

From Dumping Grounds To Living Systems

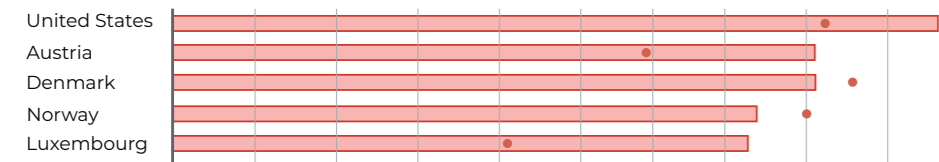
05.01.2026
Connecting Ideas to Implementation:
A Texas A&M Capstone Showcase



Jee Park
Capstone Professor: Sungming Lee
Texas A&M University
Landscape Architecture and Urban Planning

From Dumping Grounds To Living Systems

Top 5 OECD Municipal Waste Per Person (2023 vs 2021)



100M

Tons Of Trash Is Illegally Dumped Per Year Worldwide

1.5M

Tons Of Trash Is Illegally Dumped Each Year In The Us

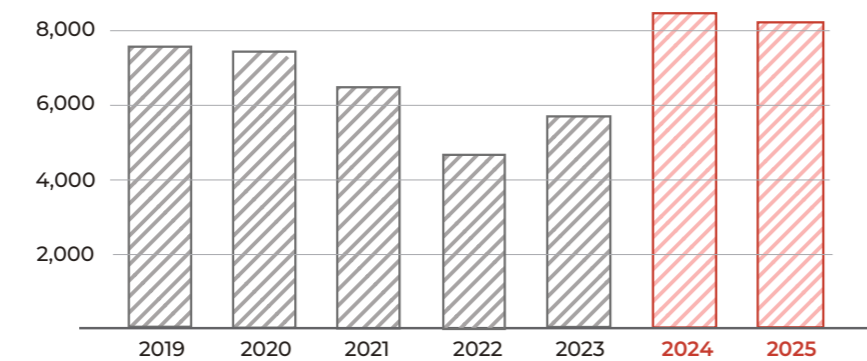
Illegal dumping is increasing not only globally but also within the United States, where total municipal waste continues to rise and the U.S. remains among the highest waste-generating OECD countries. Globally, municipal solid waste is projected to grow from about 2.1 billion tonnes to 3.8 billion tonnes by 2050, and at least 33% of waste is currently mismanaged through open dumping, burning, or other improper disposal, reinforcing the link between rising waste output and the scale of illegal disposal pathways.

10.8K

Tons Of Waste Was Removed From, And More Than 5,000 Illegal Dumping Sites Were Investigated In Texas



Requests Related to Illegal Dumping in Houston



The number of "trash dumping" and "illegal dumpsite" service requests **increased in 2024 and 2025**

Illegal Dumping in Houston: A Policy and Community Timeline

Houston has experienced disproportionately high levels of illegal dumping and community complaints, in part due to rapid urban growth, gaps in municipal response, and repeated resident reports that have brought the issue sustained public and legal scrutiny.

1955
The Houston mayor declared a "war on illegal trash," initiating formal enforcement policies and police action against illegal dumping.

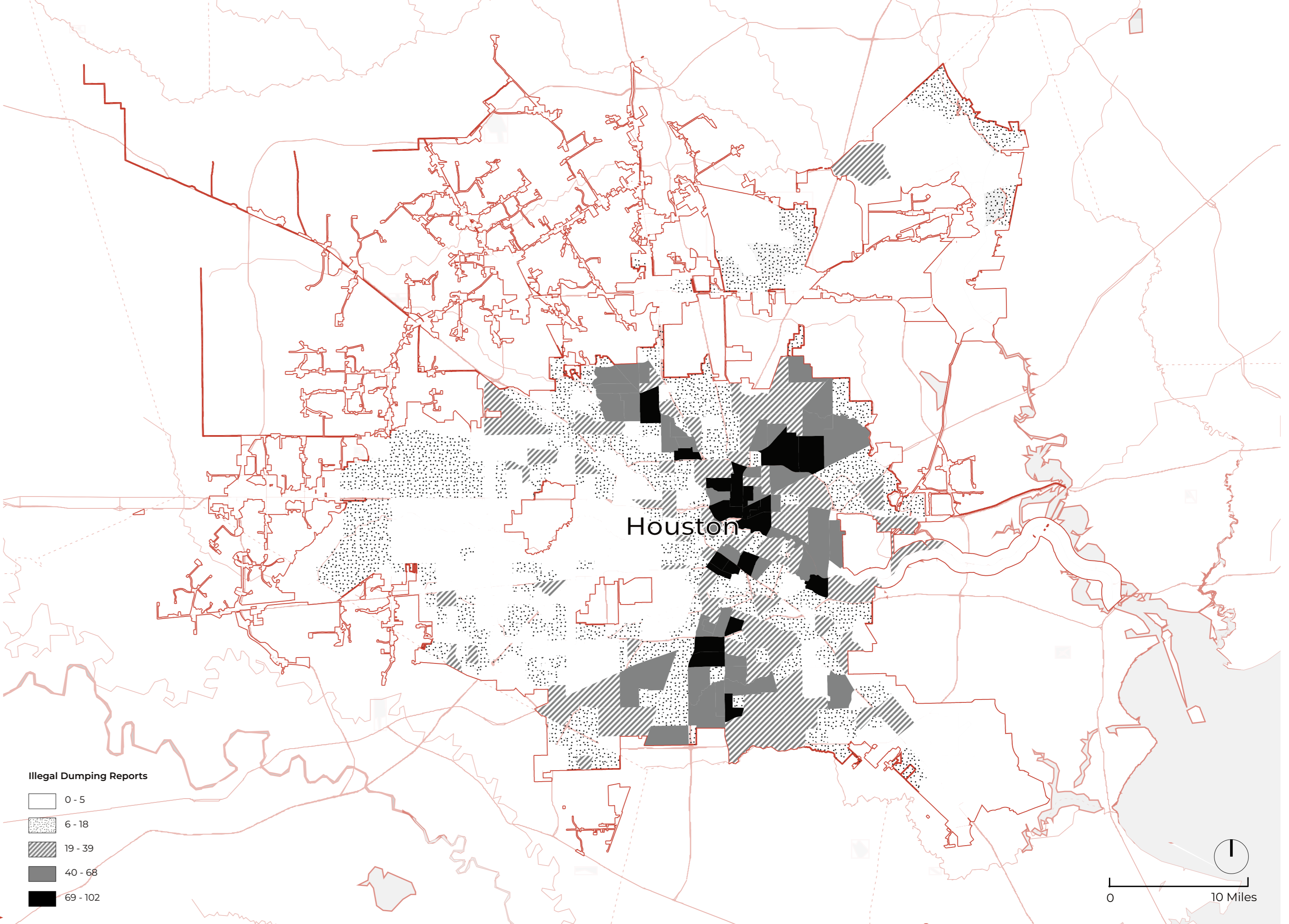
1960 - 1990
From the late 20th century through the early 2000s, rapid urban growth increased waste volumes, alongside rising illegal dumping complaints, especially in low-income areas.

2015 - 2017
Repeated resident complaints and media coverage brought illegal dumping into broader public attention as a citywide issue.

2023 - 2025
In 2023, the U.S. Department of Justice reached an agreement with Houston over inequitable illegal dumping responses, and its federal monitoring concluded in 2025.

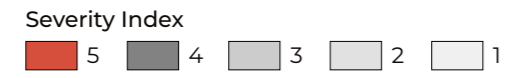
2026
Illegal dumping remained a major community issue, with ongoing complaints and social and environmental impacts.

Illegal Dumping 311 Requests By Census Tract (2025)

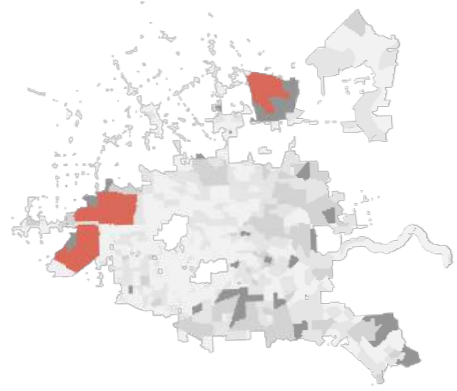


Layer Weighting for Site Prioritization

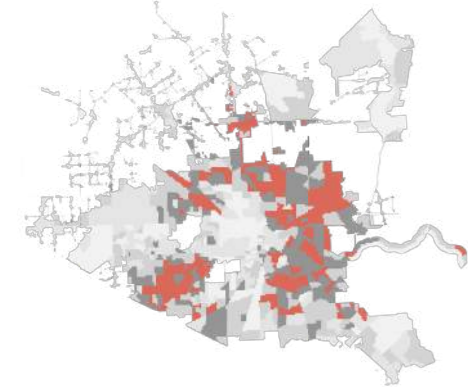
Weights emphasize illegal dumping as the primary issue while balancing social vulnerability, environmental stress, health risk, and site feasibility to prioritize areas with the greatest need and intervention potential.



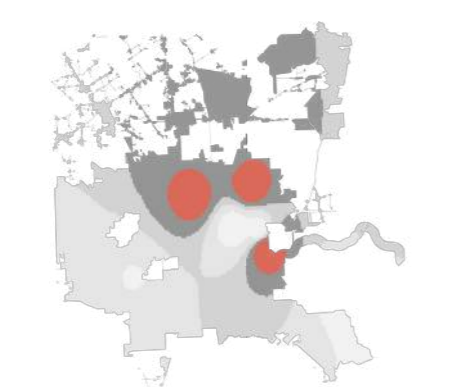
Illegal Dumping - 38%
Illegal dumping was prioritized as the primary issue to be addressed.



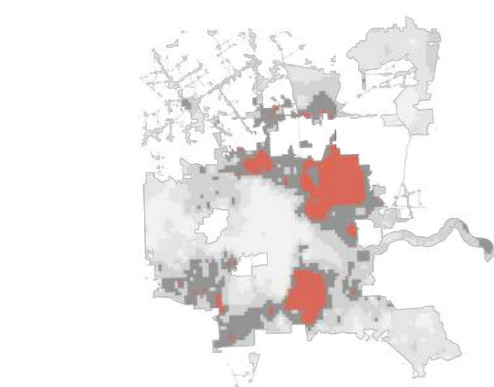
Vacant Ratio - 22%
Illegal dumping most commonly occurs on vacant land.



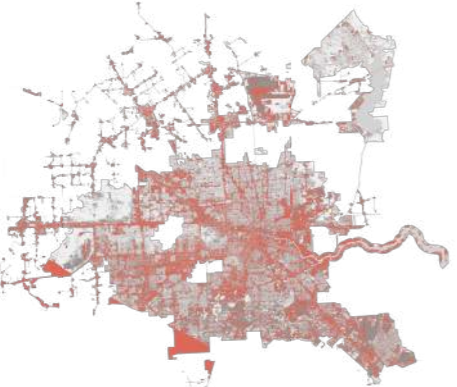
Social Vulnerability Index - 14%
Social vulnerability was assessed using seven indicators, including low income, disability, and elderly populations.



PM 2.5 - 14%
PM2.5 is a major air pollutant linked to waste-related environmental impacts.



