3.0

WATER

FLOODING AND WATER MANAGEMENT ARE A **TOP PRIORITY** FOR THE CITY OF CHARLESTON AND THE FRIENDS.

THE LOWLINE WILL FOLLOW THE RECOMMENDATIONS FROM THE **DUTCH DIALOGUES** CHARLESTON REPORT.

THE LOWLINE WILL PLAY A SIGNIFICANT ROLE IN THE FUTURE OF **WATER MANAGEMENT** FOR THE PENINSULA.

THE LOWLINE PROVIDES 40 ACRES OF OPEN SPACE ENABLING THE IMPLEMENTATION A VARIETY OF STRATEGIES THAT **EMBRACE AND MANAGE** WATER.

STORMWATER STORAGE ON THE LOWLINE **OPENS STORMWATER CAPACITY** IN THE SURROUNDING NEIGHBORHOODS.

ELEVATION MAP[13]

KING STREET, ONE OF THE OLDEST ROADS ON THE PENINSULA, FOLLOWS THE NATURAL RIDGE.

TOPOGRAPHY
0-20′

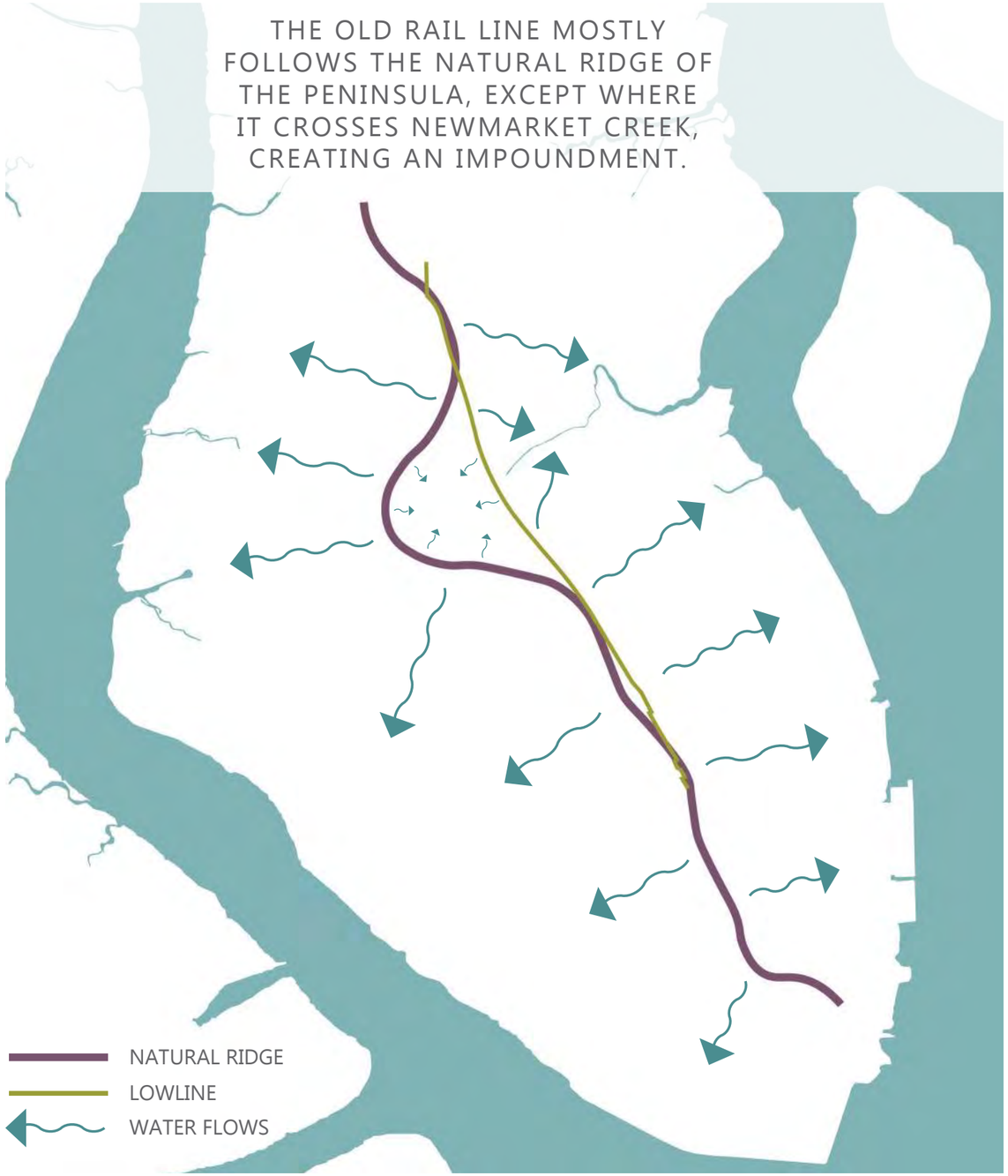
- ≤ 2′
- ≤ 4′
- ≤ 6′
- ≤ 8′
- ≤ 10′
- ≤ 12′
- ≤ 14′
- ≤ 16′
- ≤ 18′
- ≤ 20′

