2.0

WATER

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

THE PENINSULA OF CHARLESTON BEGAN AS A NARROW STRIP OF LAND SURROUNDED BY **MARSHES AND CREEKS**. OVER THE YEARS, MANY OF THESE WERE FILLED IN TO EXPAND THE CITY BOUNDARIES.

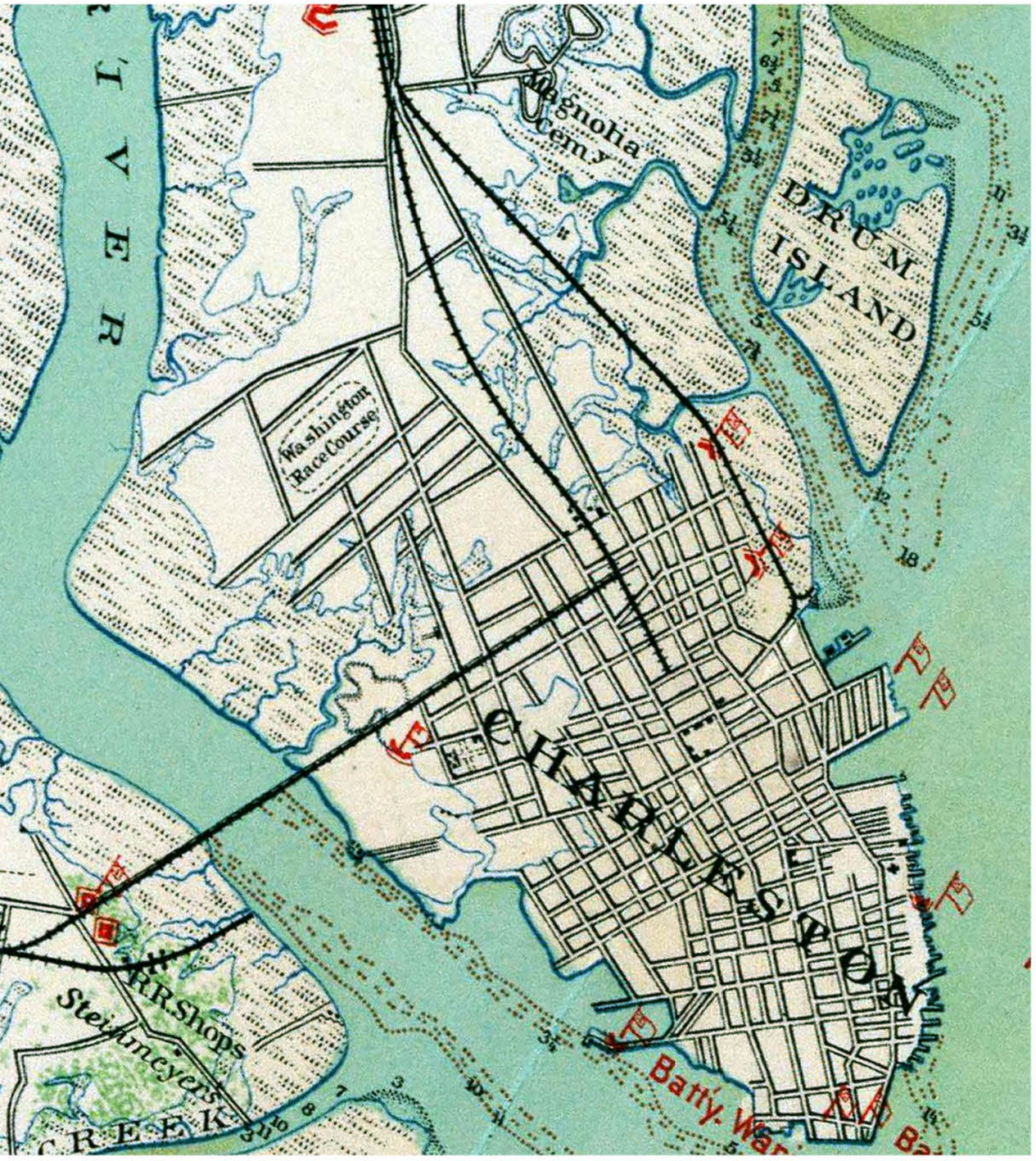
WHILE THE CREEKS AND MARSHES HAVE BEEN FILLED, THEIR **FLOOD PATTERNS** REMAIN.