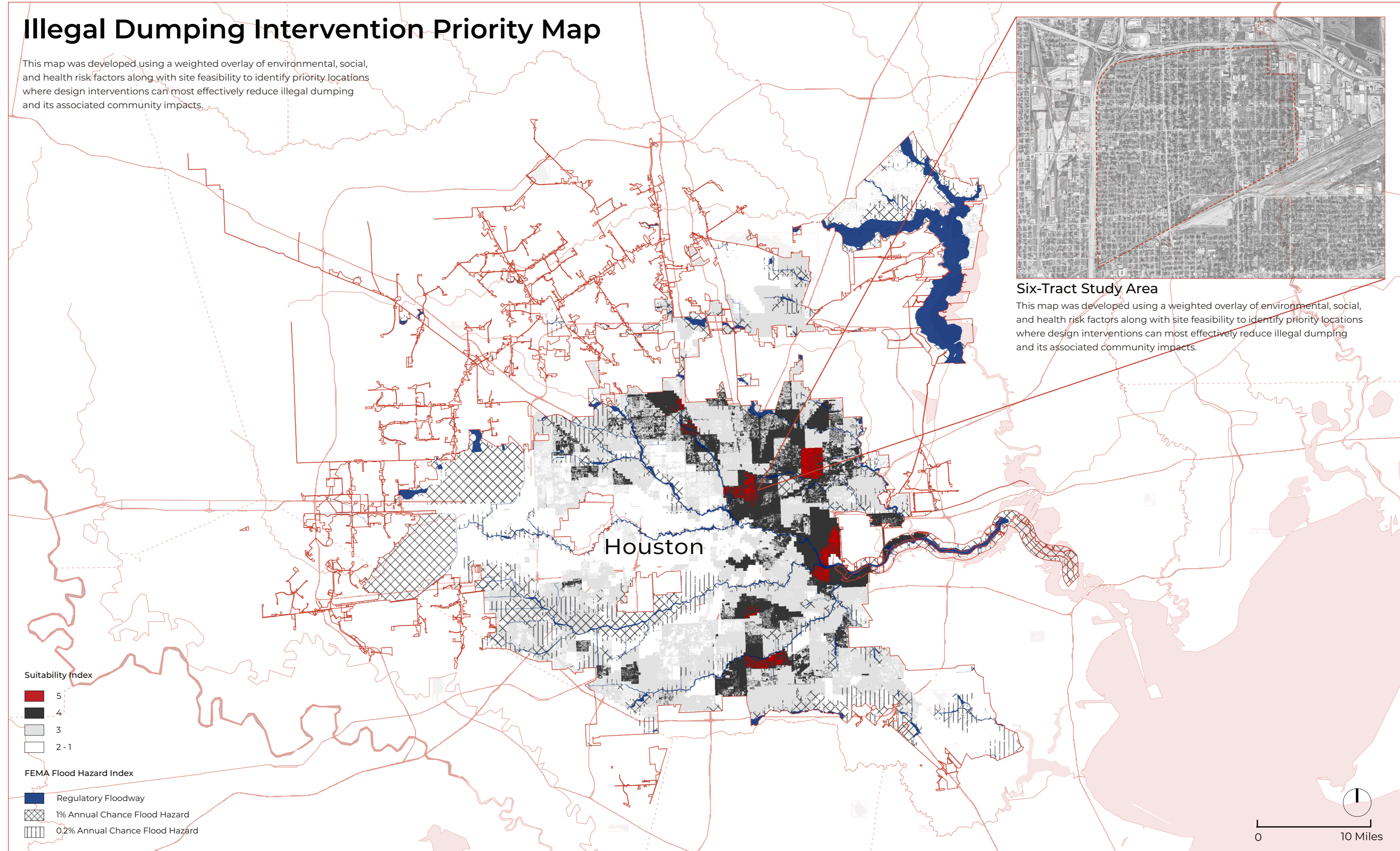
Respiratory Disease - 8%
Air pollutants generated by waste contribute to a high incidence of respiratory illnesses.



Radiant Temperature - 4%
Radiant heat can intensify odors and various health risks associated with waste.

Illegal Dumping Intervention Priority Map

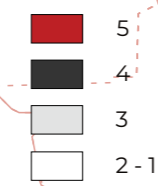
This map was developed using a weighted overlay of environmental, social, and health risk factors along with site feasibility to identify priority locations where design interventions can most effectively reduce illegal dumping and its associated community impacts.



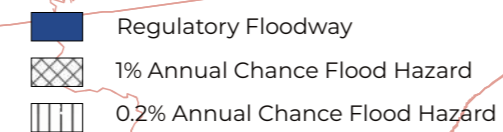
Six-Tract Study Area

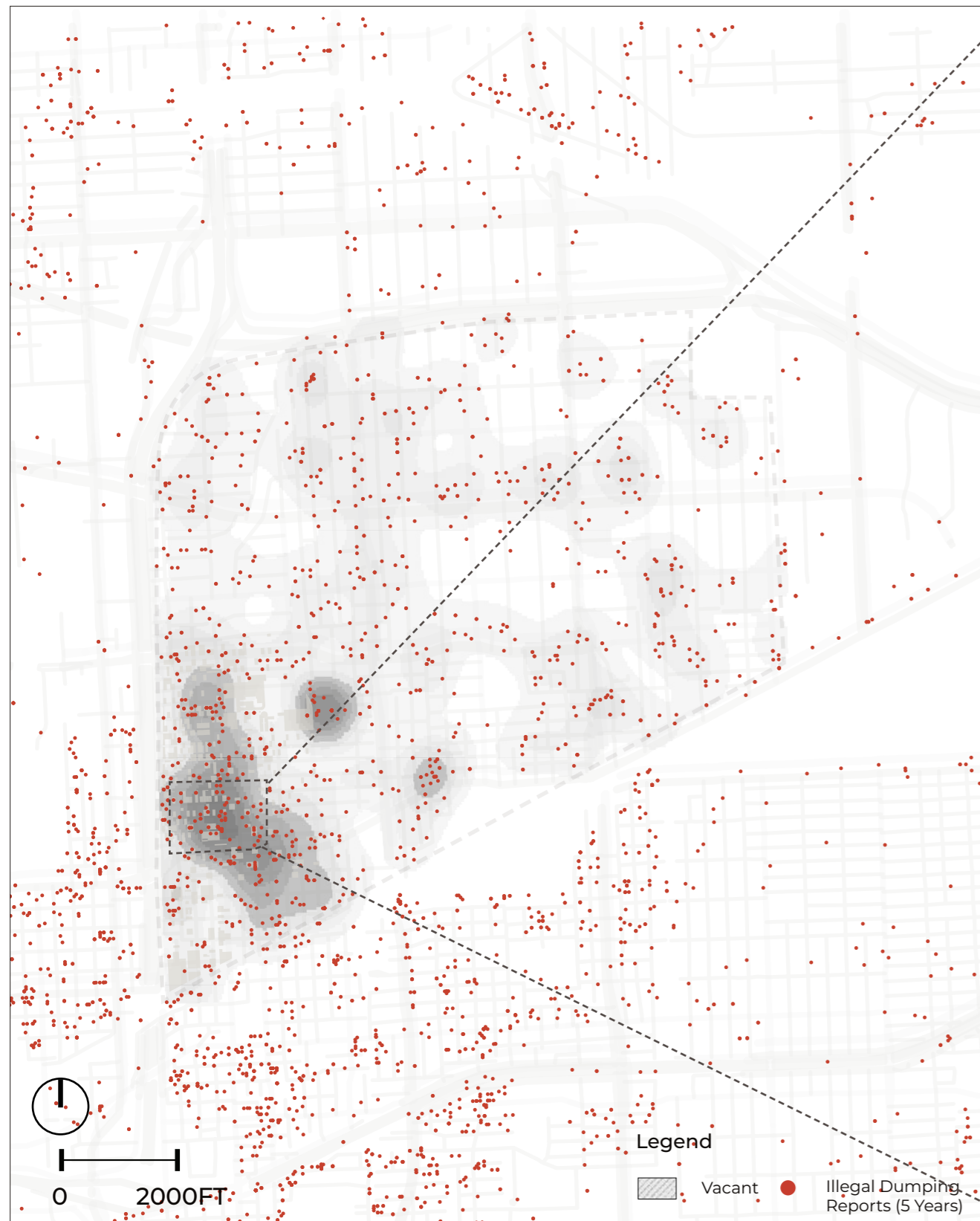
This map was developed using a weighted overlay of environmental, social, and health risk factors along with site feasibility to identify priority locations where design interventions can most effectively reduce illegal dumping and its associated community impacts.

Suitability Index



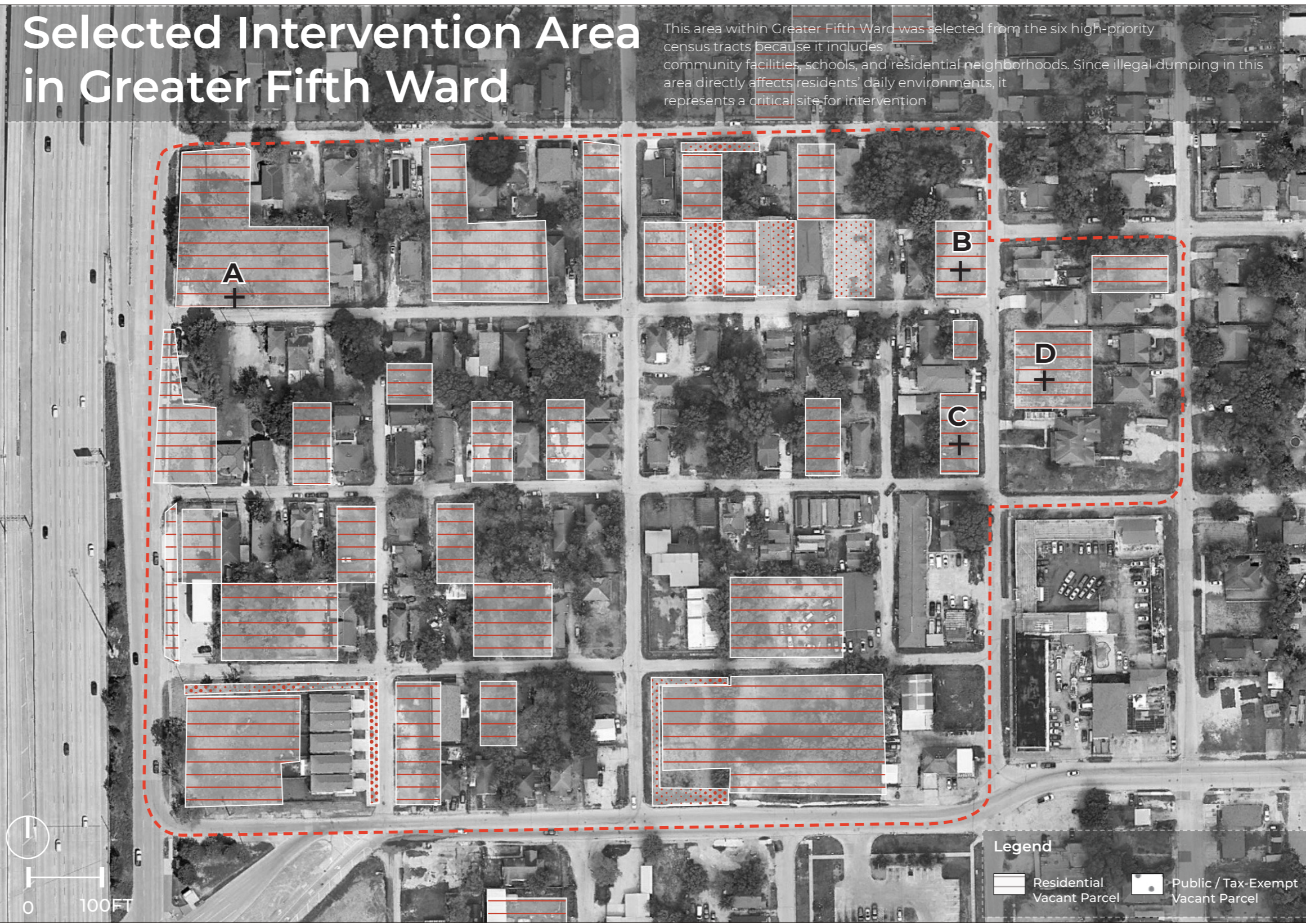
FEMA Flood Hazard Index



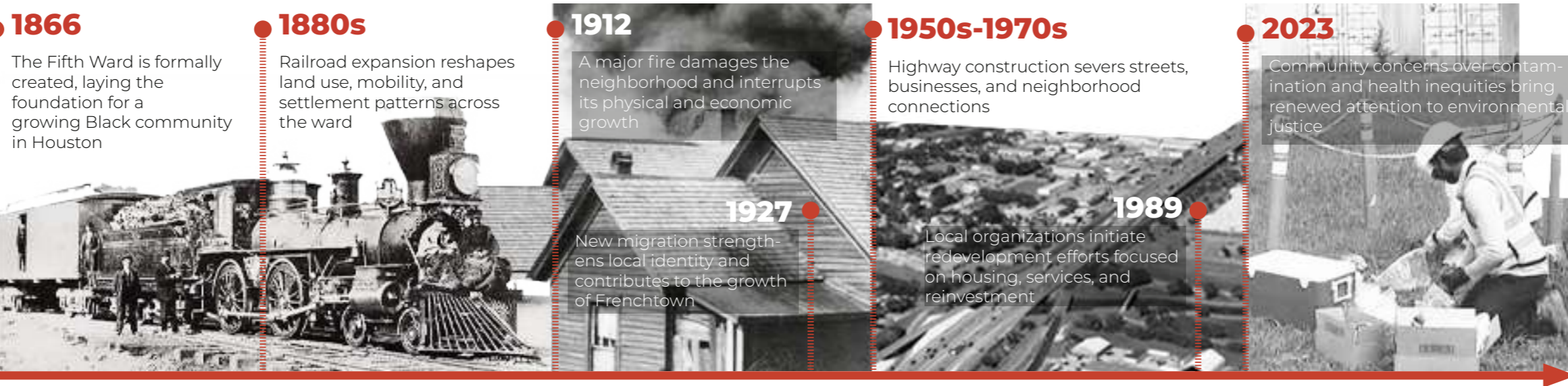


Illegal Dumping Locations, Kernel Density Hotspots, and Vacant Land Context within the Six-Tract Study Area