BATHYMETRY
0-20′

- ≤ 0′
- ≤ -5′
- ≤ -10′
- ≤ -15′
- ≤ -20′
- ≤ -25′
- ≤ -30′
- ≤ -35′
- ≤ -40′
- ≤ -45′
- ≤ -50′
- ≤ -55′
- ≤ -60′
- ≤ -65′
- ≤ -70′
- ≤ -75′
- ≤ -80′

WATER FLOWS

THE OLD RAIL LINE MOSTLY FOLLOWS THE NATURAL RIDGE OF THE PENINSULA, EXCEPT WHERE IT CROSSES NEWMARKET CREEK, CREATING AN IMPOUNDMENT.



DRAINAGE BASINS

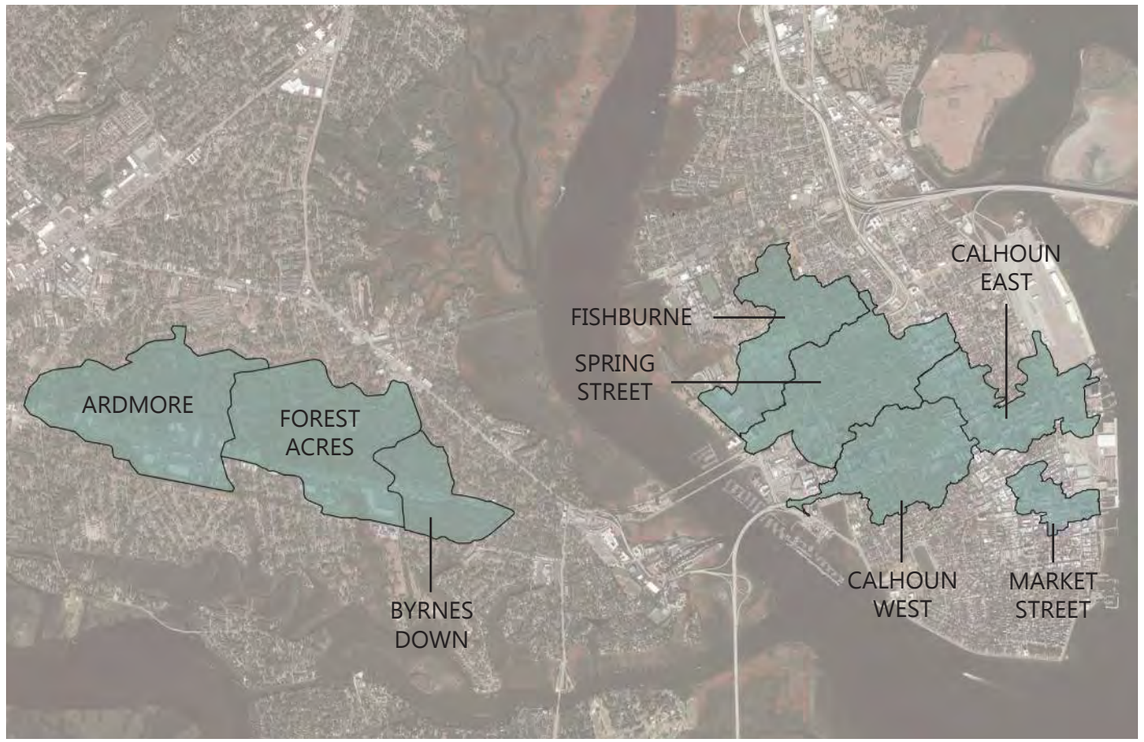
WHAT IS A DRAINAGE BASIN?

