UNIVERSITY OF NEW ORLEANS MASTER PLAN

APPENDIX E : COMPREHENSIVE WATER (ECOLOGY / RESILIENCE) ASSESSMENT
CIVIC STUDIO

TRAPOLINPEER | VMDO
CIVIC STUDIO A NEW ORLEANS CO-OP
K&CO
BRAILSFORD & DUNLAVEY
spackman mossop michaels

Water (Ecology/Resilience)

Civic Studio Final Outputs

CIVIC STUDIO

A NEW ORLEANS CO-OP

Summary of Key Findings

1. **The coastline of New Orleans is always changing**. A resilient campus plan and design strategies will accommodate change, e.g., in sea level, salinity, waterfront development.
2. **UNO occupies a ridge** and slopes down towards the low-lying St. Anthony neighborhood. This means reducing stormwater runoff from UNO will benefit not just UNO, but the rest of Gentilly as well by alleviating the load on Drainage Pump Station 4.
3. **See UNO as part of a broader ecology**. Understand it as part of a changing coastline, as part of the intercontinental Mississippi Flyway, as a landscape of oaks and cypresses and other trees that will outlive most of us. We can develop urban design strategies that relate to these longer timeframes, and UNO's community as stewards of a particular lakefront ecosystem.
4. **Parking is/is not the problem.** Massive parking lots result in large volumes of runoff. A decisive shift towards a multi-modal campus where parking occupies far less space will radically reduce UNO's stormwater impact on the city. (Water management cannot be addressed as a standalone issue.)
    a. **Direction 1: Keep parking as is**, but retrofit with large amounts of green infrastructure. This may be effective in reducing runoff and improving water quality, but will likely be cost prohibitive in terms of both initial investment and long-term maintenance costs.
    b. **Direction 2: Invest in a multi-modal campus** that substantially reduces parking needs. Depave unnecessary parking areas and planting low-maintenance landscapes will be high impact and have lower maintenance costs.

Restoration is imperative for healing the earth, but reciprocity is imperative for long-lasting, successful restoration. Like other mindful practices, ecological restoration can be viewed as an act of reciprocity in which humans exercise their caregiving responsibility for the ecosystems that sustain them. We restore the land, and the land restores us.

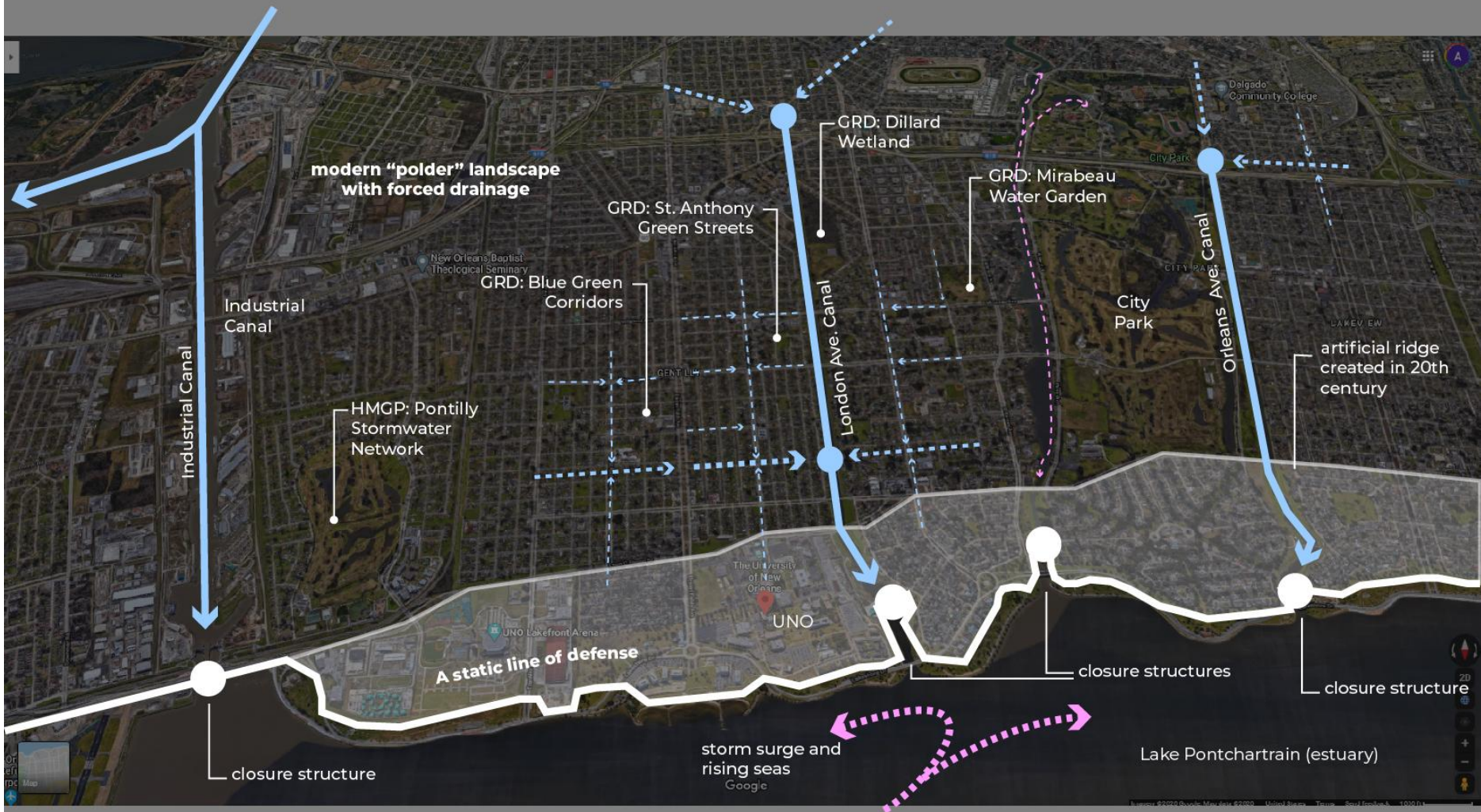
-Robin Wall Kimmerer

Pre-colonial

The Mississippi River, its distributaries, and myriad bayous once flowed across the delta, overflowing or breaking through their banks and depositing fresh sediment across present-day Gentilly. The coastline shifted with each spring flood, tropical storm, and the changing tide.

Present-day

In the present-day, modern forced drainage and flood protection measures have resulted in a radically different landscape. Artificial fill, upon which UNO is situated, forms a ridge separating the lake from the rest of Gentilly and the rest of the city. Levees, floodwalls, and massive closure structures repel storm surge, while pump stations within the levees drain stormwater and groundwater from neighborhoods that are now below sea level.



Hardened Edge

Even into the 20th century, the lakefront was a gentle slope into the waters of Lake Pontchartrain, as seen in the image on the left. The introduction of the concrete seawall at the water's edge, seen in the image on the right, hardened and straightened the coastline.

Next two slides
USGS maps and historic photos over a century show how much the coastline has changed, with the city expanding out into the lake (red cross marks the same location on each map), and hardening its edge with the concrete seawall that is especially prominent in the 1936 map.

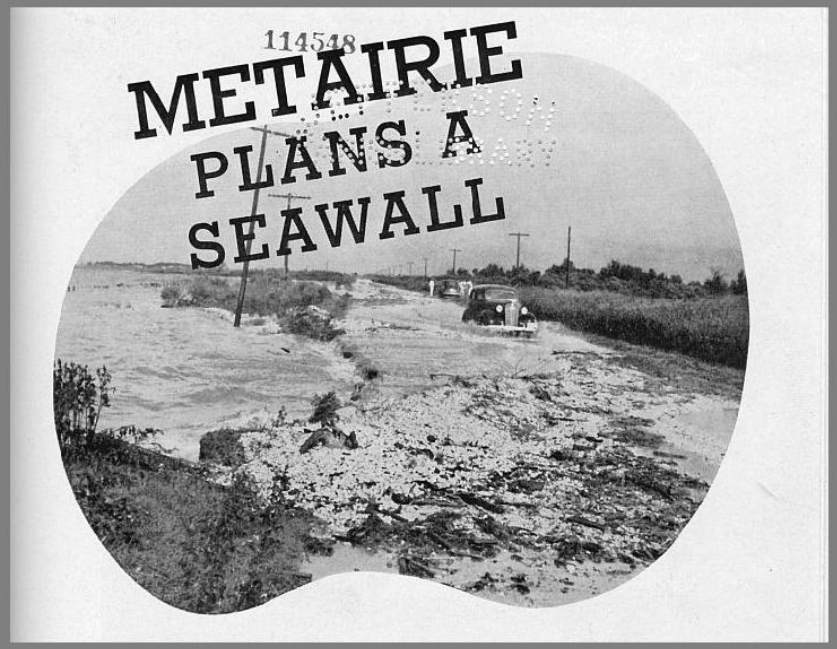
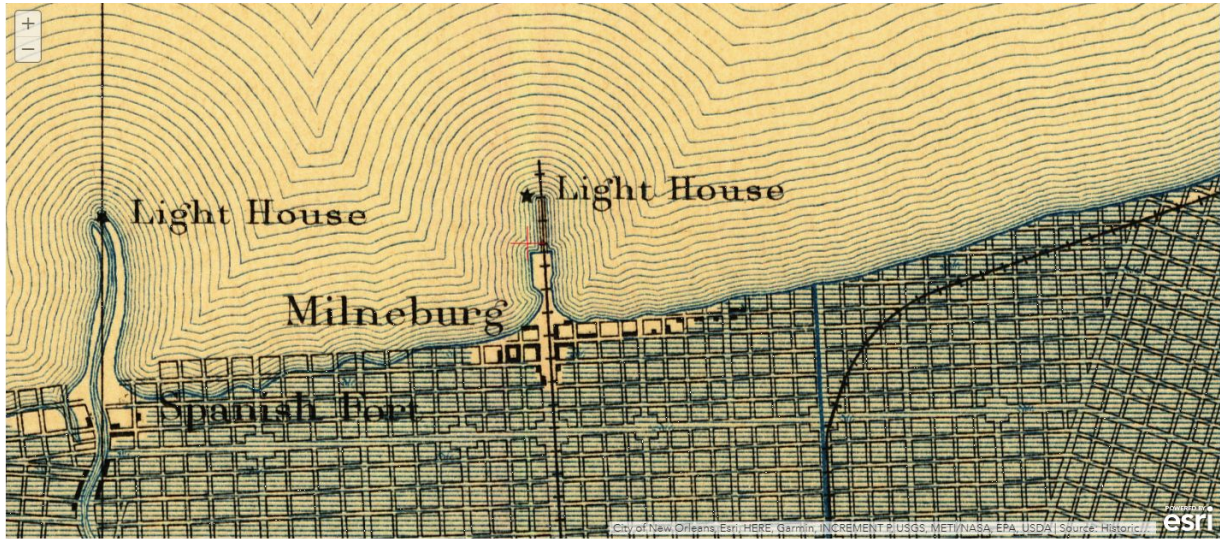
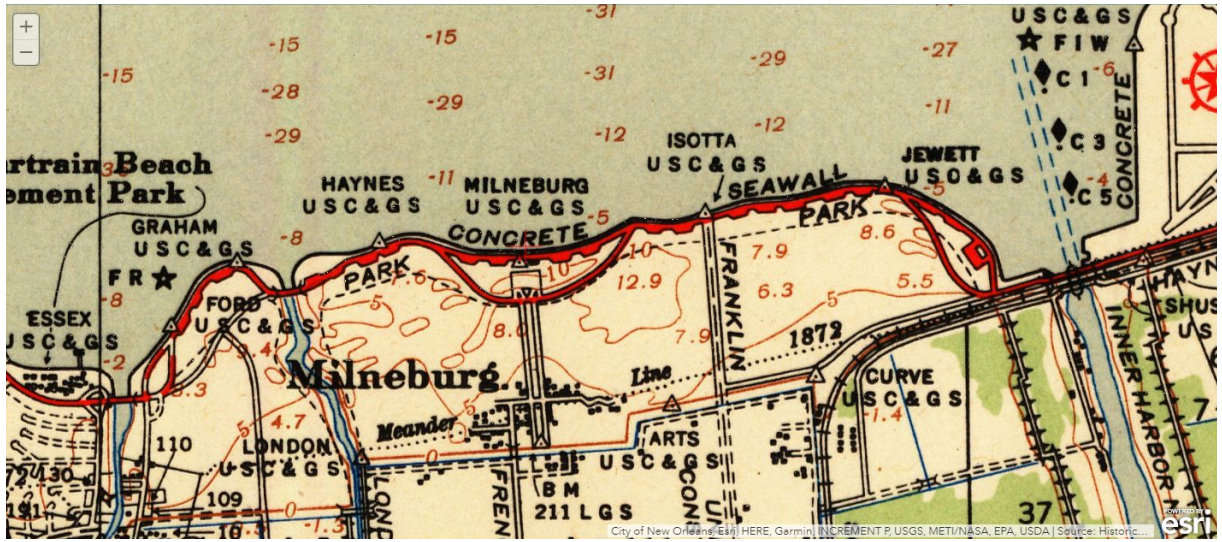


Image: Jefferson Parish Yearly Review

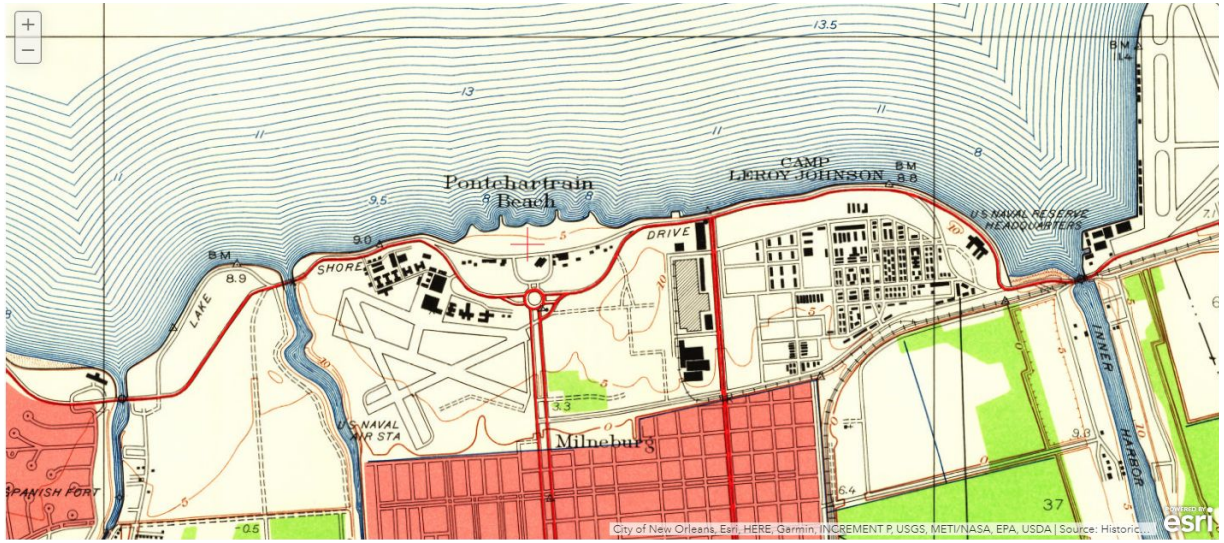
Photo: Charles L. Franck
Franck-Bertacci Photographers Collection / The Historic New Orleans Collection



