STORMWATER MANAGEMENT AS A COMMUNITY ASSET: TRANSFORMING A NECESSITY INTO AN AMENITY

LRGV WATER QUALITY MANAGEMENT & PLANNING CONFERENCE
05.25.17

PREPARED BY

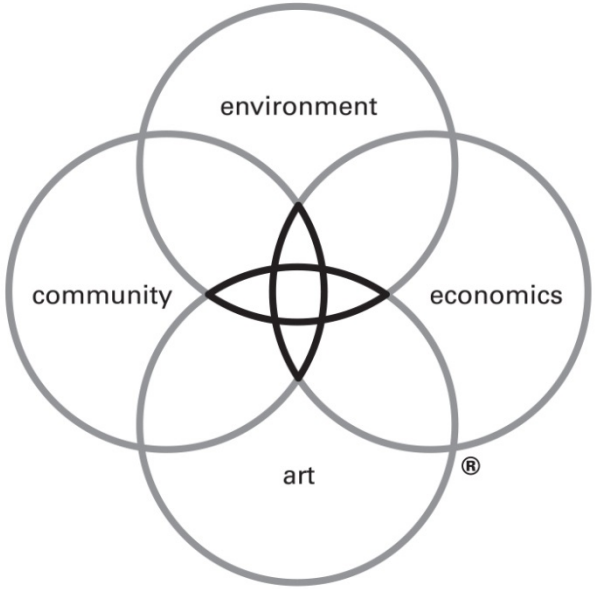
DESIGNWORKSHOP

Aspen ▫ Asheville ▫ Austin ▫ Chicago ▫ Denver ▫ Dubai ▫ Houston ▫ Lake Tahoe ▫ Los Angeles ▫ Shanghai

ABOUT DESIGN WORKSHOP

rethinking
ENVIRONMENT

building
resilient
COMMUNITIES



innovating
ECONOMIC
landscapes

through
ARTFUL integrity

ABOUT DESIGN WORKSHOP

TODAY'S AGENDA

DISCUSSION OF ISSUES / DILEMMA

DISCUSSION OF SOLUTION / THESIS

Regional Scale: New Braunfels Regional Stormwater Plan

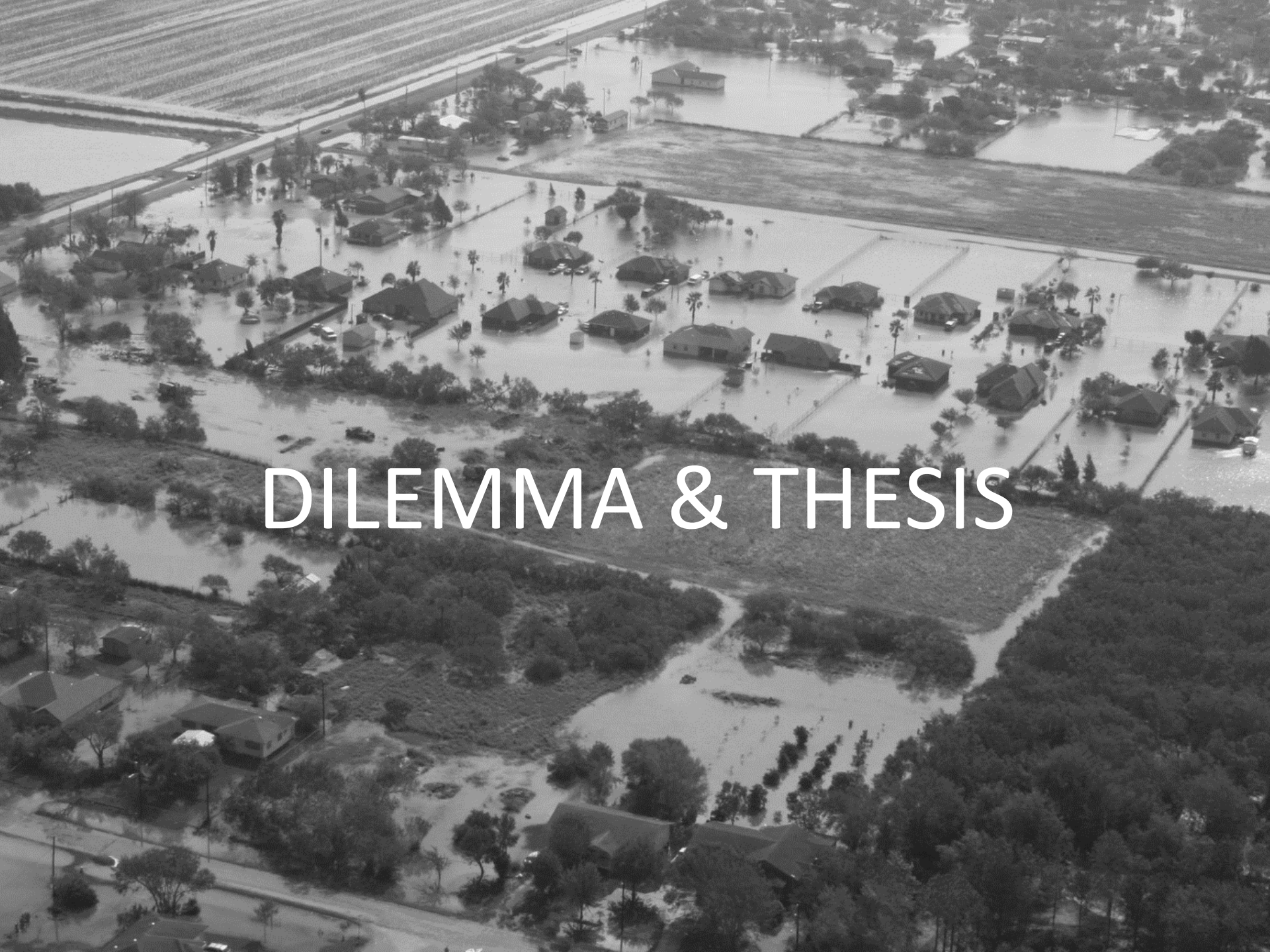
CASE STUDIES

Community Scale: Bagby Street Reconstruction //
Hackberry Gully Regional Park

CLOSING

Site Scale: Mont Belvieu Drainage Standards

QUESTIONS



DILEMMA & THESIS

DILEMMA

Many cities along the U.S. Gulf Coast are highly susceptible to flooding and drainage problems. There is a challenge of providing safety to residents, complying with water quality regulations, and providing an adequate quality of life through infrastructure and services.

2016 HOUSTON FLOODING

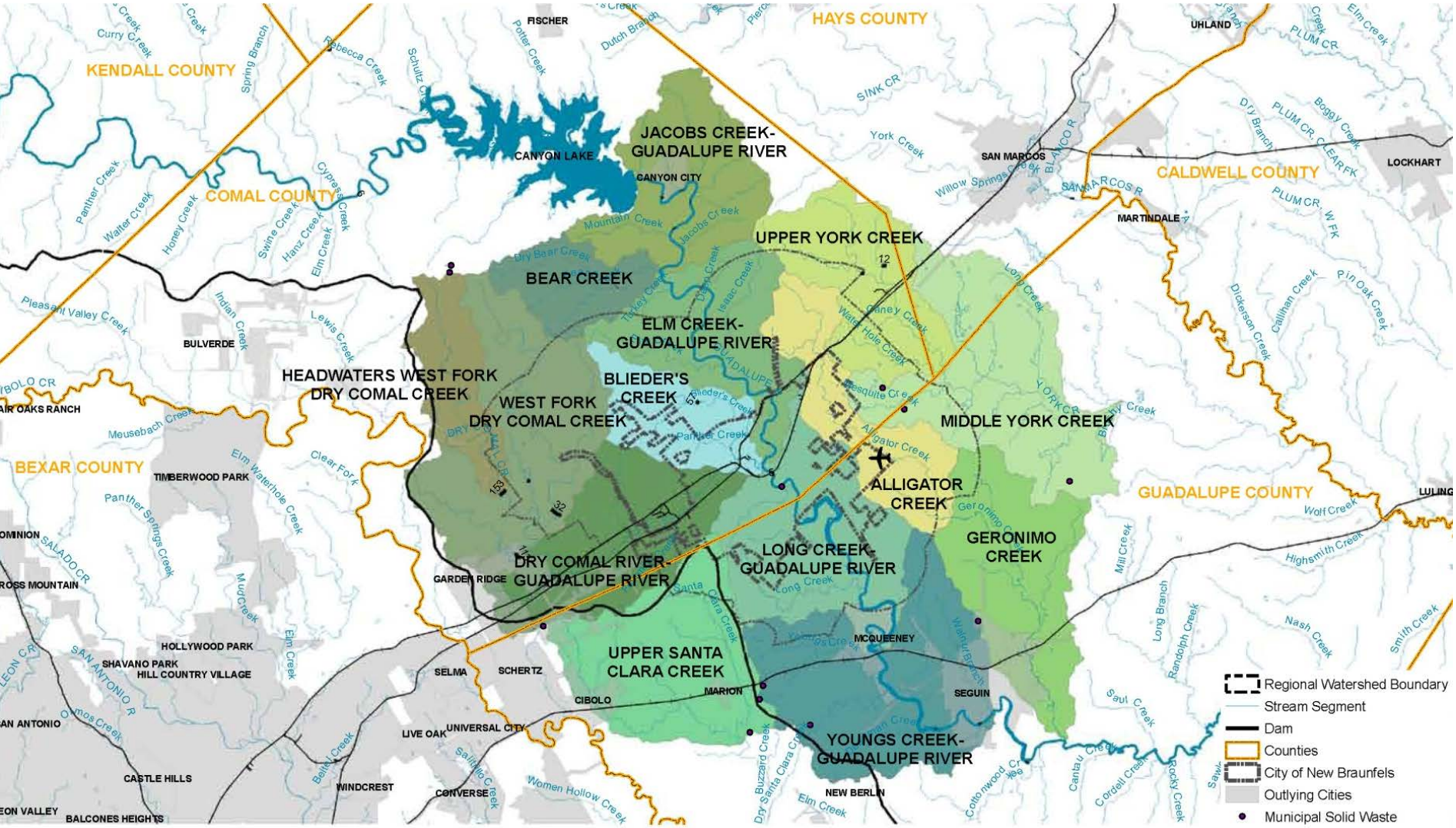
Buffalo Bayou, Memorial Drive and Allen Parkway| Houston, Texas