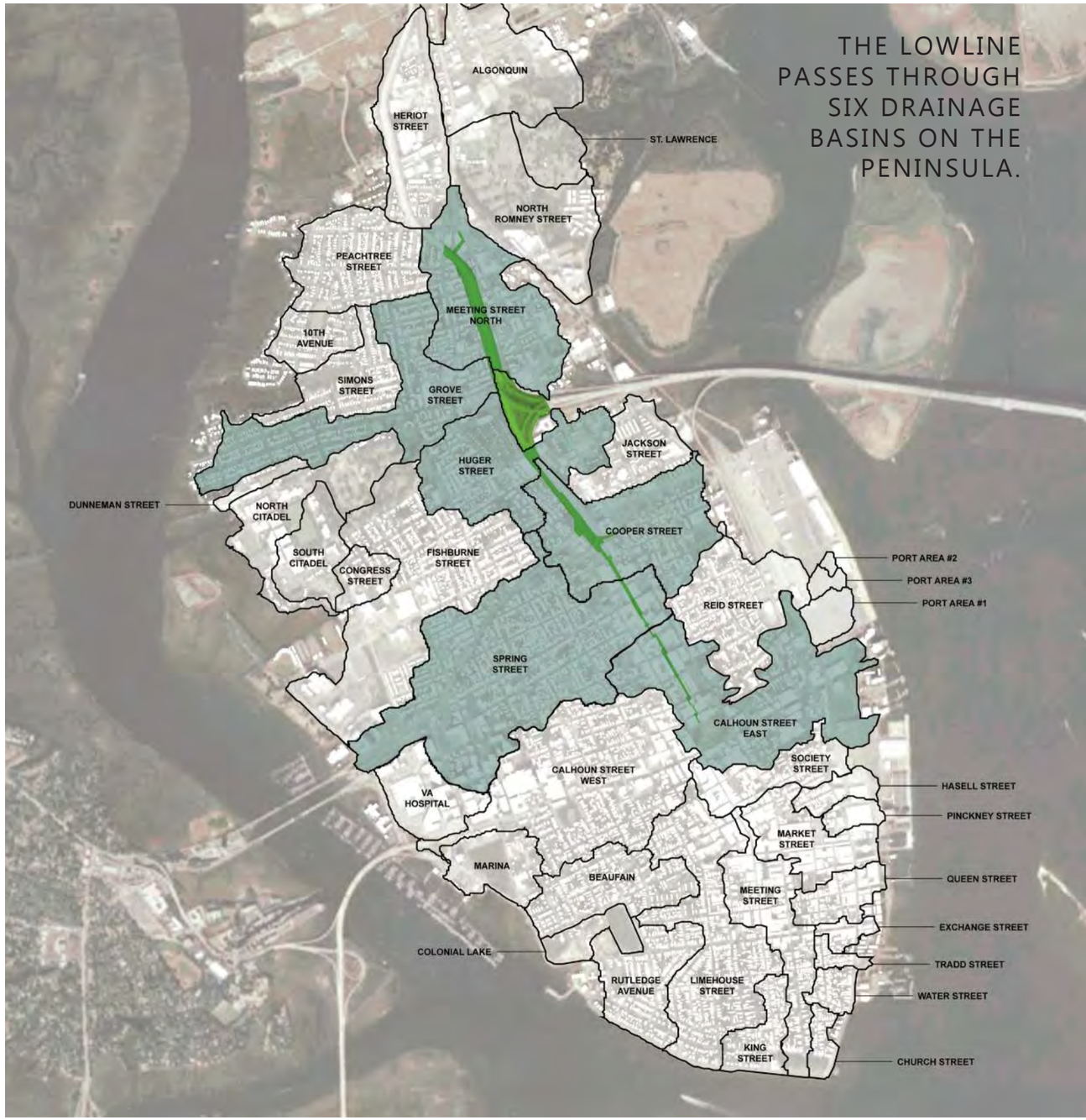
A drainage basin is an area within which stormwater collects and drains to a common outlet. A drainage basin is defined by the topography of an area. The peninsula of Charleston is divided into many different drainage basins, shown in the image on the opposite page.

