a city like New Orleans where the ground is constantly shifting due to subsidence. These ground movements can lead to joint displacements, cracks, and even full pipe collapses. Additional utility conflicts and failures can occur with the drain system sharing the same roadway with other utilities like gas, water and sewer. Figure 9 below is an example from a previous drainage project performed by GreenPoint of a gas line bored through a pipe where a water leak is entering the drainage system. These types of failures not only reduce the capacity of the drainage network but can also create conditions for sinkholes, surface flooding, and ongoing infrastructure deterioration.

Figure 8: Example of Broken Terracotta Drain Line

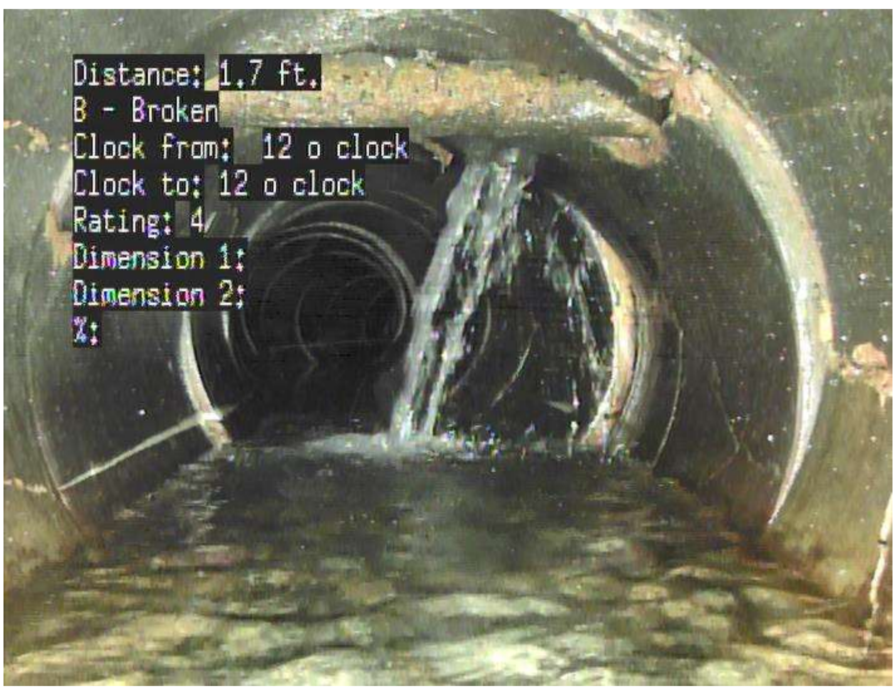

Figure 9: Example of Water Leak Intrusion to Drainage Pipe

In some cases, lateral connections from the catch basins to the drain line can collapse compromising the conveyance of storm water into the system at its entry. When collapses occur at or near the catch basin, it may cause the catch basin to sink, as shown in Figure 10 below, narrowing the entry of the basin and potentially severing the connection between the catch basin and the main line.

Figure 10: Sunken Catch Basin on 900 N. Tonti St

4.3 Clogs, backups

Clogs within the drainage system are a common cause of localized flooding in New Orleans. When pipes or catch basins are obstructed with foreign objects and materials entering the system- such as grease, pollutants, trash, and natural debris like leaves, dirt, and sediment- stormwater cannot enter the network or move efficiently through it. This causes water to accumulate on the surface, often resulting in street flooding during even minor rain events.

In some cases, clogs are the result of contractor malpractice, such as concrete being improperly poured or washed into a drain line during construction. As shown in Figure 11, concrete inside a drainage pipe significantly reduces its flow capacity. In more severe cases, concrete can fully block a lateral or main line, particularly near catch basins, leading to immediate flooding during rainfall events. Due to the interconnected nature of the drainage network in Tremé, a clog downstream can prevent upstream water from flowing, causing water to back up and flood those upstream blocks that may otherwise function properly.

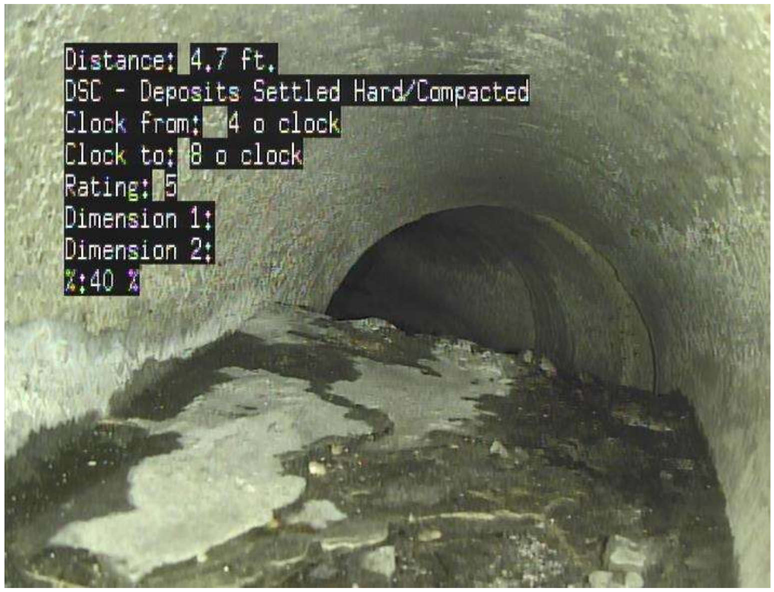

Figure 11: Hardened Concrete in Drain Pipe

Resident reports and field observations suggest that debris, hardened concrete, and general buildup of materials may be contributing to clogs at several locations throughout the neighborhood.

During this study, SWBNO's routine cleanings and GreenPoint's field visits revealed that streets like N. Robertson and S Johnson were almost entirely clogged with years of accumulated debris, bottles, sediment, and trash, indicating long periods without proper maintenance.

Figure 12: Visual Evidence of Blocked Inlet on 800 N. Prieur Street

These observed instances indicate that this is a pattern throughout the neighborhood with the lack of routine cleaning and maintenance, which is likely to be a large cause of the flooding in Tremé. Many catch basins remain inoperable due to this neglect, especially in heavily vegetated areas like Esplanade and St. Philip. It is unclear when many of these areas were last cleaned, and some may not have been serviced since Hurricane Katrina.

4.3.1 Tree Roots and Clogs

Oak trees, which are protected and iconic in New Orleans, contribute greatly to the character of the Tremé neighborhood. These mature trees have grown alongside the community for generations and are deeply embedded in its identity. However, their powerful root systems present serious challenges to nearby drainage infrastructure, especially in a historic neighborhood like Tremé where aging pipes and subsurface structures are common.

Tree roots naturally seek out moisture and can grow into small cracks or joints in older pipes, as shown in Figure 13 below. Once inside, they can trap debris such as grease, leaves, and sediment, creating blockages that restrict or completely obstruct water flow. Over time, expanding roots can place pressure on pipe walls, causing cracks, separations, or even full collapses. Additionally, large root systems may shift surrounding soil, leading to misalignment or slope displacement of drain lines.

In Tremé, there are several locations where oak trees are situated directly adjacent to intersections and drainage structures such as catch basins and lateral connections. Given the age of the system, it is likely that roots have become intertwined with the drainage network. From our experience conducting CCTV inspections in similar urban neighborhoods in New Orleans, it is possible that drain lines in areas like this can be completely collapsed and blocked. CCTV will be recommended for areas of inoperable catch basins that are located in close proximity to oak trees or large trees.

Figure 13: Tree Roots Intrusion in Drain Line

Areas of dense tree cover, particularly along St. Philip, Ursulines, Esplanade, Bayou Road, and portions of Governor Nicholls and N. Johnson Street, frequently experience flooding due to leaf litter and organic debris clogging inlets and catch basins. These streets often lack sufficient grading to promote runoff, causing water to pond in low spots. Reports of inoperable or slow-draining catch basins consistently align with these heavily vegetated corridors, reinforcing the need for more frequent cleaning and proactive maintenance in tree-lined areas.

4.4 Lack of Drainage Infrastructure

Within Tremé, several areas were identified as lacking modern drainage infrastructure, contributing to localized flooding and persistent standing water. In some cases, like that of 1300 N. Tonti and 1200 N. Johnson Street, blocks and intersections have no catch basins and appear to rely on surface features like shallow ditches or French drains. These features are severely outdated, provide limited storage and do not convey water effectively during storm events.

In other cases, such as 800 N. Johnson and North Villere Street near Armstrong Park, adequate catch basin coverage is missing with only one or two catch basins serving entire blocks that regularly flood during rain events. Additionally, along N. Claiborne Avenue there are limited drainage catch basins.

These deficiencies are mapped and documented in the GIS recommendations dataset, identifying lack of catch basins areas needing new infrastructure highlighted in pink. A complete list of these locations and proposed upgrades is included in the Project Summary spreadsheet in Appendix B.

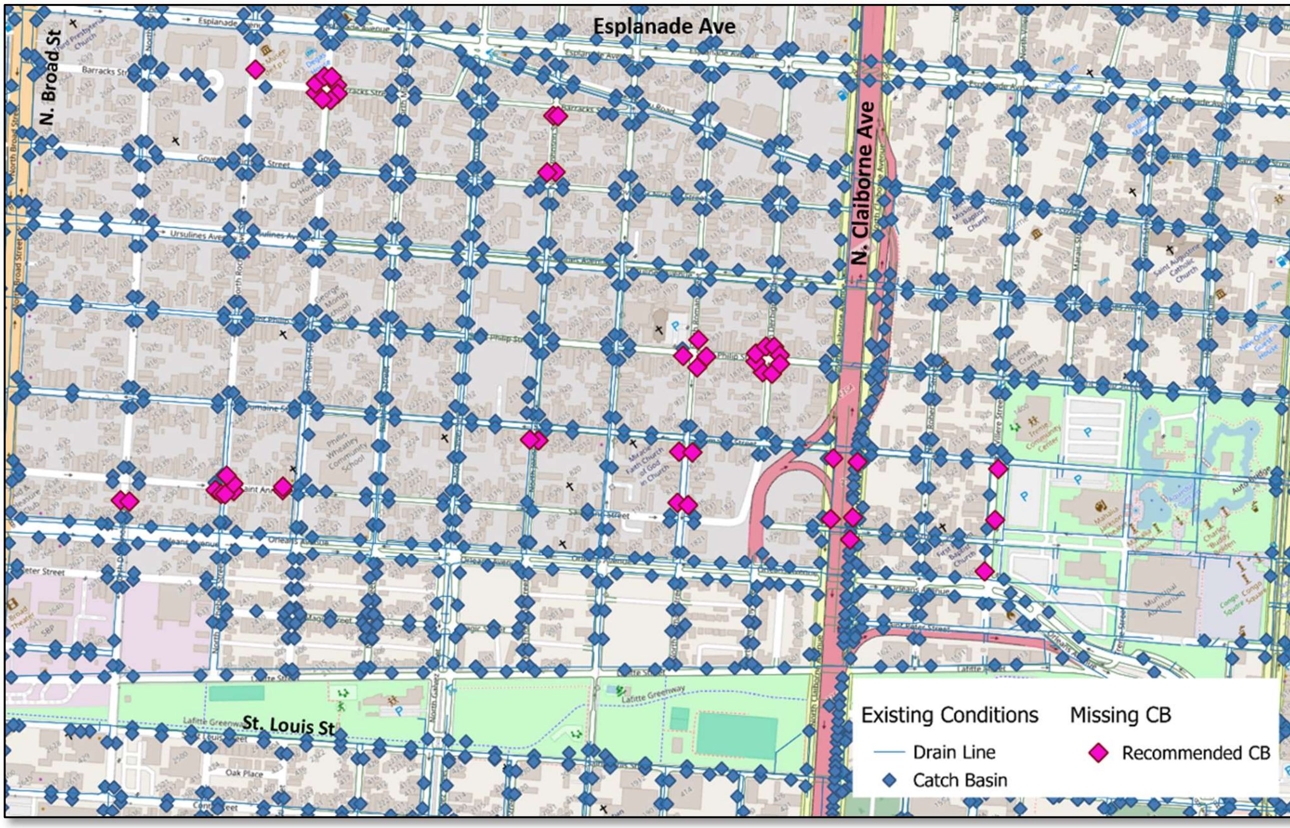

Figure 14: GIS Map of Missing Catch Basins

4.5 System Capacity

In addition to aging infrastructure, another factor to consider is the capacity of the city's drainage and pumping system. The system is operated by a combination of constant-duty and variable-speed pumps that are activated based on water level thresholds in the intake basins. When rainfall occurs at rates exceeding system design capacity, stormwater can accumulate faster than it can be removed, leading to street flooding. This risk increases during intense storms or hurricanes when power outages may occur, or when pumps are taken offline for scheduled or emergency maintenance.

The hydraulic behavior of the drainage system also plays a key role. When the stormwater network is full it becomes pressurized and the hydraulic grade line, or natural water level in a closed pipe system, can exceed the elevation of catch basin inverts or adjacent roadways. This can result in water backing up through the system and emerging at surface inlets or manholes. This water level will not recede until the overall hydraulic grade in the system is lowered. In essence, water at any given catch basin cannot flow into the drainage system until the water level at the outlet is lowered to allow natural gravity flow. This is particularly true in areas where conveyance relies on older, undersized and in some cases damaged pipes.