DESIGNWORKSHOP

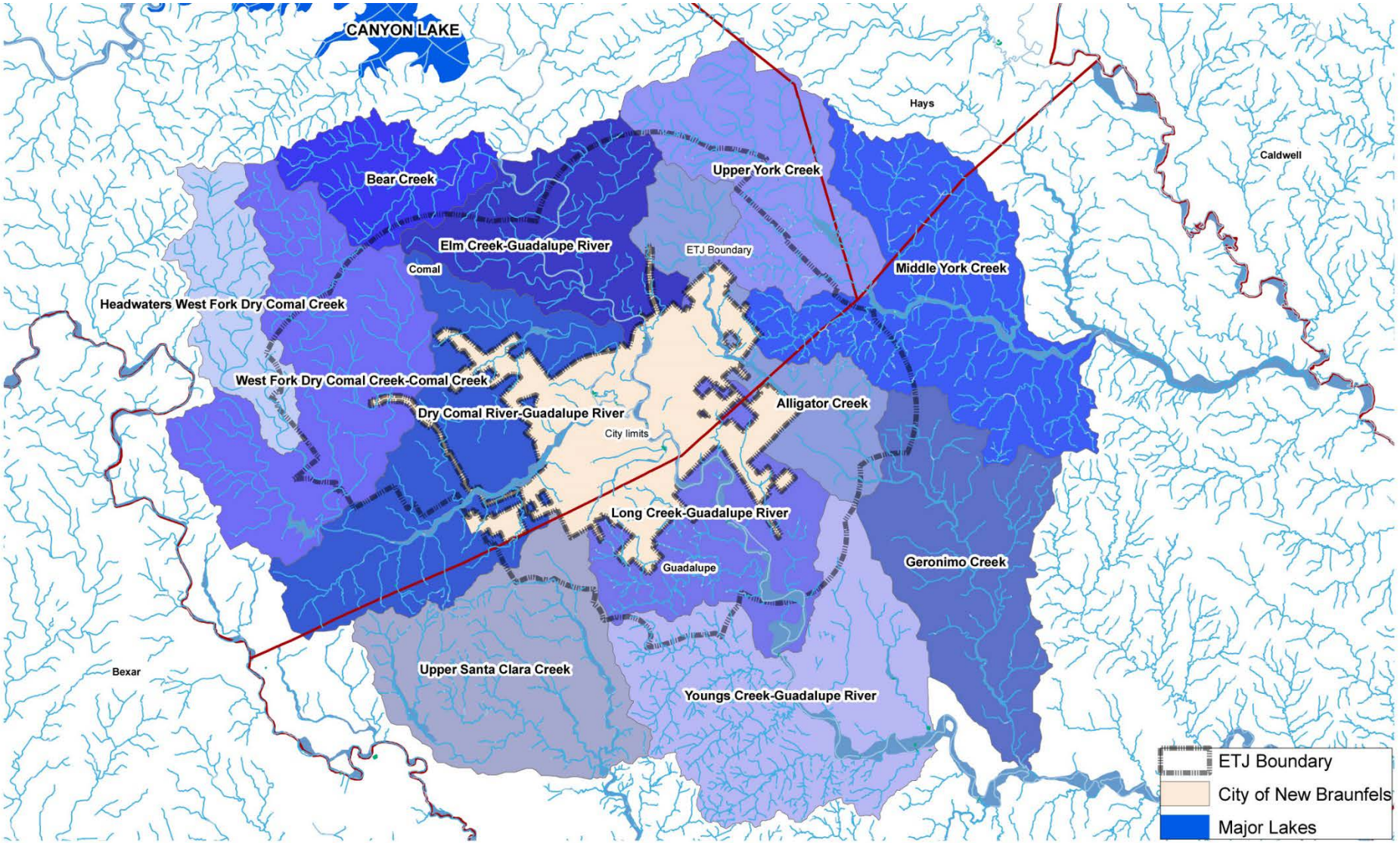
THESIS

We, as designers and engineers, have the opportunity to combine our expertise in creative ways which manage both stormwater and open space challenges through the creation of multifunctional spaces that benefit the community and bolster economic development.