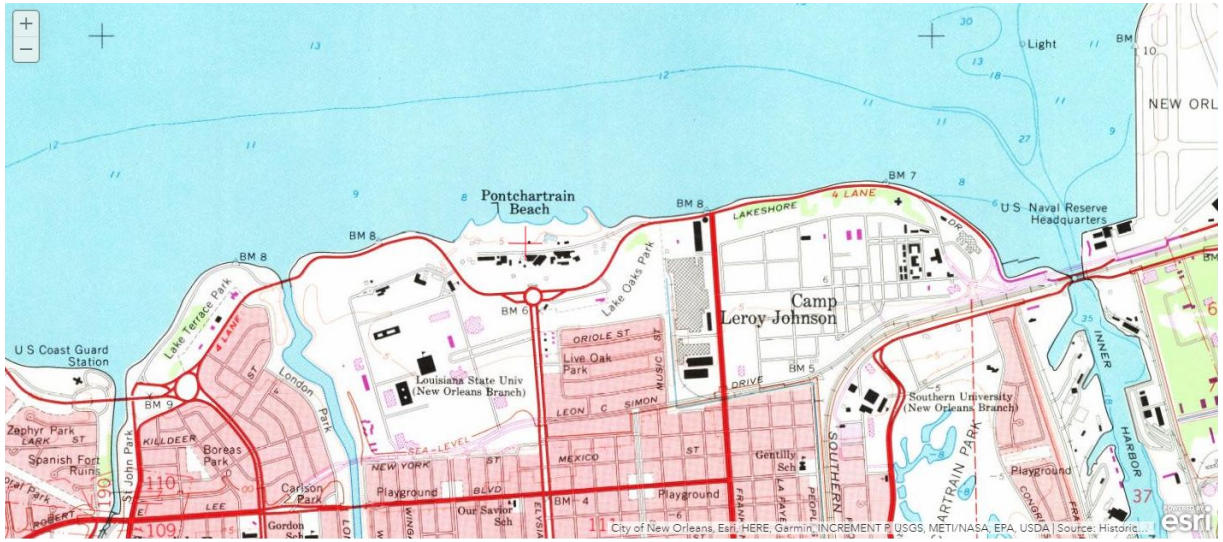
1890



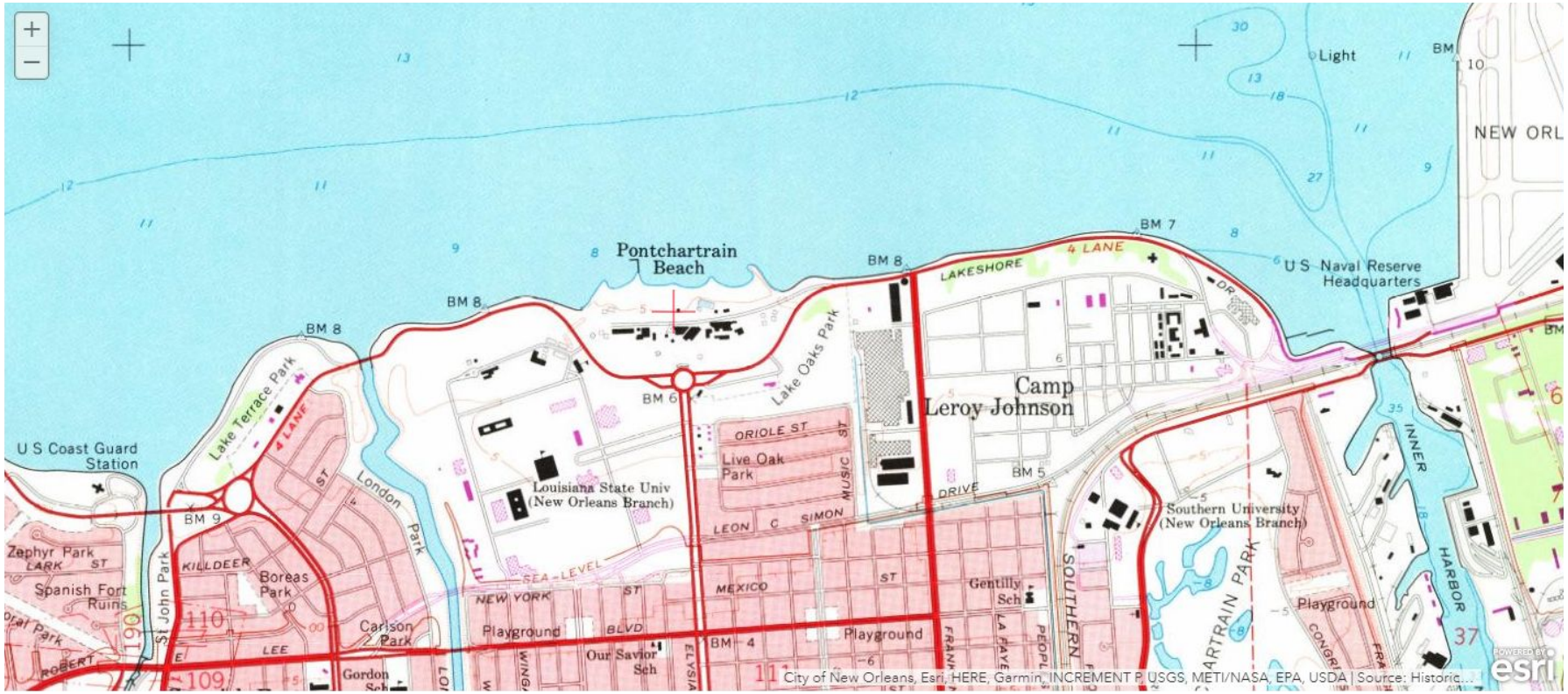
1936



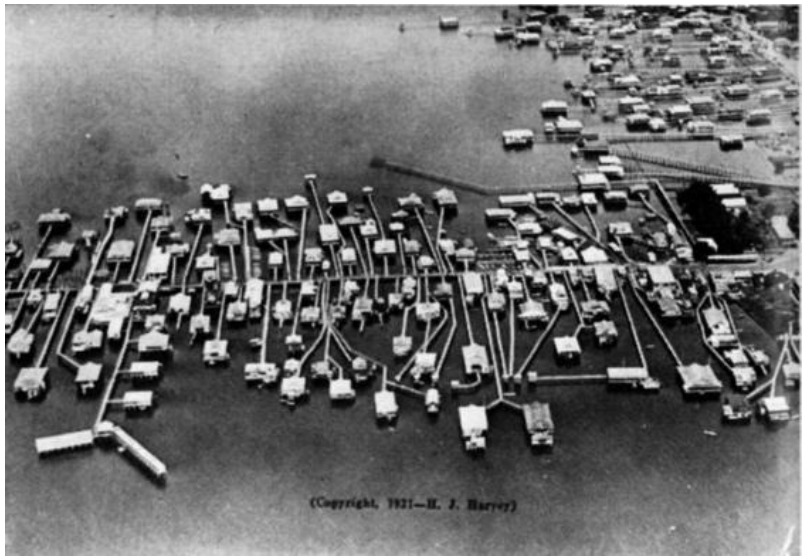
1951



1972


Pontchartrain Beach
Lake Terrace Park
U S Coast Guard Station
Zephyr Park
Spanish Fort Ruins
Boreas Park
Carlson Park
Gordon Sch
Louisiana State Univ (New Orleans Branch)
Live Oak Park
Lake Oaks Park
Camp Leroy Johnson
U S Naval Reserve Headquarters
Southern University (New Orleans Branch)
Gentilly Sch
Our Savior Sch
Playground
Light
NEW ORL
LAKESHORE
4 LANE
ORIOLE ST
LEON C SIMON
NEW YORK ST
MEXICO ST
SEA-LEVEL
KILLDEER
LEE
ROBERT
MUSIC ST
DRIVE
INNER HARBOR
SOUTHERN
BM 4
BM 5
BM 6
BM 7
BM 8
BM 9
City of New Orleans, Esri, HERE, Garmin, INCREMENT P, USGS, METI/NASA, EPA, USDA | Source: Historic...

1992



UNO Special Collections (http://library.uno.edu)

1920s

1930s

1940s to 1960s

Images: H.J. Harvey / UNO Special Collections / New Orleans Public Library City Archives & Special Collections

Pontchartrain Beach, a segregated amusement park

Images: New Orleans Public Library City Archives & Special Collections

Water Issues

1. Localized flooding due to rainfall negatively impacts quality of life -- e.g., ponding along pathways and at entries makes it more difficult to move around campus
2. UNO runoff contributes to the city's drainage pumping load and flood risk for lower-lying areas
3. Long-term risk from tropical storms and sea level rise

Katrina, 2005


Hardwood Dr.

University Center


Liberal Arts Building


St. Anthony


Engineering Parking Lot

Water & Soils Issues

1. The city's drainage system relies on pumping to remove stormwater from the city's neighborhoods. The dewatering of soils causes the ground to sink, particularly in former swampland, such as Gentilly.
2. Subsidence, the sinking of the ground, compromises infrastructure such as sidewalks, roadways, and utilities, as well as building foundations.

Images show evidence of significant subsidence along UNO's southern edge, including exposed manhole vaults (above) and collapsing sidewalks (left).

Water & Soils Issues

1. The city's drainage system relies on pumping to remove stormwater from the city's neighborhoods. The dewatering of soils causes the ground to sink, particularly in former swampland, such as Gentilly.
2. Subsidence, the sinking of the ground, compromises infrastructure such as sidewalks, roadways, and utilities, as well as building foundations.

Images show evidence of significant subsidence on the east campus (above) and also at NET Charter, at the intersection of Leon C. Simon and Franklin.

Design

3. Break Out Room: PARKING

Design Question
How might we _manage_ water in a way that __reduces flooding (dry feet! easy to transit through campus)____ and ____re-use water (capture for landscaping, educational tool, etc)_____?
Connecting parking lots to nice places to stay, be in place?

3. Break Out Room: GATEWAYS / ENTRIES

Design Question
How might we integrate water features in a way that supports better bike and pedestrian access and creates real front doors and connections into campus?

3. Break Out Room: QUAD/COURTYARD

Design Question
How might we slow/store (e.g. detention, retention, & infiltration) water in a way that attract people (e.g. for the awareness of green infrastructure/biodiversity/campus/NOLA history, walkability, reduce heat island effect, & the quality of campus life for students and local residents)?

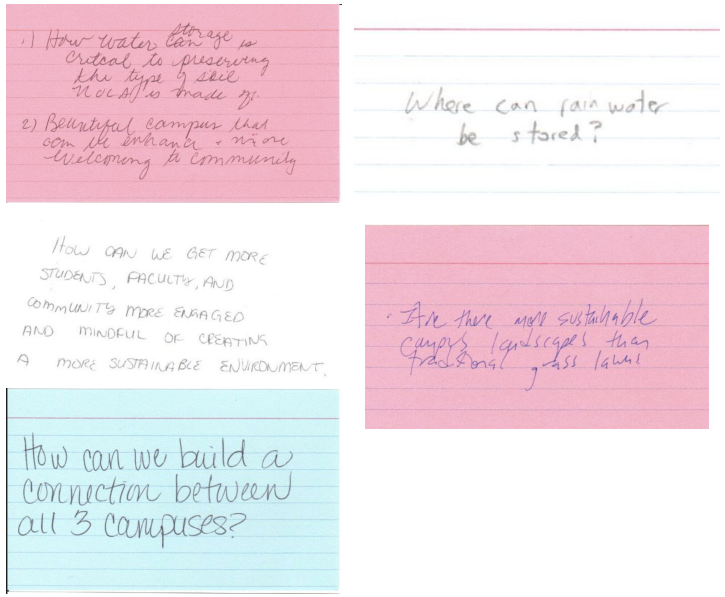
4. Break Out Room: OUTDOOR GATHERING

Design Question MANAGE ENHANCES CAMPUS LIFE
How might we _____ water in a way that _____ and _____?
ATTRACTS WILDLIFE

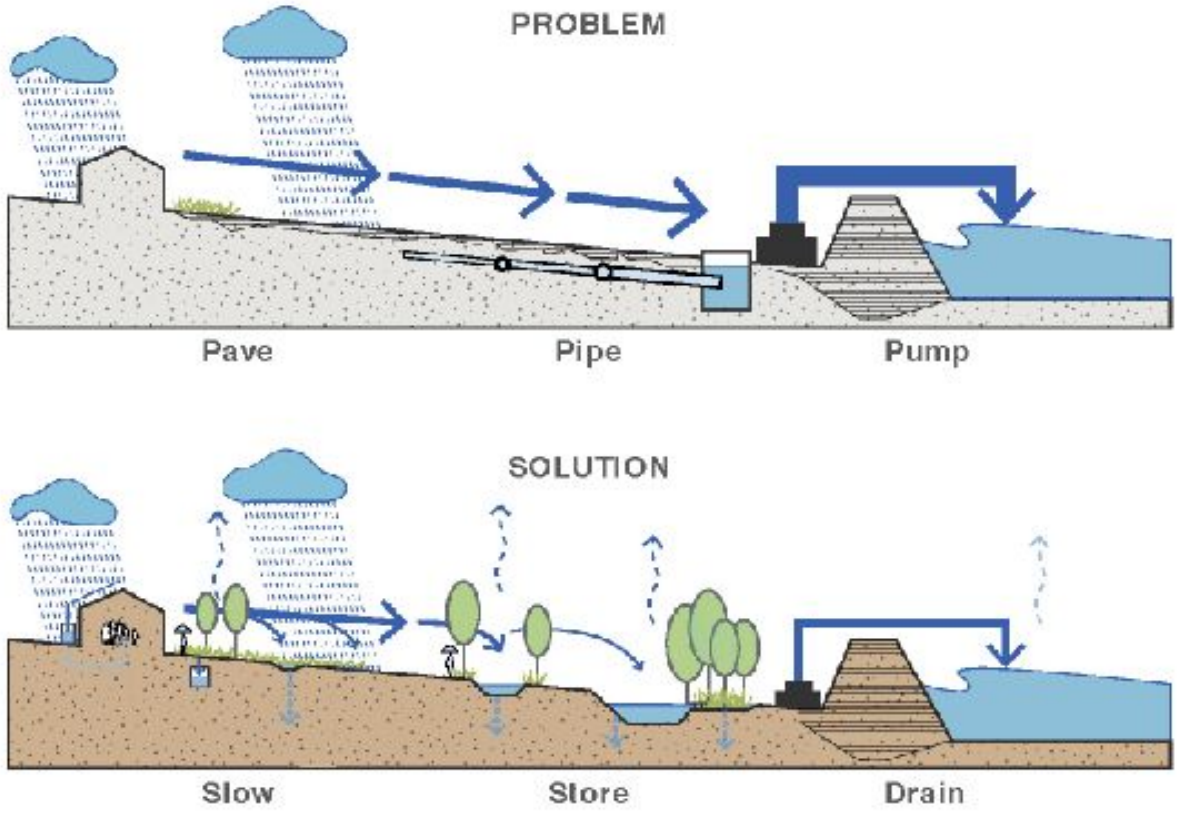
Design questions from Fall 2021 Water and Urban Design Workshop

Design Principles

1. Slow & store stormwater through changes in land use patterns, vegetation, and detention/retention features.
2. Improve wayfinding, identity, & placemaking through landscape interventions
3. Strengthen regional and local ecology through landscape interventions