While most flooding in Tremé is due to rainfall, coastal hazards such as storm surge can also affect drainage conditions. Water pushed inland by hurricanes or strong storms can raise water levels in the canals and outfalls, reducing the system's ability to discharge runoff and compounding inland flooding issues. DPS 3 is integrated into the Sewerage and Water Board of New Orleans (SWBNO) 25-cycle power loop, ensuring continuous operation during storm events. Water from the subsurface drainage network is pumped into the London Avenue Canal, which normally drains by gravity into Lake Pontchartrain. At the lake's edge, a discharge gate remains open under typical conditions to allow continuous outflow by gravity. As a part of post-Katrina flood protection, the U.S. Army Corps of Engineers installed flood gates at the mouths of the drainage canals at Lake Pontchartrain, to be closed if the lake water level rises as a flood protection measure to prevent storm surge from entering the city's drainage canals. While this barrier protects against lake backflow, it can, under certain conditions, limit the system's ability to discharge stormwater during active rainfall, creating a potential bottleneck until the gate is reopened. However, for most day-to-day storm events, the gates remain open and do not impact normal drainage operations.

These issues highlight that even with fully operational pumps, physical constraints and hydraulic bottlenecks within the canal network can severely limit system performance during peak storm events. While recent anecdotal information suggests ongoing issues with flow routing and system capacity, a full investigation of pump hydraulics and pump station connectivity is beyond the scope of this report. Addressing such deficiencies, both mechanical and operational, will be critical to improving drainage outcomes for Tremé. However, meaningful upgrades to outfall system features are likely constrained by operational risks, such as the need to take pumps offline, which can introduce short-term vulnerabilities during rain events. It is also worth noting that SWBNO may not currently have the capital, staffing, or system redundancy needed to undertake significant outfall system upgrades without external support. Further evaluation by the City or SWBNO would be needed to assess feasibility, capacity limits, and opportunities for phased improvements.

4.6 Impact of Armstrong Park Runoff

Located at the southern end of the Tremé neighborhood, Armstrong Park contributes to localized flooding in surrounding residential areas. While the park does offer some green space, large portions of the park are covered with impervious surfaces like parking lots, which generate significant runoff during rain events and contribute to runoff into the neighborhood rather than absorbing it. Resident flooding severity in this area was consistently rated as "5".

The park's elevated parking lot on the north side drains toward a limited number of four catch basins located along the internal park roads. Dense tree coverage within the park may be contributing to clogs through leaf litter, root intrusion and general organic debris.

Of these limited catch basins, it was revealed during a field visit that an inlet within the parking lot near the back of the park is clogged with mud, as seen in Figure 15. Field observations confirmed additional surface runoff, likely caused by non-functioning catch basins within the park, is flowing directly into the neighborhood near N. Villere and St. Philip Streets, where flooding is frequently reported.

Figure 15: Blocked Inlet in Armstrong Park

Structurally, these remaining functional catch basins are connected to drainage lines along St. Ann, Dumaine, and St. Philip Streets, directing runoff into an already overburdened system. Residents also noted that maintenance crews routinely blow leaves and debris from the park onto N. Villere and St. Philip, where they accumulate and clog catch basins. These issues indicate a lack of drainage awareness among park staff and inadequate internal conveyance within the park itself.

Recommendations

Recommendations to help contain runoff within the park, reduce neighborhood flooding, and better utilize the park's internal green infrastructure are to:

- Implement staff education on proper maintenance practices and coordinate them to stop blowing debris into the street to reduce debris migration into the neighborhood.
- Evaluate catch basins within Armstrong Park for functionality
- Clean and maintain existing catch basins within the park.
- Determine whether park runoff can be better contained by adding catching basins or redirecting outfall locations to reduce the burden on Dumaine and St. Philip.
- Consider rerouting internal drainage toward the park's lagoon system to retain more water on-site.
- Investigate other structural measures to attenuate peak runoff to minimize flow into the neighborhood.

Green Infrastructure Opportunities/Possibilities

Mud and sediment deposits run off into the drainage system. This is likely a cause and effect of flooding. As the area floods, debris, sand and sediments get picked up in the stormwater and flow into the catch basins potentially clogging the lines even further. Green Infrastructure can help capture the sediment and mud before it gets to the conveyance system, as well as contain stormwater. Recommendations for potential green infrastructure additions in Armstrong Park include:

- Permeable Parking Surface: Consider retrofitting the existing parking lot with permeable pavement or sub-surface storage to capture runoff and allow infiltration on-site.
- Bio-Retention and Swales: Install rain gardens, vegetated swales, or bio-retention cells at low points or near the lot's drainage paths to reduce the sediment load entering the system.
- Runoff Management: Focus GI features at the park's southern and eastern edges, where runoff currently enters the neighborhood system, to reduce the volume and velocity of discharge.

4.7 I-10 and N. Claiborne Corridor

N. Claiborne Avenue experiences chronic flooding along nearly its entire corridor in Tremé, from the 700 to 1200 block, with severity ratings ranging from 3 to 5. As both a cultural hub and major evacuation route, this corridor's persistent drainage issues have serious implications for safety and mobility. Both sides of the interstate along N. Clairborne Avenue are reported to have flooding which regularly impedes traffic, creates visibility hazards, and increases the risk of accidents. This is particularly due to the intense sheeting of water from the elevated I-10 overpass, where runoff strikes the ground with force, splashing onto vehicles.

The current drainage network along N. Claiborne Avenue consists only of catch basins along the outer curbs, with no inlets beneath the I-10 overpass where runoff consistently accumulates. This limited amount of inlet coverage, combined with debris buildup, suspected line blockages, and general maintenance shortfalls, has significantly reduced drainage performance in the corridor. Resident reports and field observations confirm frequent backups along the on-ramps, with stormwater lingering long after rainfall and, in some cases, entering adjacent yards and properties. Sand and debris reportedly dumped or blown into catch basins further exacerbate the problem, especially where lines are suspected to be completely blocked, such as those connecting to St. Philip, St. Ann, and Dumaine Streets. Water regularly pools around all four interstate ramps, particularly near high-impact areas like 900 N. Claiborne by Charbonnet Funeral Home.

The Claiborne corridor serves as a primary outfall for adjacent areas, with flow split between the Orleans Avenue Canal and the Claiborne Canal toward Esplanade Avenue. Any backup here has impacts on upstream neighborhoods. While a few green infrastructure elements such as rain gardens exist beneath the overpass between the 600–700 blocks, they are limited in scope and cannot compensate for the volume of runoff entering the system.

Addressing the N. Claiborne corridor will be essential not only for stormwater management but also for public safety and preserving the cultural integrity of this important thoroughfare.

Recommendations

Infrastructure upgrades, additional catch basins beneath the overpass, and expanded green infrastructure will be necessary to restore functionality and protect the integrity of this essential corridor.

- Conduct CCTV inspections and cleaning of all drainage lines along N. Claiborne, with special focus on intersections where line blockages are suspected.
- Overpass Runoff Management- Install additional downspouts, channels, or scuppers on the I-10 overpass to consolidate runoff into controlled points, reducing uncontrolled sheeting across the corridor.
- Add new catch basins along the inner curbs of N. Claiborne, especially beneath the I-10 overpass and around the four interstate ramps where runoff frequently accumulates.
- Consider upsizing existing lines based on CDM recommendations, including potential upgrades to 4'x6' box culverts in sections with repeated flooding and undersized infrastructure.
- Maintenance Coordination- Establish routine maintenance of catch basins and drainage lines in collaboration with SWBNO, with additional oversight near debris-prone areas to prevent inlet clogging from sand and litter.

Green Infrastructure Opportunities

In parallel, ASLA and Water Wise have proposed green infrastructure installations along the Claiborne corridor to capture and retain stormwater from the I-10. Their focus is on implementing rain gardens and other bioretention features at the base of I-10 drainage spouts to intercept flow before it reaches the roadway. Key locations under consideration are the intersection of N. Claiborne with St. Philip and Dumaine, where a larger rain garden and stormwater capture zone could be constructed between the parallel overpass structures.

ASLA's broader vision for the N. Claiborne corridor focuses on creating multi-benefit landscapes that combine flood mitigation with ecological restoration, community use, and mobility improvements. Building on past efforts like Vision 2 Reality, their goal is to design site-specific green infrastructure that works to detain and filter runoff while enhancing public space with native plantings, habitat support, and educational features. These Improvements aim to balance stormwater management with active transportation and community gathering, showing how infrastructure can serve both environmental and cultural needs.

These projects also provide an opportunity to demonstrate scalable, community-supported models that could be replicated elsewhere in Tremé. Additional, smaller scale, green infrastructure strategies such as bioswales or tree trenches should be considered in areas prone to flooding, like Esplanade, to intercept and filter overpass runoff.

4.8 Localized Problem Areas a.k.a. "Hot Spots"

Apart from Armstrong Park and the N. Claiborne corridor, several smaller "hot spots" throughout Tremé were identified as part of this investigation. Using the rating criteria outlined in **Section 3.4.1**, GreenPoint categorized localized flooding issues by severity and frequency, then grouped blocks that fell within the same neighborhood area (defined in Section 3.3) or shared a common drainage outfall or system constraint. These localized problem areas, or hot spots, represent areas where flooding likely stems from a shared underlying issue. Identifying these hot spots helps prioritize investigation and improvement efforts by highlighting localized patterns of flooding that require targeted solutions.

4.8.1 Neighborhood Area 1

Area 1 has two major hot spot zones: Orleans and N. Claiborne to N. Villere and St. Philip, and the entirety of St. Philip south of N. Claiborne.

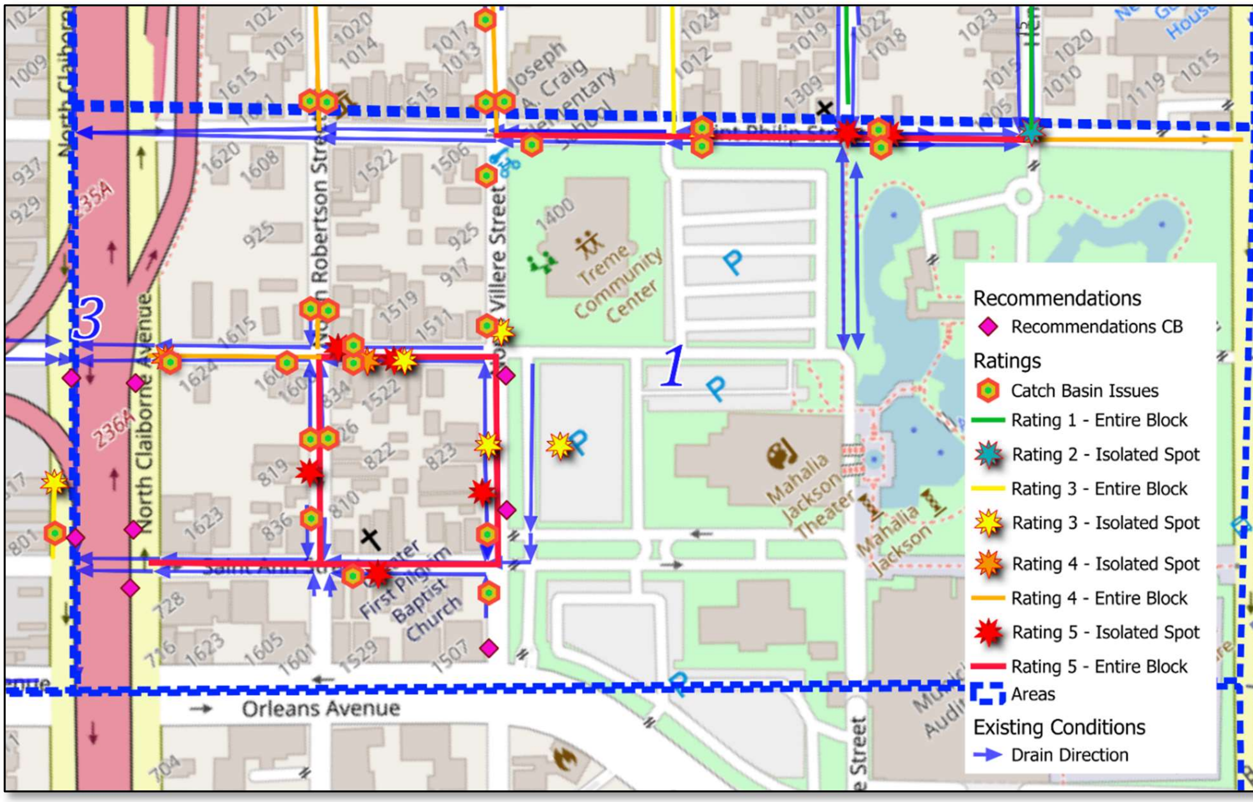

Figure 16: Neighborhood Area 1 Map

Zone 1.1 Orleans and N. Claiborne to N. Villere and St. Philip

This zone, which includes the 700-900 blocks of N. Robertson and the 1500-1600 blocks of Dumaine and St. Ann Streets, has emerged as one of the most flood-prone areas in the study. Bounded by N. Claiborne Avenue and N. Villere Street, from Orleans Avenue to St. Philip Street, the area shows repeated signs of severe flooding and widespread drainage deficiencies. These findings are based on resident reports, field observations, and limited infrastructure records gathered during the investigation.