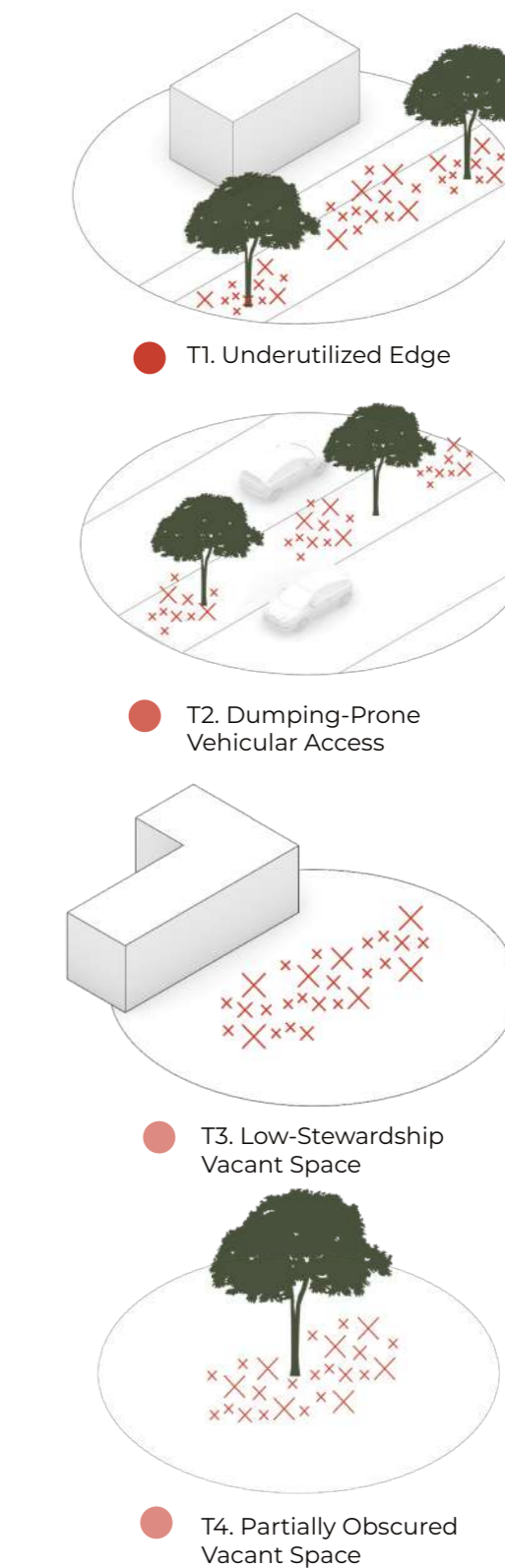
This map shows reported illegal dumping locations over a five-year period within the six-tract study area, overlaid with vacant land parcels and documented site locations. The pattern highlights recurring dumping points in relation to underutilized spaces and identifies priority areas for intervention.



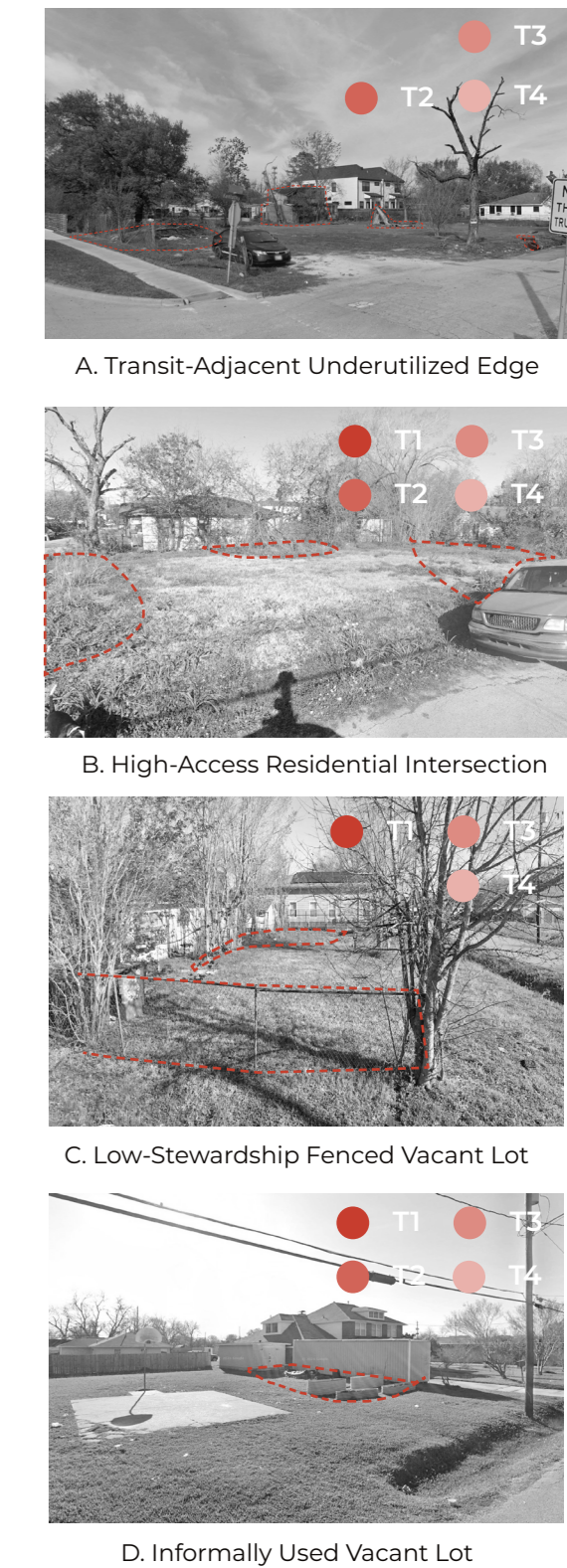
Greater Fifth Ward: Historical Urban Transformation



Dumping-Prone Spatial Condition Types

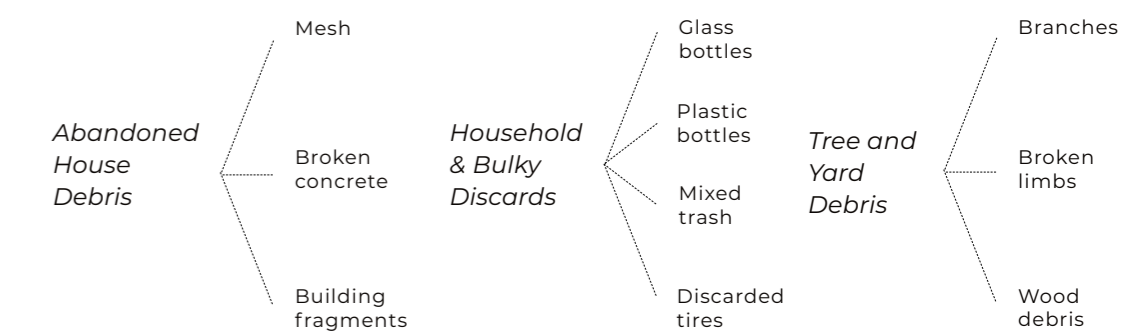


Observed Dumping Types and Impact Conditions



Common Illegal Dumping Materials

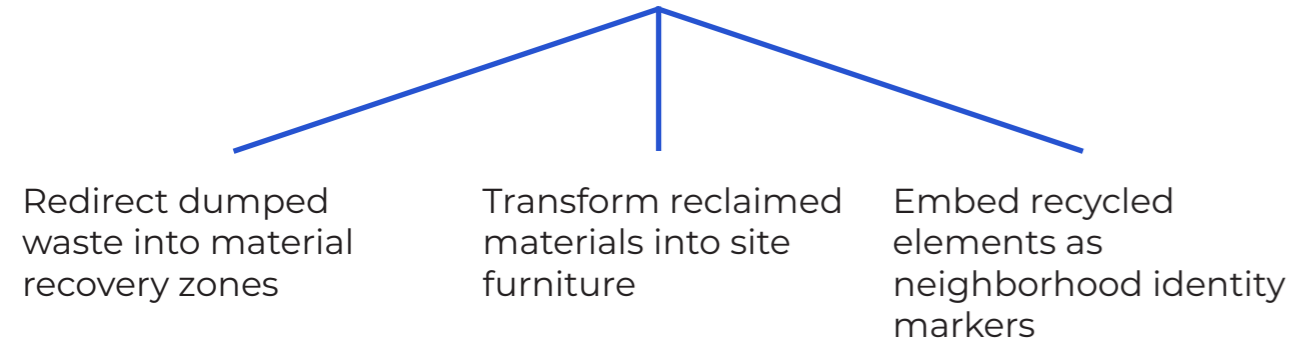
Illegal dumping observed on site appeared in the following material categories. Several of these discarded materials have potential for recovery and reuse after proper sorting, cleaning, and safety assessment.



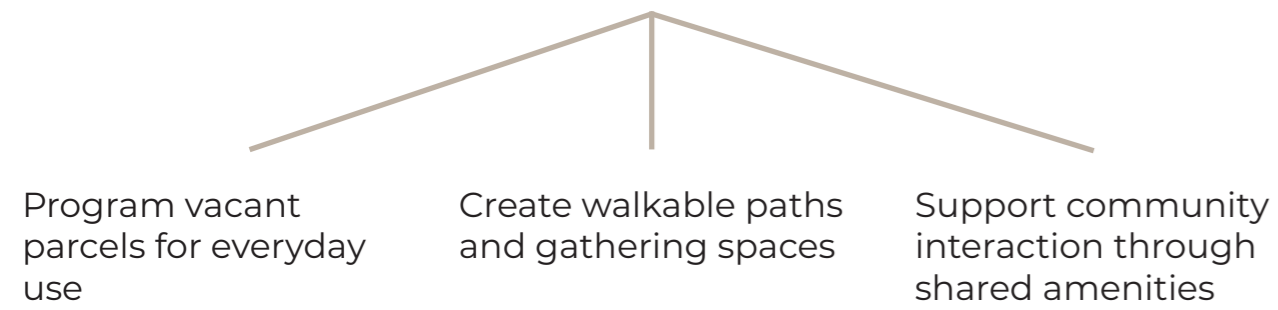
Design Framework

This framework addresses illegal dumping through three coordinated strategies: dumping prevention and material recovery, community activation and visibility, and ecological restoration and stewardship

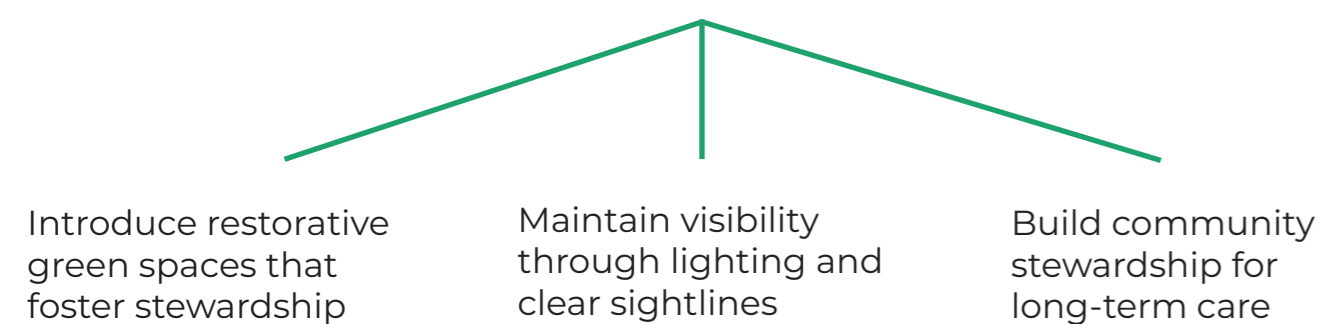
Illegal Dumping Prevention & Material Recovery