AS AN IMPORTANT PIECE OF NEW INFRASTRUCTURE THE LOWLINE WILL PLAY A SIGNIFICANT ROLE IN THE FUTURE OF **WATER MANAGEMENT** FOR THE PENINSULA.

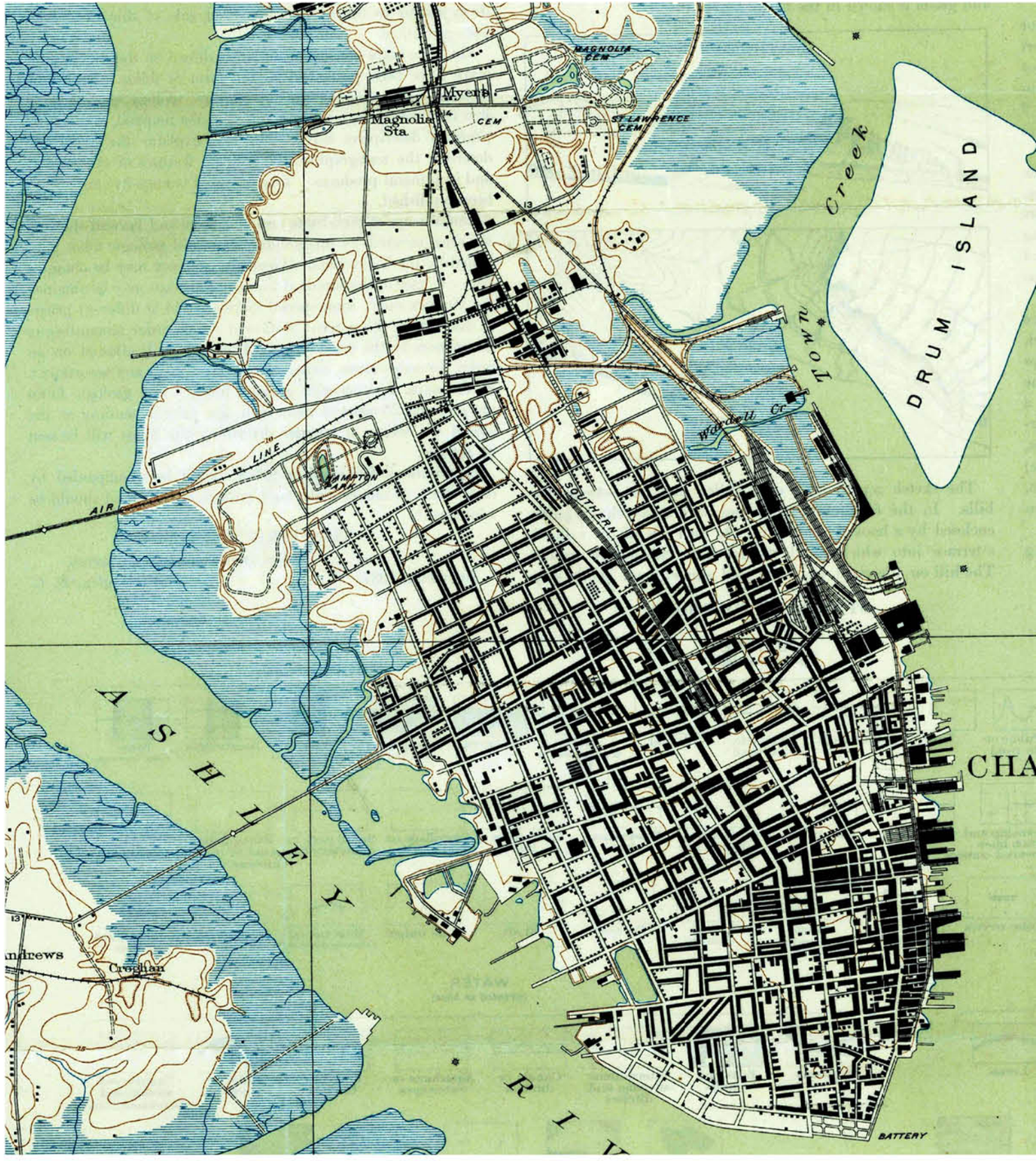
THE LOWLINE PROVIDES AMPLE OPEN SPACE TO IMPLEMENT A VARIETY OF STRATEGIES THAT **EMBRACE AND MANAGE** WATER.