Figure 17: Flooding on 1500 Dumaine Street

As discussed in the previous section on Armstrong Park, runoff from the park appears to be a major contributor to flooding in this area. The park's elevated parking lot sheds water directly toward Dumaine and N. Villere Streets. Although catch basins exist within the park, they may be undersized and some appear to be clogged, as runoff frequently reaches the adjacent street and sits for extended periods. To add to the strain, the subsurface lines are tied directly into the drain lines on St. Ann and Dumaine- two streets that already experience frequent flooding. This dual inflow, both surface and subsurface, likely overwhelms an already stressed system.

Along N. Villere, the drainage infrastructure is limited. The 700 block has only one catch basin, and the 800 block has just two on the curb opposite the park. These inlets appear insufficient for handling both localized runoff and the volume contributed by the park. During field observations, water was seen bypassing the inlet on 700 N. Villere and flowing around ADA ramps toward downstream blocks like 1500 St. Ann, suggesting likely surcharging and overwhelmed downstream lines.

Compounding these issues is the limited drainage capacity on N. Claiborne Avenue. As mentioned in the N. Claiborne Corridor section, the corridor suffers from minimal catch basin coverage, runoff from the I-10 overpass, and frequent ponding at the on-ramps. This limits the ability of Claiborne to serve as an effective outfall for upstream areas, which may be contributing to system backups throughout the zone.

Figure 18: Flooding on 800 N. Robertson

Maintenance deficiencies further complicate system performance. SWBNO field crews recently uncovered severe clogging on N. Robertson, including years of accumulated mud, trash, and debris. It is assumed that similar conditions may exist across neighboring blocks, particularly given consistent reports of non-functioning or slow-draining catch basins. Additionally, there are multiple claims of contractor malpractice. Residents have reported seeing concrete or debris poured into catch basins, particularly near St. Ann and Dumaine. While these reports have not been independently confirmed through CCTV or utility excavation, the presence of photographic evidence and consistent observations suggests that foreign material may be contributing to system blockages.

Figure 19: Resident Photos: Non-Functioning Catch Basins on 1500 Dumaine and 900 N. Robertson, respectively

Given the limited drainage infrastructure and frequency of flooding, it appears likely that several downstream lines are clogged or partially collapsed. The system layout suggests that backups on St. Philip or Dumaine may be impeding flow from N. Villere and N. Robertson, triggering a chain of localized flooding throughout the area. While these assumptions are based on available data and field observations, full system CCTV investigation will be necessary to confirm these conditions.

Finally, line capacity may also be a contributing factor. The CDM drainage report recommended upsizing several lines in this zone to improve capacity. While this investigation did not include hydraulic modeling, additional hydraulic analysis would be needed to confirm whether limited pipe capacity is contributing to the persistent flooding. Although these findings are based on observed conditions and resident input, further investigation through cleaning and CCTV will be critical in confirming system performance and determining the next steps.

Zone 1.1 Recommendations

- Clean and CCTV all lines along N. Villere, N. Robertson, Dumaine and St. Ann. Prioritize locations with reported standing water or suspected blockages.
- Add new catch basins on the 700 and 800 blocks of N. Villere to manage runoff from Armstrong Park. Existing spacing is insufficient for observed flow.
- Evaluate potential line upgrades along Claiborne and key cross streets where repeated flooding overlaps with I-10 runoff. Refer to CDM recommendations.

Zone 1.2 St. Philip Street South of N. Claiborne

The 1100–1600 blocks of St. Philip Street, stretching from N. Rampart and N. Claiborne, are experiencing consistent drainage issues primarily driven by leaf accumulation and a lack of routine maintenance. The corridor is heavily lined with mature oak trees, sitting adjacent to runoff from Armstrong Park's, as mentioned similarly in previous sections. Combined, these conditions create a system that appears overwhelmed by organic debris and sediment buildup.

The drainage flow on St. Philip is split. Blocks from 1300 to 1600 St. Philip flow toward Claiborne, while 1100 to 1200 blocks flow toward Rampart. Several catch basins are visibly blocked, especially at intersections with N. Villere, Tremé, and Henriette Delille. In many areas, water bypasses the inlets entirely and continues onto adjacent blocks, where flooding has been observed to persist for days after rainfall. The 1200 and 1300 blocks, in particular, appear completely blocked, with stormwater bypassing the catch basins and flowing downstream.

Figure 20: Flooding on 1300 and 1400 St. Philip Street

Runoff and improper leaf maintenance from Armstrong Park worsens the issue. The park's elevated lot drains directly onto St. Philip where catch basin capacity is already limited. Since drains are not operating on St. Philip, runoff from the park continues across and into adjacent streets like Tremé. Debris trails and standing water indicate system-wide clogging. This runoff, combined with regular leaf fall from the adjacent trees, creates a feedback loop of clogging and overflow that impacts multiple blocks downstream.

Figure 21: Evidence of Leaf Accumulation on 1300 St. Philip Street

Downstream bottlenecks on N. Claiborne may also be restricting flow, causing water from St. Philip to back up. Tremé Steet, along with 1000 blocks of N. Robertson, N. Villere, and Marais, outfall into St. Philip and have also reported flooding. These upstream blockages are likely symptomatic of St. Philip's compromised capacity.

Although structural damage cannot be ruled out without CCTV investigations, most of the evidence points to widespread blockage rather than system collapse. The overall flooding patterns, persistence of standing water, and visible debris accumulation strongly suggest that a cleaning-focused intervention could restore much of the lost functionality in this area.

Zone 1.2 Recommendations

- Clean and CCTV all drainage lines and catch basins from N. Rampart to N. Claiborne, with priority on intersections at N. Villere, Tremé, and Henriette Delille.
- Establish regular maintenance with City and Park staff for this corridor due to high debris accumulation from tree coverage.
- Consider small-scale green infrastructure along the park edge to slow runoff and reduce the burden on street-level drains.

4.8.2 Neighborhood Area 2

Area 2 has one major hot spot zone, along Governor Nicholls and Esplanade Avenue, including the 1200 blocks within this area.

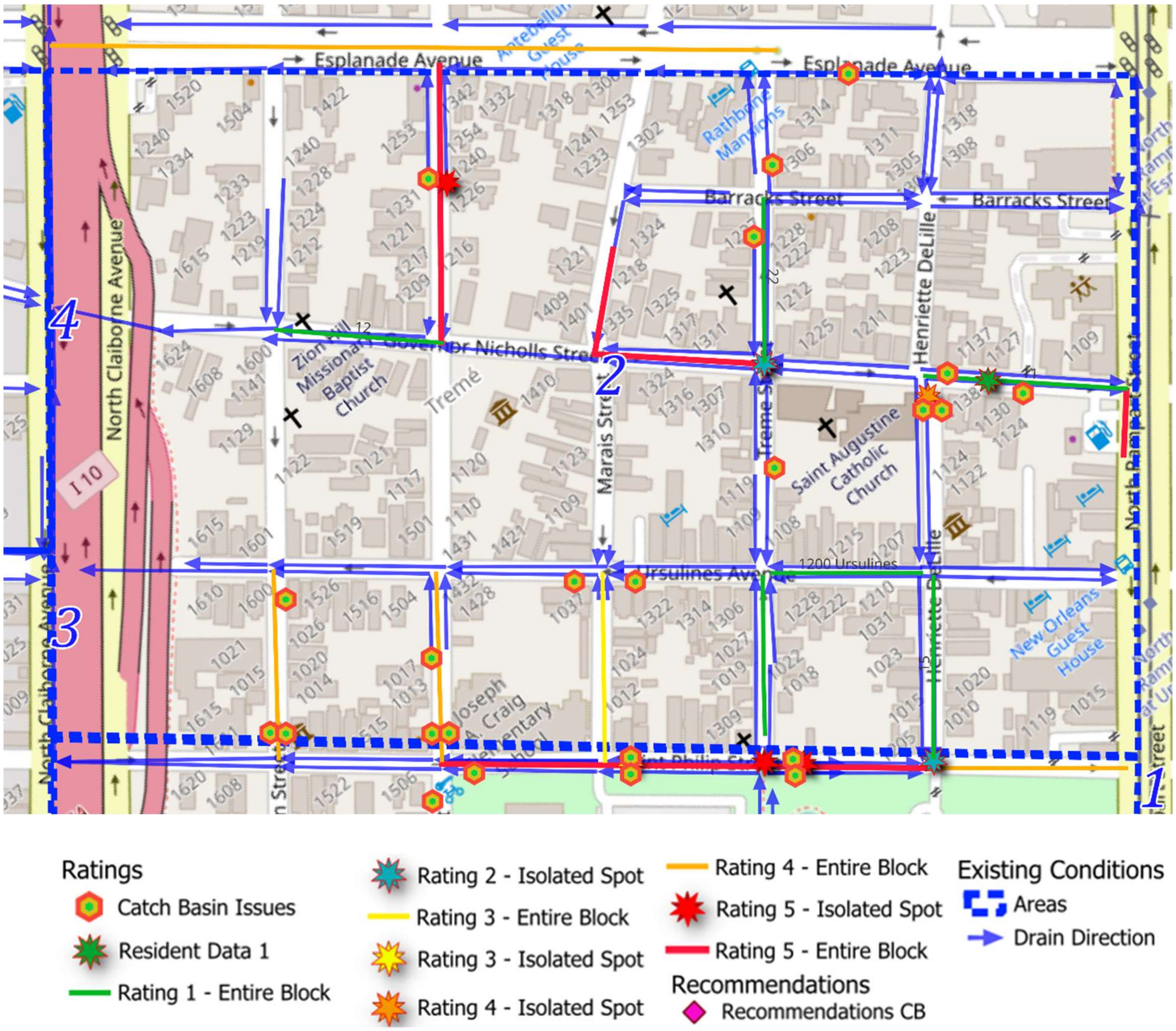

Figure 22: Neighborhood Area 2 Map

Zone 2.1 Governor Nicholls to Esplanade – South of N. Claiborne

This zone includes the 1100–1200 blocks of N. Robertson, N. Villere, Marais, and Tremé Streets, all of which flow into the major east-west line along Governor Nicholls Street, which then outfalls into the N. Claiborne Avenue canal. The 1600 block of Governor Nicholls functions as the main downstream outfall for drainage from surrounding blocks, including runoff from Esplanade Avenue. Esplanade Avenue has reports of flooding observed inoperable catch basins. Furthermore, it is higher than the surrounding streets so water is likely not being captured on this block and flowing onto adjacent blocks, that are also clogged, which may be contributing to flooding issues upstream. The 1200 block of N. Villere is especially problematic, with persistent standing water after light rains and reports of possible contractor malpractice involving concrete dumped into catch basins.

Most blocks in this zone, especially Governor Nicholls and Esplanade, are heavily lined with oak and other trees, resulting in a high likelihood of clogging from leaf litter and organic debris. Poor roadway conditions may also be contributing to poor drainage. The presence of clogged catch basins and slow-draining conditions across multiple blocks suggest a widespread need for routine cleaning and CCTV inspection, included in the attached CCTV plan.

4.8.3 Neighborhood Area 3

Area 3 has two major hot spot zones: North Johnson from Orleans to Ursulines and surrounding areas of N. Galvez to N. Prieur, and Dumaine to Ursulines N. Prieur to N. Claiborne.