REGIONAL STORMWATER PLANNING

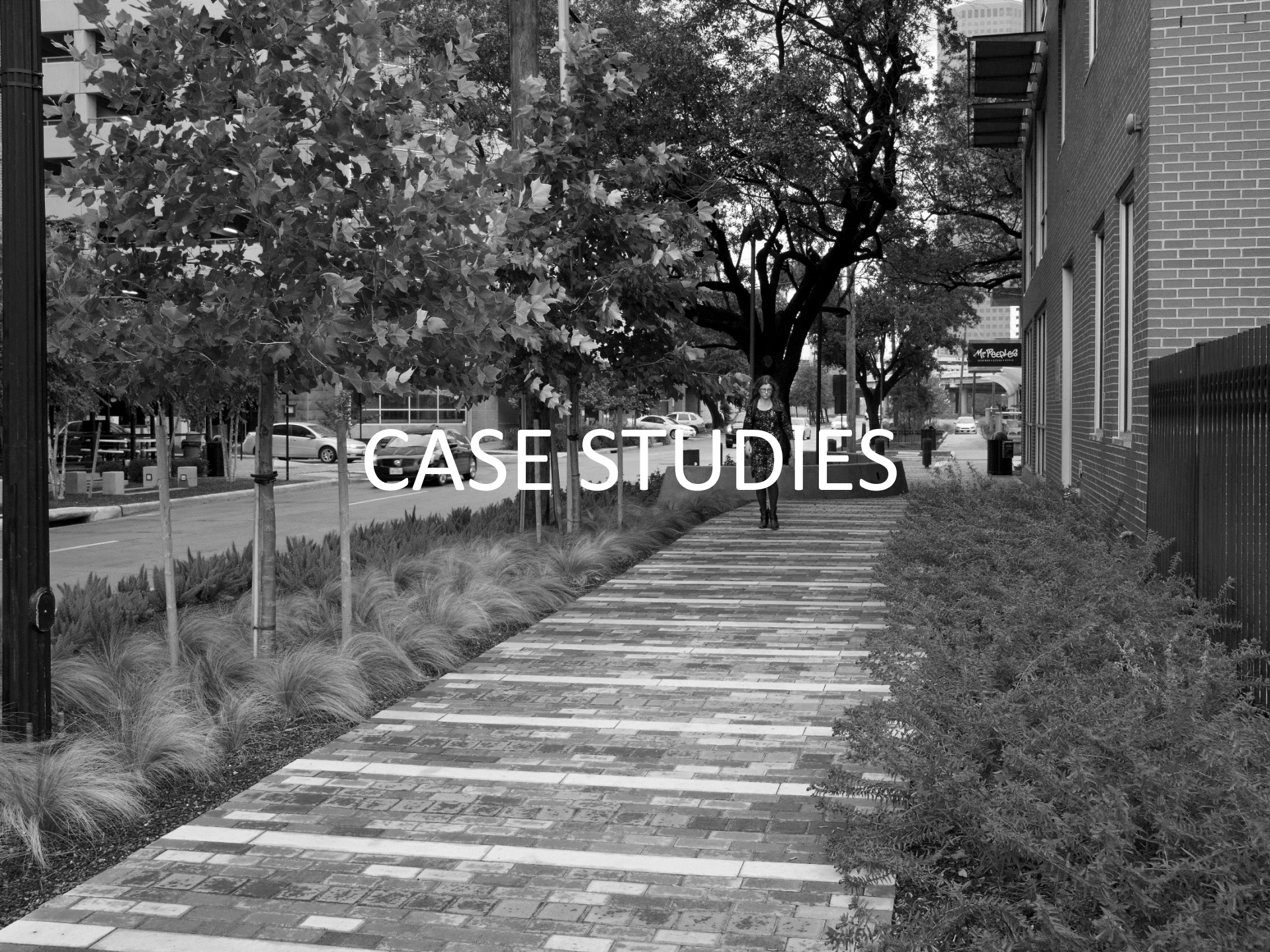


REGIONAL STORMWATER PLANNING

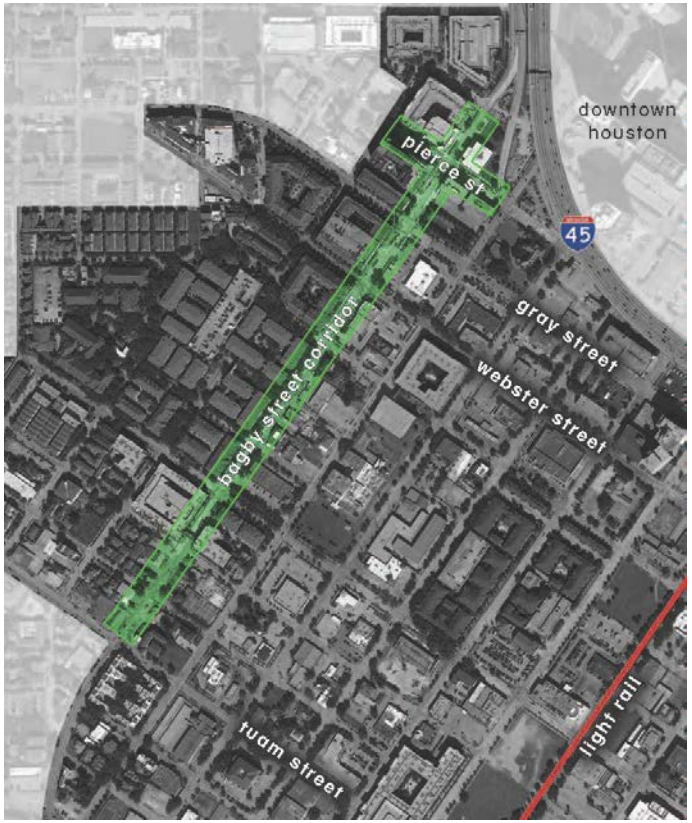


COMMUNITY INVOLVEMENT

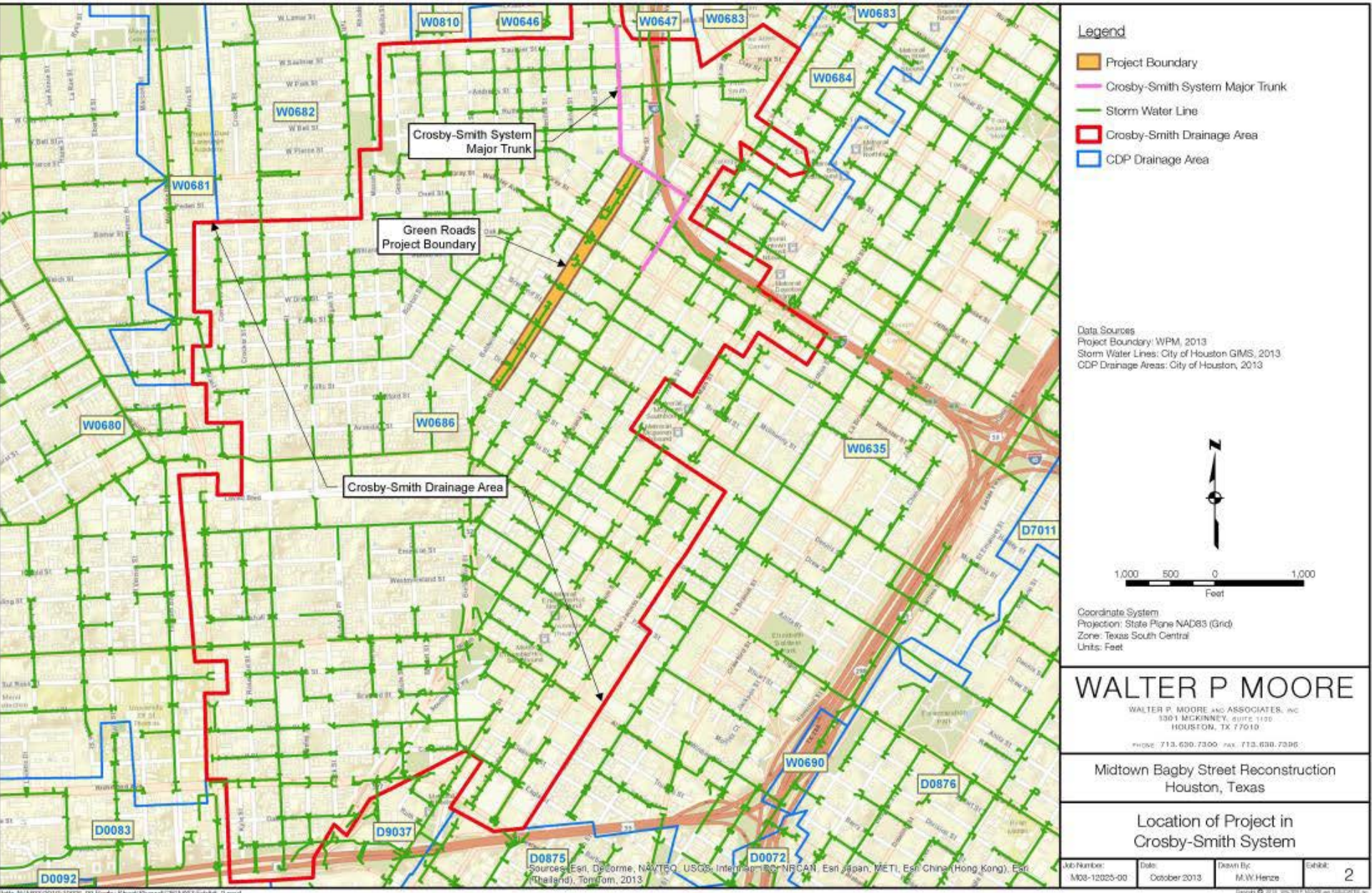
Strategy	Public Ranking (23 is highest, 1 is lowest)	Stakeholder Ranking (23 is highest, 1 is lowest)	Overall Ranking
Floodway Building Prohibitions	23	15	1
Open Space Conservation	22	18	2
Flood Hazard Mitigation	21	22Som	3
Stream and River Restoration	20	17	4
Litter Control	18	19	5
Construction Control Measures	16	16	6
Retrofit Stormwater Facilities	20	15	7
Building Runoff Capture	14	10	8
Impervious Coverage Reductions	13	14	9
Stormwater Utility Fee	12	9	10
Maintenance and Monitoring	11	23	11
Detention Basin	10	21	12
Stream Bank Setbacks	8	11	13
City Incentives or Fees	5	13	14
Retention	19	8	15
Density Bonuses	17	2	16
Stormwater Facilities Inventory	3	12	17
Clustering	9	4	18
Wetland Basin	7	3	19
Biofilter	6	5	20
Building Materials	4	1	21
Infiltration Basin	2	6	22
Porous Pavement	--	7	23


CASE STUDIES

BAGBY STREET LOCATION MAP



WATERSHED: 4.7 acre - 2-year storm event (437,000 gallons)



SITE CONTEXT

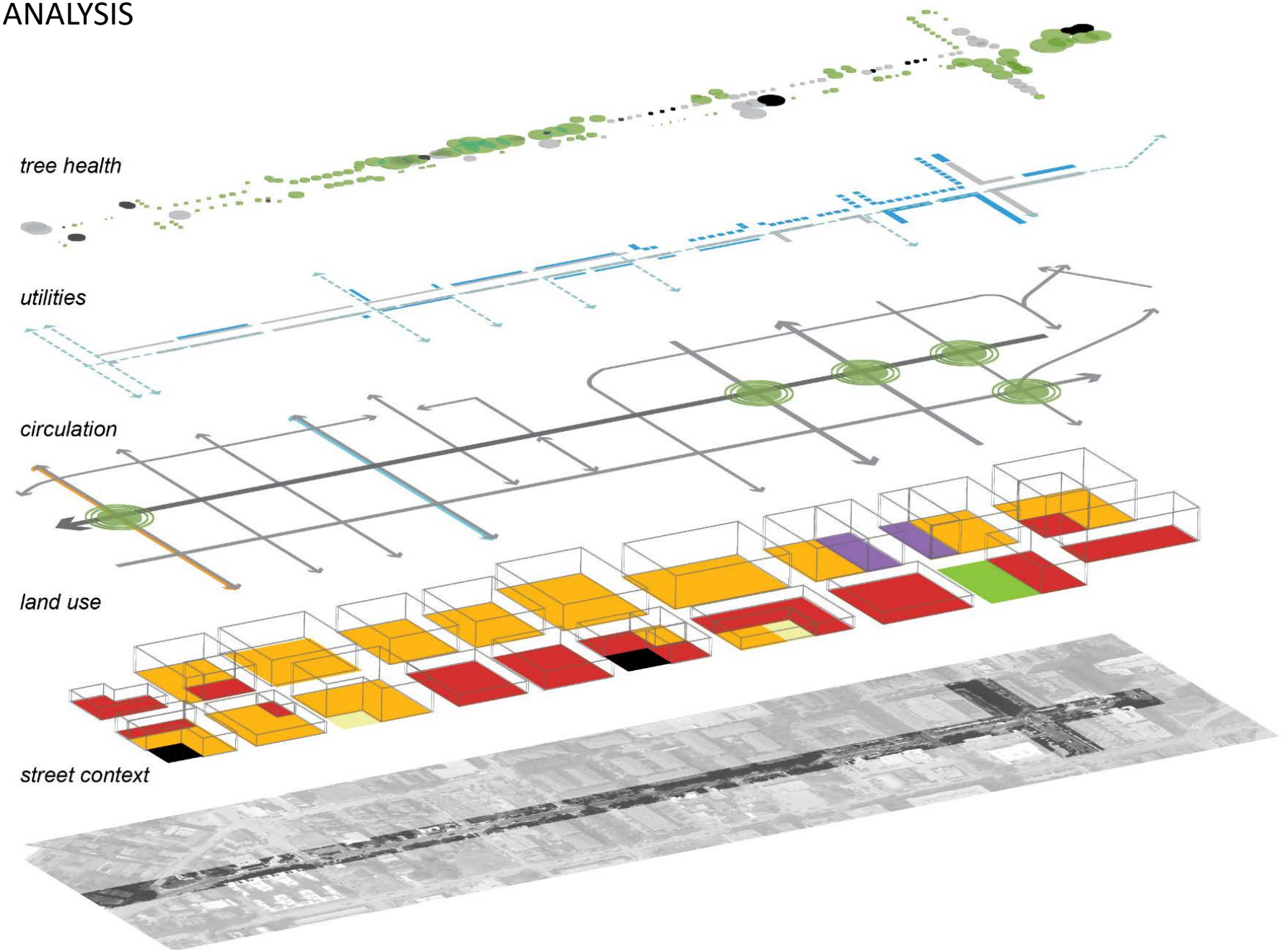
PRE-EXISTING STREET CONDITIONS

Standard vehicle- focused street
Four travel lanes despite low traffic demands


PRE-EXISTING STREET CONDITIONS
Conventional swale system
Dilapidated sidewalks


PRE-EXISTING STREET CONDITIONS
midtown
Bagby
2700
ONE
WAY
BYERS
ENGINEERING
COMPANY
Conventional curb and gutter system

ANALYSIS


tree health
utilities
circulation
land use
street context

PROJECT SITE PLAN – 0.6 MILES OF STREET RECONSTRUCTION

ENVIRONMENT

- Beneficial planting
- Reduction of heat island effect
- Reduction of noise pollution
- Increase green stormwater use
- Implement Green Streets Standards

COMMUNITY

- Provide community programming/activities
- Collaborate with community members
- Foster neighborhood identity and character
- Improve wayfinding and visitor experience