Community Activation & Visibility



Ecological Restoration & Stewardship



Integrated Corridor and Node Strategy for Illegal Dumping Prevention

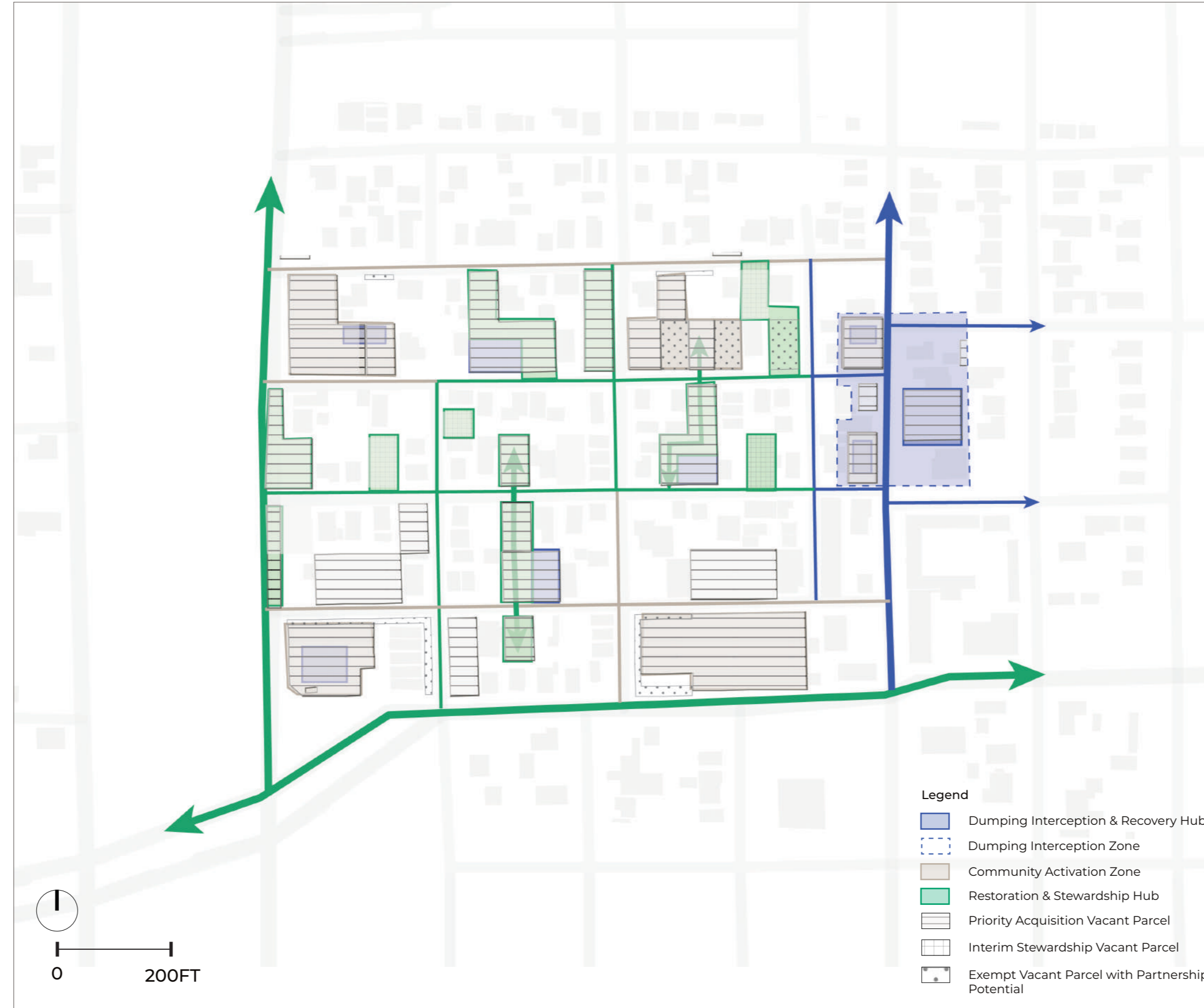
A coordinated network of corridors and nodes that addresses illegal dumping through dumping prevention and material recovery, community activation and visibility, and ecological restoration and stewardship, while also mitigating related impacts such as heat exposure, flood risk, and social vulnerability

Strategic Corridor Types

- Dumping Prevention & Material Recovery Corridor**
Redirects illegal dumping hotspots into managed collection, sorting, and material recovery zones
- Community Activation & Visibility Corridor**
Activates vacant parcels and pedestrian routes to increase everyday use, visibility, and natural surveillance
- Ecological Restoration & Stewardship Corridor**
Converts dumping-prone vacant land into planted, rain garden, and meadow-based

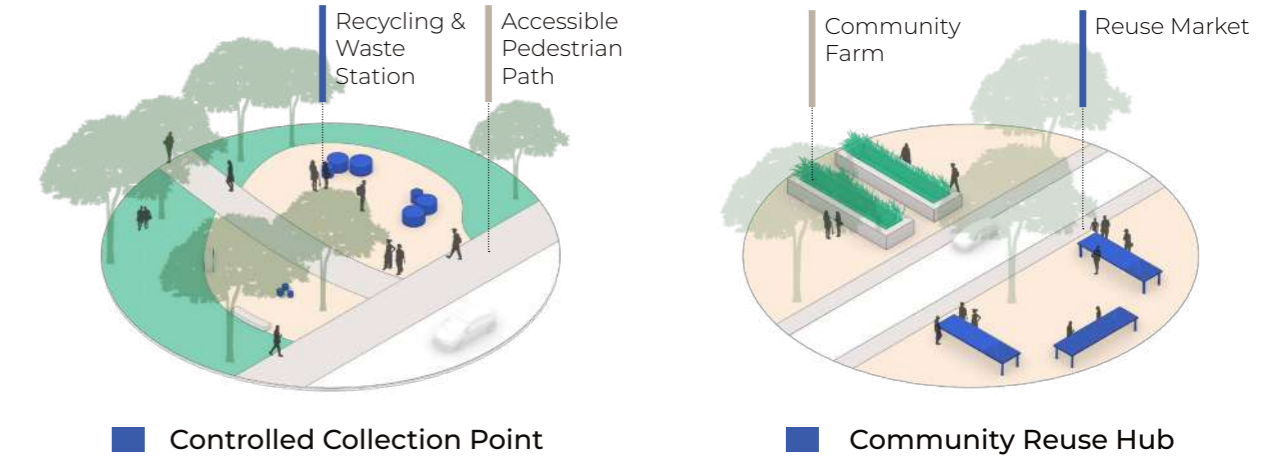
Vacant Parcel Typologies

- Priority Acquisition Vacant Parcel**
High-visibility residential vacant land with strong potential for public acquisition and neighborhood improvement
- Interim Stewardship Vacant Parcel**
Temporarily used residential vacant land for meadow or garden-based stewardship
- Exempt Vacant Parcel with Partnership Potential**
Vacant parcels with public or tax-exempt ownership status, identified as potential sites for intervention pending ownership, access, and maintenance coordination

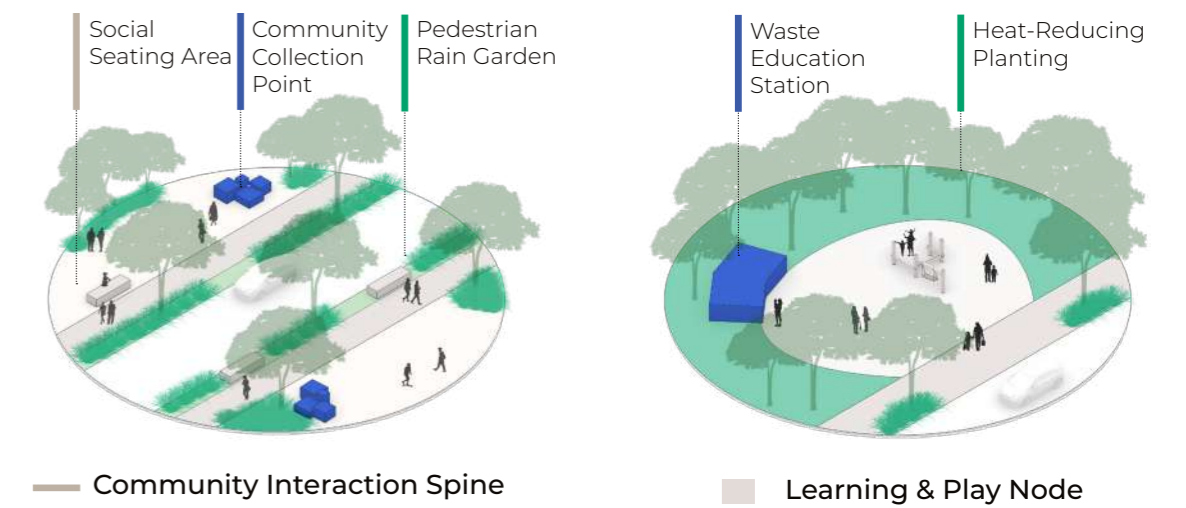


Intervention Diagrams

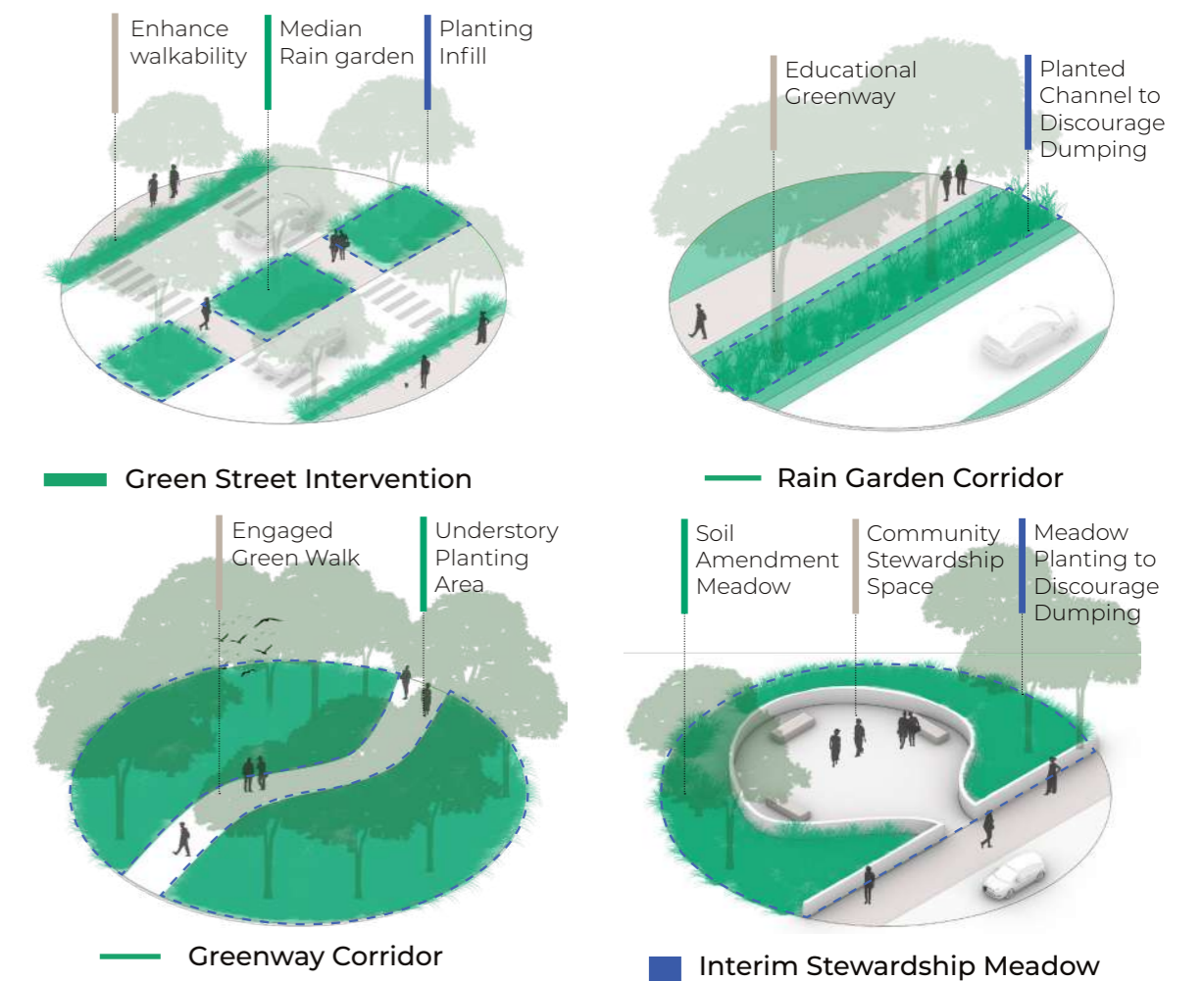
Illegal Dumping Prevention & Material Recovery