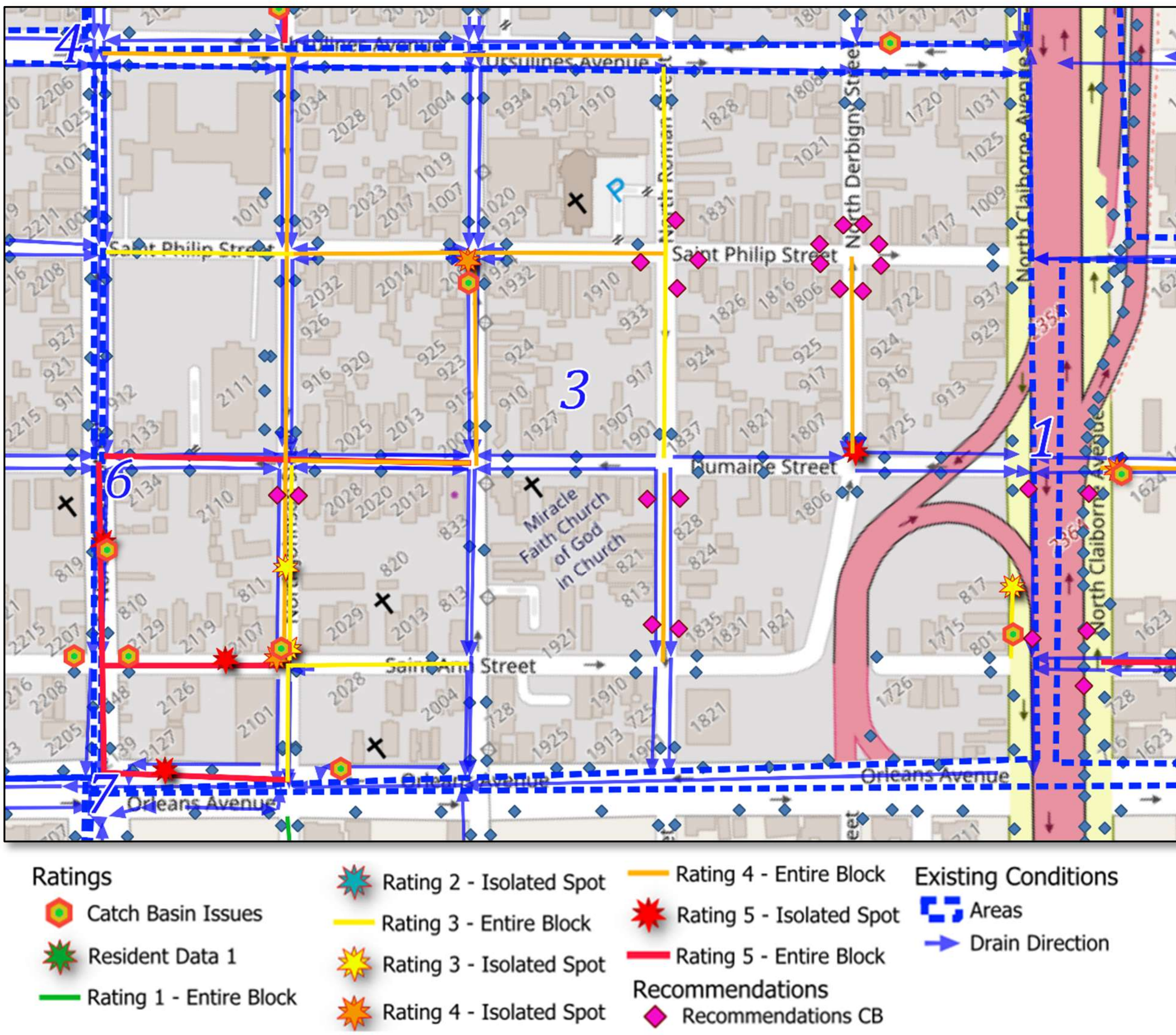

Figure 23: Neighborhood Area 3 Map

Zone 3.1 North Johnson from Orleans to Ursulines and surrounding areas N. Galvez to N. Prieur

This area has been identified as one of the two highest priority zones in the neighborhood. This zone covers the 800 to 1000 blocks of N. Johnson Street, stretching from Orleans Avenue to Ursulines, and includes adjacent and intersecting blocks such as N. Galvez, N. Prieur, St. Ann, Dumaine, and St. Philip. It has widespread reports of flooding, severe clogging, and overall drainage system failures. Residents report water taking several hours to drain even after moderate rain. In one case, a resident measured 10 inches of standing water during a February 2024 storm.

Figure 24: Flooding on St. Ann and N. Johnson behind Carver Theater

The outfall points for this zone are located at the Orleans Avenue Canal, which receives drainage from all upstream blocks. Flooding reports exist from the downstream 700 blocks all the way to the upstream 1000 blocks, indicating the issue encompasses the entire zone.

Field observations and resident photos show standing water, debris, and non-functional inlets across nearly every block. There is also evidence of structural deficiencies, like sunken concrete or sidewalk cave-ins, which may indicate broken laterals or collapsed lines. The intersection of St. Ann Street and N. Johnson has been a large concern of residents. The 2000-2100 blocks of St. Ann don’t have curbs and don’t appear to be graded in a way that allows proper flow of water to the catch basins. This intersection didn’t originally have drainage provisions, In recent years, however, two new inlets have been installed on the 800 block of N. Johnson near the intersection, and one new inlet in the intersection roadway itself.

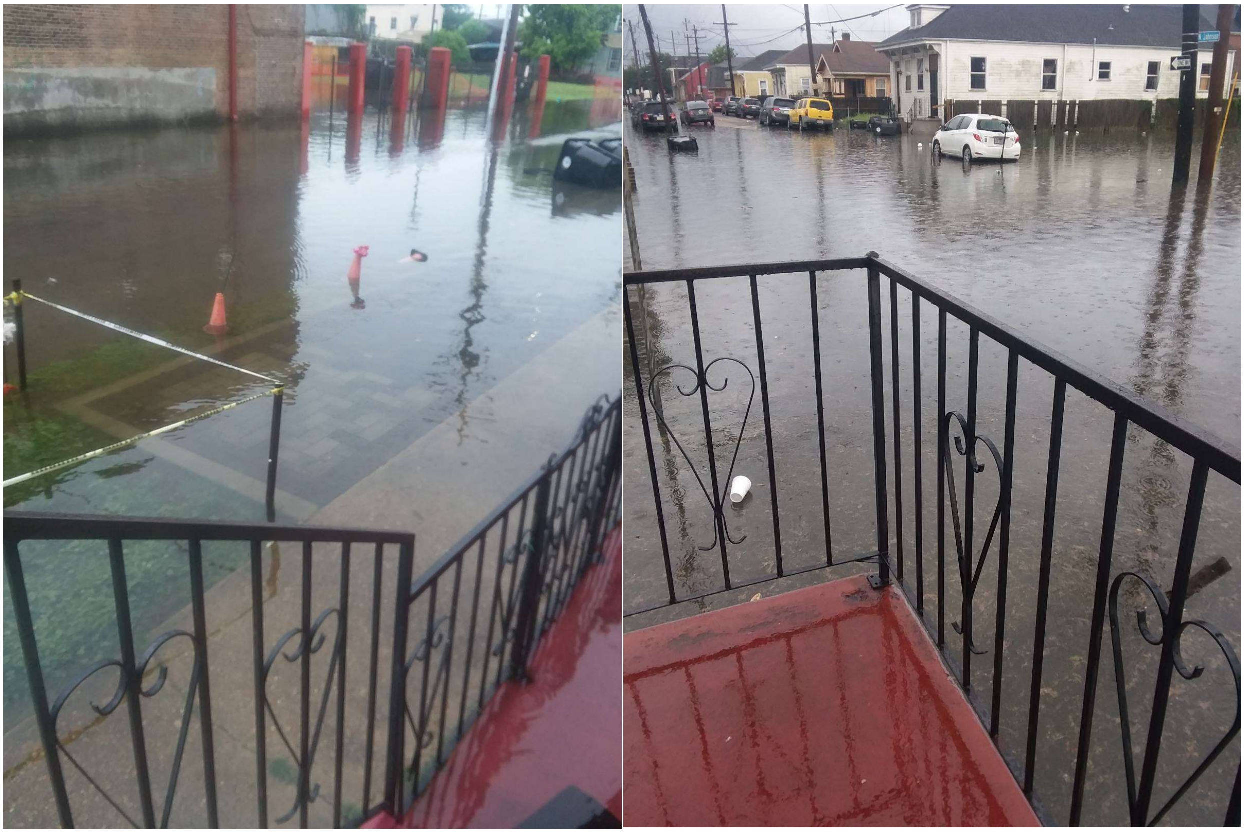

Figure 25: 2000-2100 St. Ann and N. Johnson

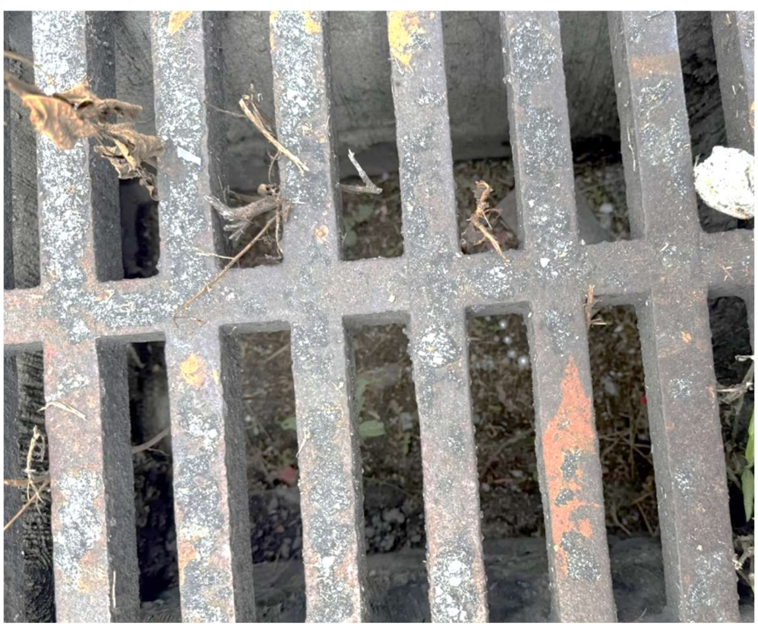

Figure 26: Blocked Inlet at the Intersection of N. Johnson and St. Ann

During a field observation, it was observed that the inlet at the intersection of N. Johnson and St. Ann is completely filled with compacted mud, blocking the connection to the pipe and preventing any flow. This inlet is at the 700 block at the downstream end of the system, validating the assumption that backups at this point are responsible for failures upstream. When these outfall lines are blocked, as appears to be the case here, it creates a chain reaction of flooding throughout the entire zone. Until this blockage is addressed, no upstream system improvements will be effective.

The possibility of additional contributing factors such as undersized lines or backwater effects from outfall features at the Orleans Avenue Canal cannot be ruled out and would require further hydraulic evaluation. However, the conditions observed point primarily to localized blockages and a lack of drainage capacity at this intersection and likely adjacent blocks as well.

Zone 3.1 Recommendations

- Extensive cleaning and CCTV of all lines from Orleans Avenue to St. Philip, with particular focus on N. Johnson, Galvez, and Prieur.
- Add new catch basins on 800–900 N. Johnson where drainage is limited or absent.
- CCTV Orleans Avenue Canal segments to rule out backwater stemming from the outfall system.
- Regrade or add curbs to blocks that have issues of stormwater flow.
- Monitor draining performance after cleaning to assess whether upsizing is necessary in future phases.

Zone 3.2 Dumaine to Ursulines N. Prieur to N. Claiborne

This zone, spanning Dumaine to Ursulines between N. Prieur and N. Claiborne, has significant gaps in existing drainage infrastructure. Many blocks either lack catch basins entirely or have very few that are insufficient to manage all the runoff from adjacent blocks. Street grading is poor in several areas, with flat or sunken sections that allow water to pool without reaching an inlet. On the 1000 block of N. Roman, runoff from the adjacent school parking lot exacerbates flooding.

Along St. Philip Street, very limited drainage infrastructure exists between N. Roman and N. Claiborne. Several blocks, especially along N. Roman and N. Derbigny show signs of persistent flooding due to the lack of drainage and catch basins at the intersections with St. Philip. The lack of catch basins prevent water from draining properly, causing it to accumulate at the curb and in the roadways.

Even blocks with more recent infrastructure, such as 1900 St. Philip, likely experience backups due to downstream deficiencies in this Area. The 1000 blocks of N. Roman and N. Derbigny have catch basins at the Ursulines intersection, but their performance is likely impacted by deficient downstream lines on Ursulines, which is lined with oak trees.

Given the lack of drainage infrastructure throughout this zone, adding new catch basins would be a long-term recommendation requiring future coordination with the SWBNO. While this may not be immediately feasible, the area should be noted as a priority for infrastructure improvements due to its consistent flooding and absence of drainage infrastructure. In the meantime, cleaning and CCTV inspection are recommended for the few areas in this zone that do have drainage.

4.8.4 Neighborhood Area 4

Area 4 has two major hot spot zones: Bayou Road and Esplanade Avenue, and Ursulines and N. Johnson.