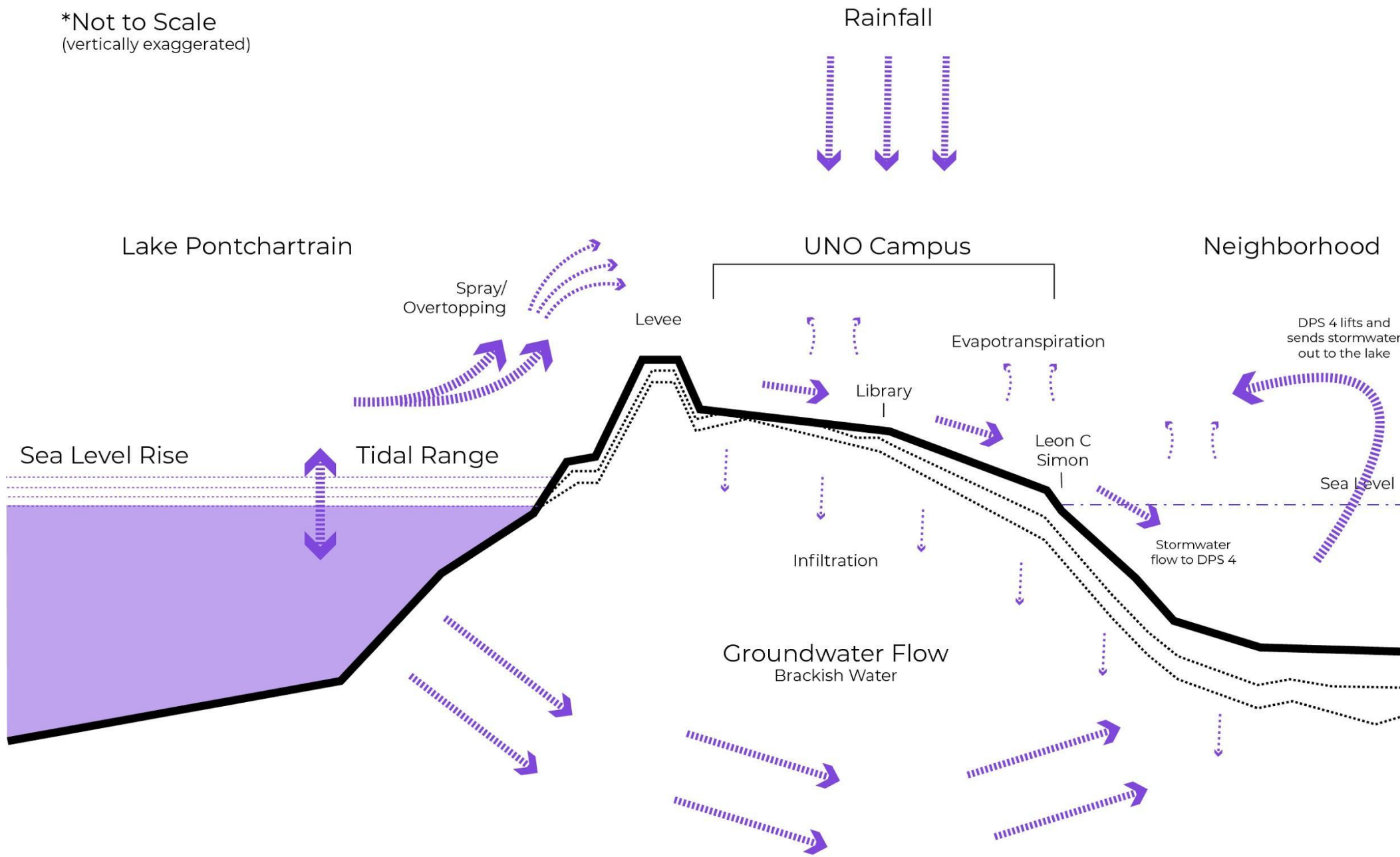
Interactive Walk Cards



Greater New Orleans Urban Water Plan Principles

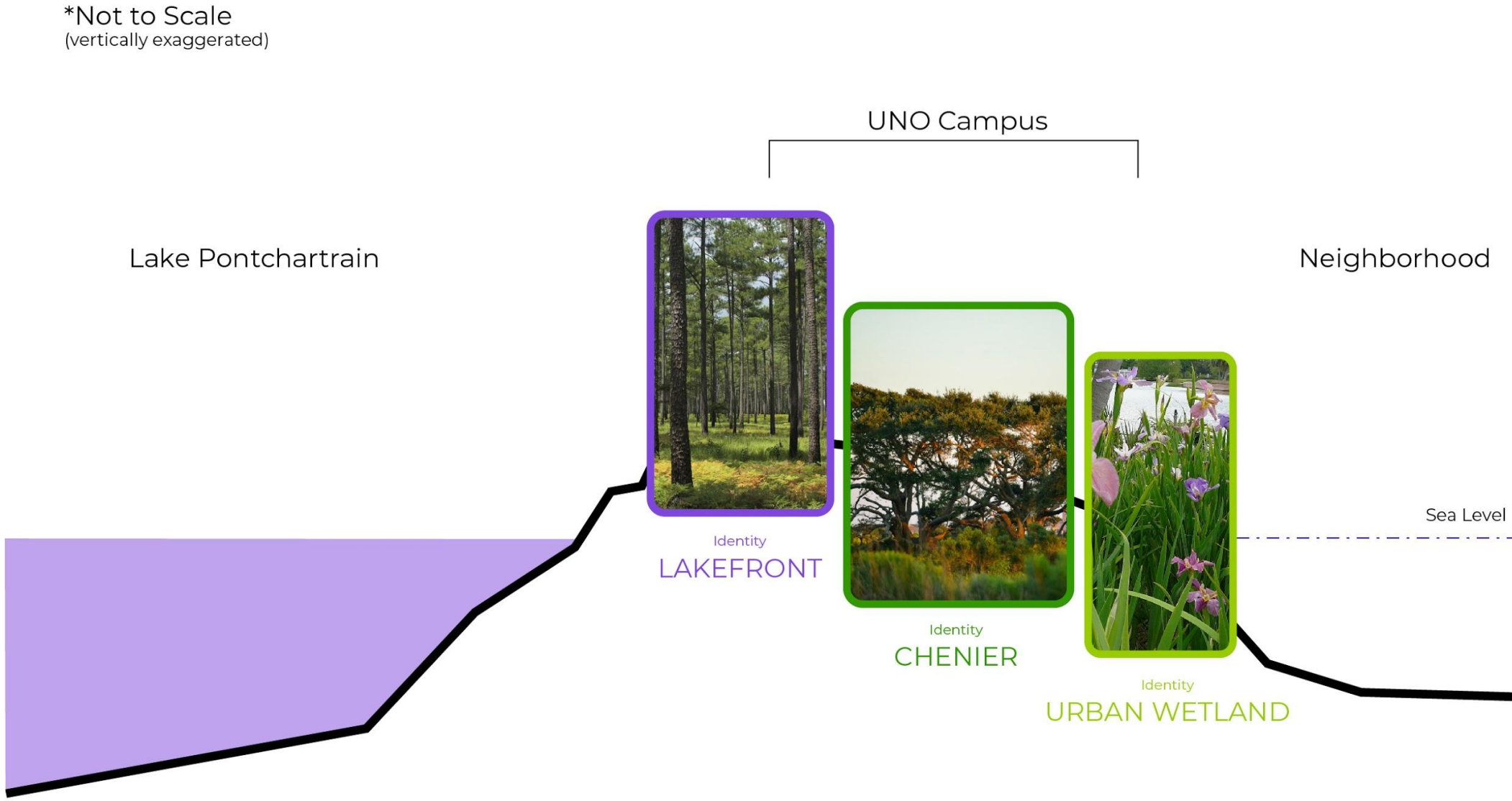
Water Flow / Subsidence

UNO is a ridge of (artificially created) land between an estuary (the lake) and the rest of the city. Pumping is causing the city to sink.



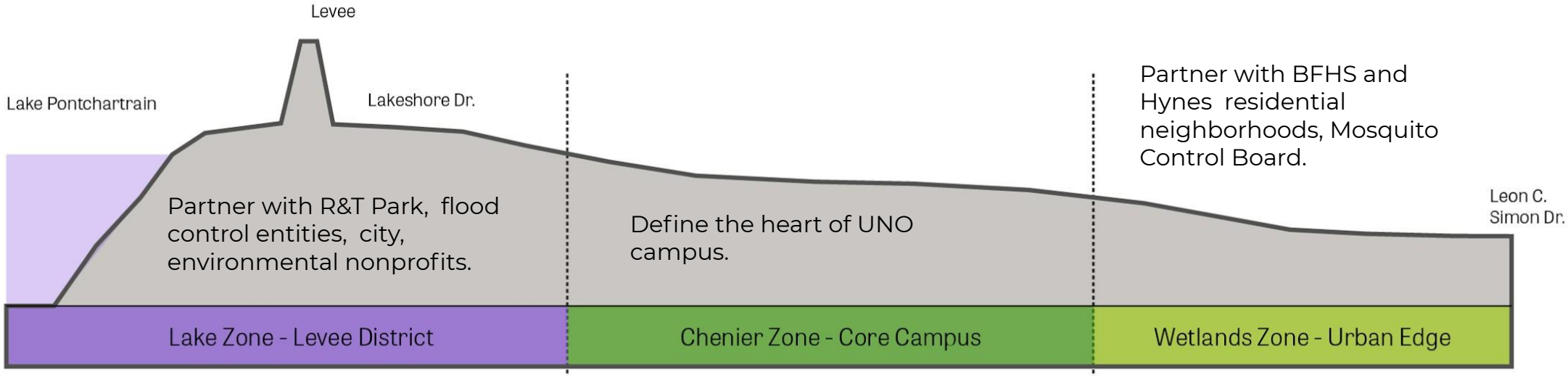
Identities

Draw inspiration and ecological knowledge from delta ecosystems to guide plant selection and urban design across campus.



Identities

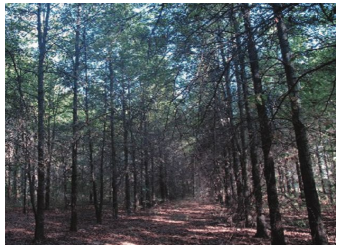
Use native plants and ecological knowledge from delta ecosystems as well as stormwater management principles to inform identities.



- Wind tolerant
- Tolerate erosion from wave action and potential salinity from lake spray and potential overtopping
- Tolerate pollution from streets and buildings in stormwater runoff
- Tolerate urban soils - compactions and pollution
- Foster wildlife habitat: provide nesting, cover, fruit and seeds for food; additionally grasses attract butterflies
- Bring the “lake feel” to campus



- Increase shade when walking across campus
- Tolerate compacted urban soil
- Tolerate pollution from street and buildings in stormwater runoff
- Reduce runoff from campus
- Foster wildlife habitat: trees nesting, cover & food source + flowering plants attract bees & butterflies
- Identifies the core of campus


- Tolerate standing water
- Closer to water table - ability to handle potential salinity from groundwater intrusion
- Retain and filter runoff from higher parts of campus
- Foster wildlife habitat - fruit and nectar for birds and insects
- Create a wetlands feel - identifies the south/ lower end of campus

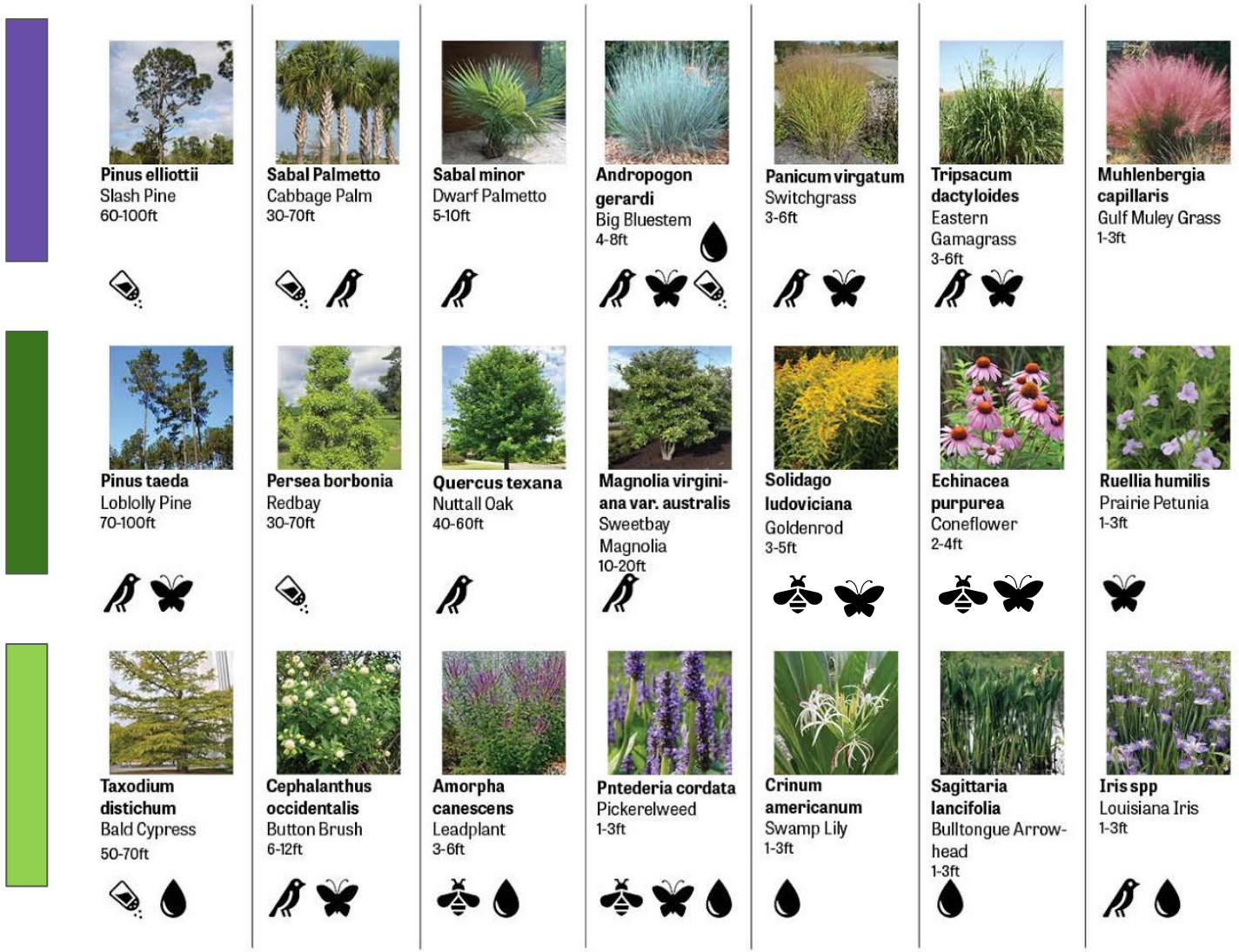


Decision Matrix

CONDITIONS	ACTION	RECIPROCITY
Ponding water and damaged infrastructure decrease water quality	Strategically implement green infrastructure, depaving and plantings	Net gain of toxin and ecosystem repair while benefitting Gentilly neighbors through reducing heat island, stormwater runoff
Lacking habitat (refuge and feeding) for wildlife	Plant diverse native species with year-round visual interest	Increased species range reduces risk of biodiversity loss (even a small forest in a small space can be beneficial)
Gaps in campus canopy - discourage walking across campus and gathering in certain areas	Strategically plan for canopy cover, visual interest and safety	
UNO doesn't have a strong cohesive campus Identity	Planting palette builds upon existing vegetation and creates cohesion throughout zone to create wayfinding and a lively UNO identity	Build ecological identity with proud alumni base as long-term stewards of UNO and broader environment
Limited funds for installation and maintenance costs	Select locally available native materials whenever possible. Planting palette and GI interventions should take into account long term costs	Maintenance plans provides value to the underappreciated labor that is required to maintain the built environment

Existing Conditions

Botanical Strategy



It is vital during site analysis to assess soils, hydrology, microclimate, typography, appropriate setbacks, the safety of pedestrians and various modes of transit, and species and aesthetic diversity to develop planting platte and patterns.

flowering strategies

Birds - specimens provide habitat and nesting material, while other bird friendly plants are a source of food

Bees- pollen sources provide bees with food. Inc in bees = potential inc in pollination of other plants. Ones noted here have special value to native bees

Butterflies - nectar point sources where butterflies are attracted to feed

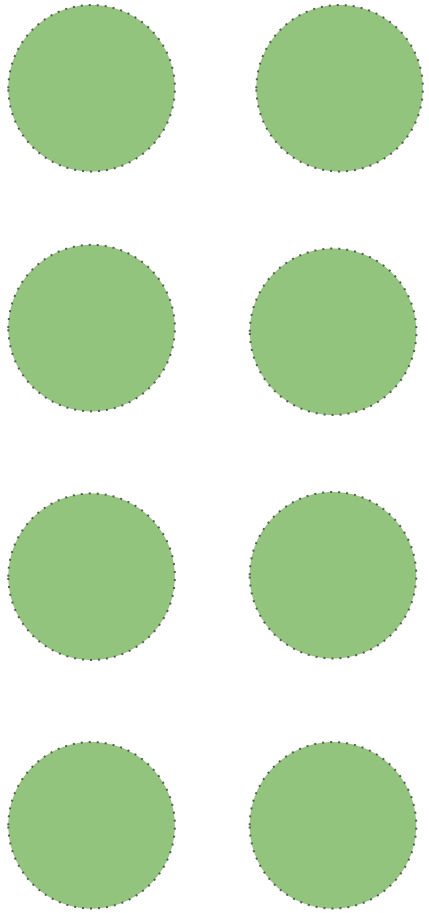
Salt- mature specimens thrive despite harsh saline conditions that can harm other plants

Wet tolerant- ability to withstand long standing wet conditions

Planting Patterns

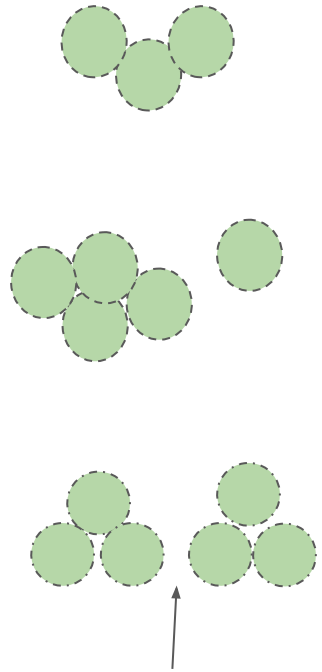
Corridors

Strategy for curating corridors and allees of street trees -creates shade, manages water, wind and views.



Clusters

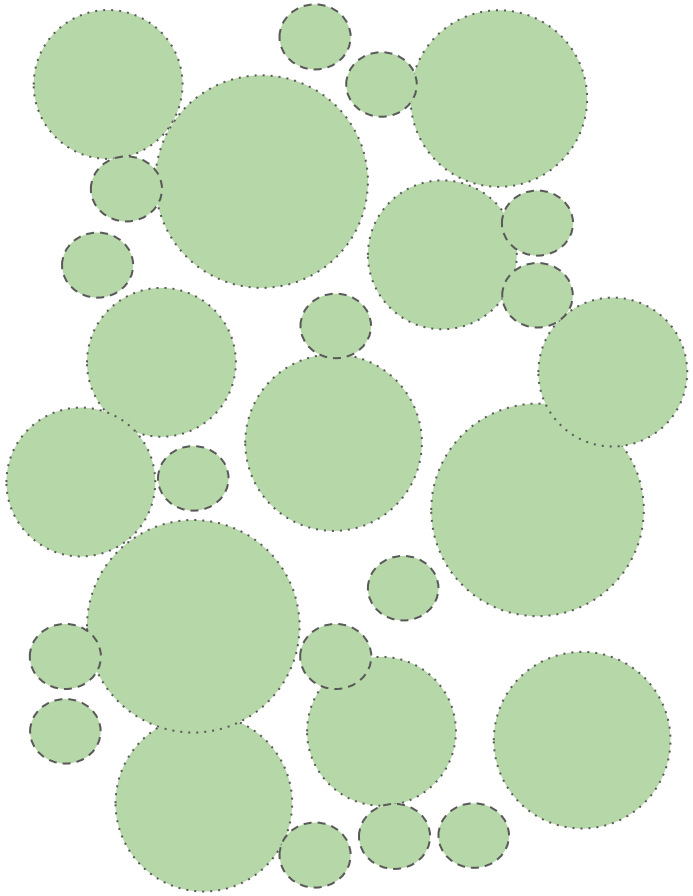
Strategy for creating habitat, managing water, and developing structures and forms for visual framing and interest.



cluster can create focal points, or frame picturesque views and belvederes

Forest (large scale)

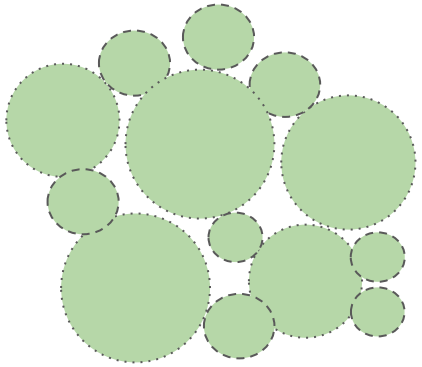
Strategy for creating more diverse habitats with greater density of vegetation, at multiple levels, from canopy to understory to ground cover.