ONGOING DRAINAGE PROJECTS

Since the early 2000's the City has invested millions of dollars making improvements to the stormwater drainage system. They have made progress, but there is still much to be done. The Lowline will function as both usable park space and public infrastructure that manages flooding.

YEAR	PROJECT	COST
2020	SPRING/ FISHBURNE	**$154,000,000**
2018	MARKET STREET	**$30,000,000**
2017	FOREST ACRES	**$15,000,000**
2007	BYRNES DOWN	**$6,700,000**
2001	CALHOUN EAST	**$15,800,000**
2000	ARDMORE	**$5,000,000**
	TOTAL:	**$226,500,000**





HOW MUCH WATER?

BASIN NAME	RUNOFF FROM THE 10-YEAR 24-HOUR STORM (IN ACRE-FEET)
MEETING STREET NORTH	60
GROVE STREET	60
HUGER STREET	52
COOPER STREET	65
SPRING STREET	135
CALHOUN STREET EAST	87

WHAT IS THE 10-YEAR, 24-HOUR STORM?

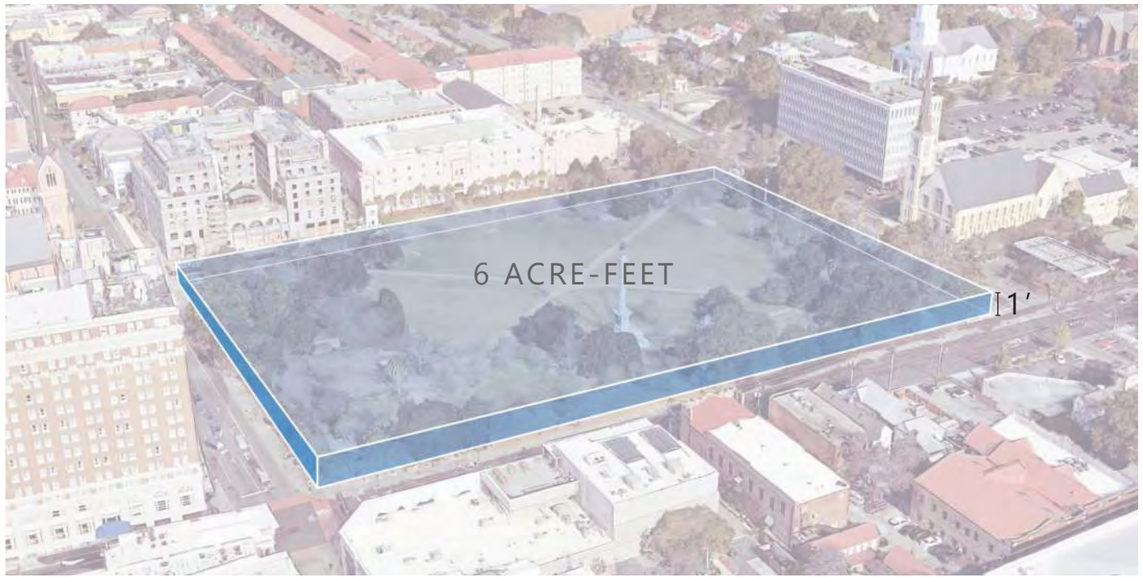
In Charleston, the 10-year, 24-hour storm means that there is a 10% chance every year that within a 24-hour period, we will have 6.41 inches of rain.

WHAT IS AN ACRE-FOOT?

An acre-foot is a volume unit used in stormwater calculations.

Marion Square is six acres (see graphic below). If it were filled with one foot of water, it would be holding six acre-feet. If it were filled with three feet of water, it would be holding 18 acre-feet.