Community Activation & Visibility

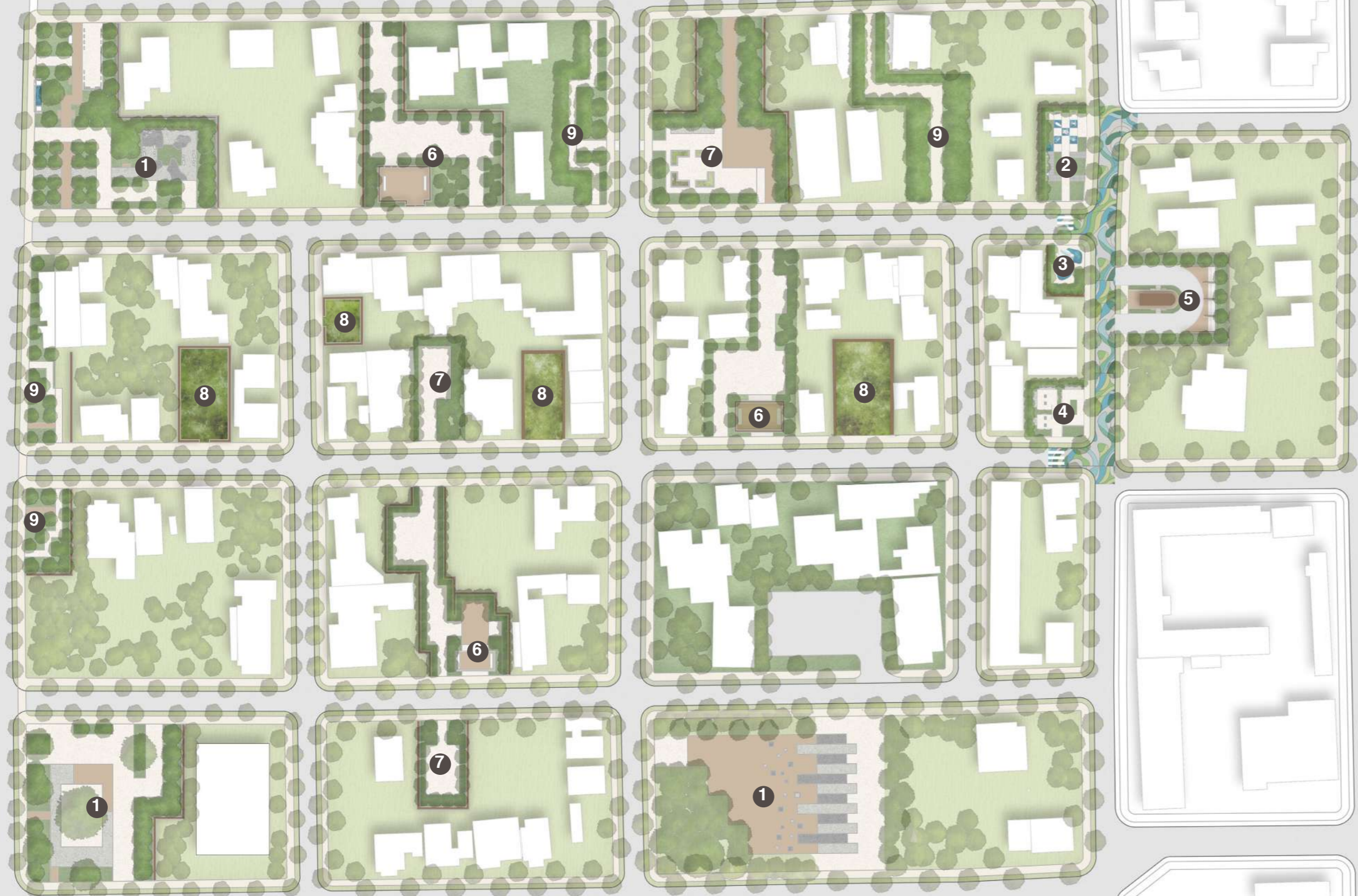


Ecological Restoration & Stewardship



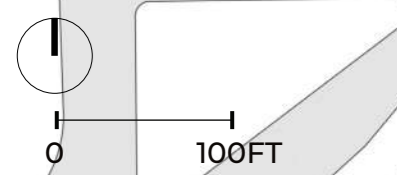
Masterplan

The masterplan transforms vacant parcels into an integrated network of recovery hubs, active community spaces, and ecological corridors. Together, these interventions increase visibility, support stewardship, and reduce conditions that enable illegal dumping.



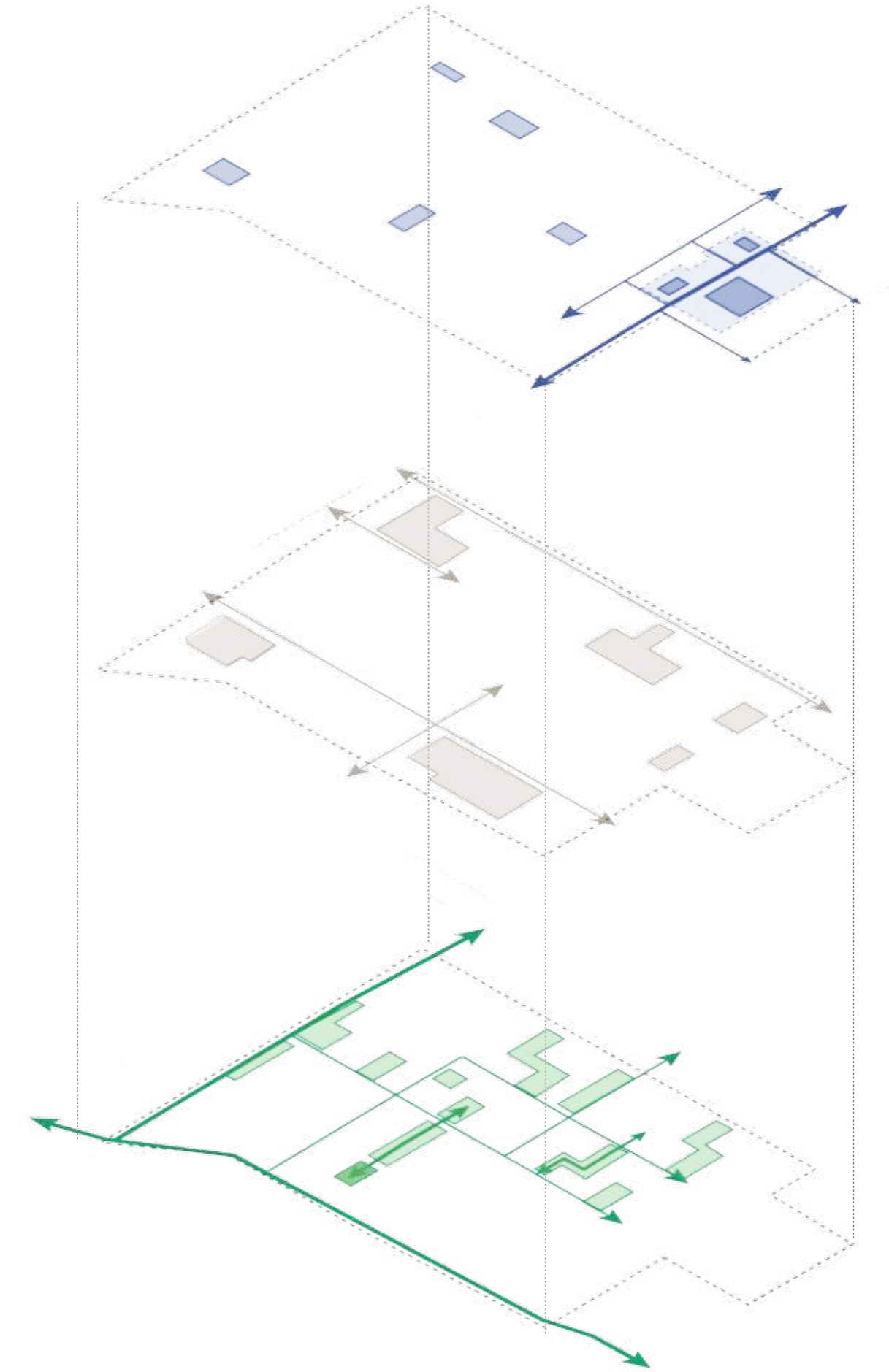
Legend

- | | |
|--|--------------------------------|
| 1. Greater Fifth Ward Reuse Gateway | 6. Controlled Collection Point |
| 2. Children's Reuse & Stewardship Garden | 7. Community Reuse Hub |
| 3. Learning & Play Node | 8. Interim Stewardship Meadow |
| 4. Reclaimed Art Exhibition Garden | 9. Greenway |
| 5. Smart Waste Collection Station | |



Layered Spatial Framework for Illegal Dumping Prevention

This spatial framework translates three coordinated strategies—dumping prevention and material recovery, community activation and visibility, and ecological restoration and stewardship—into an integrated network of corridors, nodes, and vacant parcels.



Illegal Dumping Prevention & Material Recovery

- Dumping prevention + recovery
- Dumping hotspot interception
- Controlled collection and sorting
- Material recovery zones
- Recycled site furniture
- Neighborhood identity markers

Community Activation & Visibility

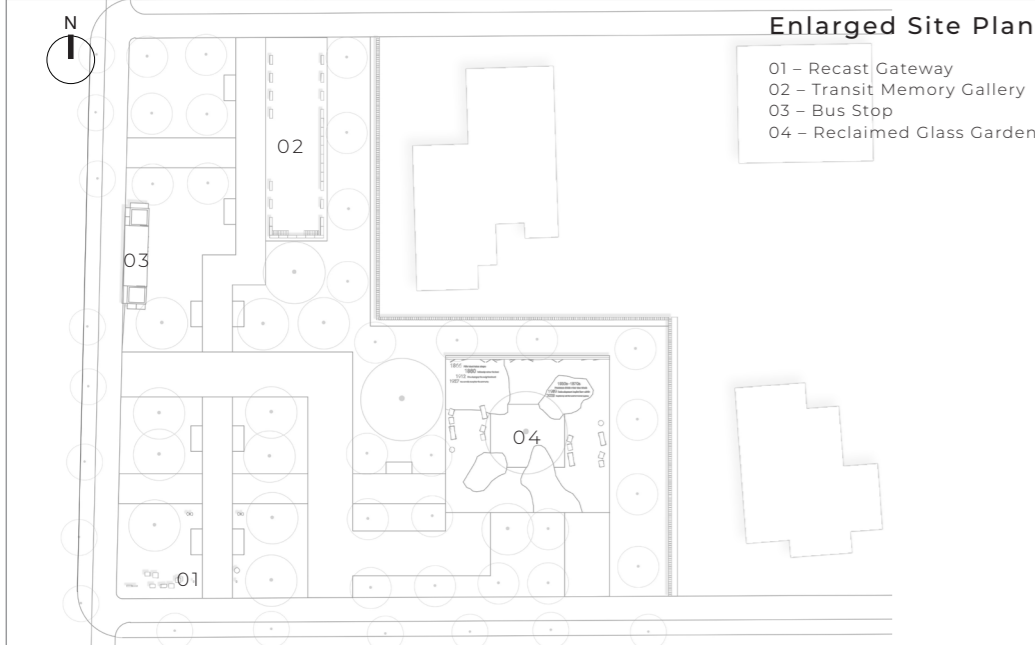
- Walkable community routes
- Shared seating and gathering nodes
- Learning and play spaces
- Everyday public presence
- Natural surveillance

Ecological Restoration & Stewardship

- Rain garden corridors
- Soil amendment meadows
- Heat-reducing planting
- Green street medians
- Long-term stewardship spaces

Greater Fifth Ward Reuse Gateway

A recycled-material gateway garden that marks the entrance to Greater Fifth Ward. By reusing discarded materials as signage, seating, and landscape elements, the space transforms illegal dumping into a visible symbol of neighborhood identity and renewal.