Forest (small scale)

Investments in small areas can still yield results and provide different rhythms such as a dense planting of trees behaving in a unique manner.

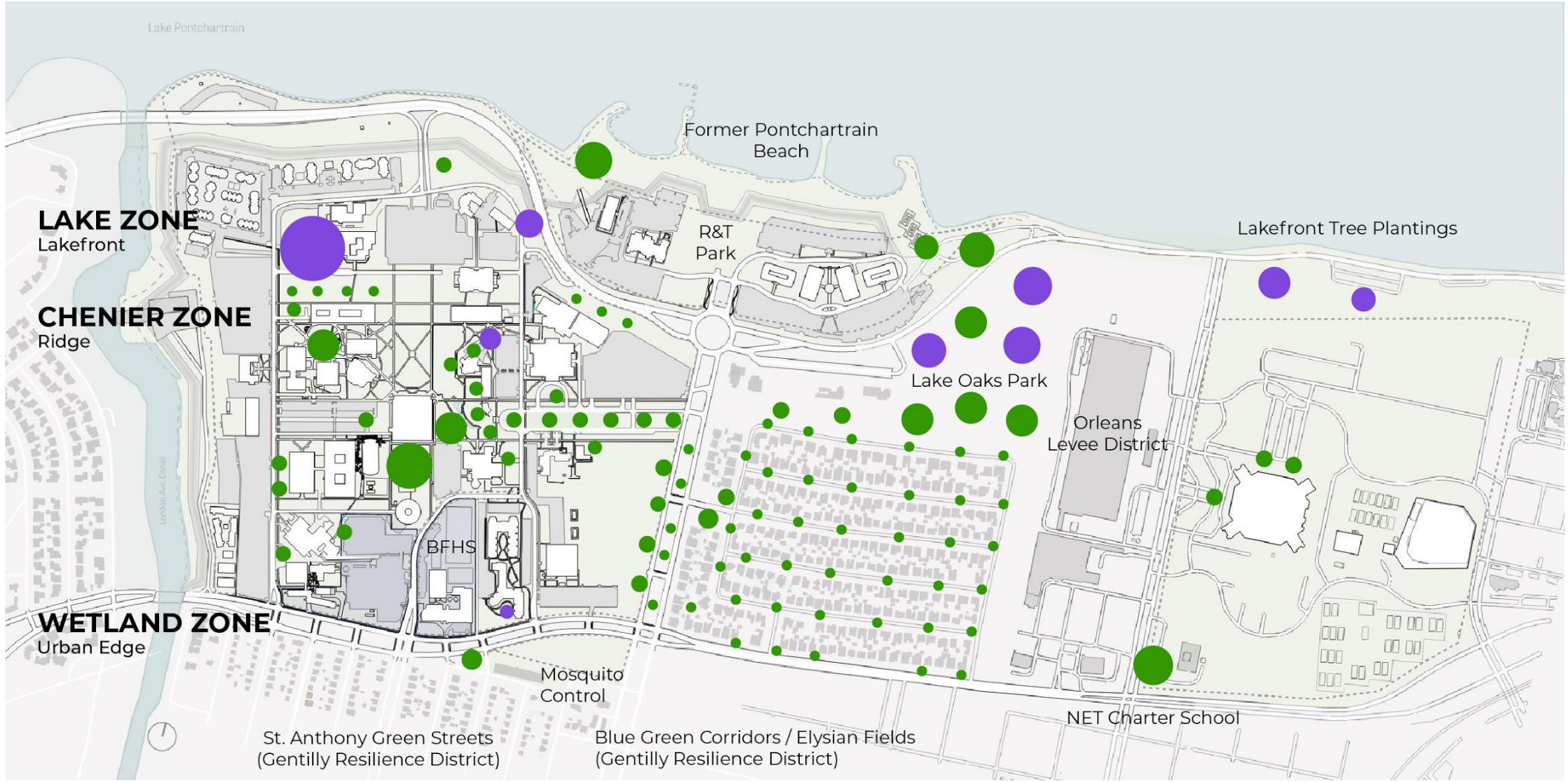
Consider Miyawaki Forest techniques



All pattern interventions are scalable to meet site needs

Connectivity: Bird's Eye View

Each dot represents an area of tree cover (and not individual trees). Here, we use what a bird sees from above as a stand-in for delineating patches, using the language of landscape ecology. The goal is to grow and connect existing patches.

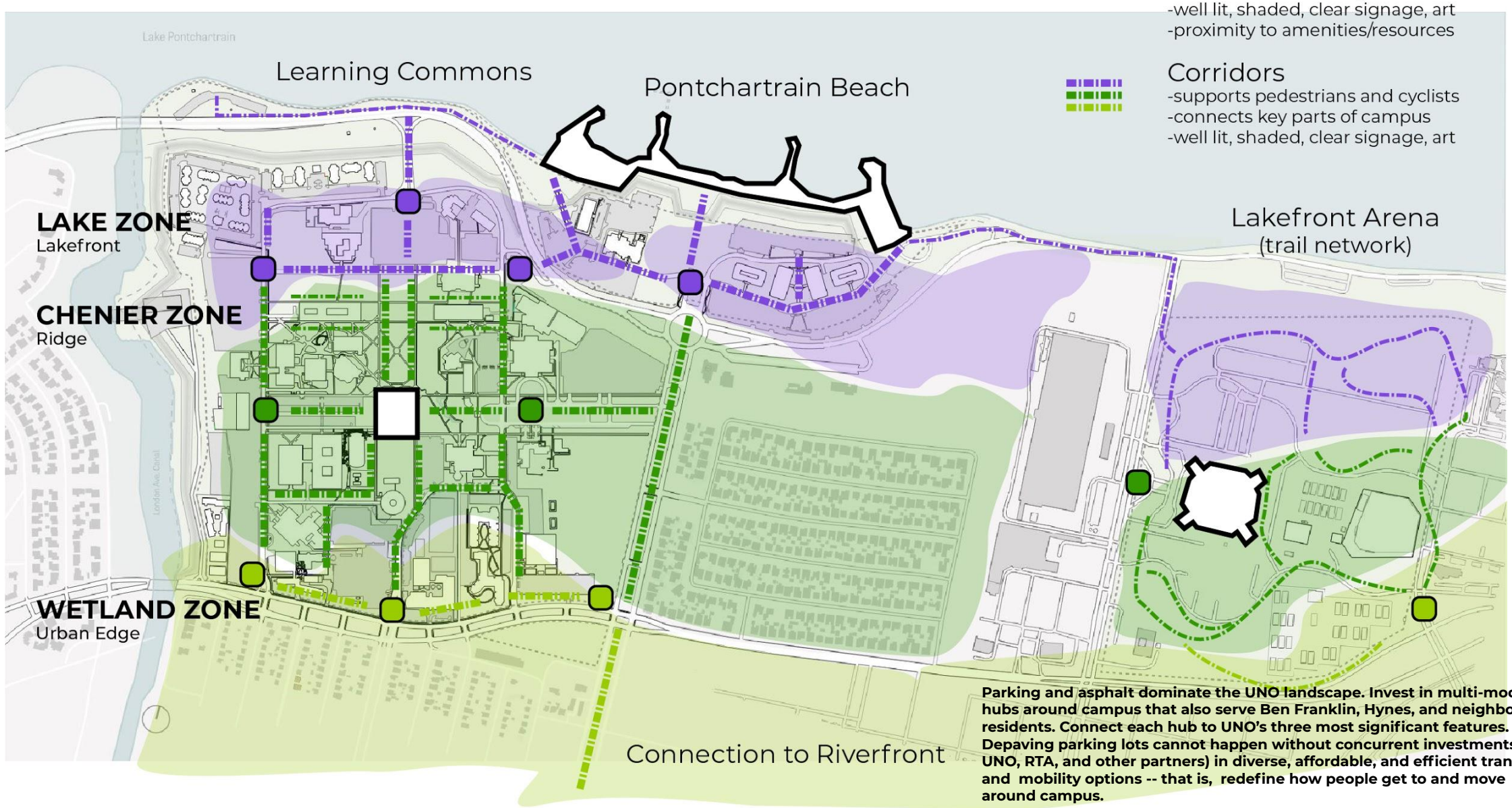


Connectivity: Bird's Eye View

This diagram overlays the identities from previous slides, and identifies locations where investing in depaving and vegetation will have the greatest ecological impact because of how those investments will connect existing patches and build towards a cohesive identity for each zone.

With so little existing vegetation around the arena, the goal should be to begin planting around entries to the site in order to maximize visual impact. Mini forests may be appropriate for each of these priority investment areas.

Connectivity: Hubs and Corridors



Multi-modal hubs

-access to public transit
-serves diverse communities
-bike racks and sharing
-well lit, shaded, clear signage, art
-proximity to amenities/resources

Corridors

-supports pedestrians and cyclists
-connects key parts of campus
-well lit, shaded, clear signage, art

Parking and asphalt dominate the UNO landscape. Invest in multi-modal hubs around campus that also serve Ben Franklin, Hynes, and neighborhood residents. Connect each hub to UNO's three most significant features. Depaving parking lots cannot happen without concurrent investments (by UNO, RTA, and other partners) in diverse, affordable, and efficient transit and mobility options -- that is, redefine how people get to and move around campus.

Existing Conditions: Lakefront

The levee separates campus and city from the lakefront -- the wind, temperatures, sounds, and light quality are different on either side. But even behind the levee, one hears and sees the shorebirds. Storm surges accompanying hurricanes flood lakeside gathering spaces and vegetation with the brackish water of Lake Pontchartrain.

Existing Conditions: R&T Park and Former Pontchartrain Beach

The most advantageous real estate, fronting Pontchartrain Beach and at the end of Elysian Fields, is dominated by a floodwall and two-story parking garage. R&T Park functions as a suburban office park, but the large number of occupants suggest a critical role for R & T in initiating (along with UNO and other lakefront stakeholders) improving public transit along the historic Elysian Fields corridor (formerly the connection from Milneburg to the French Quarter by rail).

Existing Conditions: Arena

Large expanses of grass and asphalt in a landscape designed for automobiles. Some trees adjacent to arena to reinforce fence line, but otherwise no tree canopy. A lone pine tree, shipping container structure (top left), and mound adjacent to baseball field suggest low-cost opportunities that would be available for transforming this area using variations in topography, tree plantings, and public art.

Existing Conditions: Urban Edge and NET Charter

NET Charter's campus includes an impressive cluster of oak trees at the intersection of Leon C. Simon and Franklin. Continuing these rows of trees down Franklin would transform the Franklin Corridor and the main approach to the Lakefront Arena. NET Charter also features a Groundwork water/solar bench (bottom right) and a construction training area (top right), which suggest opportunities for partnership in both programs and campus connections.

Lake Zone + Parking

Where UNO meets the lakefront, reimagine the parking lot as a vital public space for both the UNO community and lakefront visitors.

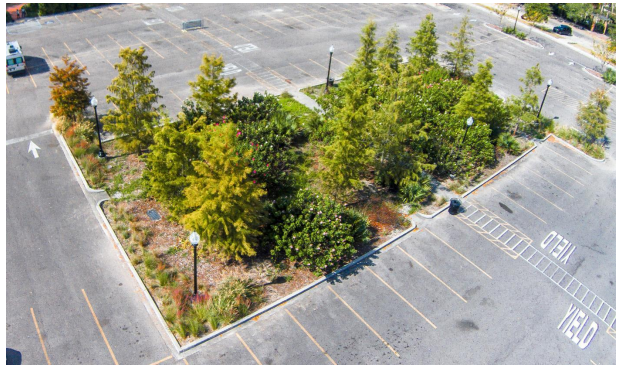
Parking Lot

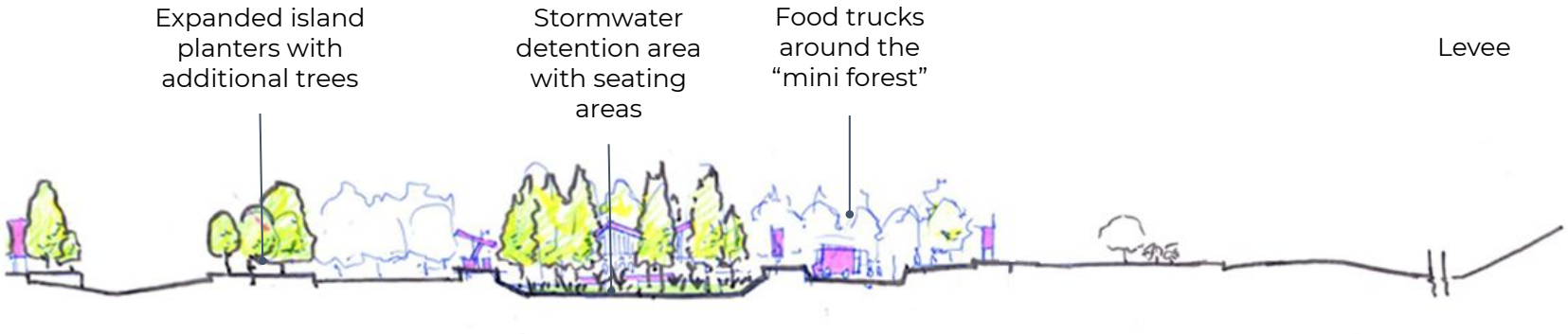
Existing

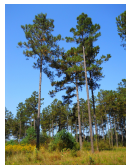
Proposed

Lake Zone + Parking

Mini Forest planting strategy with first pioneer planting.







Slash Pine
15-30x

Gulf Muhly
20-30x

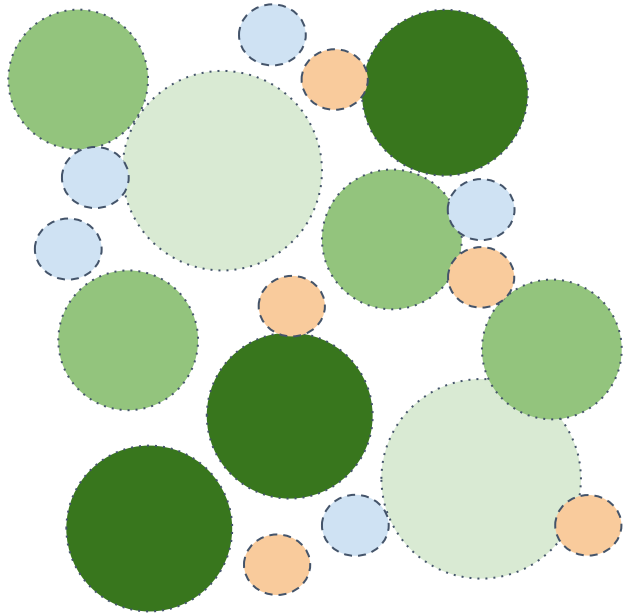
Sabal Palmetto
10-20x

Eastern Gamagrass
20-30x

Switch grass
20-30x

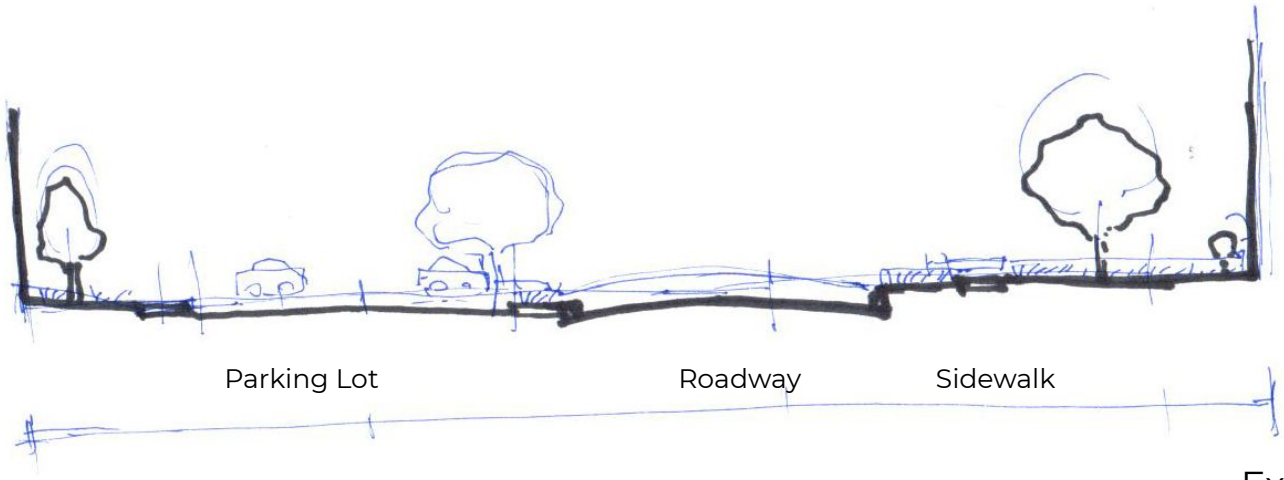
Big Bluestem
20-30x

Proposed



Multi-modal Corridors

Inside campus, like along this stretch of Milneburg, reimagine the spaces between buildings as beautiful, shaded corridors that support every form of travel.