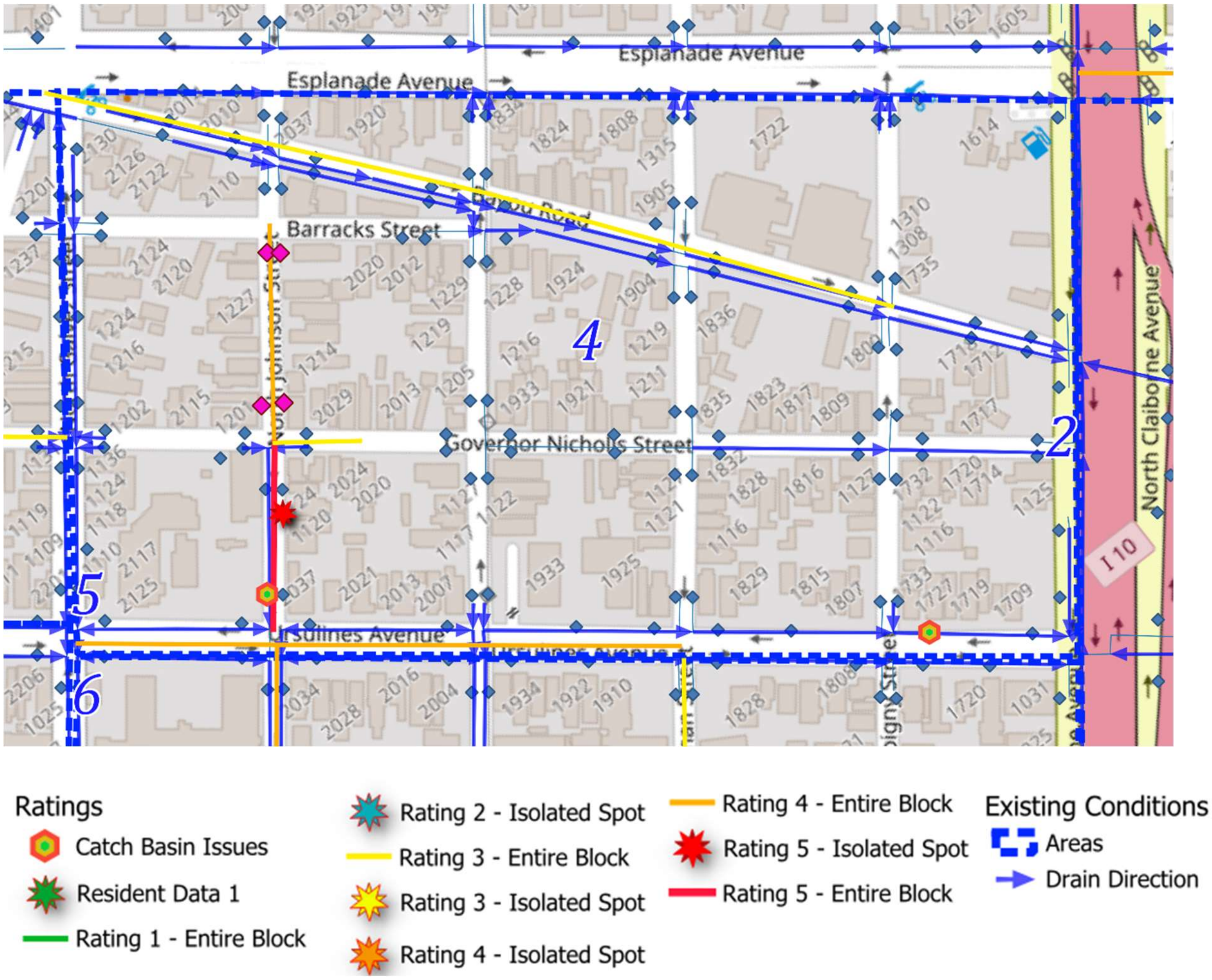

Figure 27: Neighborhood Area 4 Map

Zone 4.1 Bayou Rd and Esplanade

Bayou Road consistently floods along its entire stretch from N. Claiborne to Esplanade Avenue, with severity ratings of 4 and 5 across every block. The street is lined with large oak trees, and it is highly likely that the drainage lines are clogged with leaves and debris. The 1700 block was reported as impassable during rain events, suggesting full blockages and no flow through the system.

While Esplanade Avenue itself has no direct reports, it shares similar tree coverage and likely suffers from the same lack of maintenance. There is no indication these lines have been cleaned in recent years, and the pattern of flooding strongly points to widespread neglect rather than isolated issues. These conditions are likely worsened by the neighborhood’s topography and proximity to Esplanade Ridge, which can cause surface water to flow from a higher elevation towards Bayou Road.

Zone 4.1 Recommendations

- Clean and flush all storm lines from manhole to manhole along Bayou Road.
- CCTV inspection after cleaning to assess structural condition.
- Inspect Esplanade Avenue north of Claiborne for similar blockages.

Zone 4.2 Ursulines and N. Johnson

This zone contains several blocks experiencing slow drainage and persistent standing water, primarily due to two overlapping issues: accumulation of organic debris from the oak-lined corridors, and a lack of drainage infrastructure, particularly on 1200 N. Johnson and adjacent blocks.

Along Ursulines Avenue, 311 complaints and field reports consistently mention catch basins clogged with leaves, mud, or debris. The odd-numbered side of the 1700 block is especially problematic, and the 2100 block floods severely, pooling across the roadway. These issues likely stem from both surface debris and downstream backups, particularly on N. Johnson and N. Galvez, which share outfall points.

1200 N. Johnson is one of the few blocks in the neighborhood with basically no drainage infrastructure. The only functioning inlet is under a private driveway, which clogs frequently. The street has no proper grading to direct water toward adjacent systems, and runoff collects for days. Residents have also noted that adjacent blocks drain toward this corner, worsening ponding conditions.

Upstream and adjacent blocks of Johnson, Governor Nicholls and Barracks Street are lined with catch basins, but most are reported or observed to be clogged. These tie into Bayou Road, which itself is lined with mature trees and likely suffers from similar leaf buildup.

Zone 4.3 Recommendations

- Drain Line Cleaning and CCTV: Clean and inspect the entire length of N. Johnson between Gov. Nicholls and Bayou Rd, and Ursulines
- New Drainage Infrastructure: Consider installing four new catch basins on 1200 N. Johnson tied to Gov. Nicholls. Evaluate curb grading and sidewalk drainage in this area and on Barracks Street.
- Routine Maintenance: This tree-lined corridor should be prioritized for seasonal cleaning to prevent continued clogging and flooding recurrence.

4.8.5 Neighborhood Area 5

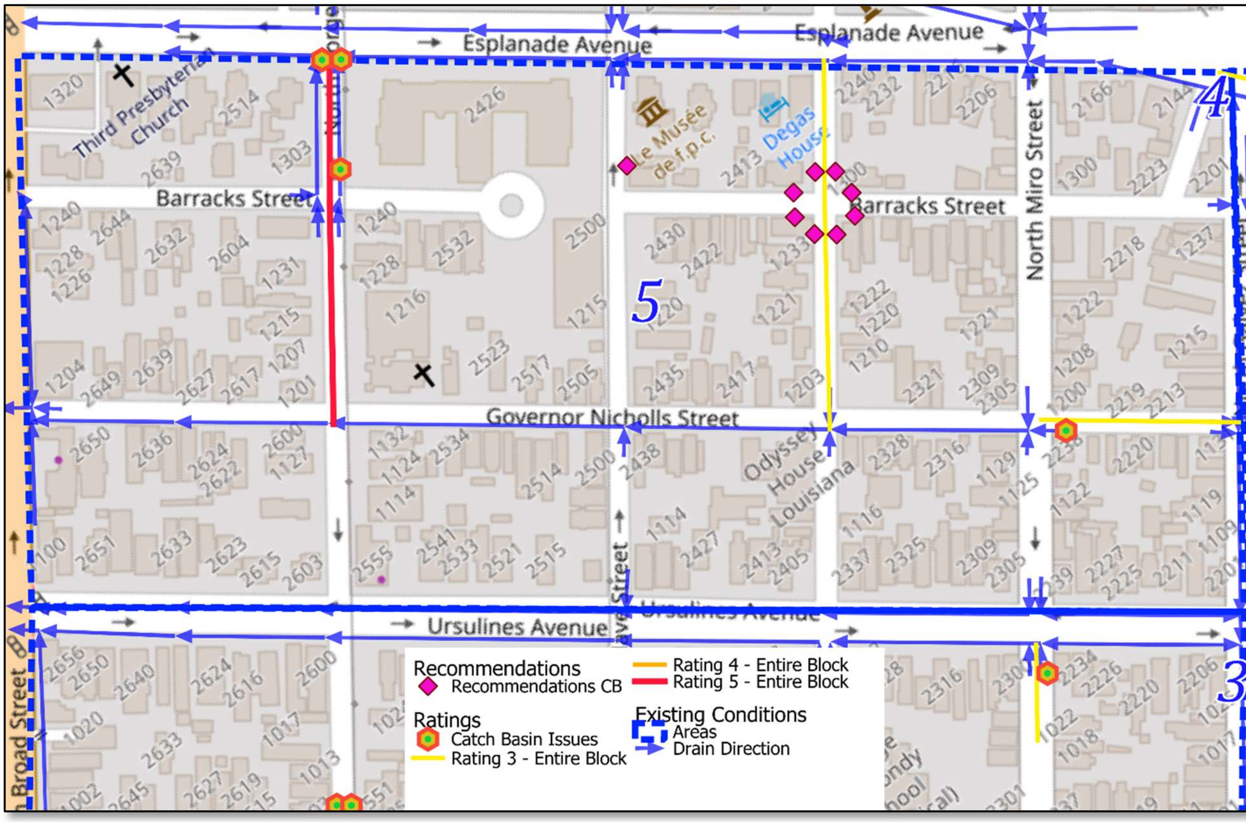

Figure 28: Neighborhood Area 5 Map

Area 5 contains scattered problem blocks but no large-scale hotspot zones. Isolated issues include drainage blockages along N. Dorgenois and N. Tonti, as well as Esplanade Avenue, which continues to show signs of leaf accumulation and slow drainage, consistent with conditions noted in Zones 2-4. Most streets in this area drain toward larger corridors like Gov. Nicholls, Ursulines, or Esplanade, all of which may be contributing to backups due to their own maintenance needs.

Tree-lined blocks, particularly on N. Dorgenois and Esplanade, appear to have drainage infrastructure that is sunken, clogged, or in need of structural repair. Notably, 1200 and 1300 N. Dorgenois have catch basins impacted by adjacent trees and long-term debris buildup. In some cases, structural issues like collapsed lids or sidewalk settling may also be affecting function.

N. Tonti shows lack of infrastructure. The 1200 and 1300 blocks rely on old surface ditches or have no catch basins at all along Barracks Street. Field observations and 311 data confirm slow drainage and standing water.

Area 5 Recommendations

- CCTV and Cleaning: CCTV inspection and cleaning of CBs and lines on 1200–1300 N. Dorgenois and N. Tonti. Pay special attention to lines near Esplanade, Gov. Nicholls, and Barracks intersections.
- CB Adjustments and Repairs: Adjust or repair CBs on 1300 N. Dorgenois where tree roots or settlement may be obstructing access.
- Drainage Additions: Evaluate the need for new catch basins along Barracks at 1200–1300 N. Tonti where drainage is lacking.

4.8.6 Neighborhood Area 6

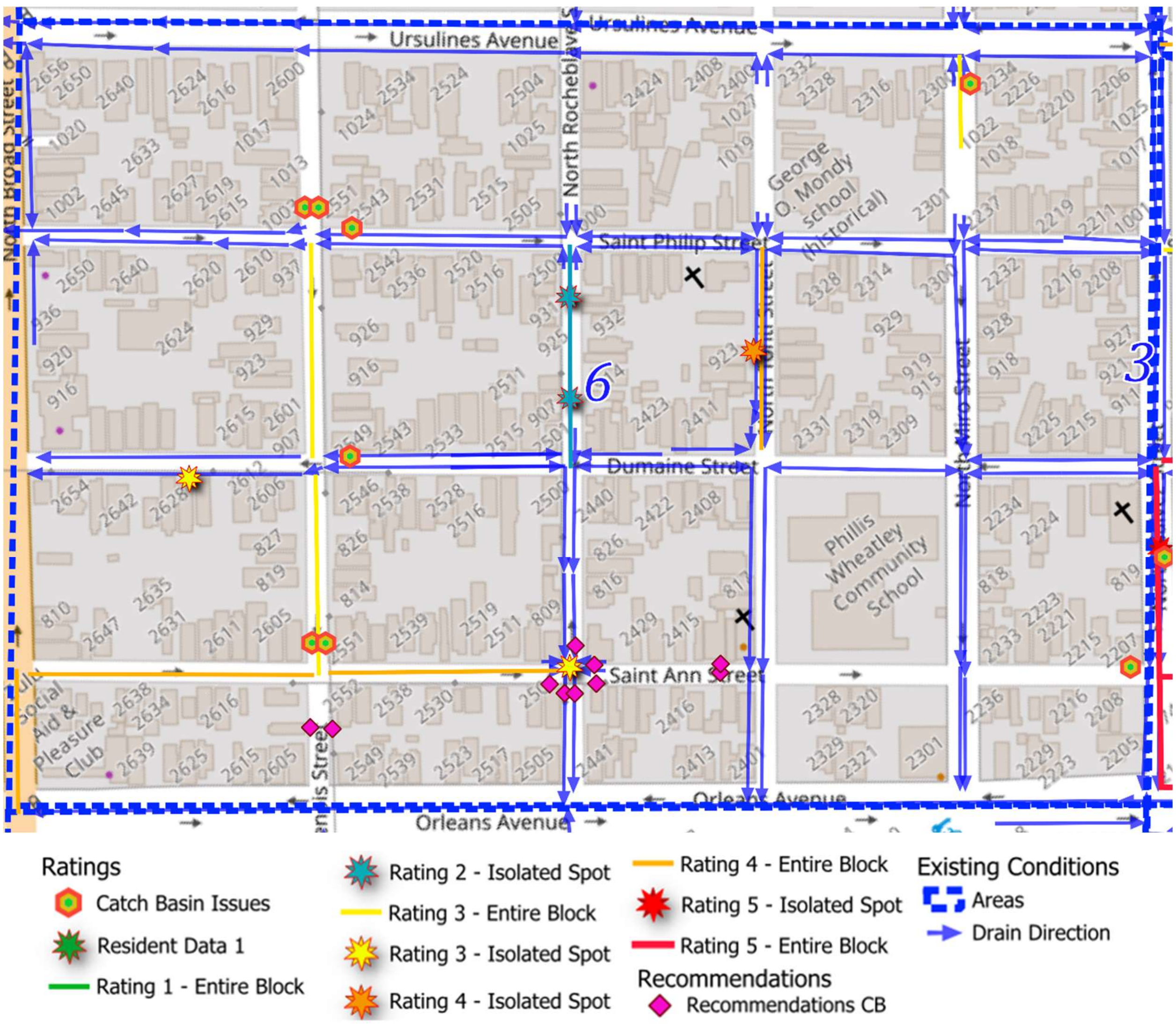

Figure 29: Neighborhood Area 6 Map

Area 6 contains scattered drainage problems rather any specific hotspots. The most severe issues are along St. Ann Street near N. Rocheblave, where multiple residents reported knee-deep flooding, vehicle damage, and basins that drain slowly or appear to have been removed after street work, suggesting possible construction impacts or debris left in the lines. Along 2400 St. Ann including both intersections lack catch basins entirely, and the single basin present on N. Rocheblave appears unable to keep up. Improper grading seems to also play a part in preventing water from reaching inlets on nearby streets.