Vacant Lot as Neighborhood Entrance
A visible vacant lot near transit, currently impacted by illegal dumping and abandonment, with potential to become a reclaimed neighborhood entrance



Transit-Adjacent Vacant Edge
A fenced vacant lot near transit, currently underused but highly visible. Its location creates potential for public reuse as a neighborhood gateway

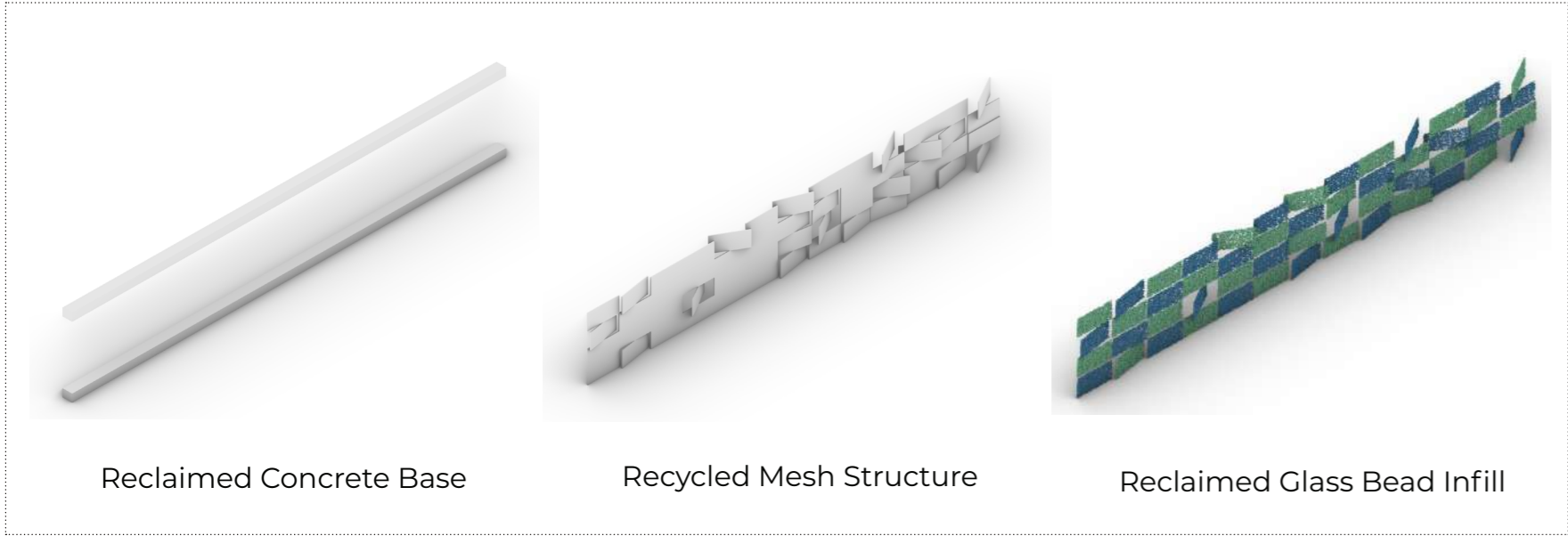


Reclaimed Glass Garden

A small public garden that marks and guides the neighborhood entrance through recycled glass and mesh installations, transforming discarded materials into a visible landscape of arrival and identity.

Recycled Glass Mesh Wall

A public feature wall made of recycled mesh filled with reclaimed glass beads, transforming discarded materials into a textured landscape element and neighborhood landmark



Reclaimed Timeline Pavers

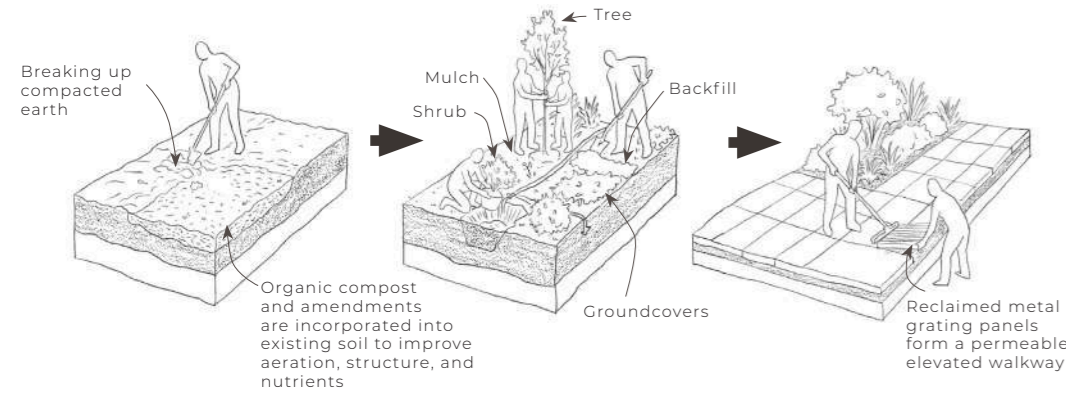
Irregular recycled-aggregate pavers transform construction waste into a walkable surface. Embedded metal text highlights Greater Fifth Ward's history, turning the ground plane into a public timeline



Children's Reuse & Stewardship Garden

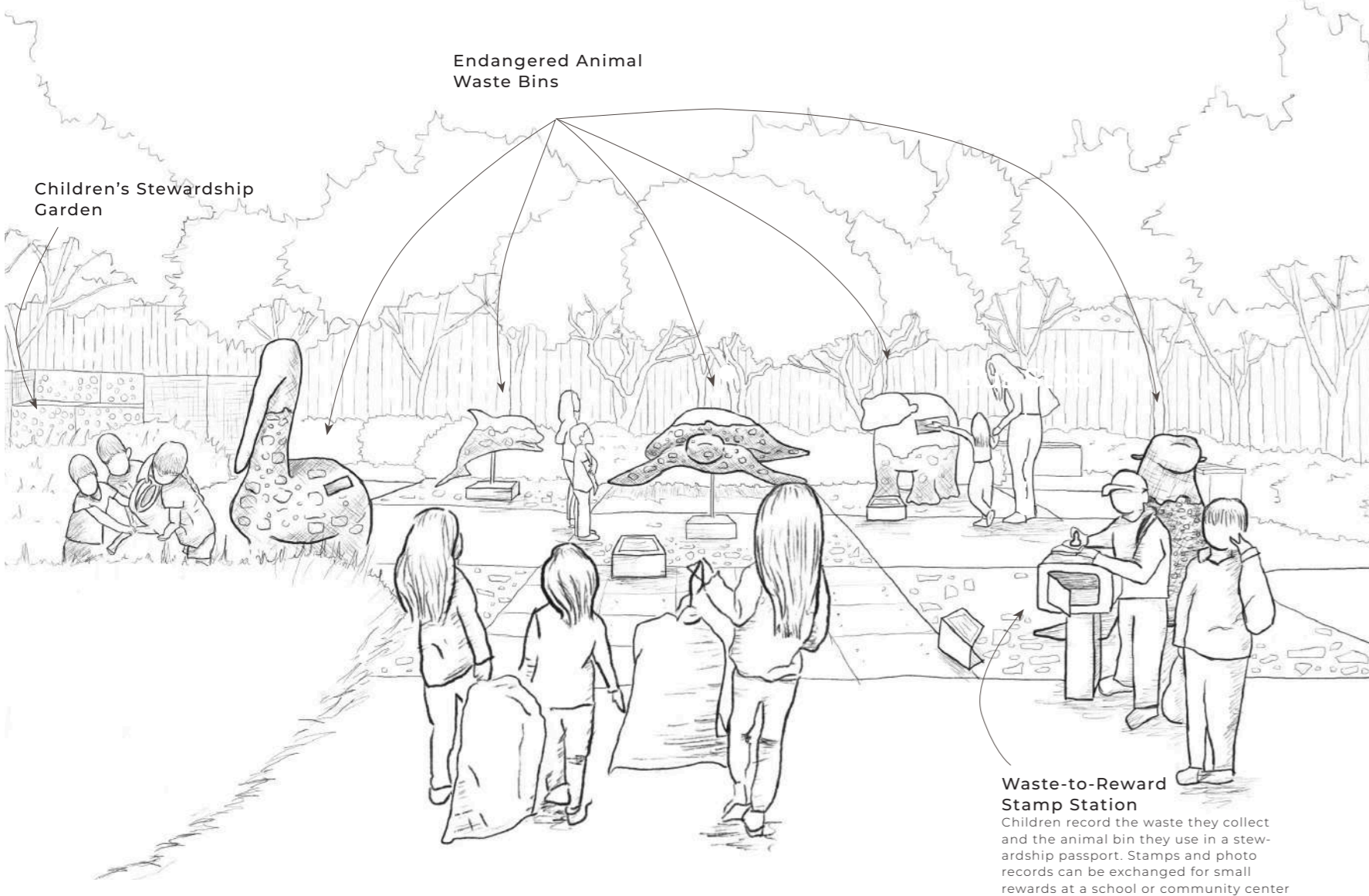
A children's learning garden that transforms collected waste and discarded materials into stewardship tools, art resources, seating, and small wildlife habitats. Through waste collection, gardening, and pollinator observation, children learn how material care can support the neighborhood ecosystem.

Garden Development Process

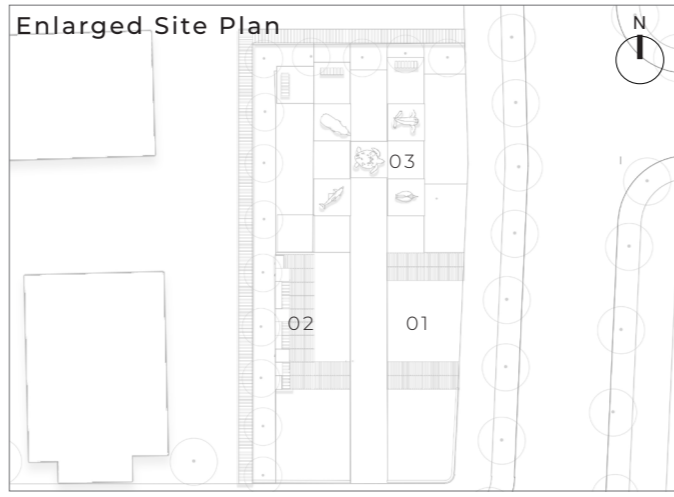


- 1. Soil Improvement
- 2. Pollinator Planting
- 3. Reclaimed Metal Grating Walkway Installation

Waste-to-Stewardship Activity Vignette



Existing Vacant Residential Lot
A vacant residential lot near a street intersection, surrounded by homes and street edges. The open site remains underused and shows signs of neglect and scattered litter.



01 - Children's Stewardship Garden
02 - Children's Pollinator Observation Bench
03 - Endangered Animal Waste Bins



Children's Pollinator Observation Bench
Made from recycled mesh and filled with discarded or broken wood, this garden bench provides seating while creating small habitats for insects and pollinators.

Endangered Animal Waste Bins
Recycled-mesh bins shaped like endangered animals encourage children to collect litter responsibly. The collected waste is cleaned and repurposed for art installations and creative activities.

Children's Stewardship Garden
Children help plant and care for the garden they create, developing responsibility through watering, weeding, and seasonal maintenance.

Reclaimed Art Exhibition Garden

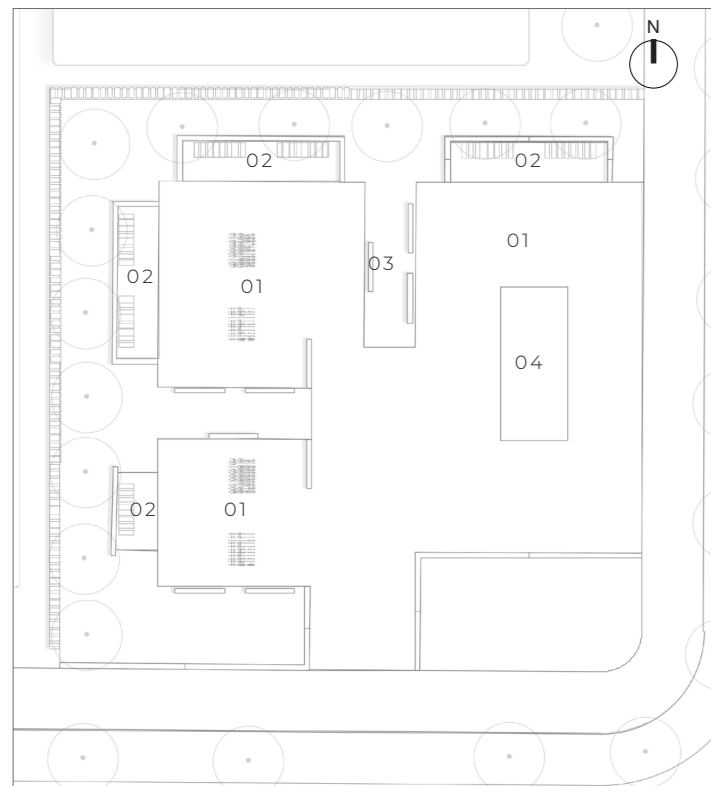
An outdoor exhibition space where discarded materials are transformed into public artworks through collaboration with local artists, highlighting reuse, creativity, and neighborhood stewardship.