ART/AESTHETIC

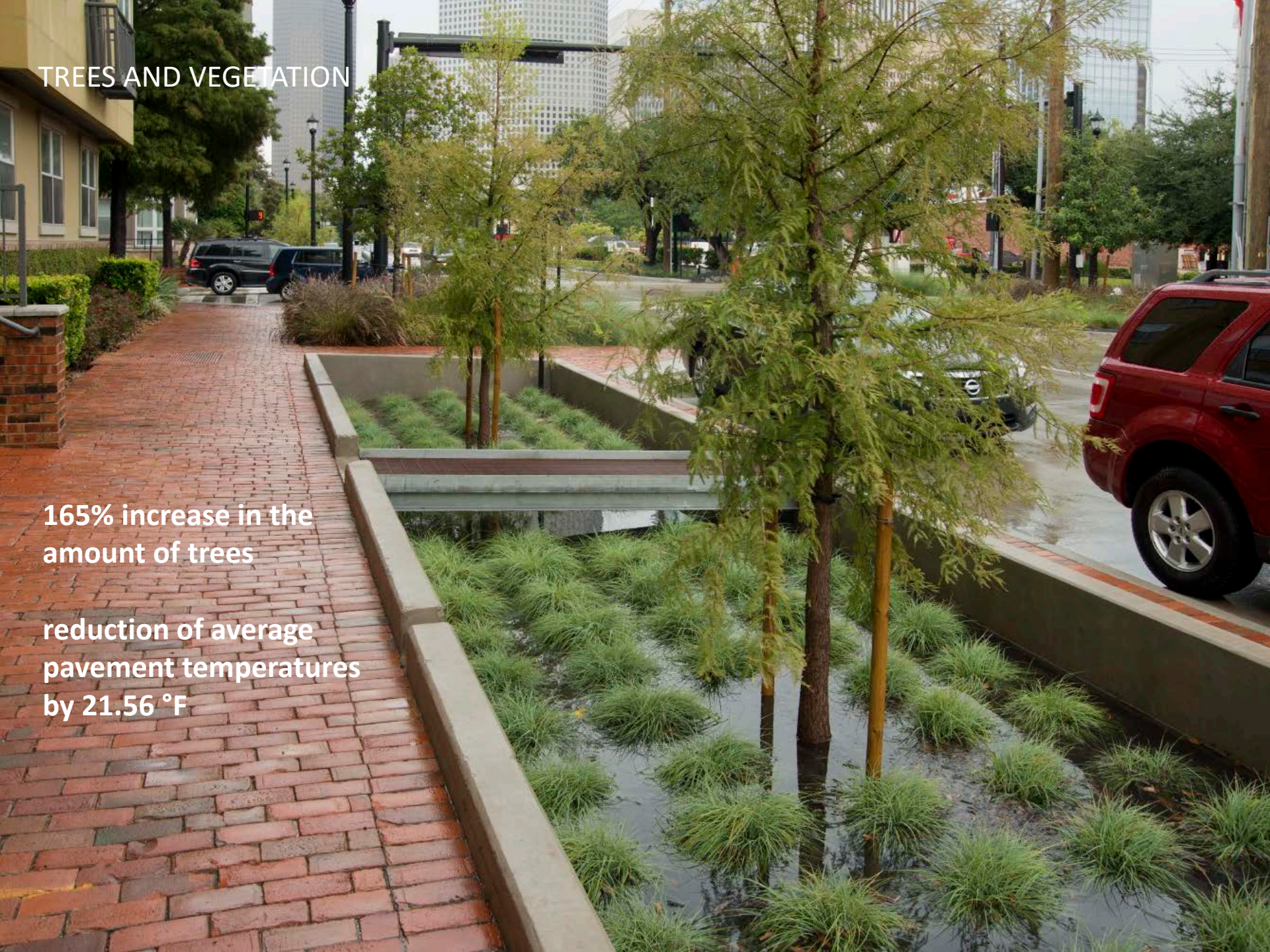
- provide a distinct and unique 'place'
- implement public art as a long term benefit

ECONOMICS

- Potential return on investment
- Limit impact on business during construction
- Implement plan that is financially attractive for redevelopment


42% increase of existing tree growth area
276% increase in dedicated pedestrian areas
300% tons of carbon reduced from emissions due to use of 25% fly ash in the concrete mix