Other concerns include chronic clogging along N. Dorgenois between St. Ann and Ursulines, where oak trees contribute to heavy leaf buildup, and several blocks on N. Dorgenois (900–1100) require cleaning and CCTV to check for root intrusion or pipe damage. N. Miro Street shows similar issues, with root impacts and low spots causing backups. On Dumaine near N. Dorgenois, clogged basins allow water to reach building steps, while N. Rocheblave has ditches filled with rocks and poor road grading that traps water. Similar issues were reported on N. Miro Street, where tree roots and low spots in sidewalks are suspected of breaking laterals and slowing drainage. Collectively, the problems in this area point to a mix of neglected maintenance, incomplete infrastructure, and possible effects of tree intrusion.

Given this area's proximity to the N Broad Canal and DPS 3, it is possible that backwater effects or pump station overflows could be contributing to localized flooding. It is worth noting, however, that we have not received many residents' reports of flooding on the blocks directly adjacent to N Broad. This suggests that widespread pump or canal backwater issues may not be the primary driver here, and that localized clogs, grading problems, or missing inlets are more likely causes. Still, because of its location, this area would likely be among the first impacted if DPS 3 or the canal were to surcharge during a major storm, although confirming this would require more detailed hydraulic evaluation. At present, the evidence suggests that routine cleaning, targeted CCTV surveys, and potential inlet additions at key intersections like N. Rocheblave and St. Ann would provide the most immediate relief.

4.8.7 Neighborhood Area 7 and 8

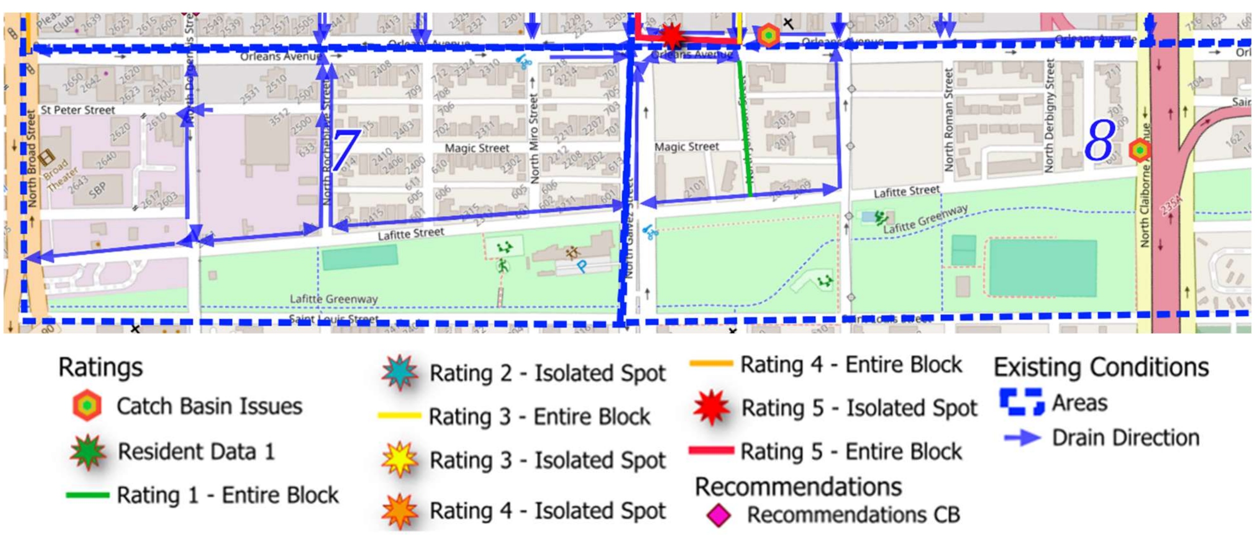

Figure 30: Neighborhood Area 7-8 Map

There were limited findings in **Area 7** and **8**. Very few resident reports were received, and no significant flooding complaints were recorded. There is evidence of heavily tree lined blocks like that on 700-800 N.

Prieur, and a reported catch basin issue on N. Claiborne, there is no clear indication of major drainage concerns in this zone. Simple cleanings and CCTV are recommended to evaluate these isolated reports.

It is worth noting that the Lafitte Greenway sits at a higher elevation than the surrounding blocks, which may contribute to runoff into adjacent areas during heavy rainfall.

4.9 Model Results Evaluation

To support and validate our findings, GreenPoint briefly reviewed existing drainage model results from Ardurra's Stormwater Master Plan and CDM Smith's capital planning reports. These models provide valuable context for systemwide behavior and were used to cross-reference our localized observations in Tremé.

Ardurra's report included design storm inundation maps for both the 10-year and 100-year storm events. When overlaid with our GIS database, the high-inundation zones in the Ardurra model 10-Year storm closely aligned with the hot spot zones we identified through resident input and field observation, particularly in **Areas 1** and **3**. This shows that apart from suspected blockages in conveyance in most high priority hot spot zones, there could also be some overarching hydraulic factors contributing to the flooding issues seen in certain areas.

Figure 31 below, shows how areas without catch basins contribute to the inundation levels in the area. It should be noted that the large area of deep flooding around Armstrong Park area is indicative of the lagoons.

GreenPoint also reviewed CDM Smith's recommendations, which included several proposed upgrades for lines near N. Claiborne and other critical outfall points. These suggestions aligned with many of our assumptions, particularly in areas like N. Villere and Dumaine, where capacity limitations or system backups are suspected.

Overall, the model outputs support the conclusions and reinforce the need for immediate cleaning, CCTV inspection, and potential upsizing in key areas. Select inundation maps and relevant excerpts from both reports are included in **Appendix C** for reference.

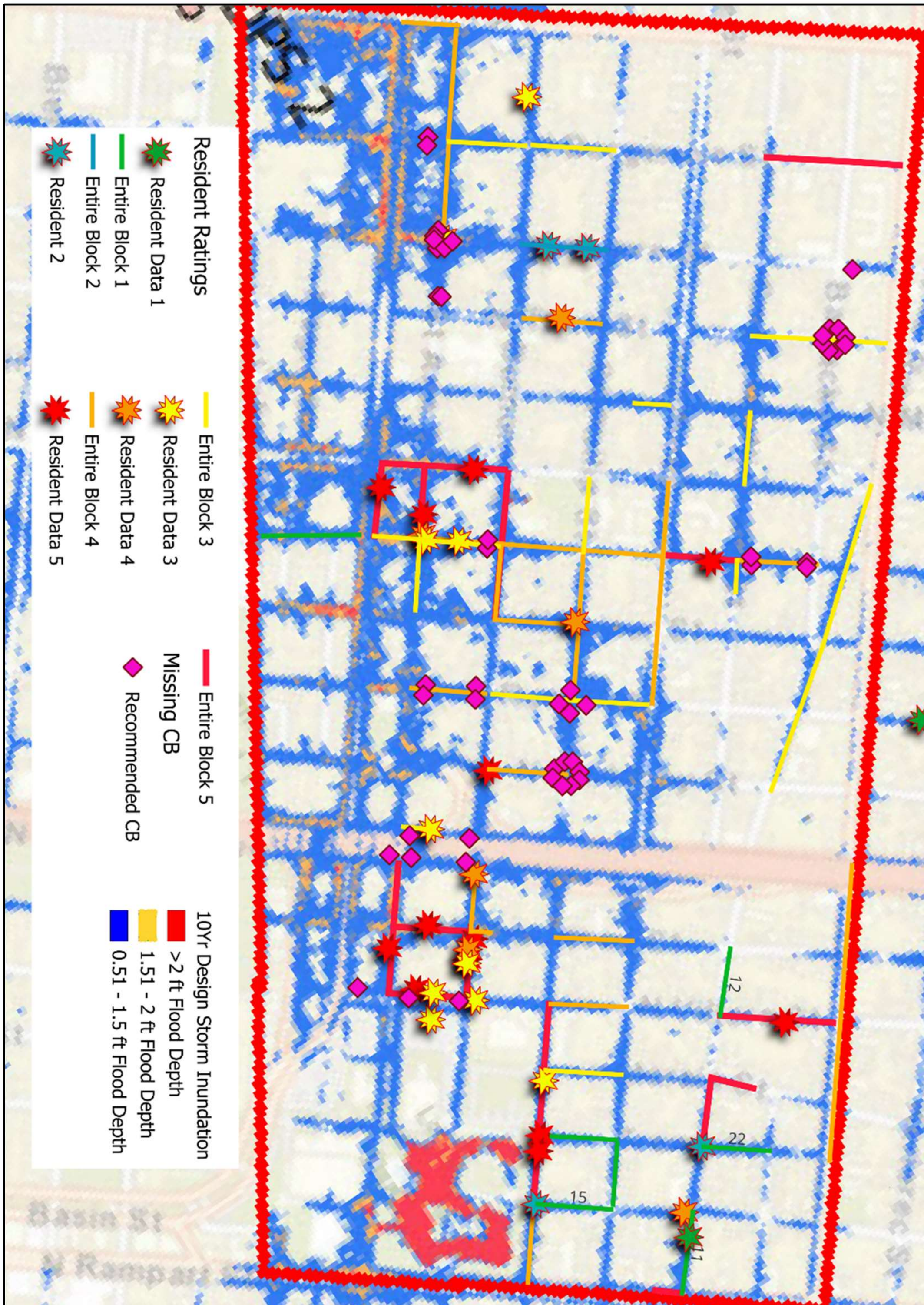

Figure 31: 10-Yr Inundation Map with Resident Ratings

4.10 Drone Survey Results

The aerial drone survey provided a high-resolution surface model of the Tremé neighborhood, proving highly valuable in identifying low-lying areas, evaluating street grading, and understanding how stormwater collects and flows through the neighborhood. These visualizations validate many of the assumptions developed through field visits and resident input, tying observed flooding directly to topographic conditions.

Figure 32 below is a topographic heat map of the entire investigation area, showing street elevations relative to the rest of the neighborhood. This map highlights critical depressions and low points in the roadway network, many of which align closely with resident reports of frequent flooding. Dark and light blue areas indicate surface elevations between 0 and –3 feet, representing low points. Yellow and red areas show higher elevations between 0 and 5 feet.

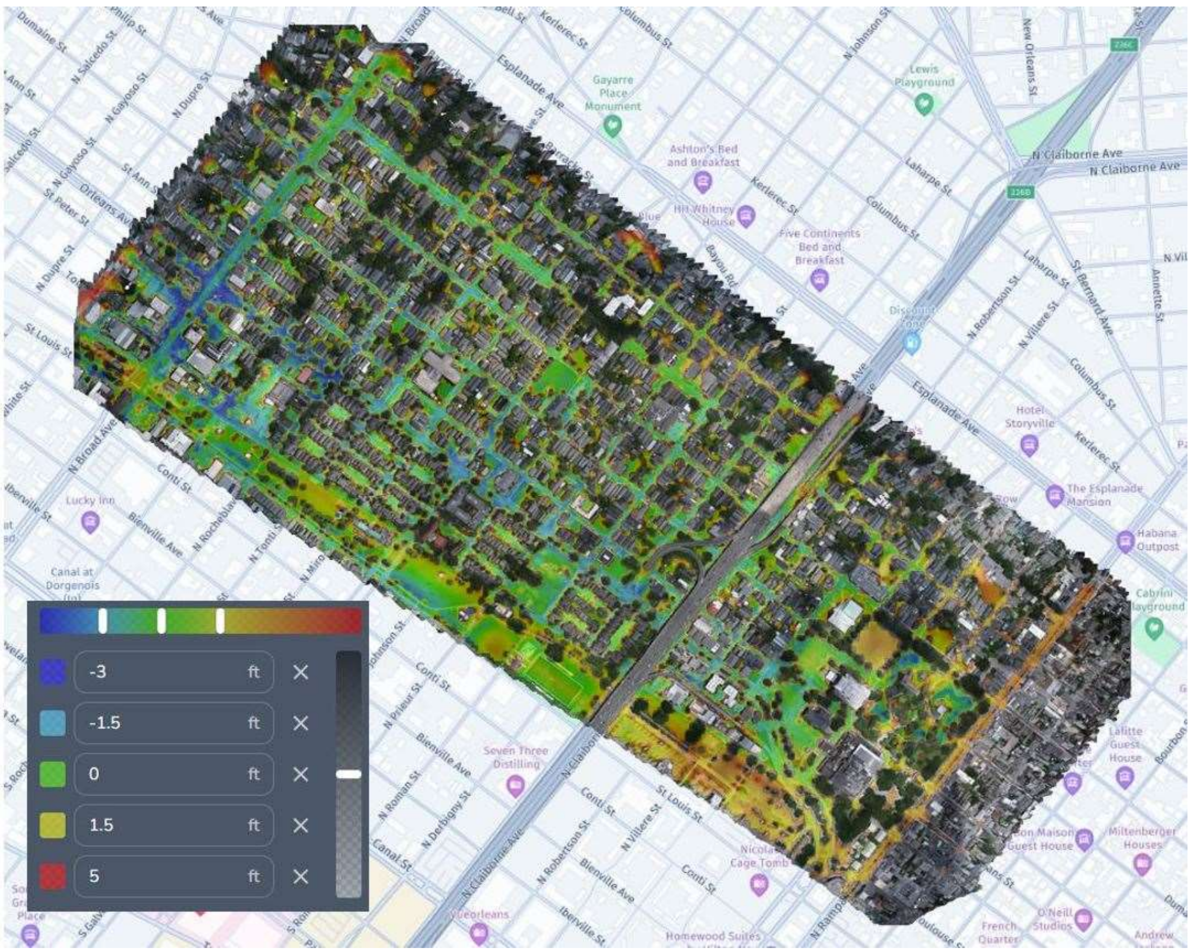

Figure 32: Topographic Elevation Heat Map of Tremé Neighborhood

Figures 33–35 provide closer views of different sections of the neighborhood for a more detailed interpretation. Consistent with field observations, low points were identified along N Broad Street and throughout Orleans Avenue, which is a primary outfall connected to the Orleans Avenue Canal. These correlations support resident reports of standing water at these locations. The elevation data also confirms that St. Louis Street and N. Rampart Street are higher in elevation, explaining some differences in flooding behavior around these corridors. The low spots on this map are good indications of areas that should be prioritized for cleaning and maintenance to ensure they can effectively receive flow from adjacent blocks that are higher in elevation.