Existing Vacant Residential Lot

A vacant residential lot located near a street intersection. Its open and underused condition, combined with repeated illegal dumping issues, makes it a neglected but highly visible neighborhood site.

Enlarged Site Plan



01 - Reclaimed Art Exhibition Space
 02 - Reclaimed Weathering Steel Seating Partition
 03 - Recycled-Aggregate Concrete Divider
 04 - Planting Area



Reclaimed Weathering Steel Screen
 Seating integrated with a solid reclaimed weathering steel partition that blocks surrounding views and helps visitors focus on the exhibitional reuse

Local Artist Reclaimed-Material Artwork
 Local artists transform collected waste into public artworks that highlight reuse, creativity, and awareness of illegal dumping

Recycled-Aggregate Concrete Divider
 A solid spatial divider made from recycled aggregate concrete, helping organize circulation and separate program areas within the exhibition space

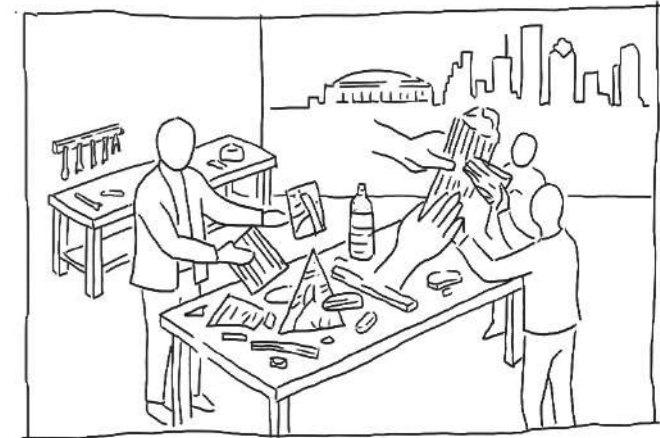
Waste-to-Art Exhibition Process

01 Waste Collection & Cleaning



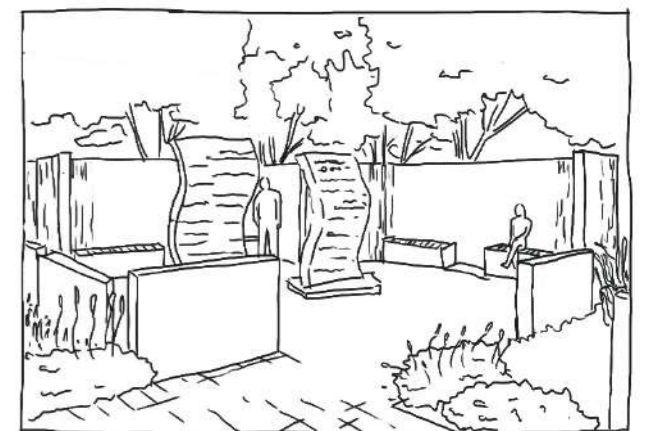
Collecting dumped materials and cleaning them for reuse

02 Collaboration With Local Houston Artists



Transforming discarded materials into sculptural artworks

03 Public Exhibition Installation



Displaying reclaimed-material artworks as a public outdoor exhibition

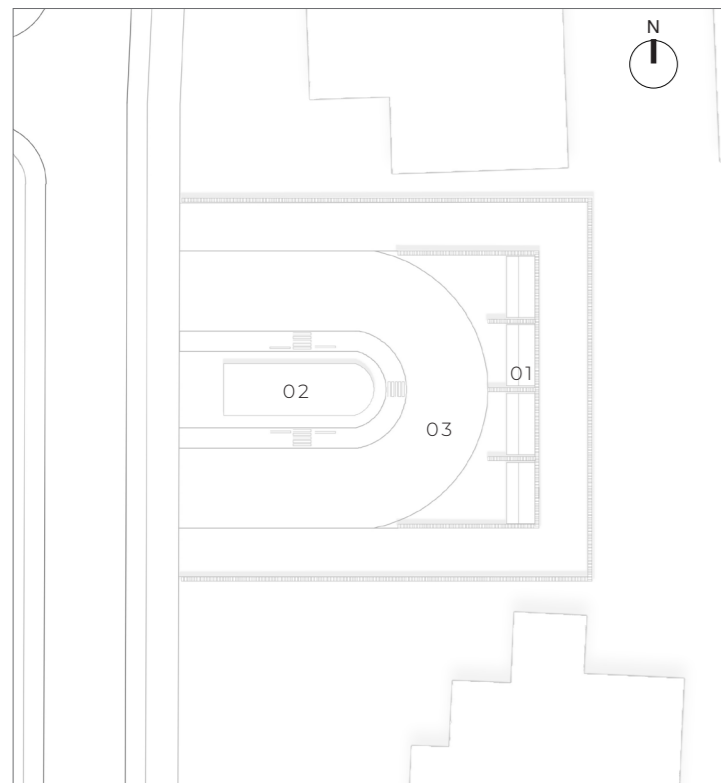
Smart Waste Collection Station

A smart collection station for household waste disposal, designed to reduce illegal dumping through organized sorting and community use



Existing Vacant Residential Lot
 Located at a street intersection, this vacant lot shows signs of community use, marked by a basketball hoop. Yet illegal dumping still persists along one edge of the site

Key Map



01 - Smart Waste Collection Station
 02 - Book Sharing Shelter
 03 - Service Access Drive



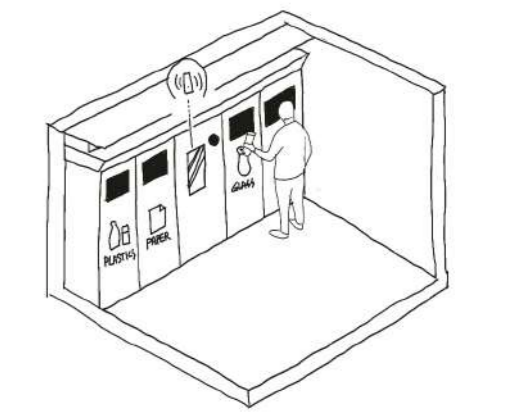
Smart Waste Collection Station
 A smart collection station for household waste disposal, designed to reduce illegal dumping through organized sorting and community use

Book Sharing Shelter
 A shaded resting space with a shared book cabinet, where discarded books can be exchanged, reused, and enjoyed by community members

Service Access Drive with Recycled Tire Rubber Asphalt
 A 24-foot-wide internal access lane for waste collection trucks, paved with rubberized asphalt that incorporates crumb rubber from recycled tires. This transforms discarded tires into a functional ground surface for service circulation

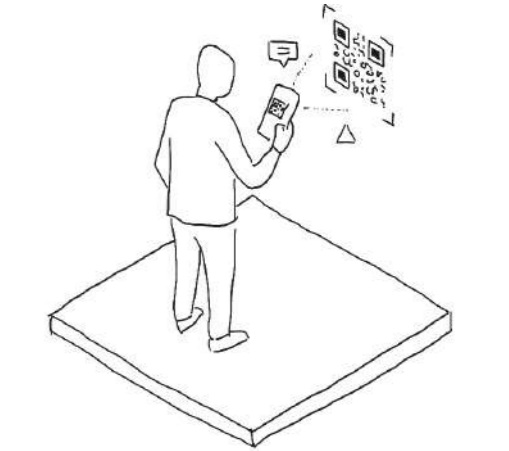
Illegal Dumping Reduction through Community Waste Collection

Step 1. Managed Drop-Off Station



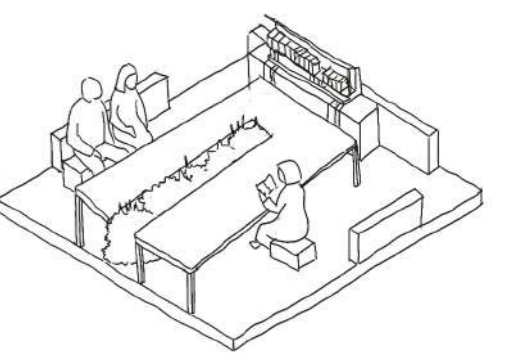
Residents dispose of everyday household waste through a managed sorting station, reducing uncontrolled dumping in vacant lots and street edges

Step 2. QR Code Incentive System



Users scan a QR code after proper disposal and receive small rewards that encourage consistent participation in legal waste collection

Step 3. Community Interaction and Resting Space

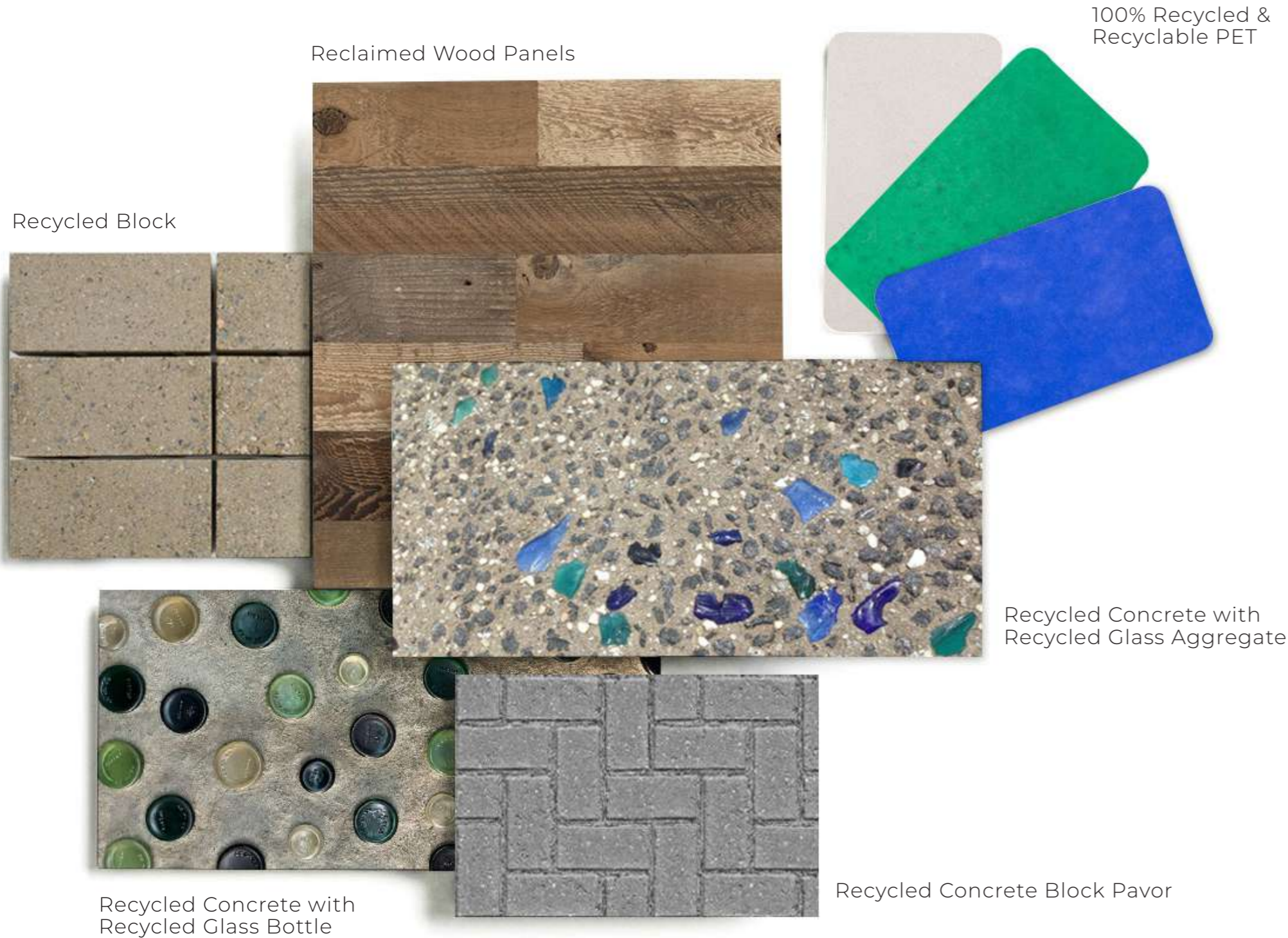


The collection area is paired with a small public space that supports everyday use, social interaction, and stronger neighborhood presence