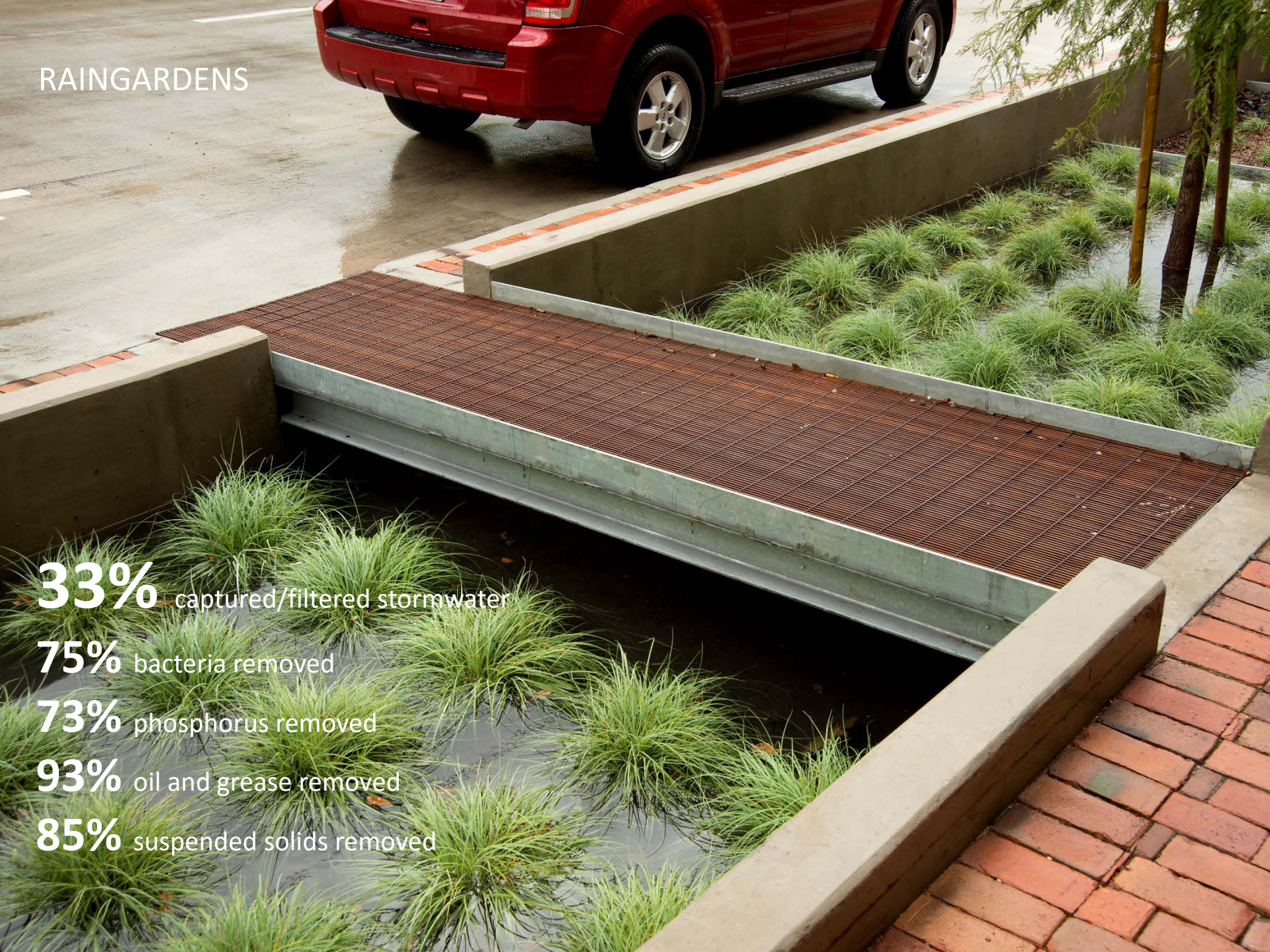
TREES AND VEGETATION



165% increase in the amount of trees

reduction of average pavement temperatures by 21.56 °F

RAINGARDENS



33% captured/filtered stormwater

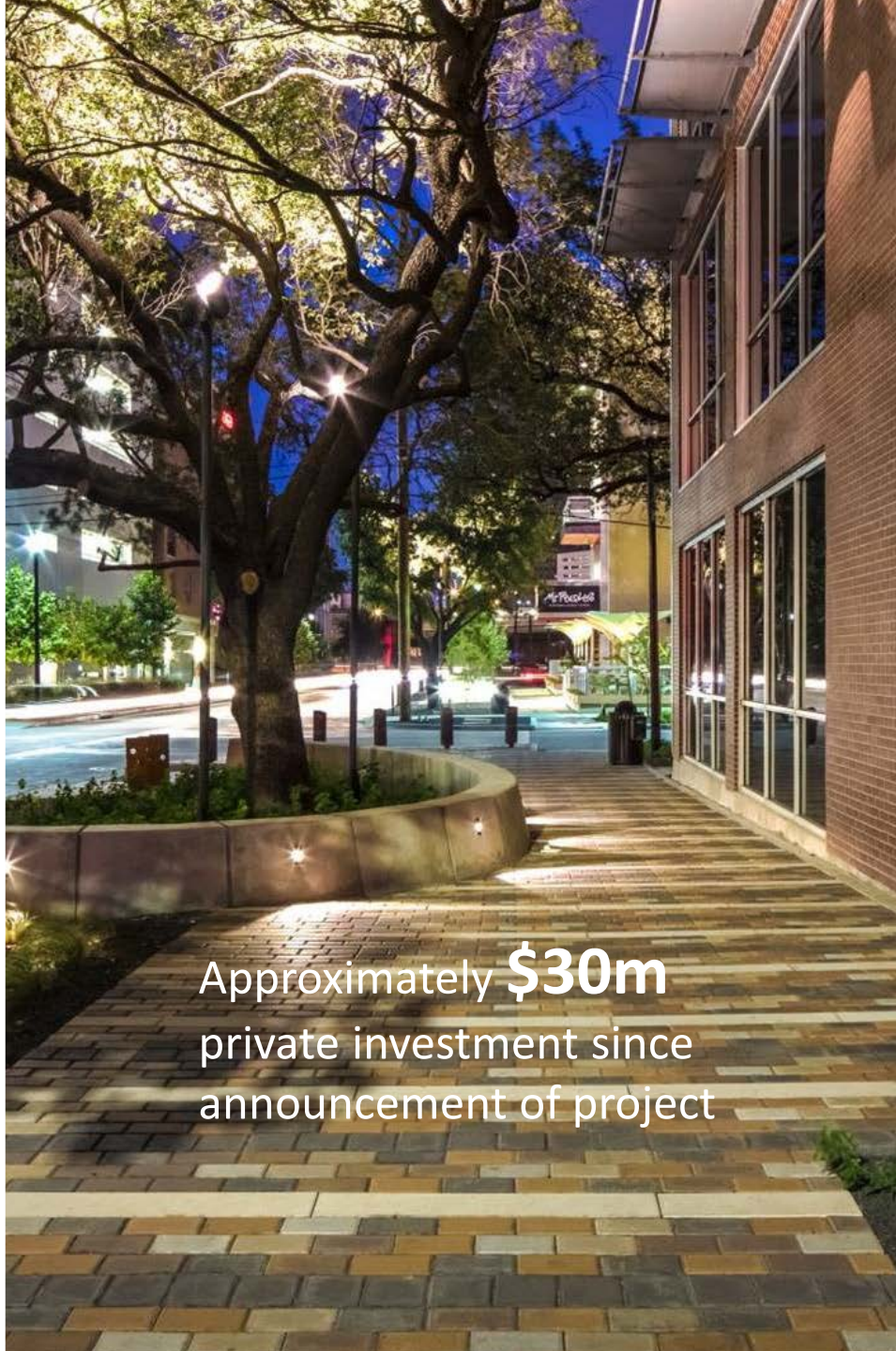
75% bacteria removed

73% phosphorus removed

93% oil and grease removed

85% suspended solids removed


RAIN GARDENS:
Sustainable Storm Water Management



Approximately **$30m** private investment since announcement of project

STREET PARKING AREA DESIGNATION AND SIDEWALK ACCESS IMPROVEMENTS

20% rental market increase
25% property value increase

BAGBY STREET | GREENROADS

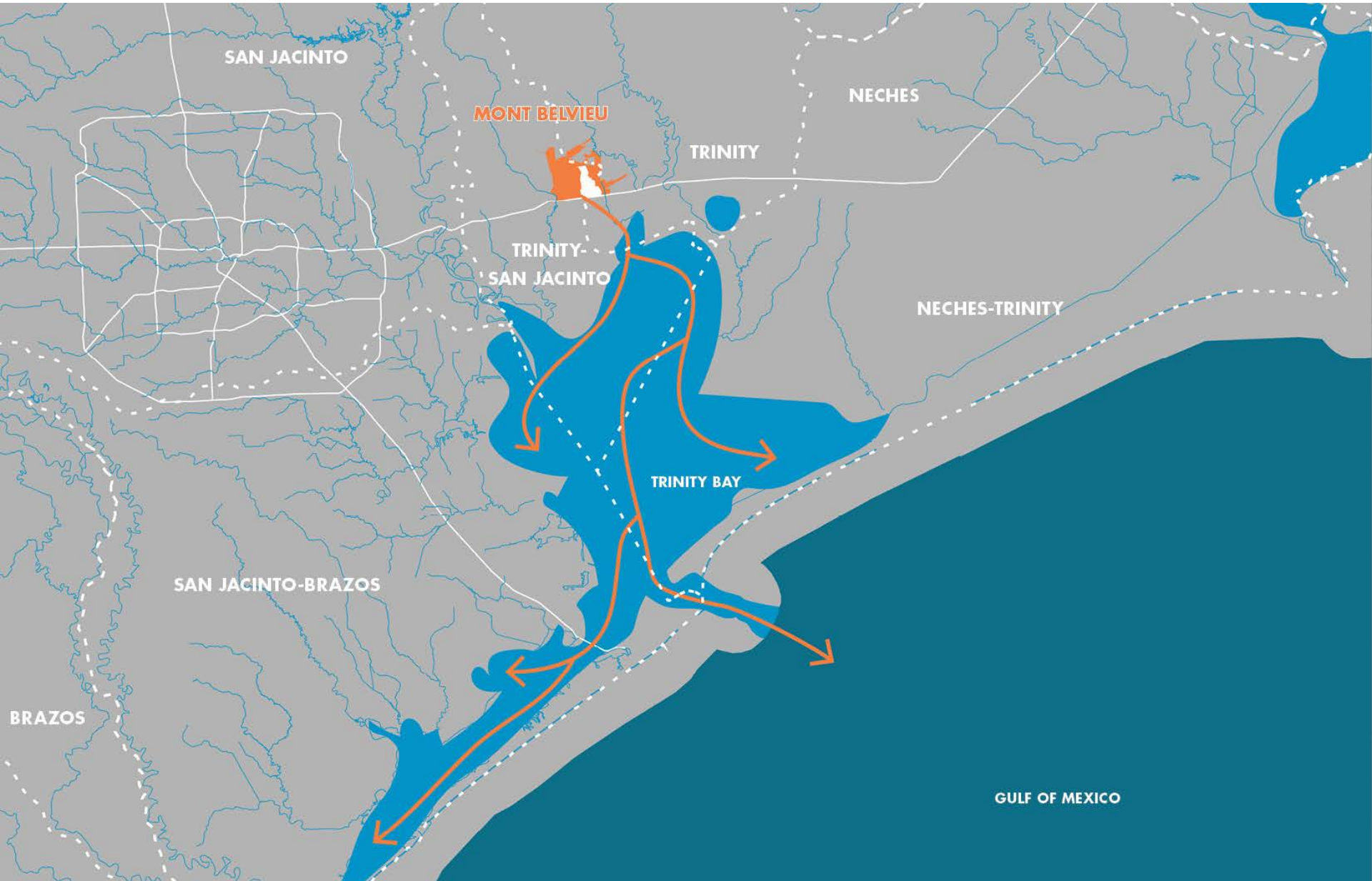
The Greenroads® Rating System is an easy way to measure and manage sustainability on transportation projects. It challenges Project Teams to go above and beyond minimum environmental, social, and economic performance measures and be evaluated by an independent, expert, third-party review.