Figure 33: Topographic Elevation Heat Map – North Broad to Galvez St.

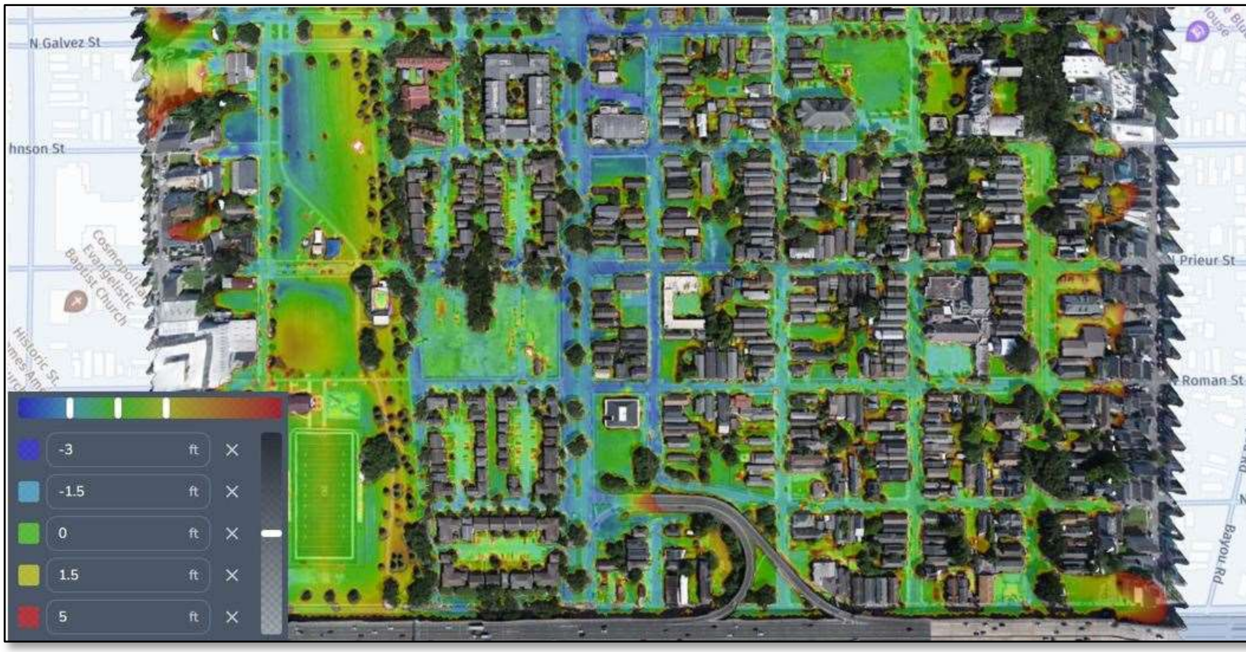

Figure 34: Topographic Elevation Heat Map – Galvez St. to N. Claiborne

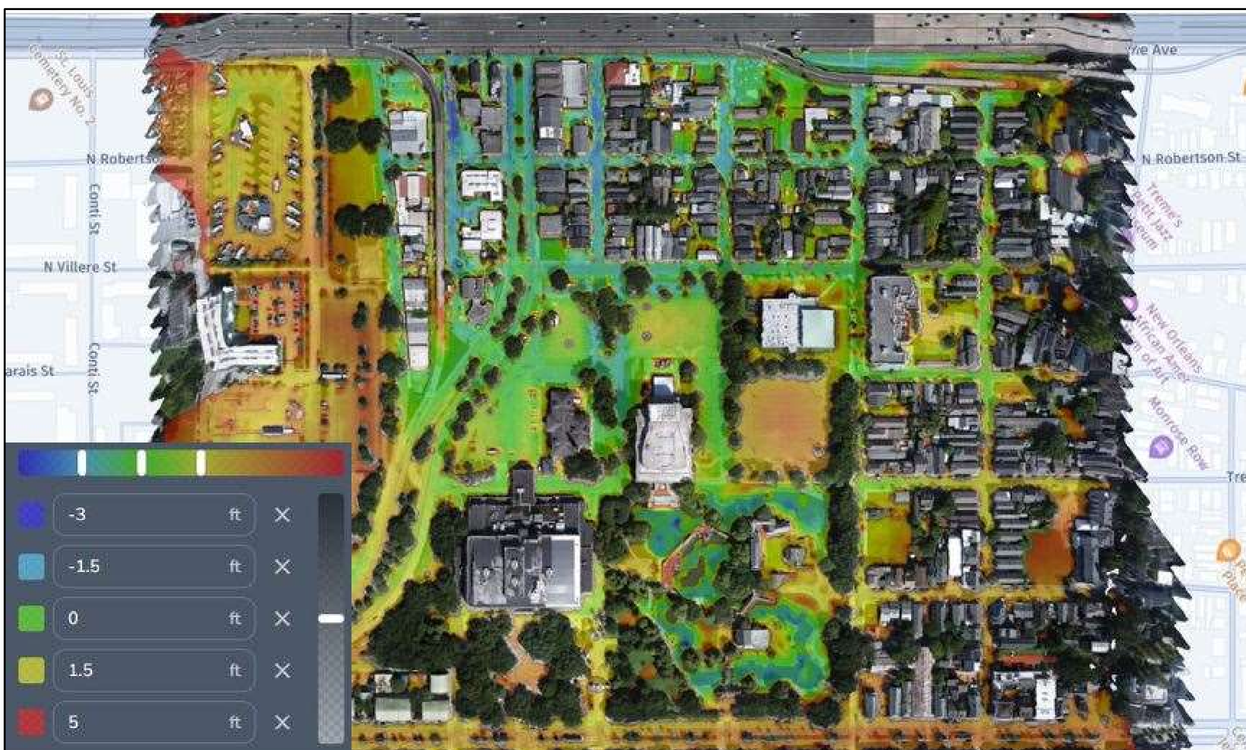

Figure 35: Topographic Elevation Heat Map – N. Claiborne to North Rampart

Figure 35 shows the elevation heat map for the area from N. Rampart to N. Claiborne. This analysis indicates that Dumaine Street, St. Ann Street, and N. Robertson Street, along with sections of N. Claiborne Avenue, are among the lowest points in this area (Area 1). These findings suggest that runoff in Area 1 originates not only from Armstrong Park, as discussed in Section 4.6, but also from St. Louis Street and the Lafitte Greenway. This reinforces the need for thorough cleaning, operational checks, and eventual capacity evaluations for these lines.

Figure 36 below illustrates modeled catchment and flow analysis derived from the drone survey for the same area shown in Figure 35. The yellow and orange arrows indicate surface flow paths, showing how rainfall moves across the landscape during storm events and where it tends to accumulate. These flow patterns confirm the location of roadway low points and validate many assumptions drawn from field visits and resident feedback.

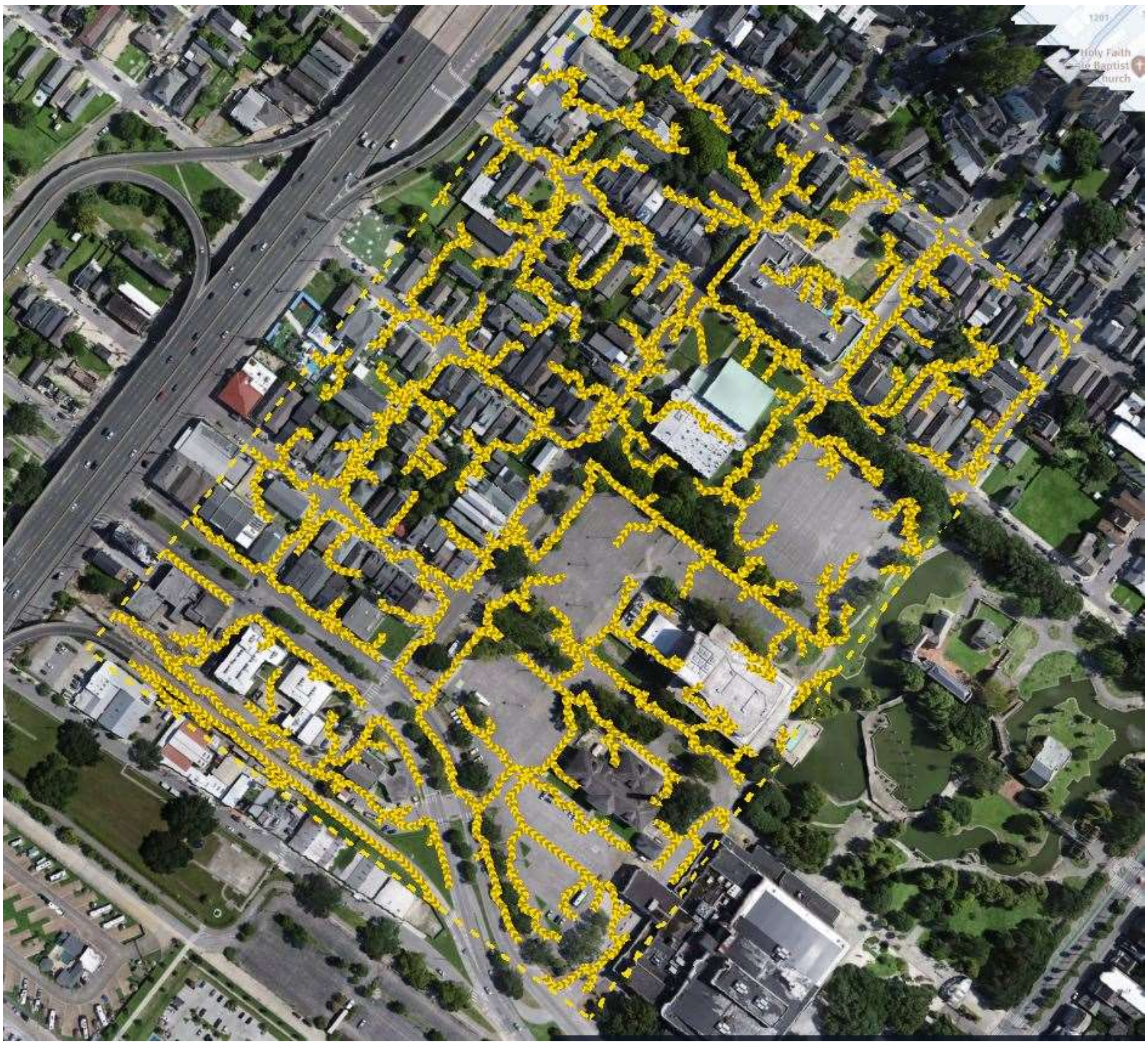

Figure 36: Flow Analysis of Areas 1 and 2

A closer look in Figure 37 focuses on the corner of N. Villere Street and Dumaine Street. The flow analysis shows runoff streams bypassing catch basins on N. Villere and continuing down Dumaine, indicating N. Villere may not be graded properly, resulting in the catch basin near the corner of Dumaine to act as an intermediate catch basin rather than a low-point catch basin. An intermediate catch basin will only collect a fraction of the runoff while the rest flows to the next low point. Therefore, the inlet may not be effectively capturing stormwater runoff from the parking lots of Armstrong Park and Tremé Community Center. As a result, larger volumes of runoff are entering the residential portion of the neighborhood. By combining this flow data with field observations, we can assess the catch basins around the neighborhood and evaluate which catch basins are optimally placed to collect runoff and which may be poorly positioned or obstructed.