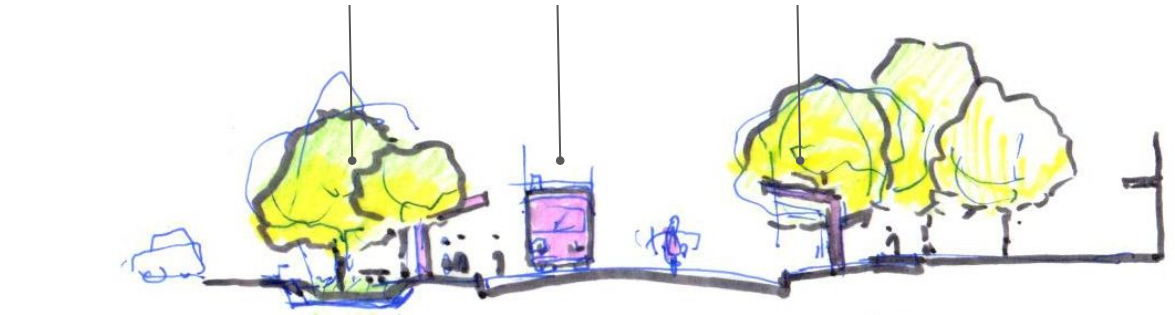


Existing

Depave and plant 50% of parking

Improve public transit

Signage, bike racks, bike sharing



Proposed

Multi-Modal Corridors

Proposed multi-modal planting strategy within Core Campus Chenier Zone. Each multi-modal site is planted with the palette in its corresponding zone.

Nuttall Oak
5-10x

Compass plant
20-30x

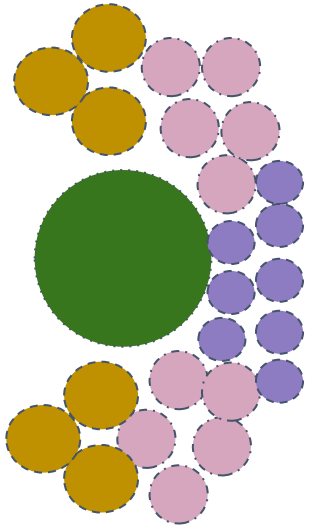
Goldenrod
10-20x

Conefl-ower
20-30x

Prairie Petunia
10-20x

Sweetbay Magnolia
4 -16x

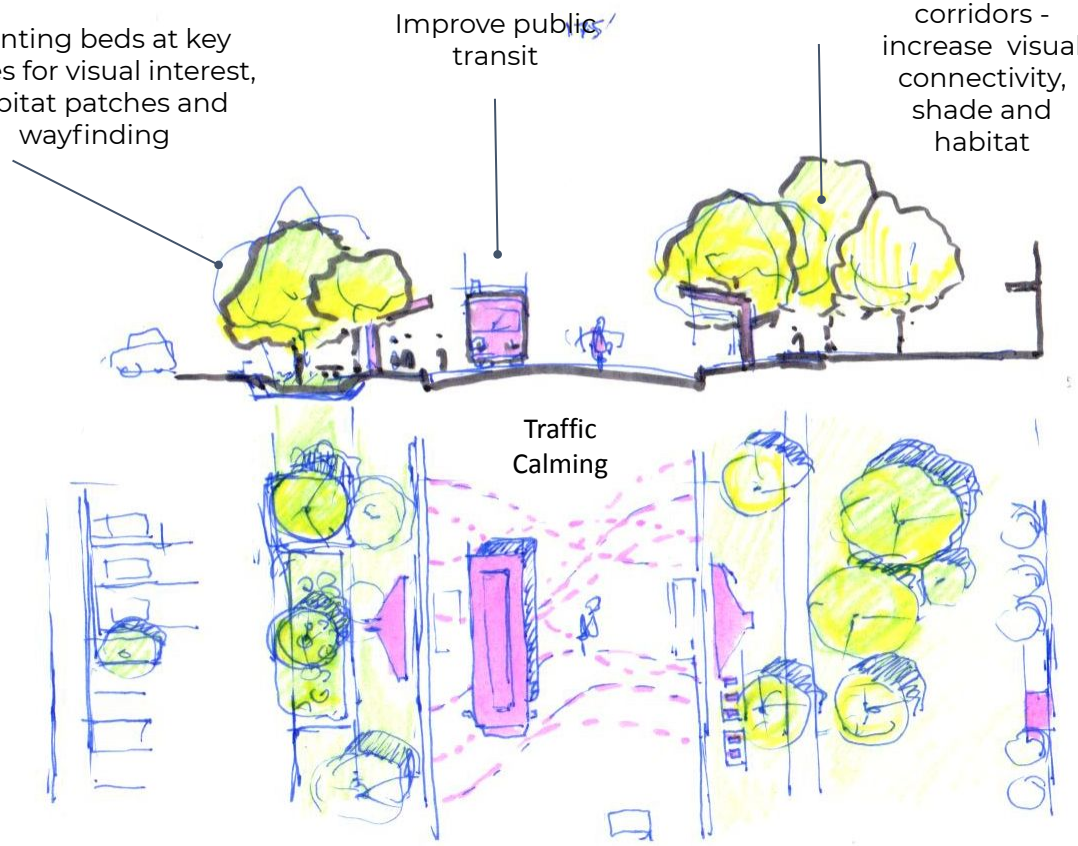
Nuttall Oak
1 -4x



Planting beds at key nodes for visual interest, habitat patches and wayfinding

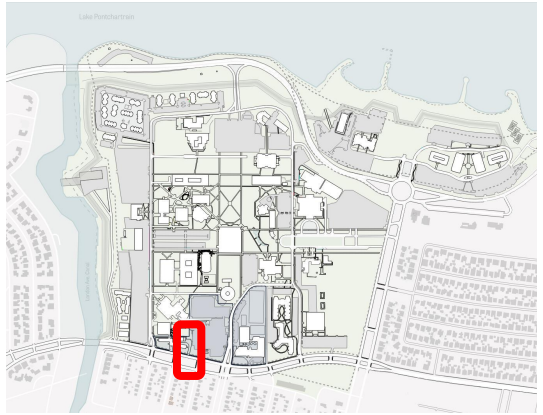
Improve public transit

Street trees line corridors - increase visual connectivity, shade and habitat

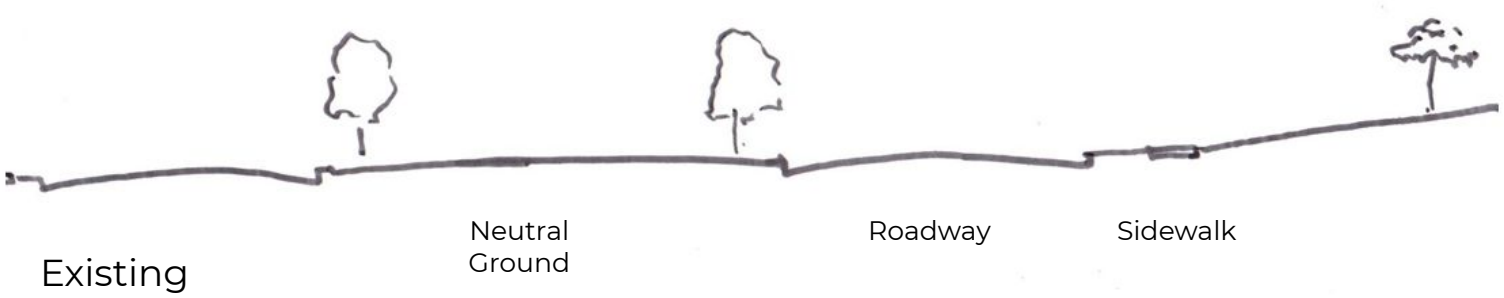


Wetland Edge

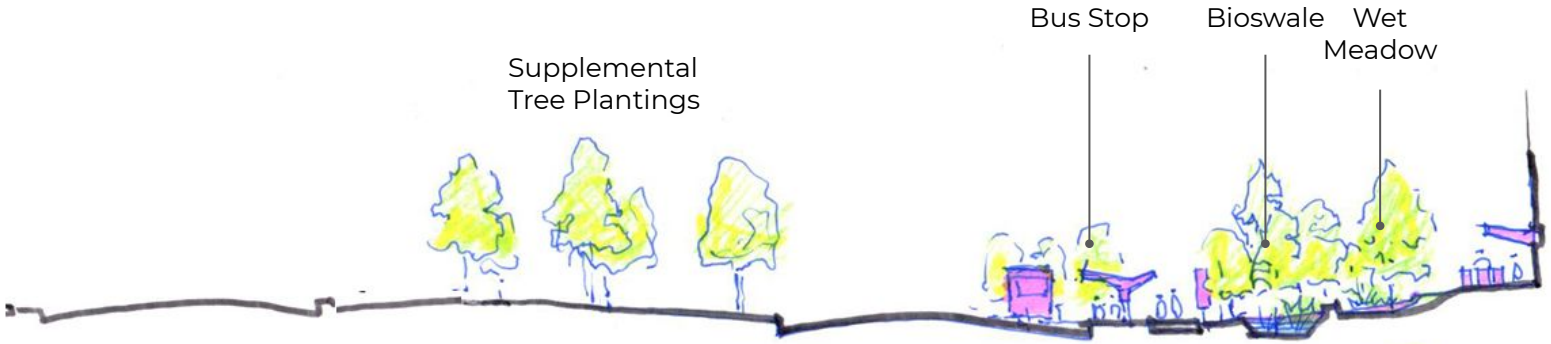
Along Leon C. Simon, establish the southern edge of the main campus as an urban wetland that catches and cleans runoff flowing away from campus.

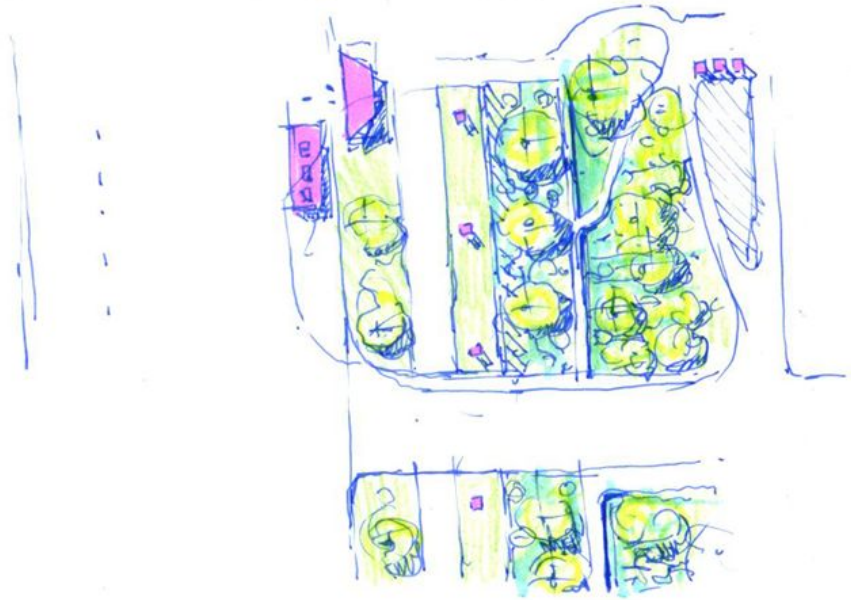


Existing



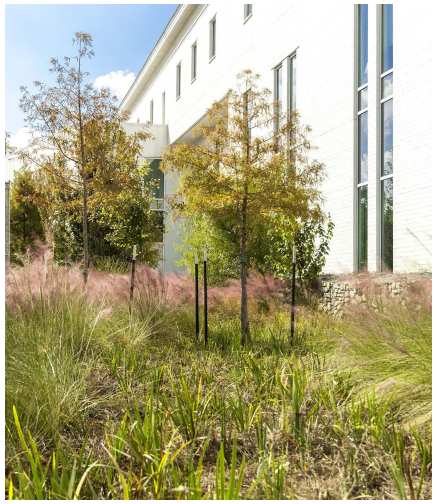
Proposed





Wetland Edge

Proposed planting plan for a wetland edge zone. The bioswales and rain gardens will need regular trash cleaning and maintenance