HACKBERRY GULLY REGIONAL PARK

Project Location – Mont Belvieu, Texas

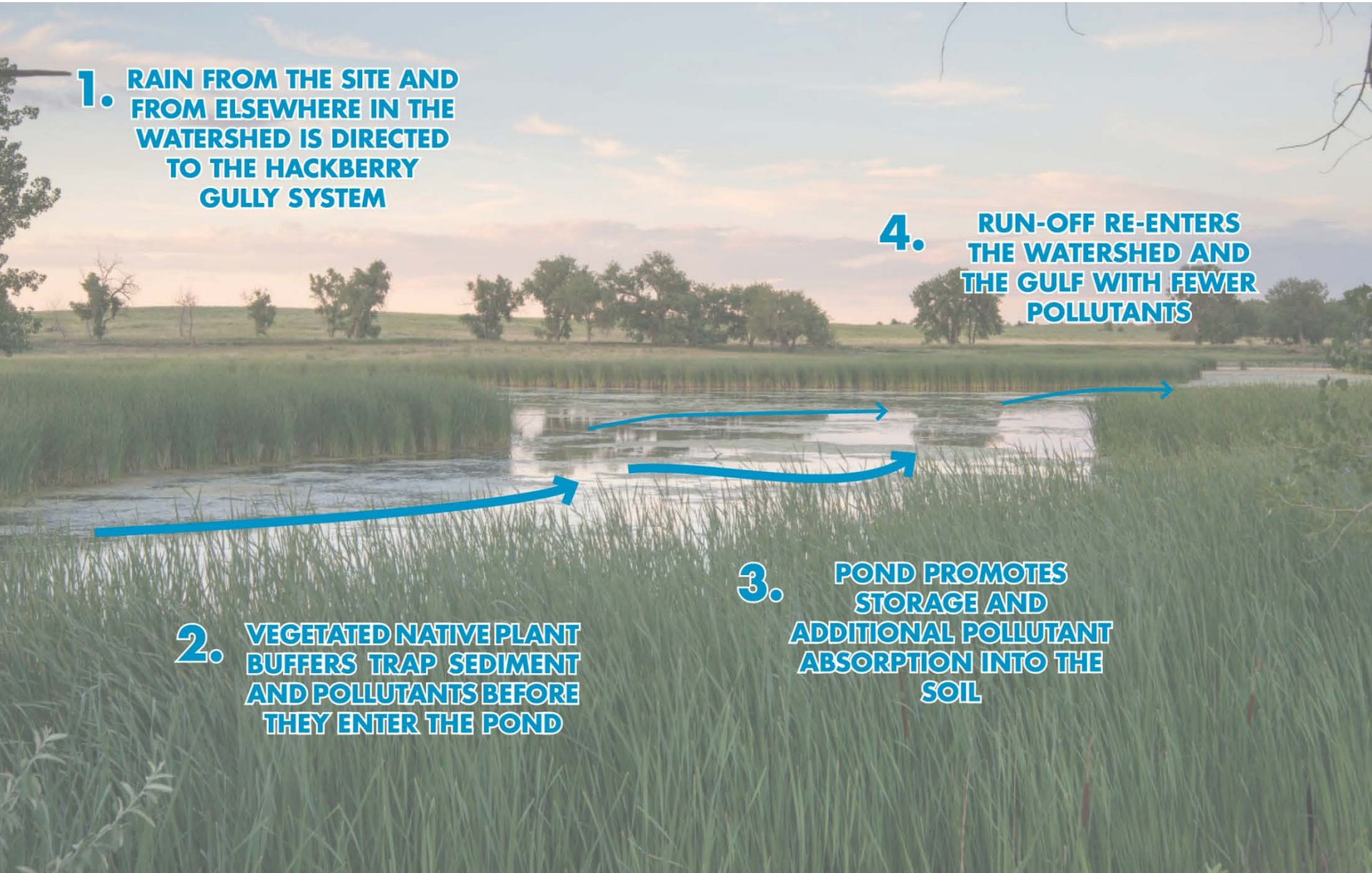
HACKBERRY GULLY REGIONAL PARK

Role in the Watershed



HACKBERRY GULLY REGIONAL PARK

Role in the Watershed



HACKBERRY GULLY REGIONAL PARK

ECONOMICS

ENVIRONMENT

COMMUNITY

ART

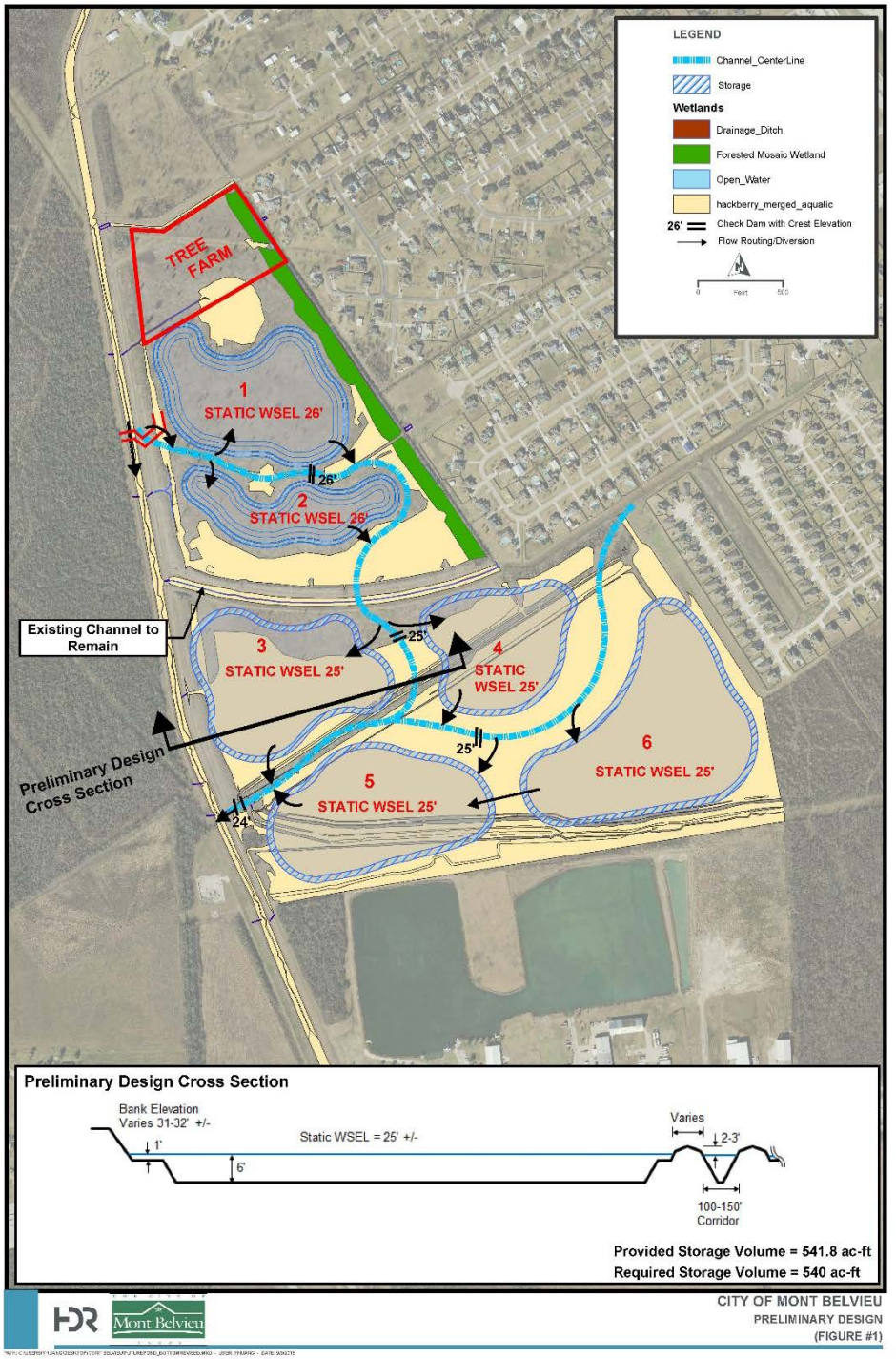
HACKBERRY GULLY REGIONAL PARK

Planning for Volume

- HDR calculated pond volume for “build out” of the Hackberry Gully Watershed – 540 ac-ft
- Team envisioned a multi-pond approach
- Minimum flow line was maintained in Hackberry Gully
- A system of wet bottom ponds were studied and a diversion channel was introduced to carry the water to each pond

REIMAGINE STORMWATER AS A MULTI-FUNCTIONAL AMENITY

CREATE AN ECOLOGICALLY RESTORATIVE RESOURCE



HACKBERRY GULLY REGIONAL PARK

Planning for Recreational Use

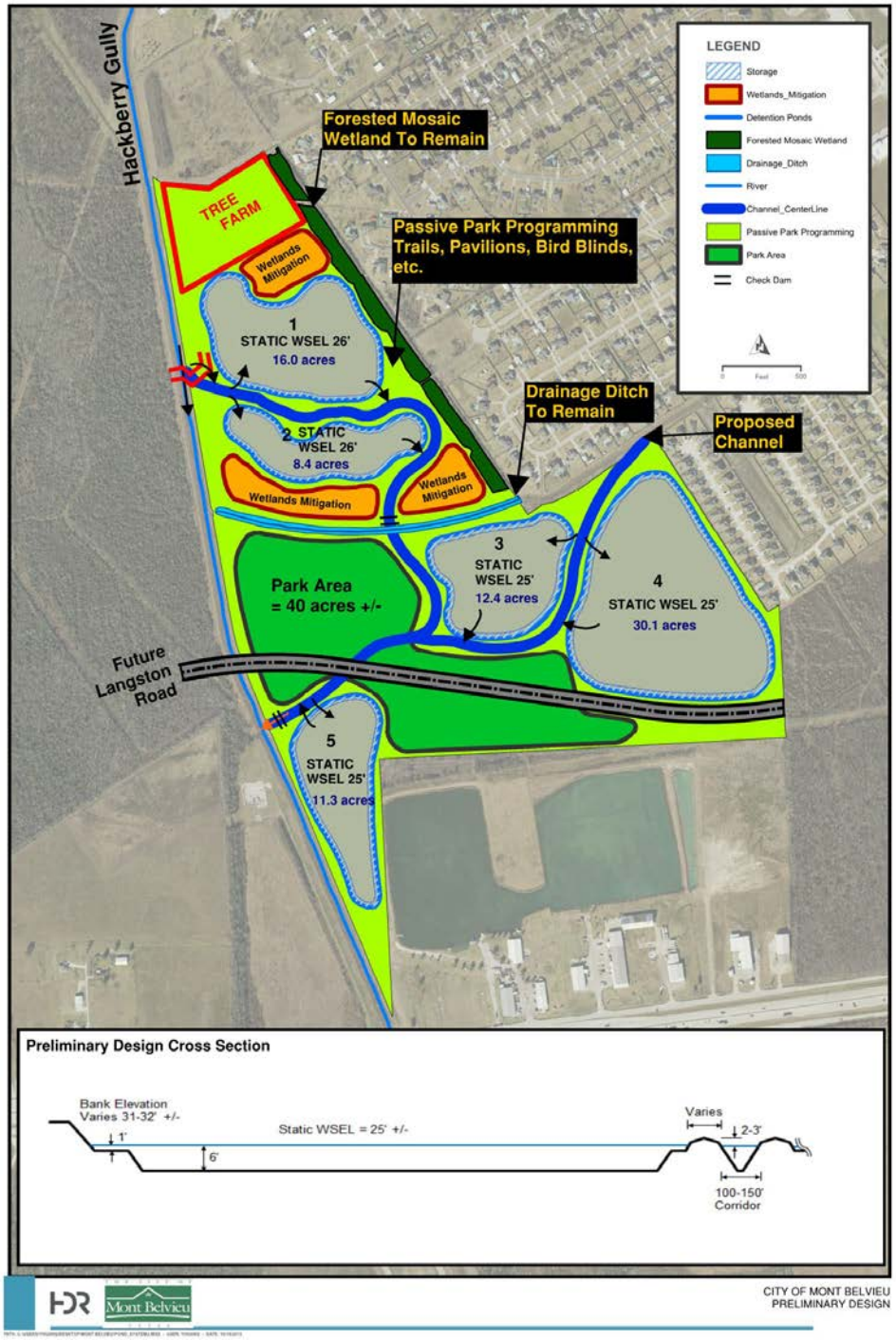
- Added room for trails and other park programs compatible with a focus on nature and wetland mitigation
- Added 40 acres of active recreational programming
- Presented the framework to the City and community to begin programming
- Deepening of ponds accommodated 545 ac-ft

REIMAGINE STORMWATER AS A MULTI-FUNCTIONAL AMENITY

CREATE AN ECOLOGICALLY RESTORATIVE RESOURCE

PROVIDE COMMUNITY PROGRAMMING FOR A GROWING POPULATION

ESTABLISH THE PARK AS A UNIQUE DESTINATION



HACKBERRY GULLY REGIONAL PARK

LEGEND:

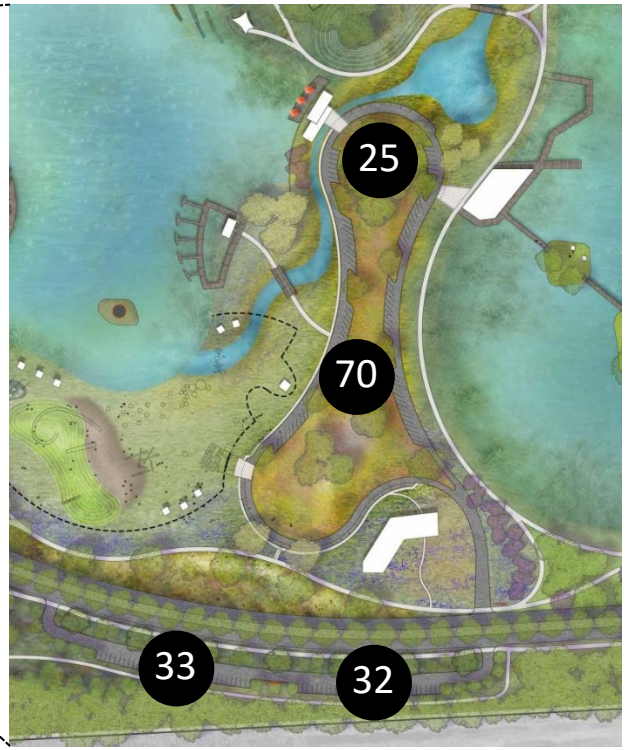
1. Tree Farm
2. Farm Trail and Bait Shop
3. Observation Hill, Boardwalk, Art
4. Habitat and Roosting Islands
5. Camping and Wetland Trail
6. Native Gardens
7. Hammock Grove
8. Great Lawn
9. Event Deck
10. Nature Center and Outdoor Classroom
11. Kayak Rental
12. Nature Playground
13. Western Park Entry Feature
14. Dog Park
15. Parking Lot
16. Future Community Building
17. Meadow Garden
18. Picnic Islands
19. Future Community Building
20. Picnic Pavilions
21. Eastern Park Entry Feature