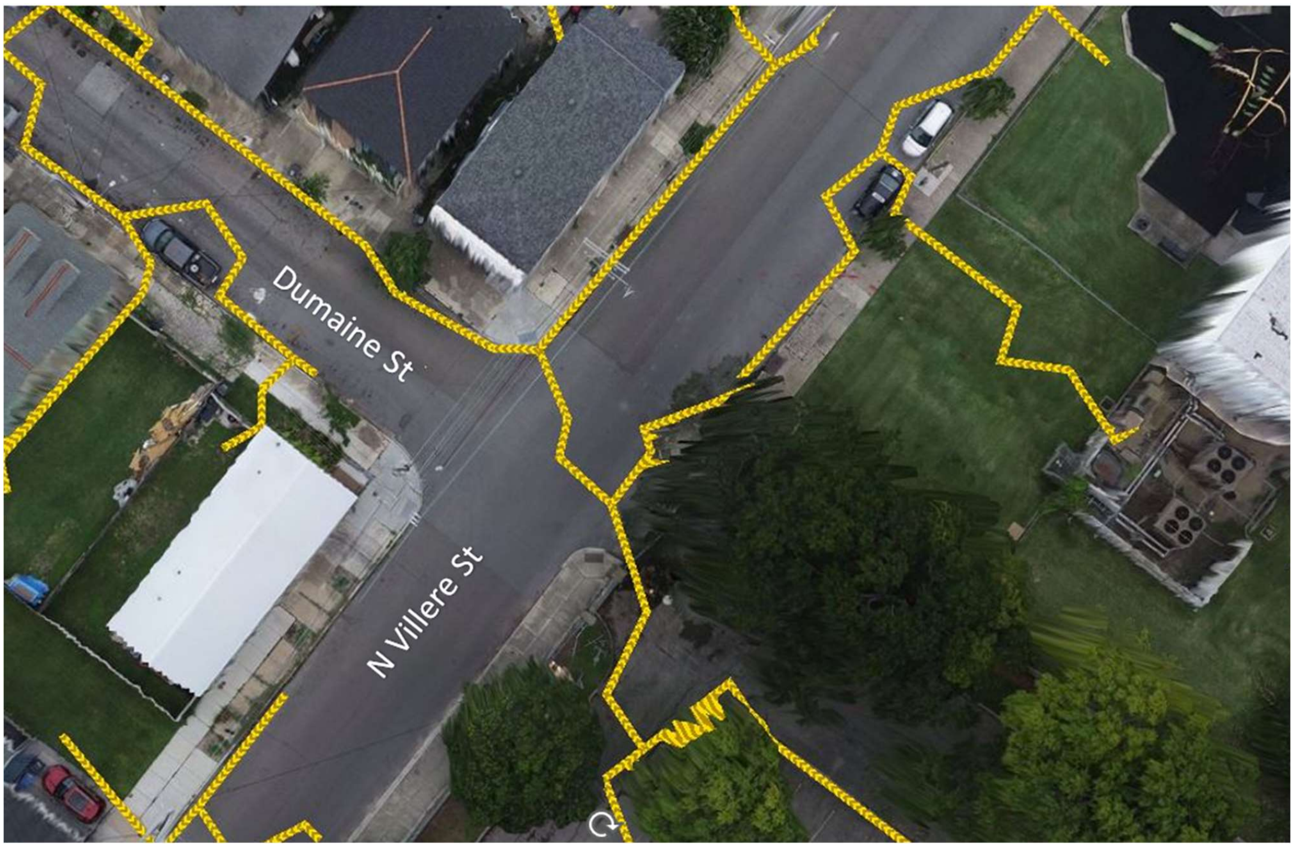

Figure 37: Figure 33: Flow Analysis of N. Villere and Dumaine Intersection

While these results provide a clear visual understanding of elevations and surface flow patterns, the next step will be to integrate this data into a detailed hydrologic and hydraulic analysis or model. This will allow for calculation of runoff volumes, assessment of pipe capacities, and evaluation of upsizing opportunities, such as the recommendations outlined in the CDM Smith report. These future analyses will build on the drone survey findings to guide future design-level drainage improvements in Tremé. Additional drone results can be found in **Appendix B.**

4.11 Overall Conclusions

Much of the flooding across much of Tremé appears to be primarily driven by conveyance issues, either water not reaching catch basins due to grading, debris, or lack of infrastructure, or water within the system being unable to reach the pump station due to blockages or downstream constraints.

The most immediate and widespread need is system cleaning. Many lines and inlets are visibly clogged with sediment, leaves, and debris, and have likely not been maintained in years. Until thorough cleaning and CCTV inspections are completed, it is difficult to determine whether additional contributing factors, such as outfall system inefficiencies or undersized lines, are playing a larger role.

There is potential that DPS 3 is not operating at full capacity or lacks the ability to handle increasingly intense rainfall events, as well as undersized pipes creating bottle necks. However, confirming that would require a much broader hydraulic investigation that accounts for system-wide interactions, rainfall intensity, and outfall system performance. Cleaning and inspection will help isolate localized issues first. If drainage problems persist after cleaning, then further analysis of pump capacity and system hydraulics may be warranted.

5 Recommendation of Next Steps

Based on the full neighborhood assessment, GreenPoint has prepared a spreadsheet of next-step recommendations for each block, compiled from field observations, resident feedback, and historical and existing drainage data. The recommendations fall into several key categories described below. These should be implemented in coordination with the Sewerage and Water Board of New Orleans (SWBNO) and the City of New Orleans, and guided by available funding, access, and system priority.

5.1 Simple Catch Basin and Manhole Investigation

Manhole and surface inlet inspections should be the first step for locations with suspected clogging. Inexpensive and non-invasive, this method can quickly determine whether debris buildup is visible at key junctions. SWBNO maintenance teams may be able to perform these checks with minimal effort and help prioritize immediate cleanouts- referred to as "zooming."

5.2 CCTV Survey and Drain Line Cleaning Plan

A targeted CCTV and cleaning effort is strongly recommended for blocks identified as clogged or severely impacted by flooding. Much of the system appears to be backed up with years of organic debris and trash. Cleaning will help determine whether the cause of the flooding is due to clogged pipes or a more serious downstream hydraulic or structural issue. This is especially important in Zone 1.1 (Orleans and Villere) and Zone 1.6 (N. Johnson corridor), where standing water persists long after rainfall.

CCTV surveys should follow cleanings where needed and will help verify pipe integrity. If clogs are removed but flooding persists, it may indicate undersized infrastructure or capacity limits further downstream. CCTV and cleaning recommendations can be found in the Project Summary detailed in **Appendix A.**

Implementing the above recommendations is basic and essential and should potentially improve the current drainage and flooding situation in the investigation area. However, by freeing up pipe capacity and allowing more flow to reach the pump stations, it will increase the runoff load on a potentially strained pump station. This cannot be confirmed at this time without further study and evaluation, which is not within the current scope of this study. GreenPoint recommends implementation of the above measures. A broader scope study of the city-wide controlled systems may be required if the above measures do not significantly improve the current flooding situation in the Tremé investigation area.

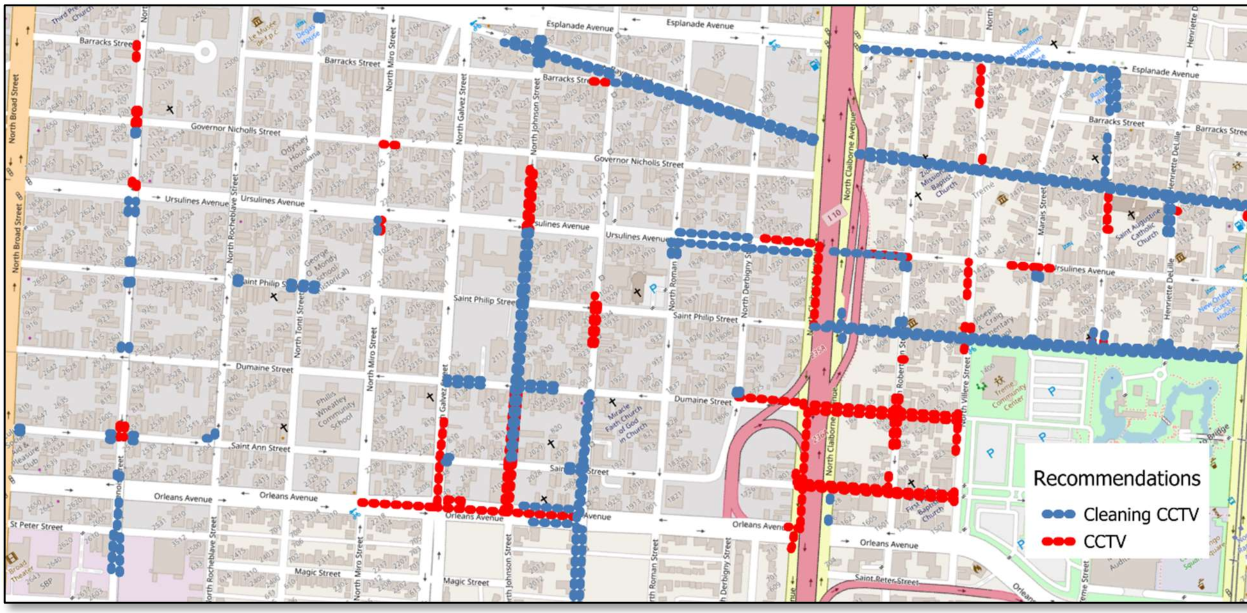

Figure 38: GIS Map with CCTV and Cleaning Recommendations

5.3 Drainage and Road Infrastructure Improvements

New drainage infrastructure should be considered for blocks that currently lack any catch basins or where surface grading does not allow runoff to reach inlets. Locations such as N. Roman Street and sections of N. Johnson were found to have no functional drainage. While new installations may be long-term and require city capital programming, these areas should be flagged for future upgrades. Drainage infrastructure recommendations are included in the Project Summary in **Appendix A.**

5.3.1 Repairing

Where evidence of concrete in lines or failed infrastructure exists, repair and possible line replacement will be necessary. Any confirmed lateral or trunk line damage should be used as an opportunity to evaluate upsizing, especially where recommendations from CDM or Ardurra already support increased capacity. This includes corridors like N. Claiborne and parts of Dumaine and St. Ann.

5.4 Pump Station and Canal System Review

As blockages are cleared and more flow is conveyed downstream, the impact on DPS 3 and the Orleans Canal should be closely monitored. While an evaluation of the outfall system is outside the scope of this report, operational limits may become more apparent as flow improves. If backup persists after clearing known bottlenecks, a further look at canal levels, system hydraulics, and outfall system factors should be considered.

5.5 Additional Data Collection

Several areas of investigation remain unresolved. Access to detailed 311 complaint records would help clarify patterns of recurring issues. More resident questionnaire input post-cleaning could help verify performance improvements. Additionally, understanding system changes post-Katrina, including the re-routing from DPS 2 to DPS 3 and 19, may help explain long-term increases in flooding reported by residents.

5.6 Best Management Practices

Community-driven stormwater management is key to long-term drainage improvements in Tremé. While larger fixes require city action, everyday flooding can be reduced through simple maintenance and behavior changes by both residents and public agencies and staff.

5.6.1 Continued Resident Education and Engagement

Resident education remains a vital strategy for reducing localized flooding and preserving system function. GreenPoint recommends continued outreach focused educating the residents on:

- How and when to report drainage issues via 311
- What not to dispose of in drains (e.g. trash, leaves, oil)
- How small actions like keeping drains clear can prevent blockages
- Promoting household-scale green infrastructure (e.g. rain gardens)

Empowering residents with practical knowledge and clear reporting channels will help address minor issues before they escalate and strengthen coordination between the community and the City.

5.6.2 SWBNO Routine Maintenance and Cleaning

Some of the most flood-prone corridors identified in this investigation, such as St. Philip Street, Bayou Road, and Esplanade Avenue, are heavily lined with mature trees and are likely to continue experiencing clogging due to continued leaf drop, as detailed in **Section 4.3**. GreenPoint recommends the development of a seasonal or prioritized cleaning list for these locations, so they can be maintained more proactively. Perhaps even establishing a flagging mechanism between SWBNO and community organizations, so recurring problem areas can be reported and added to cleaning schedules more easily.

Additionally, cleaning crews in public spaces like Armstrong Park should be trained or reminded not to blow leaves and debris into the street or toward catch basins, as this behavior contributes directly to clogged inlets downstream.

5.7 Technical Coordination

For any next phase of this drainage investigation, GreenPoint recommends establishing a clear technical coordination framework. This includes outlining the roles and responsibilities of all key stakeholders, primarily the Sewerage and Water Board of New Orleans (SWBNO) and the City of New Orleans (CNO), in both short-term data access and long-term project implementation.

A Cooperative Endeavor Agreement (CEA) should be formalized with SWBNO to enable collaboration on inspections, cleanings, CCTV work, and data sharing. This working relationship is critical for accessing existing infrastructure records, coordinating cleaning schedules, and aligning future phases of design and construction. Establishing this CEA will help ensure that drainage improvements are implemented in a way that is both technically sound and mutually supported by all parties.