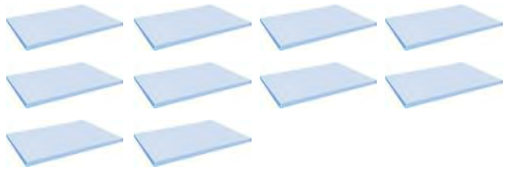
MARION SQUARE:



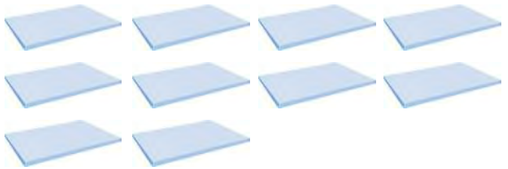
1 LOWLINE = 7 MARION SQUARES

THIS PAGE ILLUSTRATES THE RUNOFF VOLUMES FROM THE TABLE OPPOSITE. FOR EACH BASIN, THE ACRE-FEET OF RUNOFF IS TRANSLATED INTO HOW MANY MARION SQUARES (1 FOOT DEEP) WOULD BE REQUIRED TO ACCOMMODATE THE RUNOFF.

MEETING STREET NORTH
60 Ac-ft = 10 Marion Squares (1 foot deep)



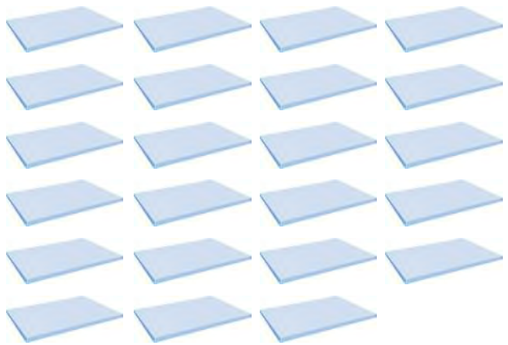
GROVE STREET
60 Ac-ft = 10 Marion Squares (1 foot deep)



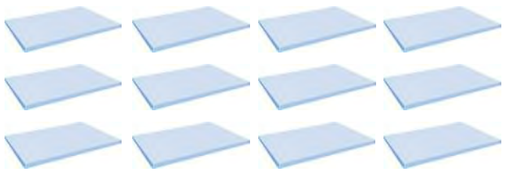
HUGER STREET
52 Ac-ft =~9 Marion Squares (1 foot deep)

COOPER STREET
65 Ac-ft =~11 Marion Squares (1 foot deep)

SPRING STREET
135 Ac-ft =~23 Marion Squares (1 foot deep)



CALHOUN STREET EAST
87 Ac-ft =~15 Marion Squares (1 foot deep)

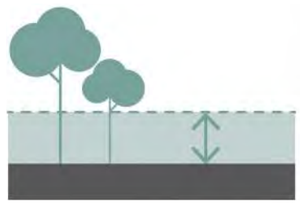


THROUGH SEVERAL DIFFERENT STRATEGIES, THE LOWLINE HAS THE POTENTIAL TO ALLEVIATE RUNOFF.