Iris
50-100x

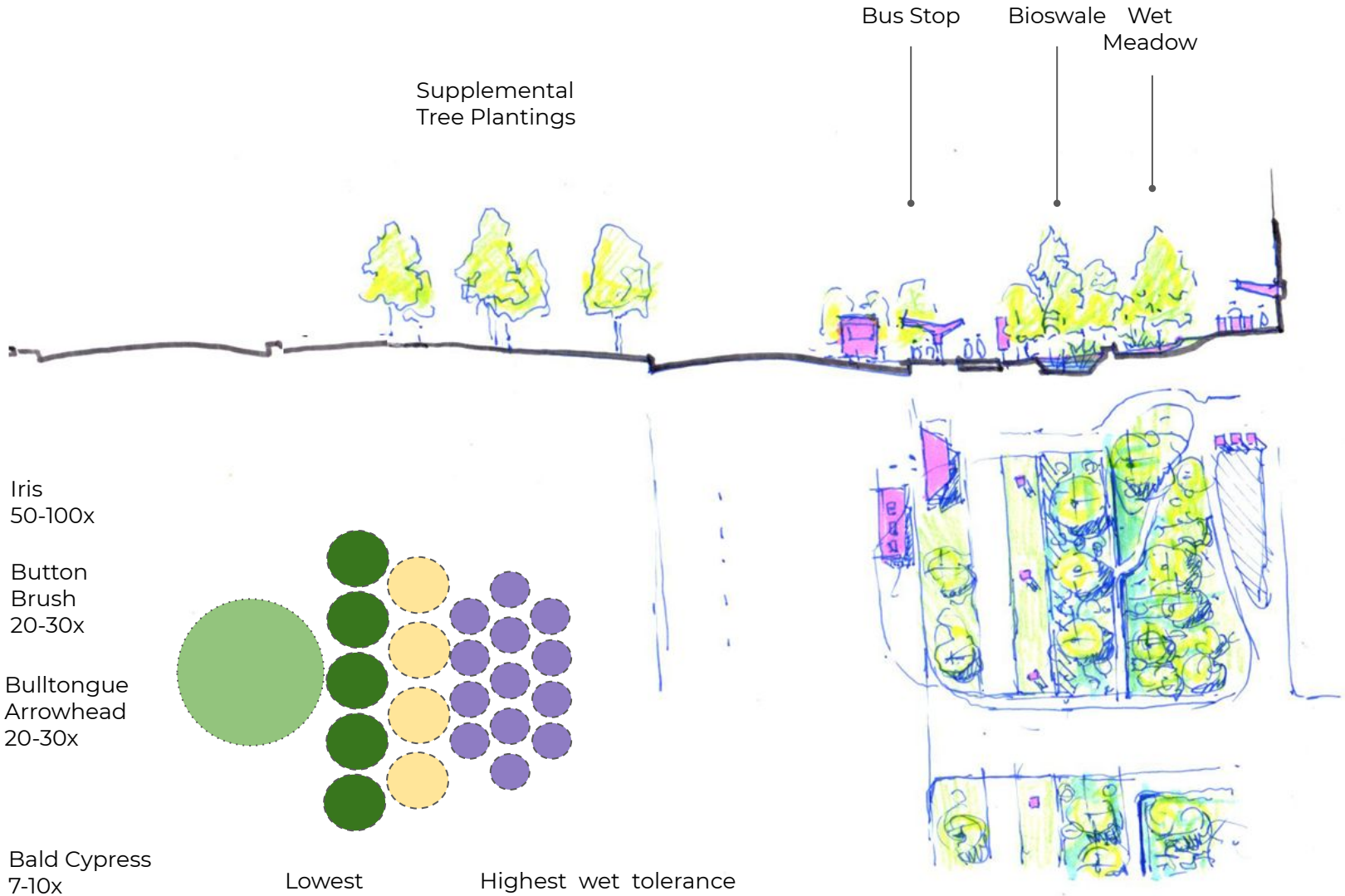
Button
Brush
20-30x

Bulltongue
Arrowhead
20-30x

Bald Cypress
7-10x

Lowest

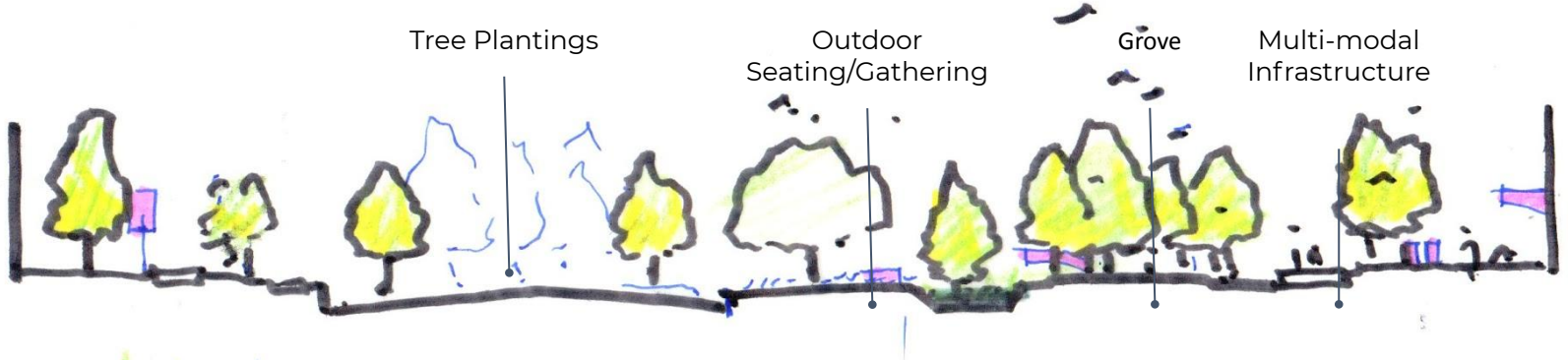
Highest wet tolerance



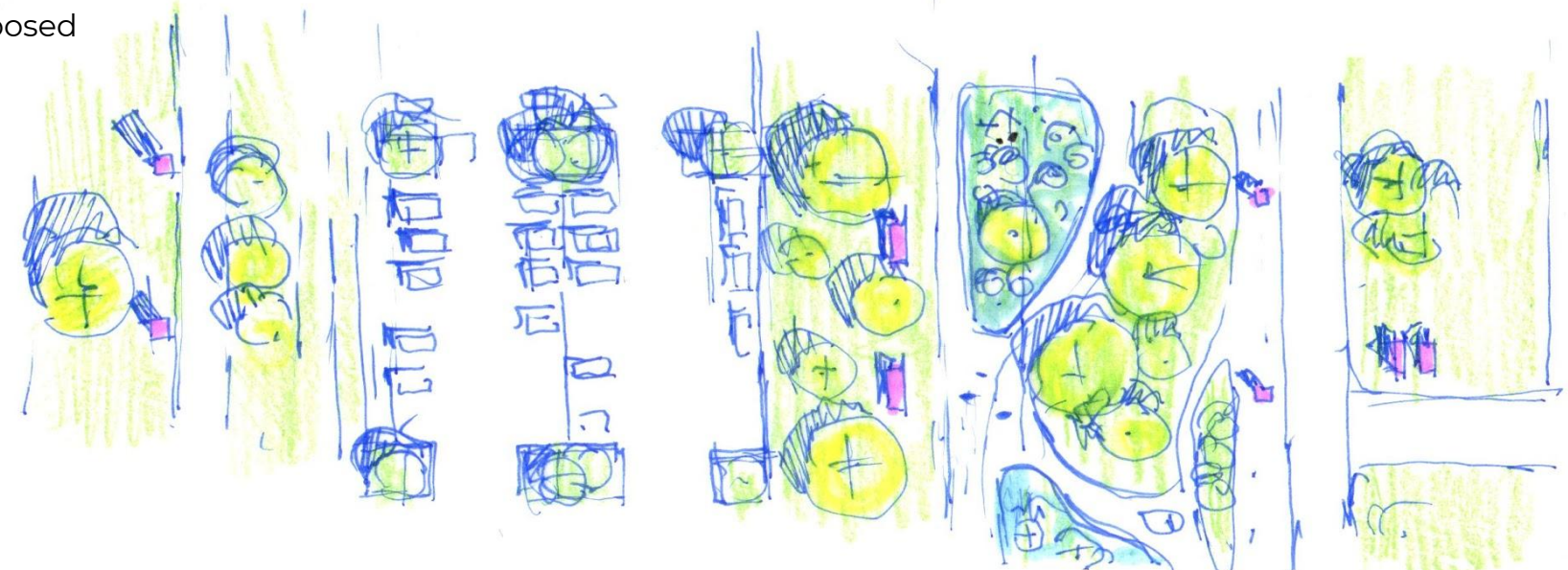
Live Oak Axis

Between Founders Road and the Library, depave and plant a swath of asphalt to create a strong axis for movement, learning, and outdoor activities into and through the heart of campus.

Existing

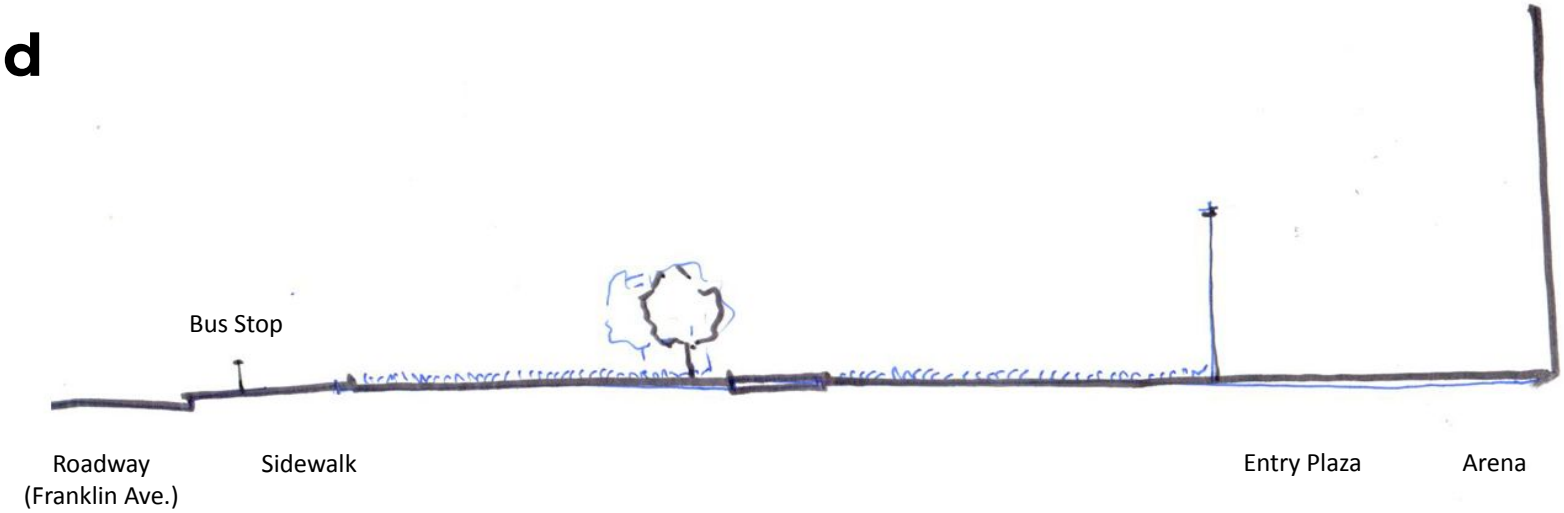


Proposed

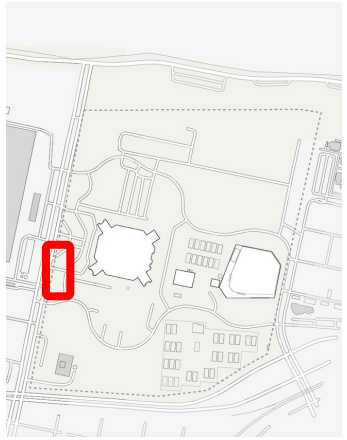


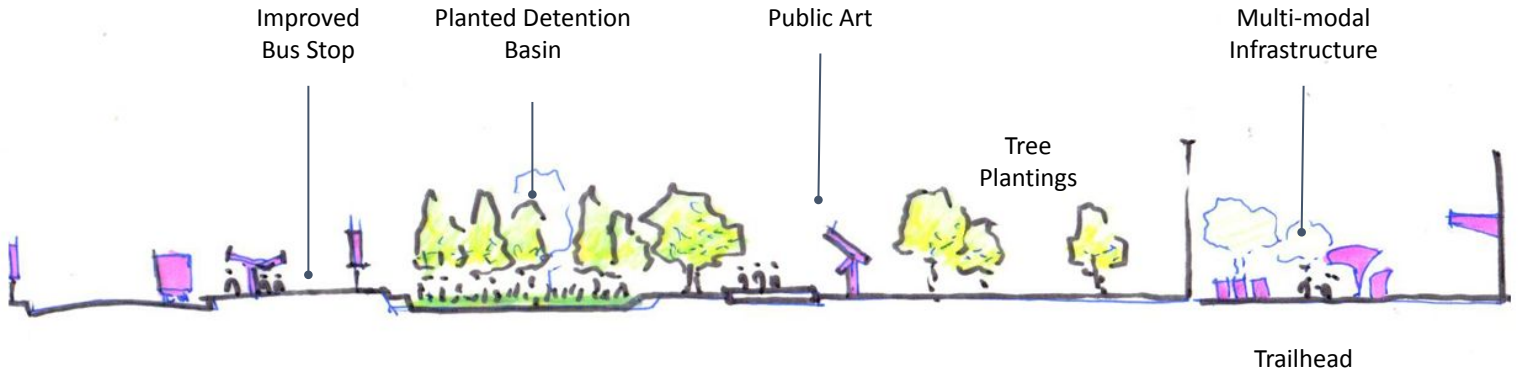
Arena Entrance and Trailhead

Along Franklin Ave. create an eye catching and welcoming entrance to the Lakefront Arena that matches its destination status. Opportunity to create multi-modal hub for events and connection to main campus and the rest of the city. Entry plaza also serves as trailhead for the rest of the site (next slide).



Existing

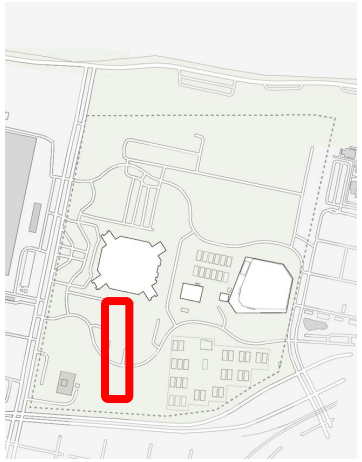




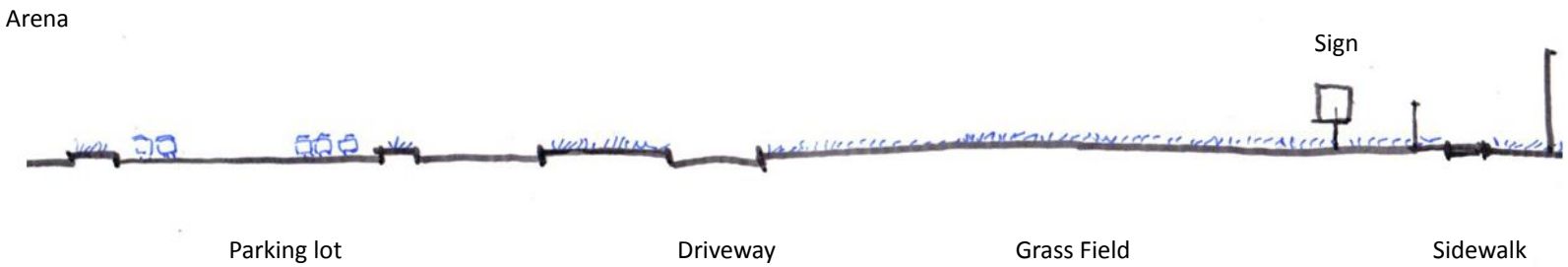
Proposed

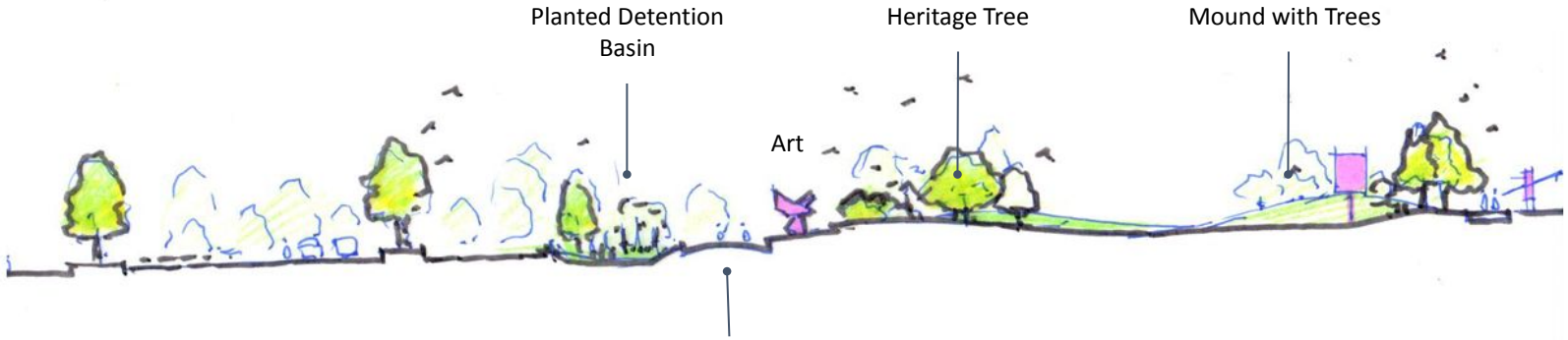
Lakefront Arena Trail Network

Turn the expansive area around the arena into a low-maintenance park space with trails and public art. Vary topography to create lower stormwater detention areas as well as higher planted areas to create variety and interest for walkers, joggers, and cyclists exploring different habitats.



Existing





Proposed

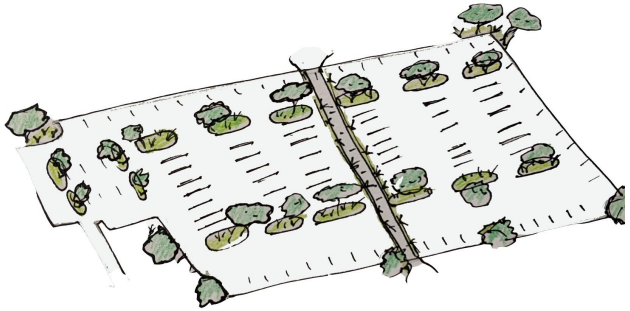
From Parking to Planting: A Case Study on Green Parking Lot Options

Lake Exit Parking Lot
475 Parking Spaces
3.81 Acres
Estimated Annual Runoff: 51.24 in

Re-imagining the Lake Exit Lot

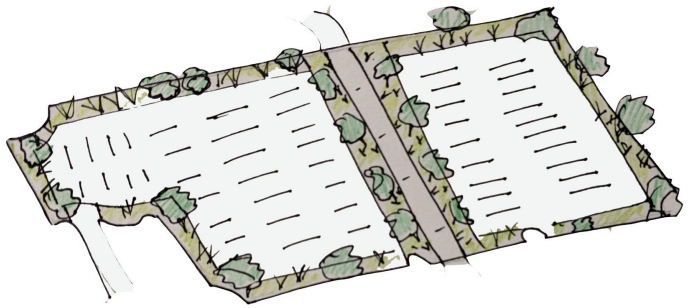
Assume: 33% reduction in parking spaces (approx 24,500 sf of parking lot assuming standard parking stall dimensions (8.5’ x 18’)

Estimate created using the New Orleans Green Infrastructure Stormwater Calculator, which calculates storage volume needed to meet requirement to detain the first 1.25 inches of rainfall for a specific site



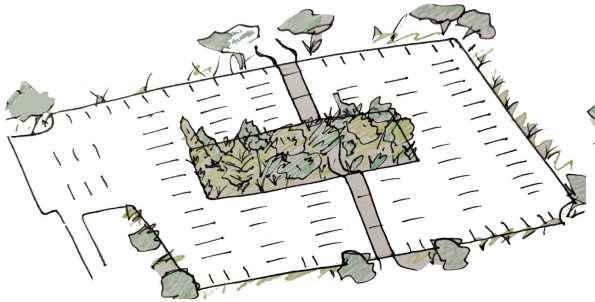
Distributed

- Reduces run-off
- Minimal disturbance to current lot - expands current landscaping



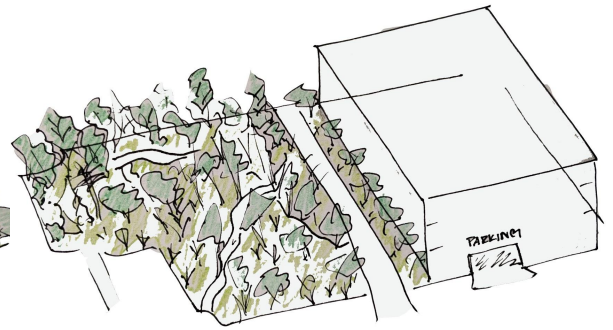
Perimeter

- More contiguous green space supports greater biodiversity
- Improved water quality



Concentrated

- Highly effective at managing and filtering stormwater
- Concentrated planting supports maneuverability for trucks in lot
- Visual amenity in parking lot