HACKBERRY GULLY REGIONAL PARK

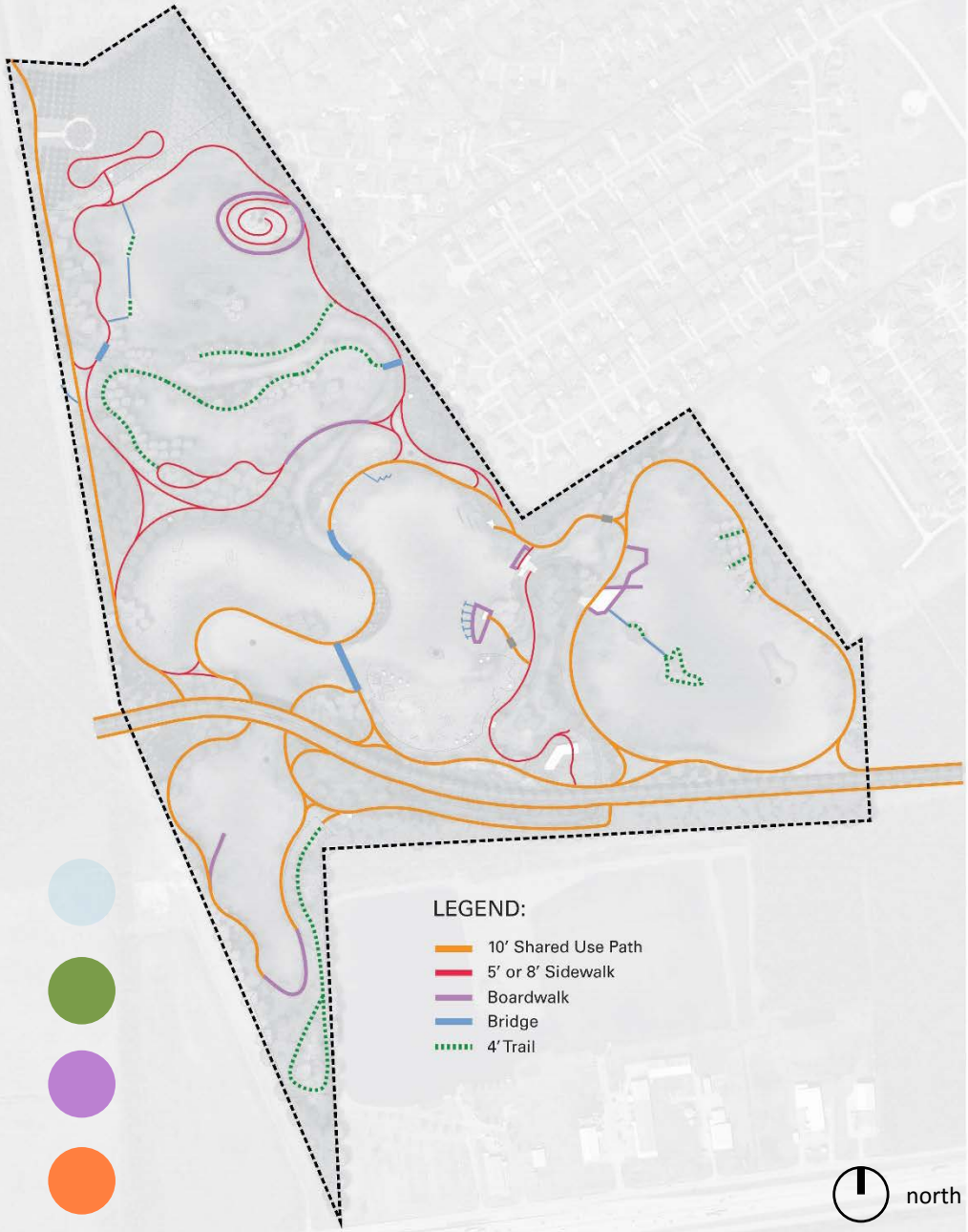
Enlargement of Northern Site - “Nature Focused”

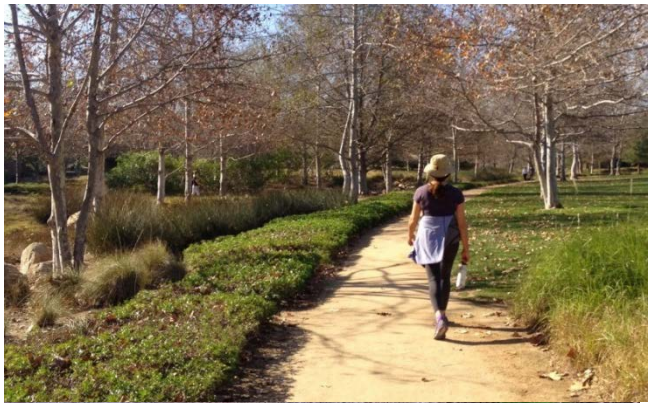
HACKBERRY GULLY REGIONAL PARK | Parking and Access