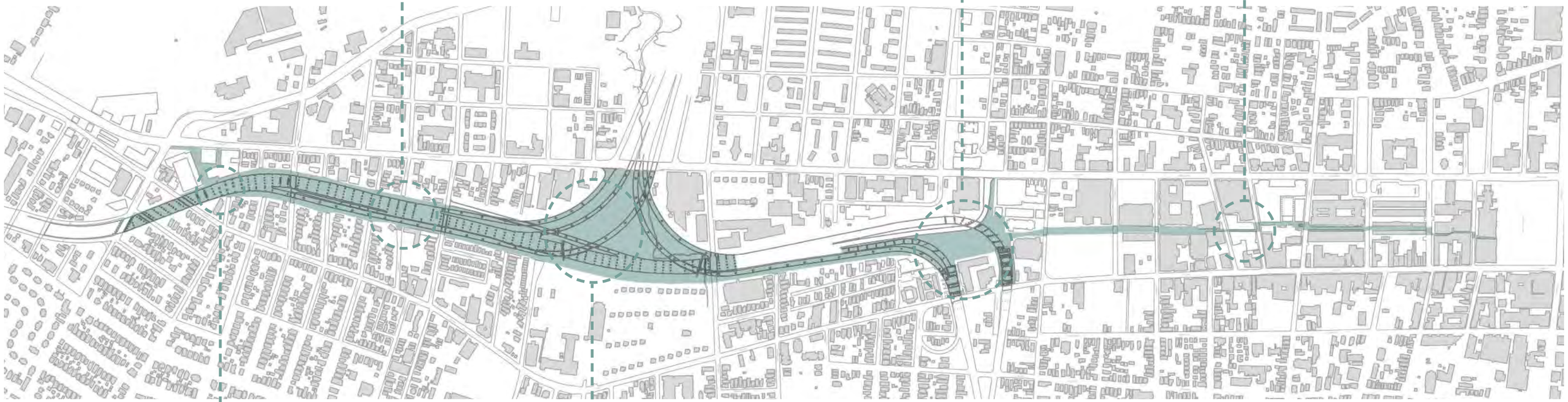
WATER STRATEGIES

CAPTURE AND TREAT RUNOFF FROM ELEVATED ROADWAYS.

CREATE **FLOODABLE PARK SPACE**



INFILTRATE STORMWATER



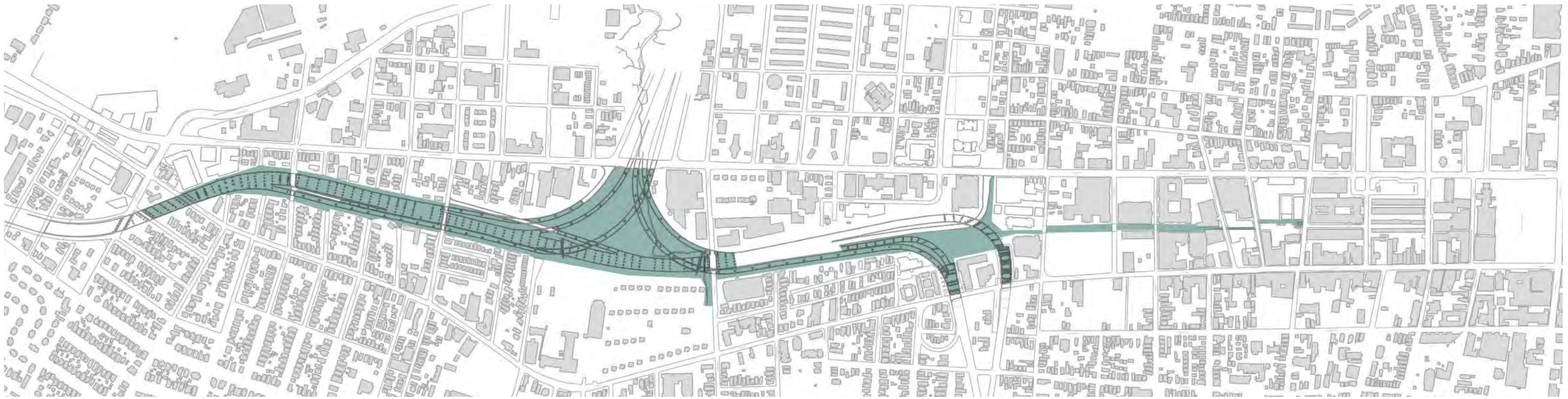
TEMPORARILY **STORE WATER**

EXPAND CAPACITY AND QUALITY OF EXISTING **STORMWATER WETLANDS**

SITE CONDITIONS INCLUDING ELEVATION, SOILS, AND WATER TABLE WILL AFFECT THE FEASIBILITY OF THESE STRATEGIES.