Mini-forest + Parking Structure

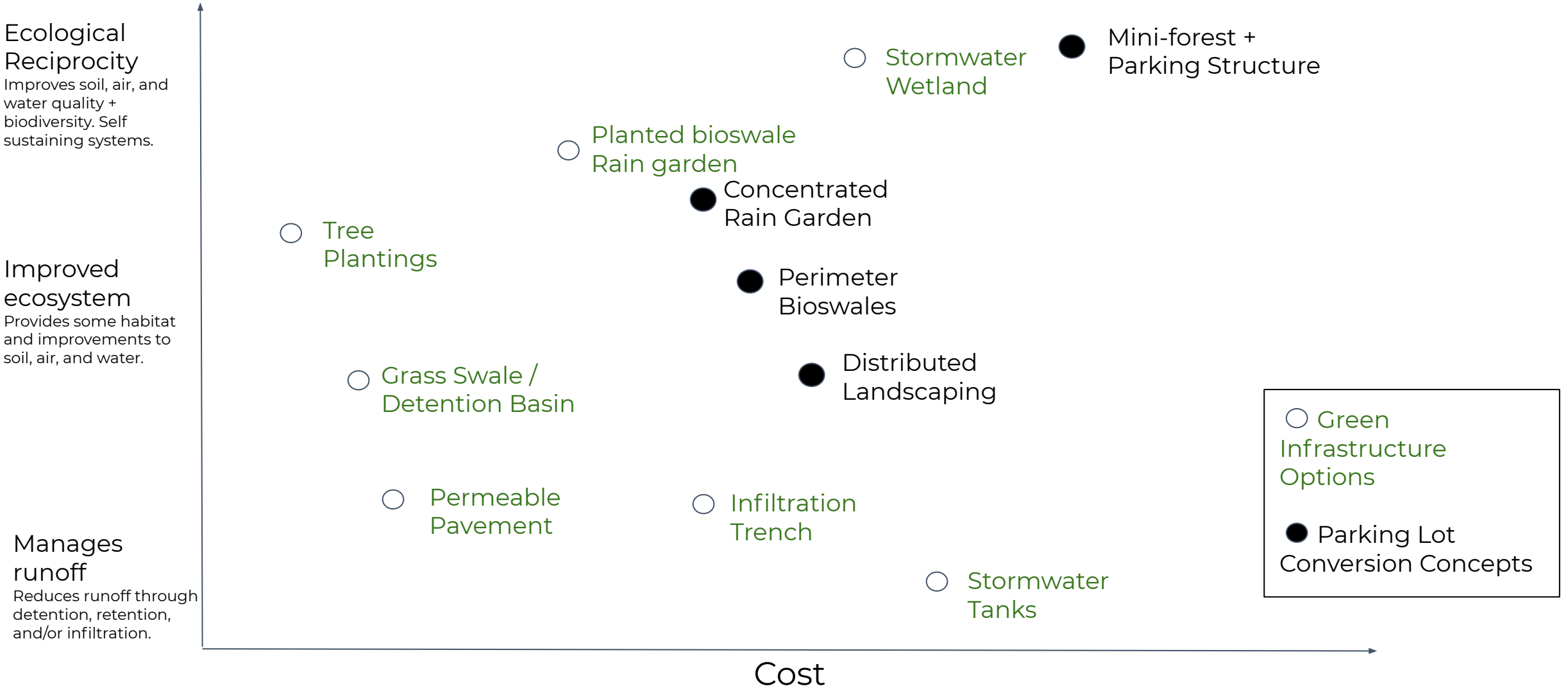
- Supports most biodiversity
- Amenity for UNO/community
- Possible lakeview roof space on structure

Manages Runoff → Improved Ecosystem → Ecological Reciprocity

The Comprehensive Zoning Ordinance carries specific parking lot landscaping regulations. Design patterns shown are exaggerated to emphasize differences between these approaches.

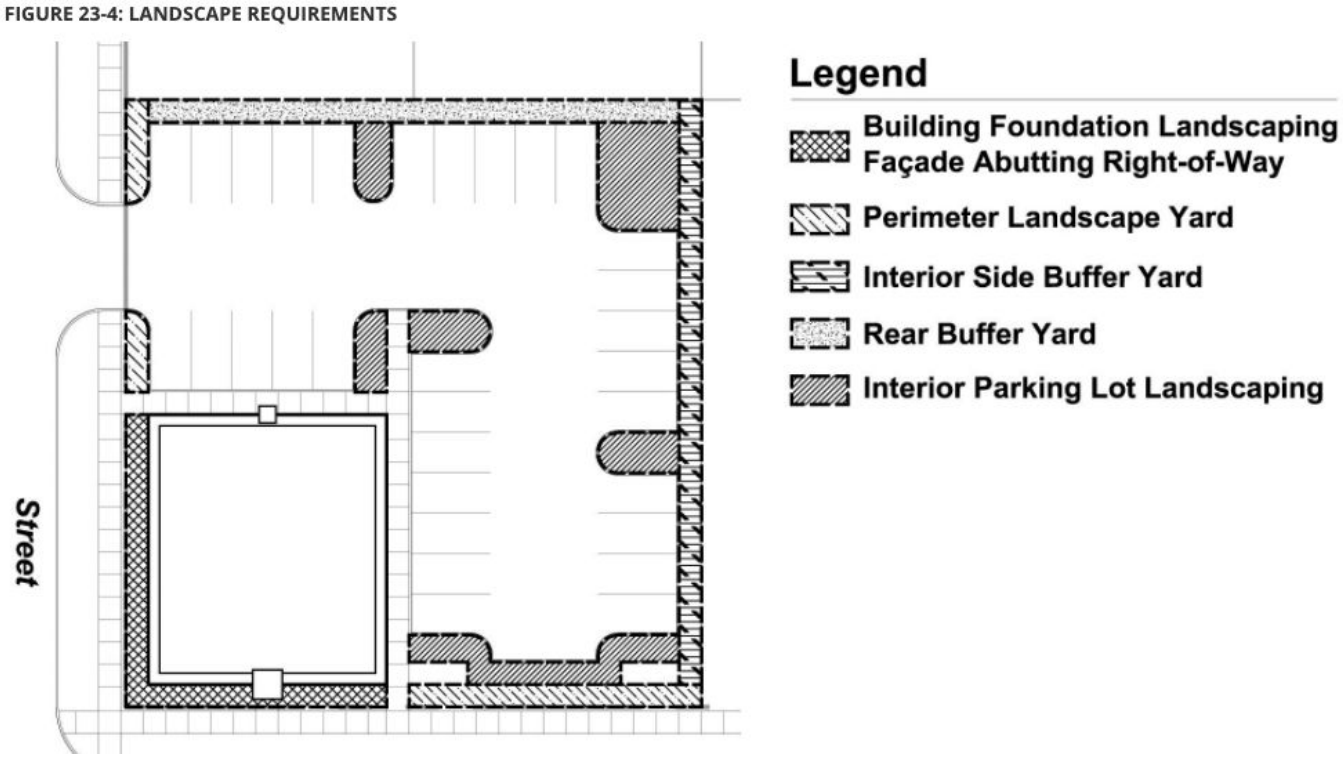
Green Parking Lot Options

Some green infrastructure measures reduce runoff by storing water, some reduce and clean runoff, and some reduce and clean runoff while also serving as habitats for other species. Here, we propose evaluating water management strategies along two axes: Cost + Impact on Water/Ecology. Some strategies perform well against stormwater management metrics, but do little to clean water or improve local/regional ecology.



CZO Requirements - Interior Parking Lot Landscaping
for reference

- One (1) parking lot island between every ten (10) contiguous parking space
- 10% minimum total landscaped area, including parking lot islands. All rows of parking spaces must end in a island or landscaped area.
- Parking lot islands must be the same dimension as the parking stall and no less than 160 sf.
- Landscaped areas must be design to allow flow and access of stormwater. Landscaped areas must be depressed below grade, provide an underdrain to ensure drainage within 48 hours of each rain event.
- Trees, preferably with high water retention capacity, must be the primary plant materials used.
    - One shade tree for every parking lot island (two for a double row island), shrubs, minimum 75% live groundcover, perennials or ornamental grasses.



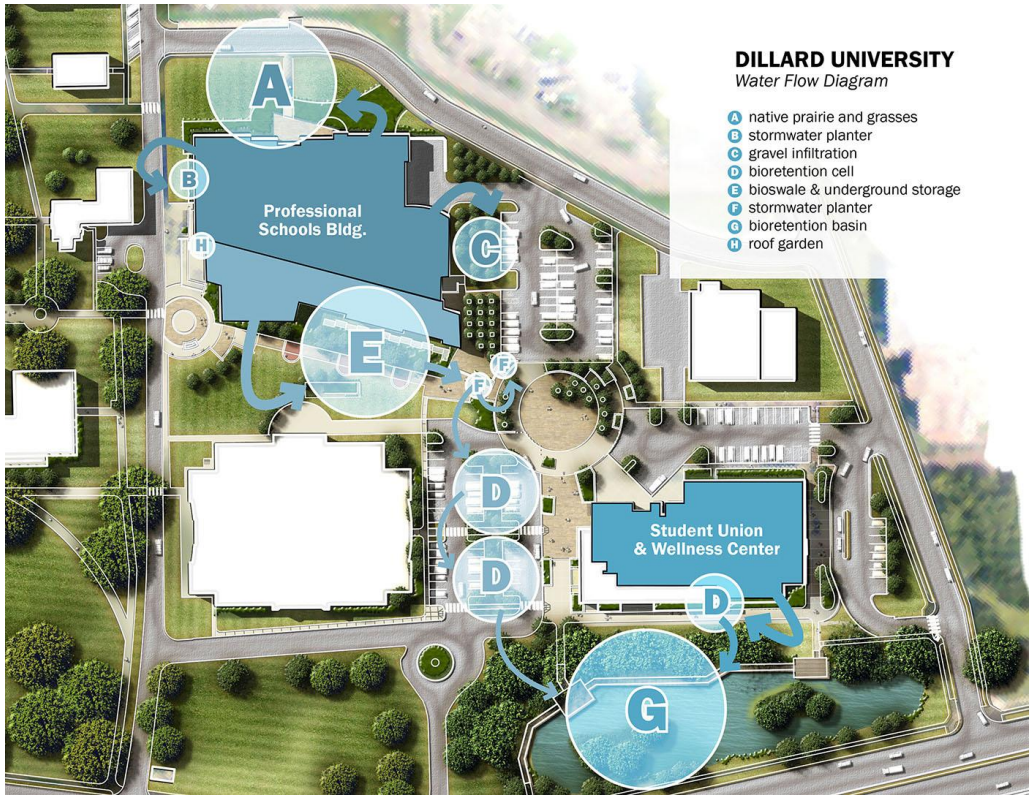
Precedents

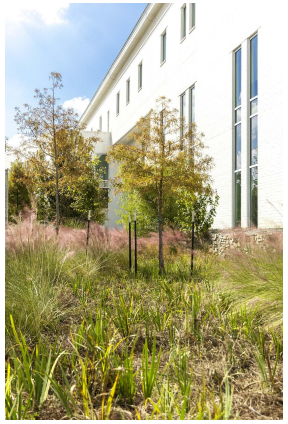
Dillard University East Campus Green Infrastructure

This project integrates bioswales, bioretention cells, native meadows, stormwater planters, a green roof, rainwater harvesting, and pervious paving to reduce runoff and alleviate localized flooding, while also improving water quality.

Learn more here: https://www.danabrownassociates.com/dillard-university-east-campus/

Images: All from Dana Brown & Associates / Bottom right image from Aron Chang

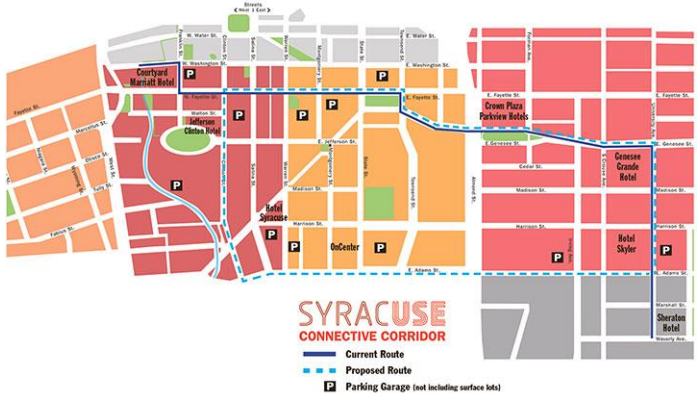




Syracuse Connective Corridor

A project that strengthens the connection between campus and downtown through a combination of coordinated investments and partnerships in transportation, wayfinding, public space, public art, and public programs.

Learn more here:
https://connectivecorridor.syr.edu/
and
https://www.syracuse.edu/stories/connective-corridor/



Princeton Parking Garage

The projects include: a new parking garage with transit amenities located on a portion of the existing parking Lot 21, new soccer stadium and practice field, an athletics operations building, and a geo-exchange utility facility that will advance the University's goal of achieving net carbon neutrality by 2046.

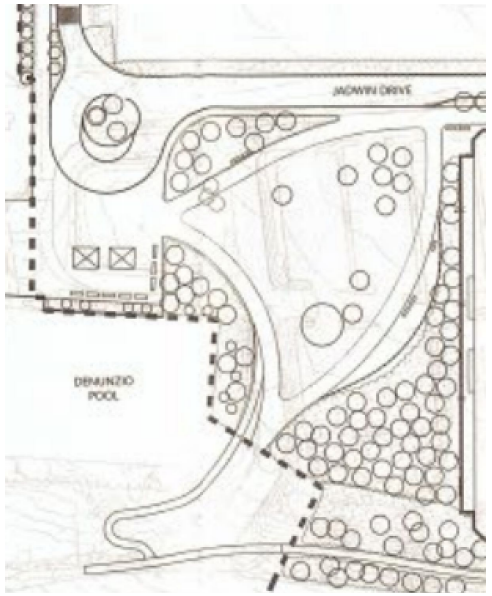
- Removes 140 ground parking spaces from Lot 21 with new garage
- Net increase of 226 spaces with flexible overflow

Learn more here:
https://www.dailyprincetonian.com/article/2021/01/university-receives-approval-for-new-stadium-practice-fields

existing


existing view

2021 improvement



2021 landscape improvement

Additional Design Drawings and Sketches

February 24 Diagram of Urban Design Concepts

Big ideas that are about spaces and places, as well as partnerships and programs, and that can be used to organize priorities, investments, and public narratives.

PHASE ONE CONCEPTS

-strong stories
-test ideas
-make a mark

CORRIDOR CONCEPT...

FRAMEWORK
-establish ecological identities
-pilot sites
-connections and wayfinding
-entries

FACILITIES
-building upgrades
-facades and signage
-academic communities

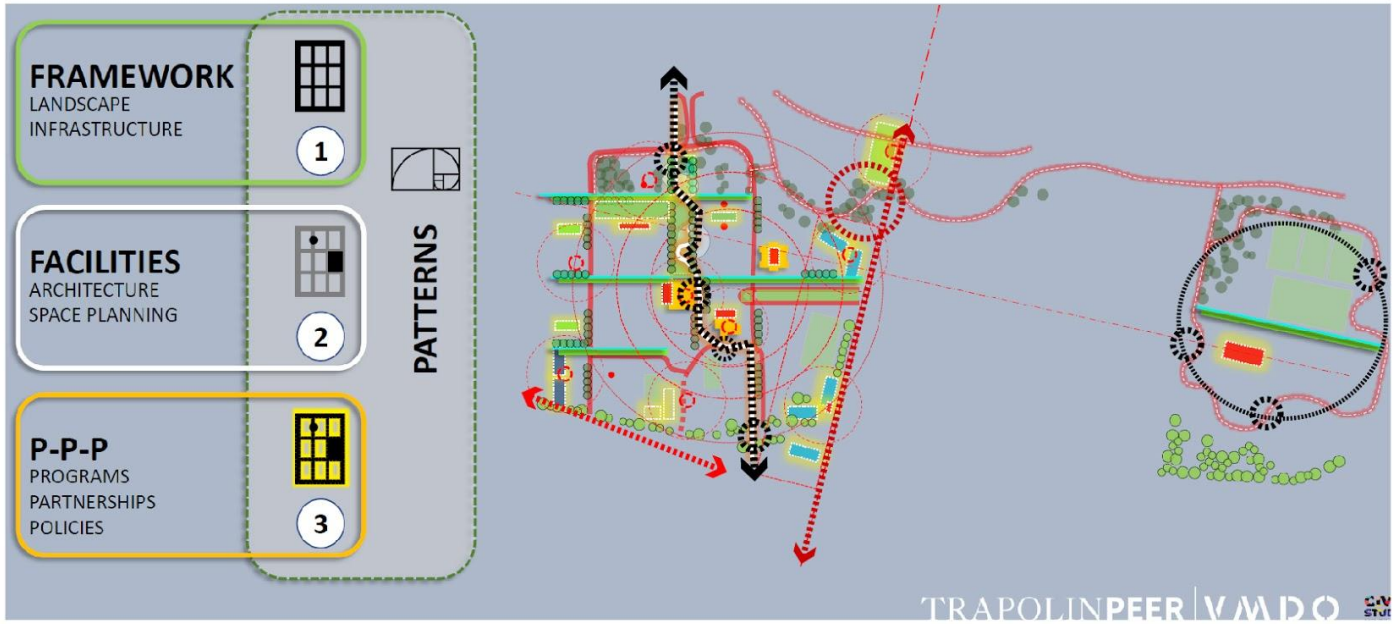
P-P-P
-Lakefront
-academic programs + student spaces
-city/neighborhood

RIVER TO LAKE CONCEPT...