160 total parking spaces

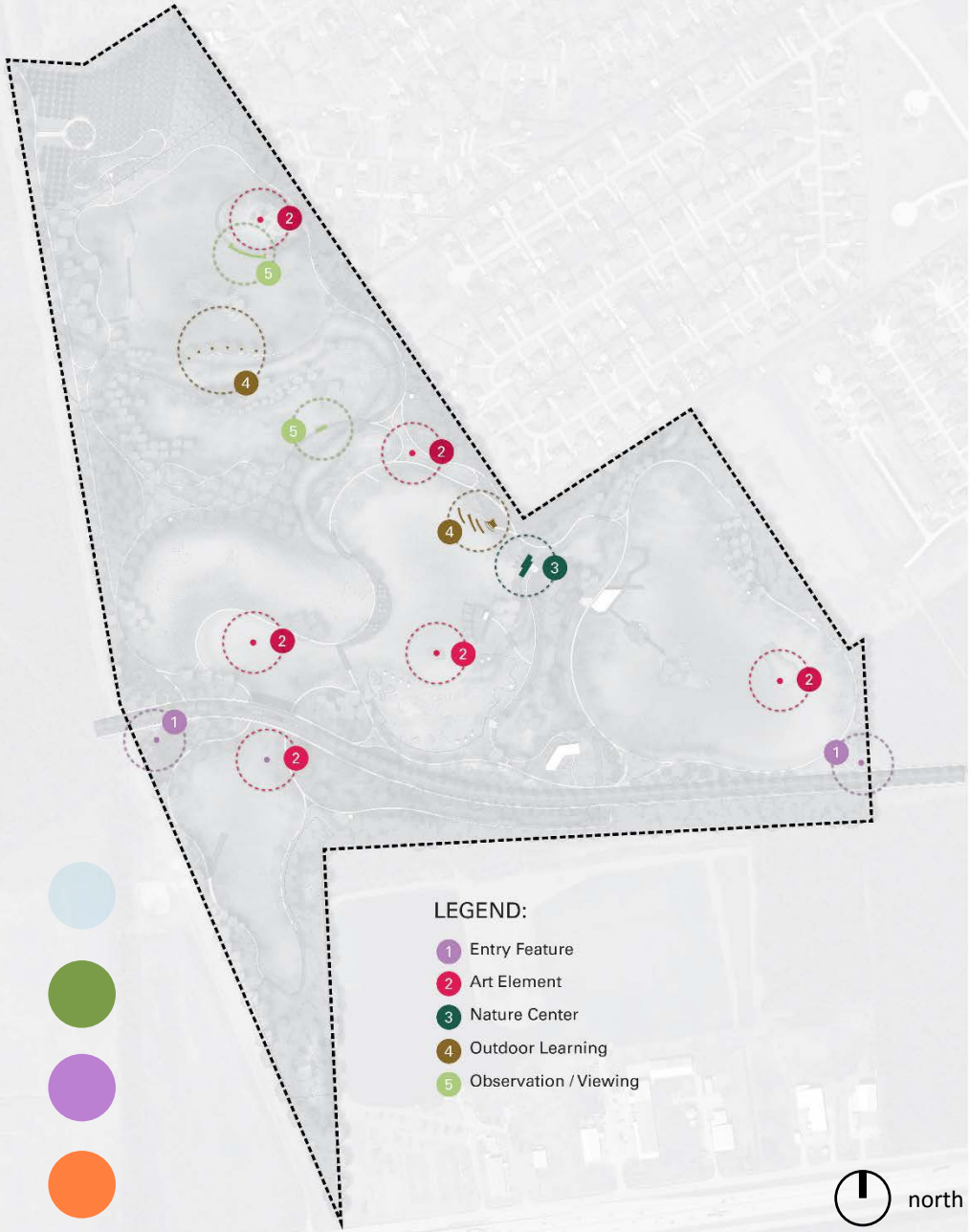


HACKBERRY GULLY REGIONAL PARK | Trails

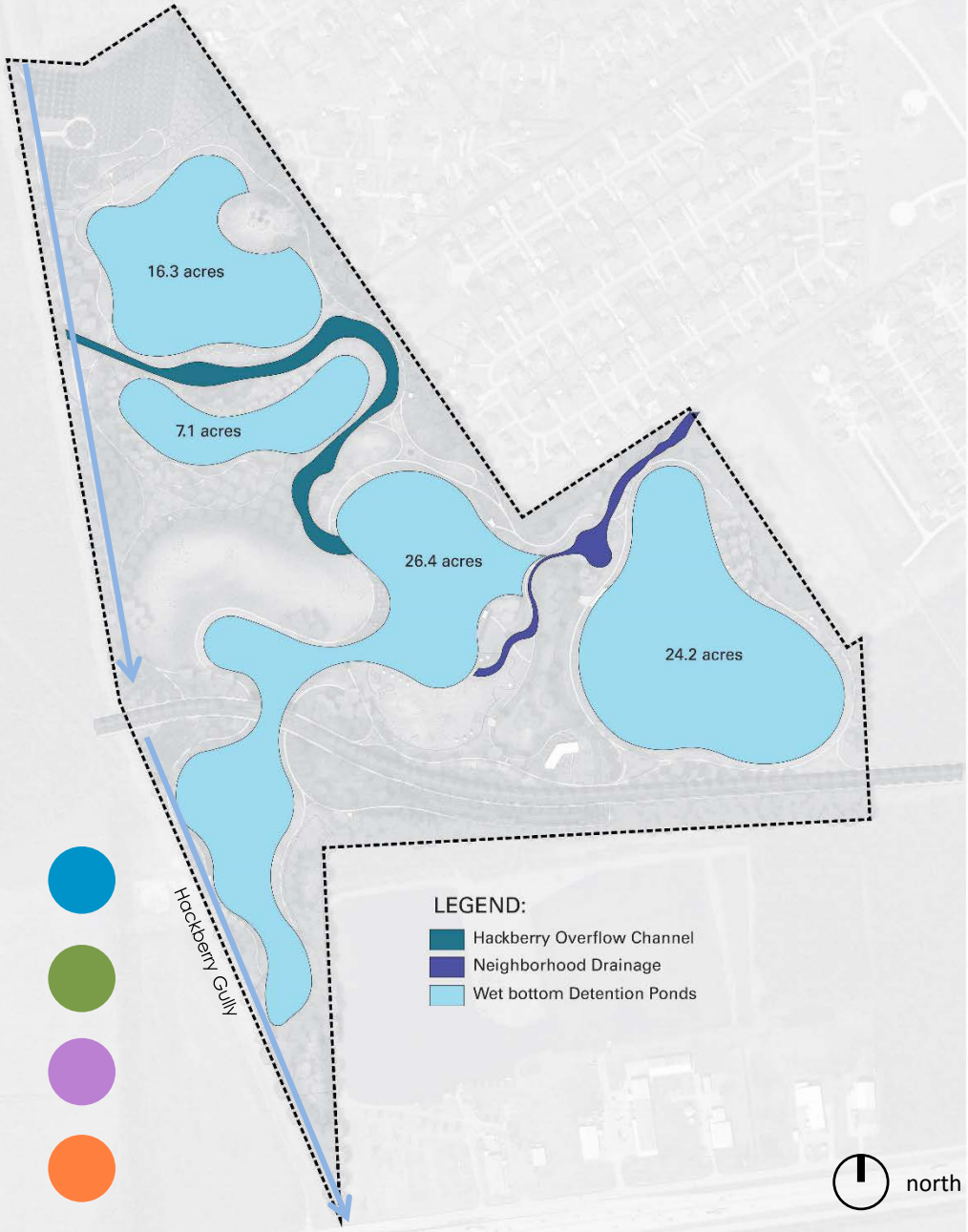




HACKBERRY GULLY REGIONAL PARK | Arts and Education



HACKBERRY GULLY REGIONAL PARK | Stormwater



HACKBERRY GULLY REGIONAL PARK | Park Structures

HACKBERRY GULLY REGIONAL PARK

7.6 MILES
OF TRAILS

74 ACRES
OF SURFACE POND

90 ACRES
PROGRAM

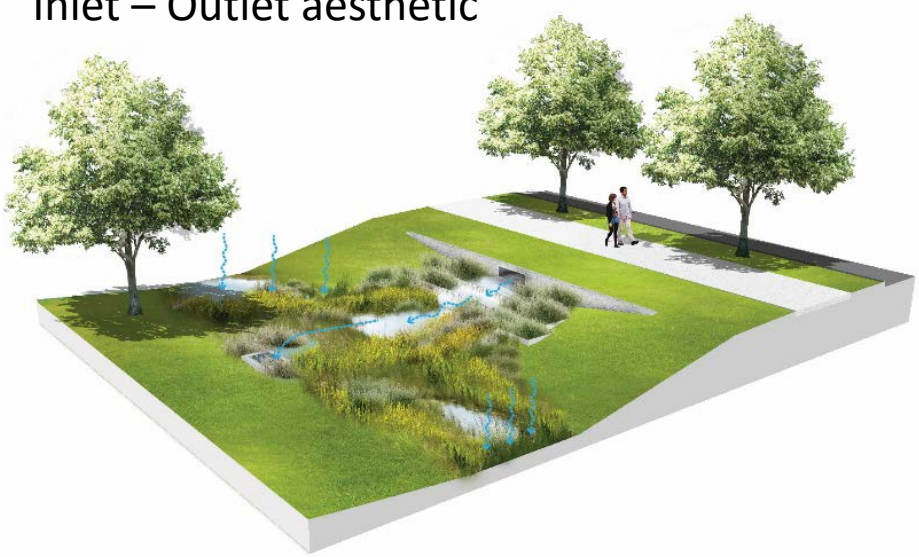
160
PARKING SPACES


CLOSING
ISLAND SYSTEMS
nature center
picnic islands

MONT BELVIEU DRAINAGE STANDARDS

Inlet – Outlet visible

Inlet – Outlet aesthetic



Inlet – Outlet hidden

Inlet – Outlet obscured

MONT BELVIEU DRAINAGE STANDARDS | detention before

MONT BELVIEU DRAINAGE STANDARDS | detention after

CASCADE PARK

BROWNSVILLE, TX

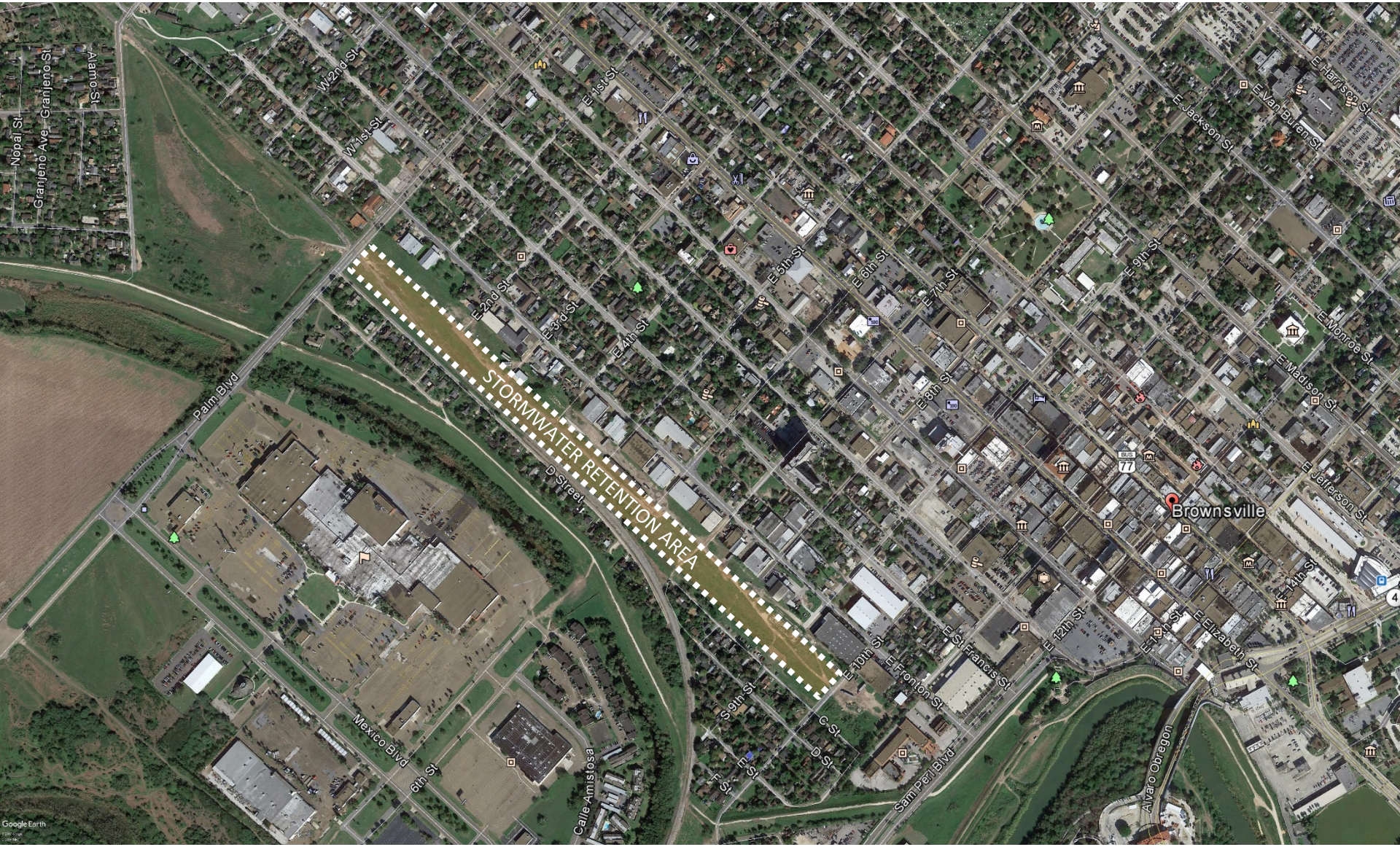
DESIGNWORKSHOP

LA HACIENDA CASITAS
buildingcommunityWORKSHOP and CDCB

HARLINGEN, TX

DESIGNWORKSHOP

PROPOSED STORMWATER MANAGEMENT AREAS IN DOWNTOWN BROWNSVILLE



BROWNSVILLE, TX

DESIGNWORKSHOP

QUESTIONS?


Thank you,
Design Workshop
713-227-0862
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