TEMPORARY WATER STORAGE

IMPERVIOUS SURFACES POTENTIALLY IMPACTING THE LOWLINE

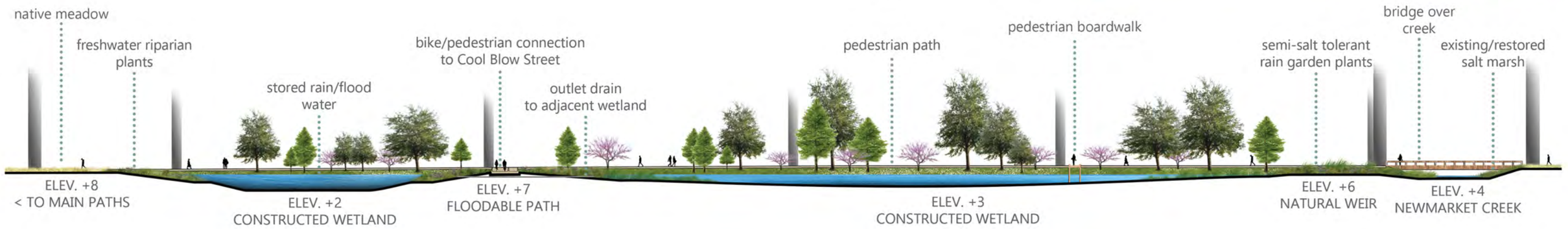


POTENTIAL AREAS FOR WATER STORAGE ALONG THE LOWLINE

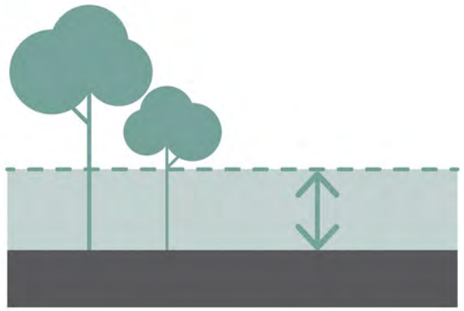
STORMWATER WETLANDS: NEWMARKET PARK

The proposed Newmarket Park on the Lowline is a stormwater wetland that functions to detain, retain, and filter stormwater runoff. It also provides the opportunity to create an interactive ecological park that supports wildlife, adds recreation space, and brings public awareness to healthy water management.

This design advocates for the daylighting of Newmarket Creek on Huger Street. The old rail line created an artificial ridge which cut short the natural reach of the creek, causing flooding to the west. By providing an outlet to Newmarket Creek under the Lowline, the flooding at the intersection of King and Huger Streets could be alleviated.



FLOODABLE PARK SPACE: LOWLINE PARK



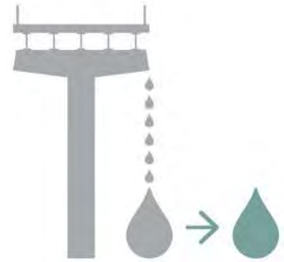
Lowline Park provides the opportunity to create a large, open park space with typical park amenities that is allowed to flood in heavy rains to become temporary stormwater infrastructure.

Mill Race Park in Indiana, designed by Michael Van Valkenburgh Associates.

The park is designed to accommodate seasonal flooding from two rivers.

THESE IMAGES SHOW AN IMAGINED LANDSCAPE THAT FUNCTIONS AS THE LOWLINE PARK COULD - OPEN PARK SPACE IN DRY CONDITIONS, AND WATER STORAGE DURING WET CONDITIONS

CAPTURE AND TREAT RUNOFF



Capturing and treating all runoff created by the elevated roadways is a priority for the Lowline. This will reduce runoff to the adjacent basins.

Runnel

Rain gardens

Bioswales

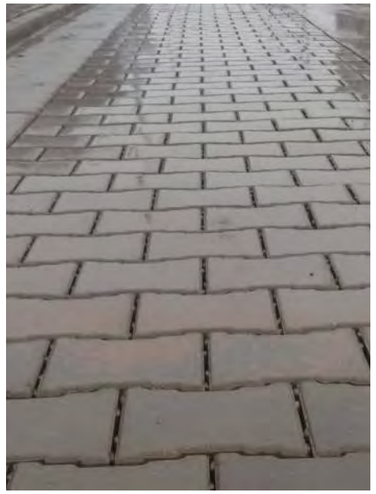
Current Site Conditions: Runoff from the overpass

Current Site Conditions: Rain at Newmarket Park

INFILTRATE STORMWATER

Stormwater can be infiltrated in several different ways, depending on site conditions. In the urban core, infiltration will likely be limited to smaller rain gardens and permeable paving. Along the North Central Corridor, with more space, bioretention areas, bioswales, and vegetated filter strips can be used.

Permeable paving



Curb cuts to rain gardens

Retrofitted downspout

Current Site Conditions: Stormwater from Hurricane Dorian