FRAMEWORK
-redefine edge, connect to city
-connections and wayfinding
-entries
-R&T park connection

FACILITIES
-mixed use

P-P-P
-Pontchartrain Conservancy, SFLPAA-East, Army Corps, etc.
-public transit, bike advocates
-econ. development agencies
-developers



CITY EDGE CONCEPT...

FRAMEWORK
-redefine edge, connect to city and to lakefrontvc
-connections and wayfinding
-entries

FACILITIES
-new school
-mixed use

P-P-P
-Hynes
-BFHS
-Mosquito Control, Rodent, and Termite Control Board
-Gentilly Resilience District

ARENA LOOP CONCEPT...

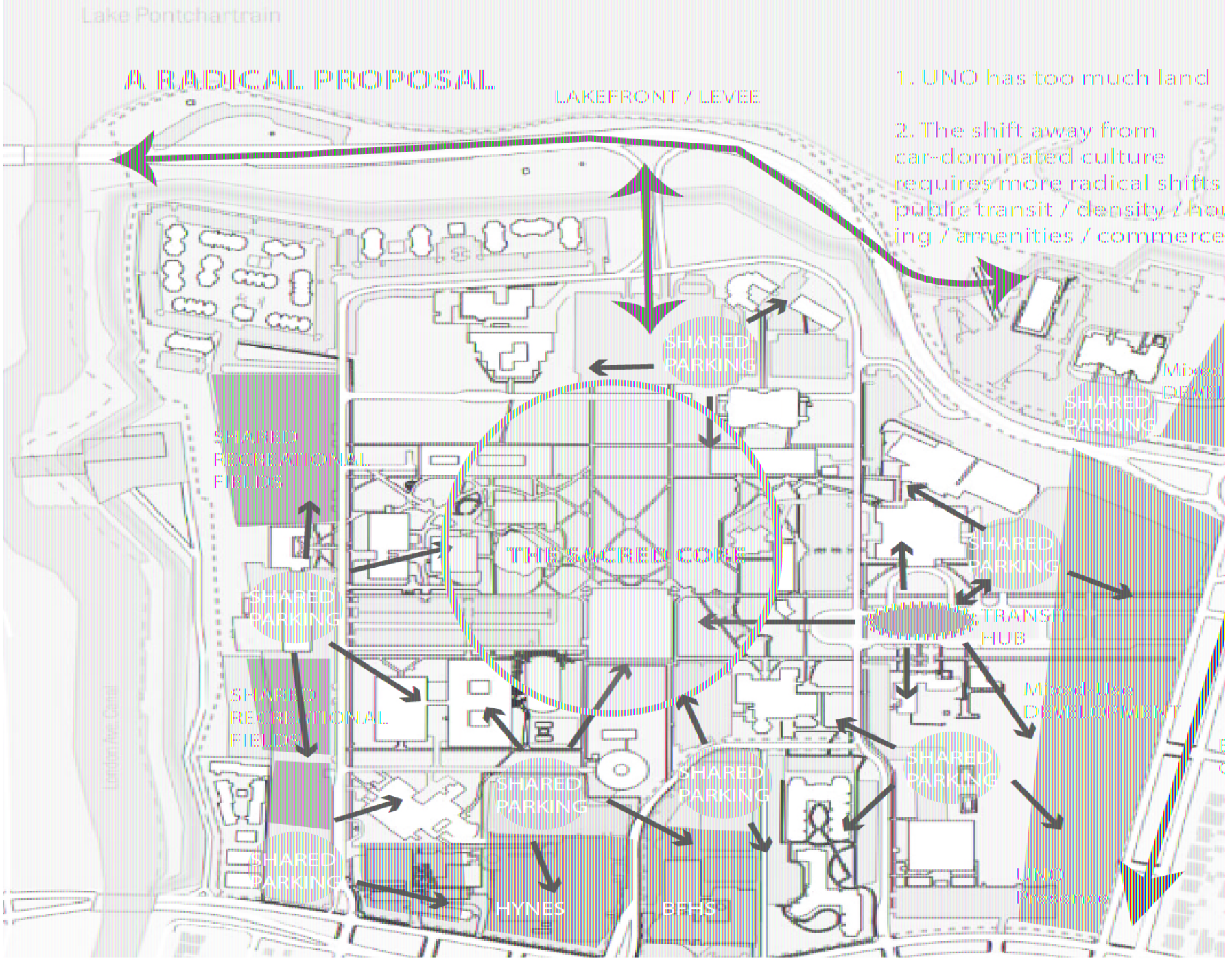
FRAMEWORK
-redefine Arena site
-pathways and trails for daily use
-forest/meadow zones vs. parking

FACILITIES
-transit stops
-mixed use development

P-P-P
-festival schedule
-recreation stakeholders
-developers

January 7, Charrette Diagram focusing on strategies for addressing the need for car parking and integrating transit and mixed-use development investments to reshape what it means to travel to and from campus.

Key idea is to create smaller parking areas that serve each part of campus; building a real transit hub that serves campus, neighborhood residents, and new residents; and orienting development and transit along Elysian Fields, and the connection from the lakefront and beach to the riverfront.



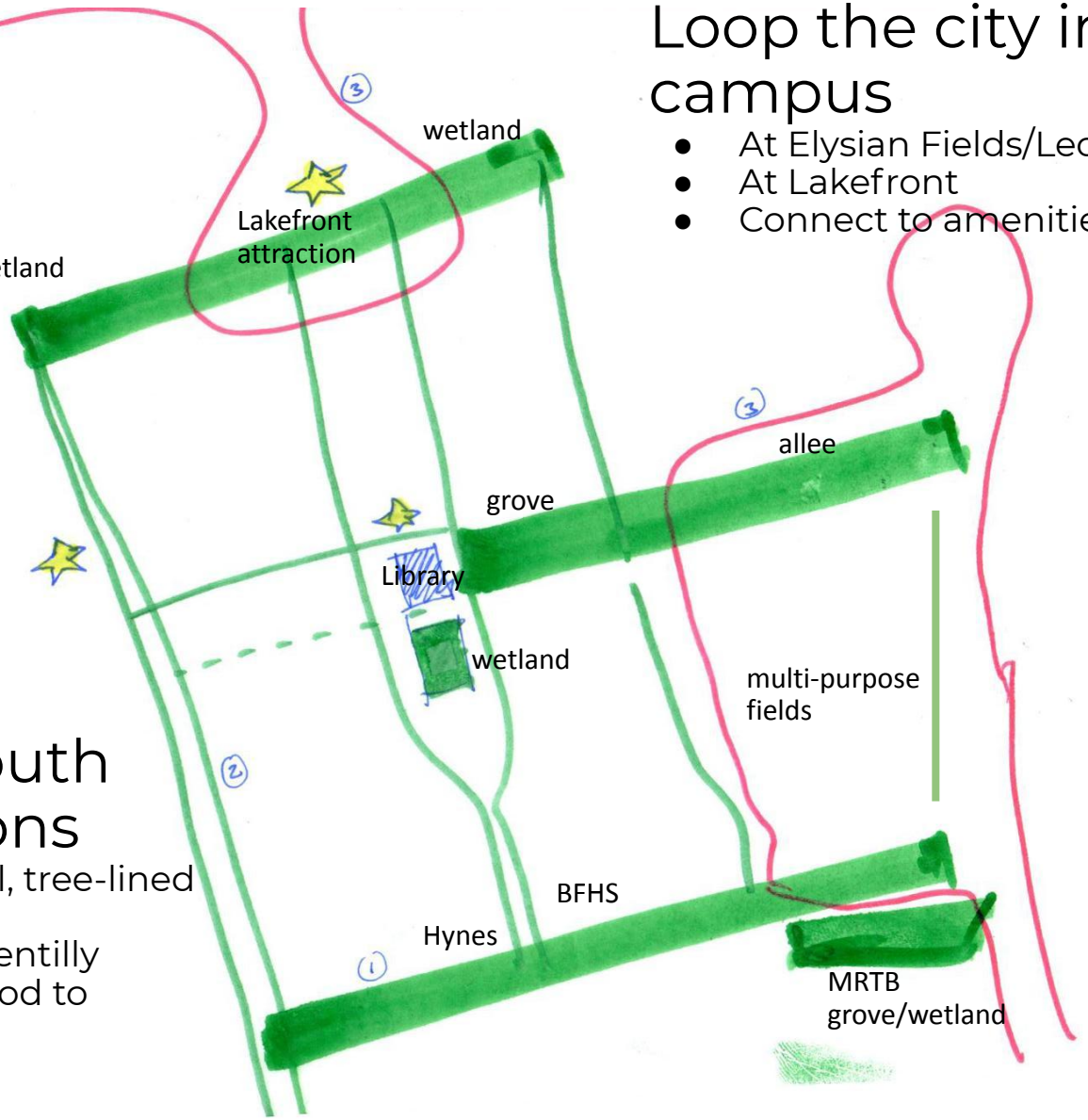
Concept Schematic - “Loops and Bands”

Loop the city into campus

- At Elysian Fields/Leon C Simon
- At Lakefront
- Connect to amenities

East - West Bands

- broader corridors connecting key amenities
- cohesive identity established through plantings (colors and blooming periods)



North - South Connections

- Multi-modal, tree-lined corridors
- Connects Gentilly neighborhood to lakefront

Remaining Spaces

- apply sustainable water management practices as needed

Activities & Gathering

Lake Front

Turn Parking Lot into **Multi-use, Adaptable Lakefront Attraction** that also manages water

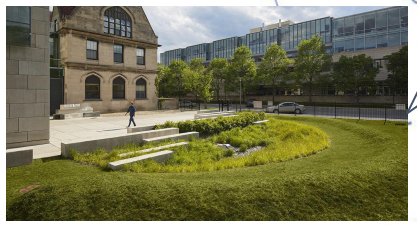
Inc retention / detention of “Sculpture Forest”

Create welcoming environment and identity with increased plantings

Heart of Campus - Learning and Nature Hub creates central focal point

Extend lush environment and gathering space of the Cove - creates connection for neighborhood to lake. Increase parking lot permeability.

Inc retention / detention of **“Library Forest”**



Inc retention / detention before flowing off site. Opportunity to connect to neighborhood

Environmental Strategies

Wetland Park
University of Lafayette

New Street Section
Multimodal, shaded corridor

“Front Door” Plantings

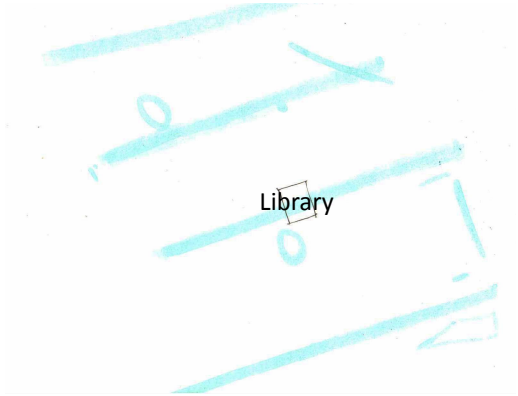
Food Truck Friday at LinkdIn

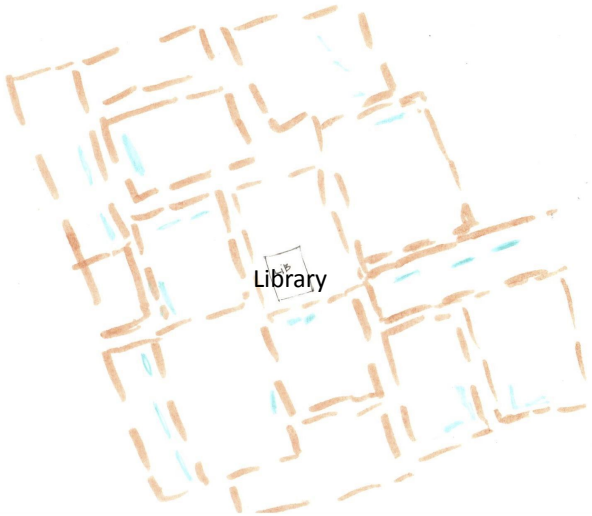
Welcoming Allee of Trees

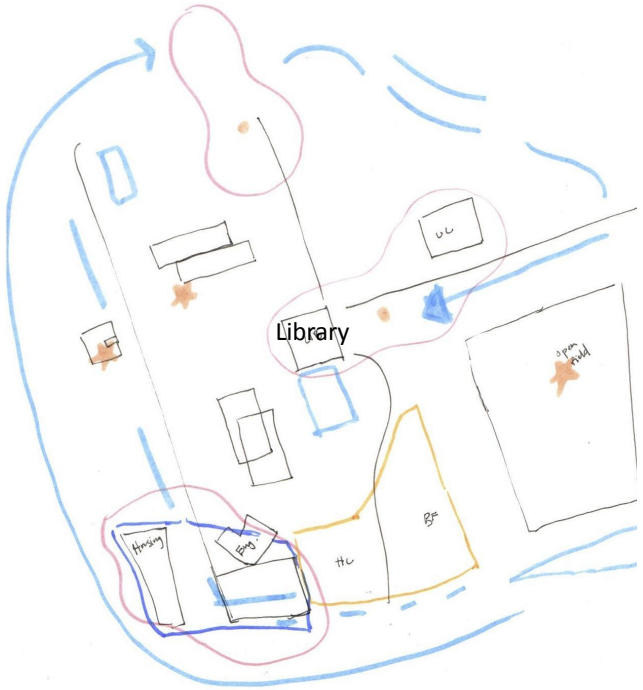
New Street Section
Multimodal, shaded corridor

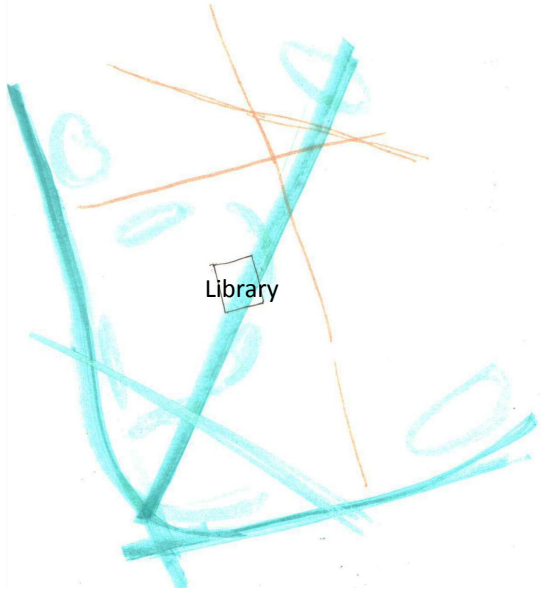
Wetland
City Park, New Orleans

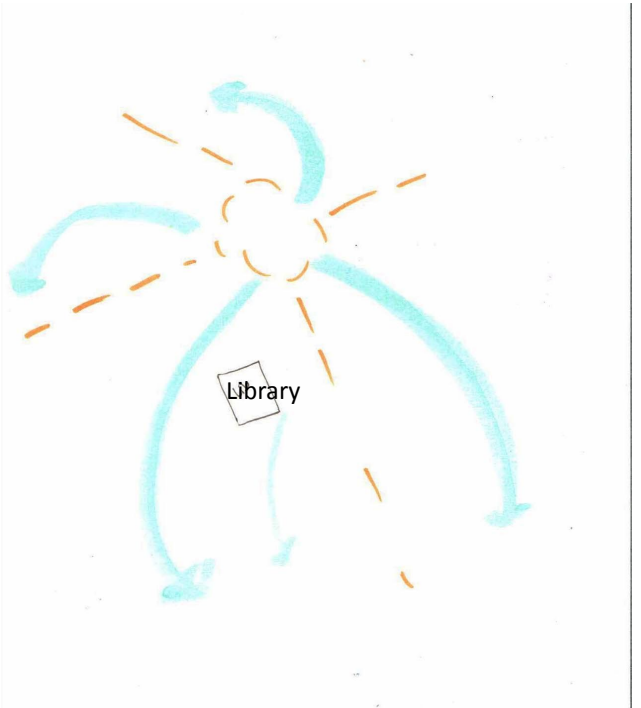
Concept Schematics - Process



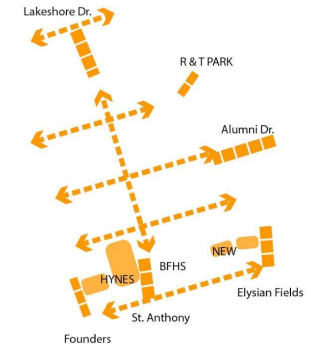




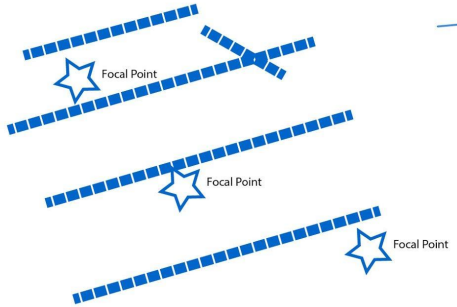




Concept Schematics - Process



Movement and Development



Water/Plant Corridors/Thresholds

Water Features