Site Elements

Materiality

Material selection plays a central role in expressing the project's commitment to reuse, environmental repair, and neighborhood stewardship. By transforming discarded materials into durable public elements, the palette reinforces the idea that waste can become a visible resource within the landscape



Colors

Consistent use of color helps unify the project across site analysis, intervention strategies, and spatial design proposals. The palette is derived from the environmental and social conditions of Greater Fifth Ward, using color not only as a visual identity but also as a wayfinding and storytelling device throughout the project

Electric Blue

RGB 38, 83, 208
 HEX #2653D0
 CMYK 82, 60, 0, 18

Electric Blue is associated with restoration, water, and site repair. It is used for interventions related to ecological recovery, circulation, and visible public improvement

Eggshell

RGB 227, 219, 216
 HEX #E3DBD8
 CMYK 0, 4, 5, 11

Eggshell provide visual balance and serve as a background reference to recycled concrete, vacant land, and the existing material condition of the site

Emerald Green

RGB 1, 162, 108
 HEX #01A26C
 CMYK 99, 0, 33, 36

Emerald Green represents community stewardship, planting, and shared use. It marks spaces that encourage gathering, care, reuse, and neighborhood activity



Primary Logo



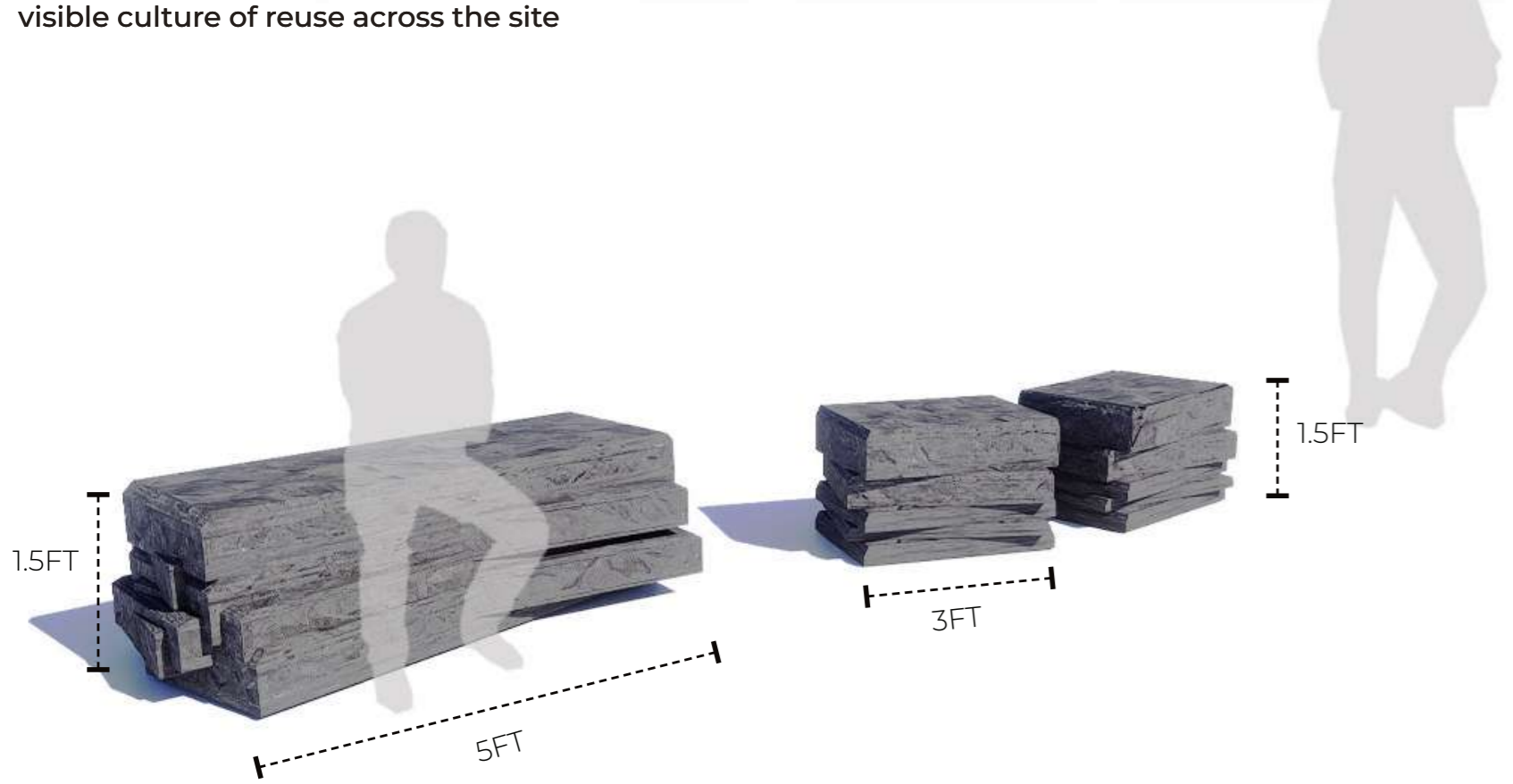
Compact Badge



Horizontal Lockup

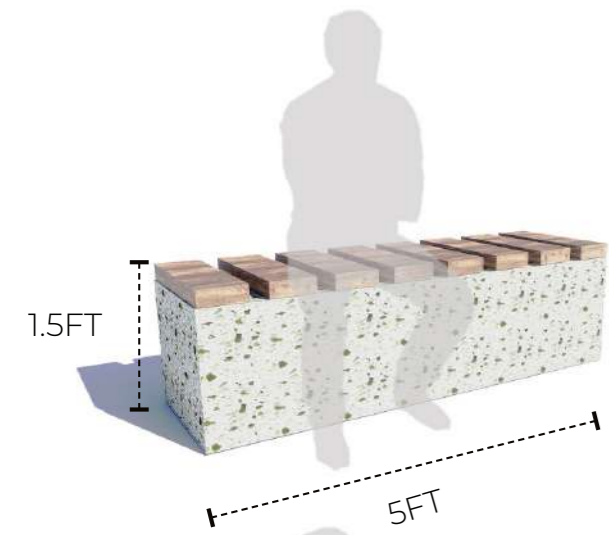
Site Seating Types

Site seating is constructed from recycled and reclaimed materials, turning discarded matter into durable public furniture. Using recycled concrete, reused brick, reclaimed mesh, salvaged wood, stone infill, and stacked slabs, each bench type supports rest, gathering, and a visible culture of reuse across the site



Stacked Reclaimed Concrete Slab Bench

Bench constructed from stacked reclaimed concrete slabs, repurposed as durable seating elements for informal rest and gathering



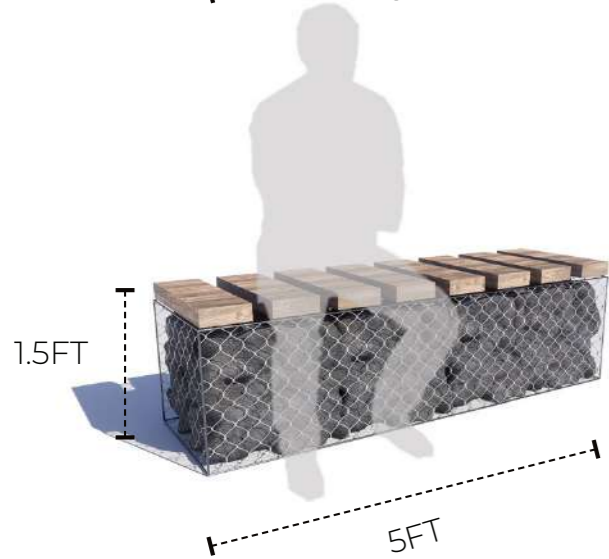
Recycled-Glass Aggregate Concrete Bench

Bench with a recycled-concrete base containing recycled glass aggregate, paired with timber slat seating for durable everyday use



Reclaimed Concrete Brick Bench

Bench constructed from reclaimed concrete bricks salvaged from abandoned houses and topped with timber slat seating, creating a durable public seating element through material reuse



Reclaimed Mesh Gabion Bench

Bench constructed with a gabion cage made from reclaimed mesh salvaged from discarded fencing and building materials, filled with reused stone from construction debris, and topped with timber slat seating

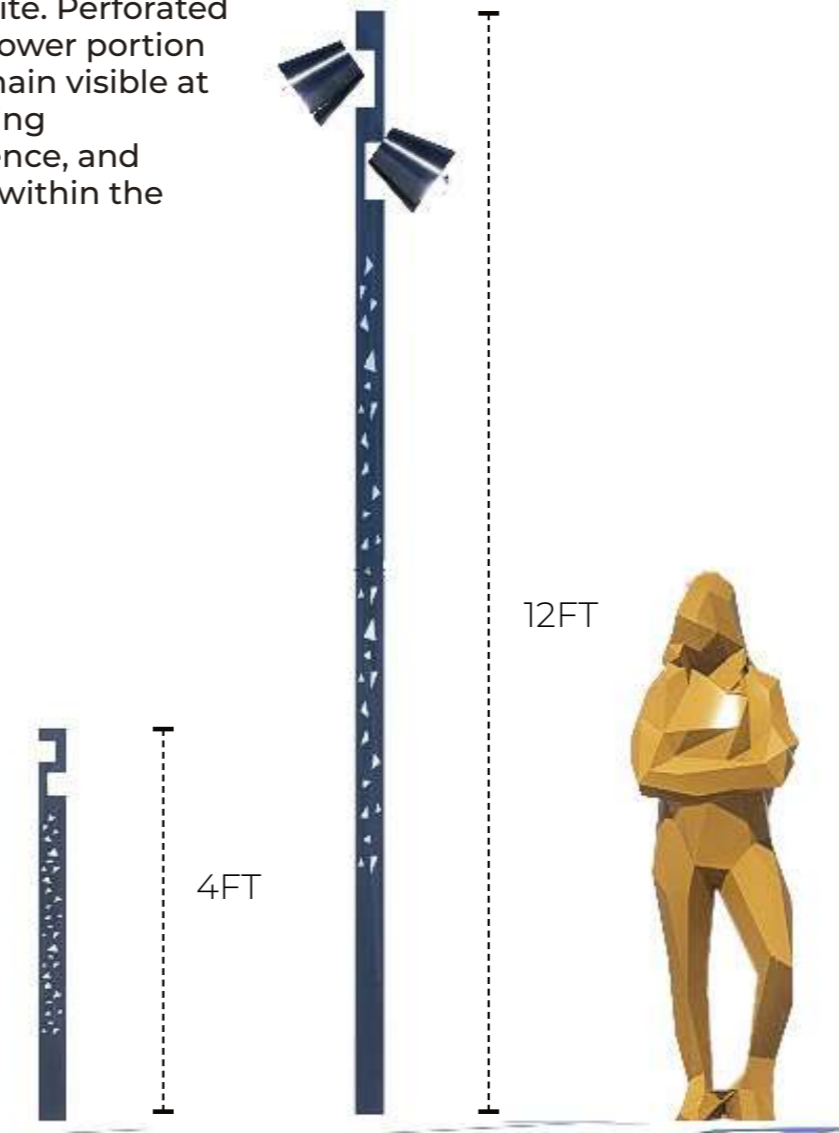


Reclaimed Mesh Bench With Salvaged Wood Infill

Bench constructed with a reclaimed mesh cage salvaged from discarded fencing and building materials, filled with broken tree limbs collected from the street, and topped with timber slat seating

Lighting Detail

Lighting is designed to improve visibility and reinforce passive surveillance throughout the site. Perforated openings at the lower portion allow light to remain visible at eye level, increasing brightness, presence, and a sense of safety within the space



Trash Can Detail

This detail proposes a trash can design created in collaboration with Houston artists, with artwork applied to the surface through either printed graphics or direct painting



Royal Sumikat Artwork Application



Jim Koehn Artwork Application



Justin Garcia Artwork Application