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

1863 MAP OF CHARLESTON



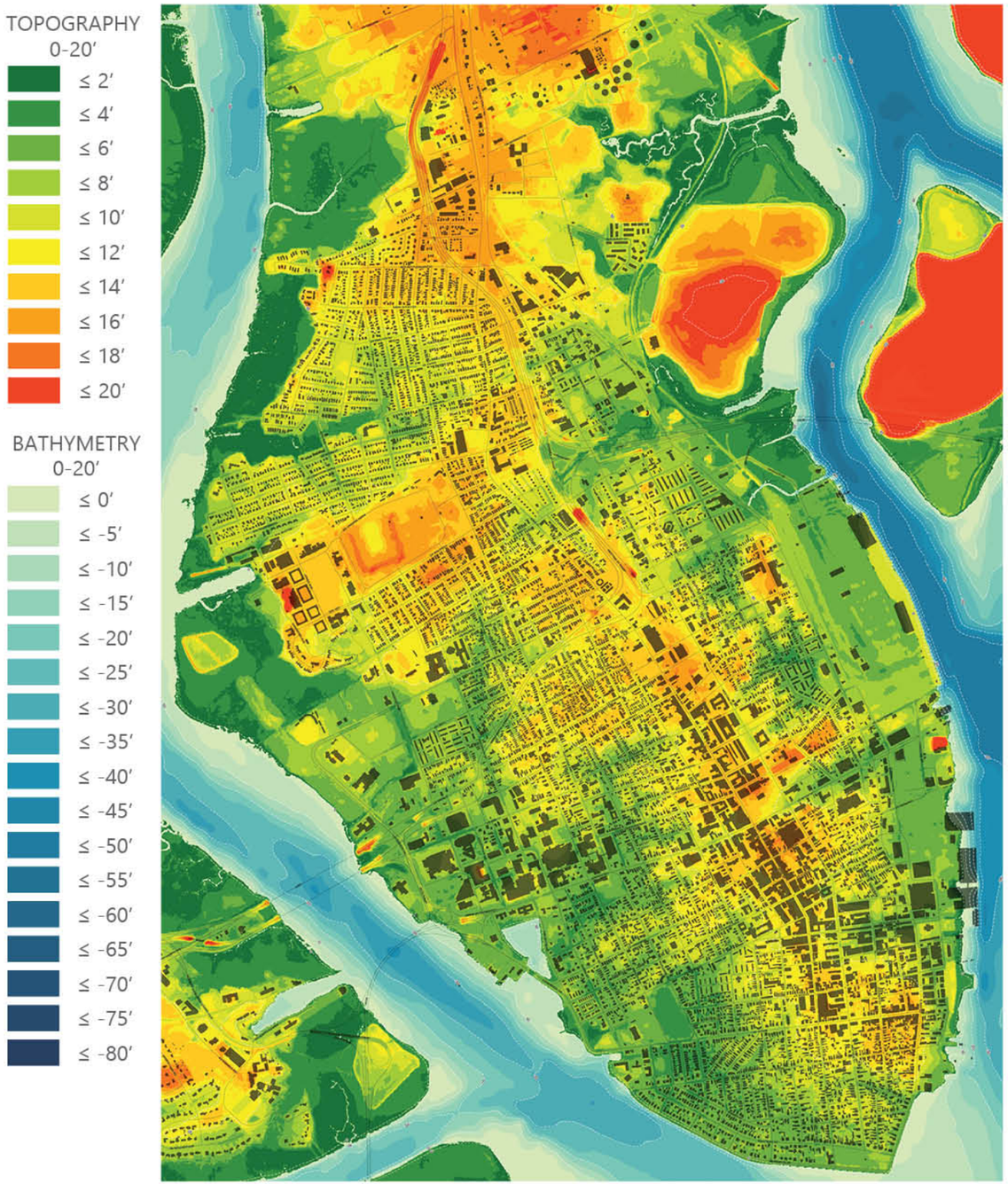
1919 MAP OF CHARLESTON



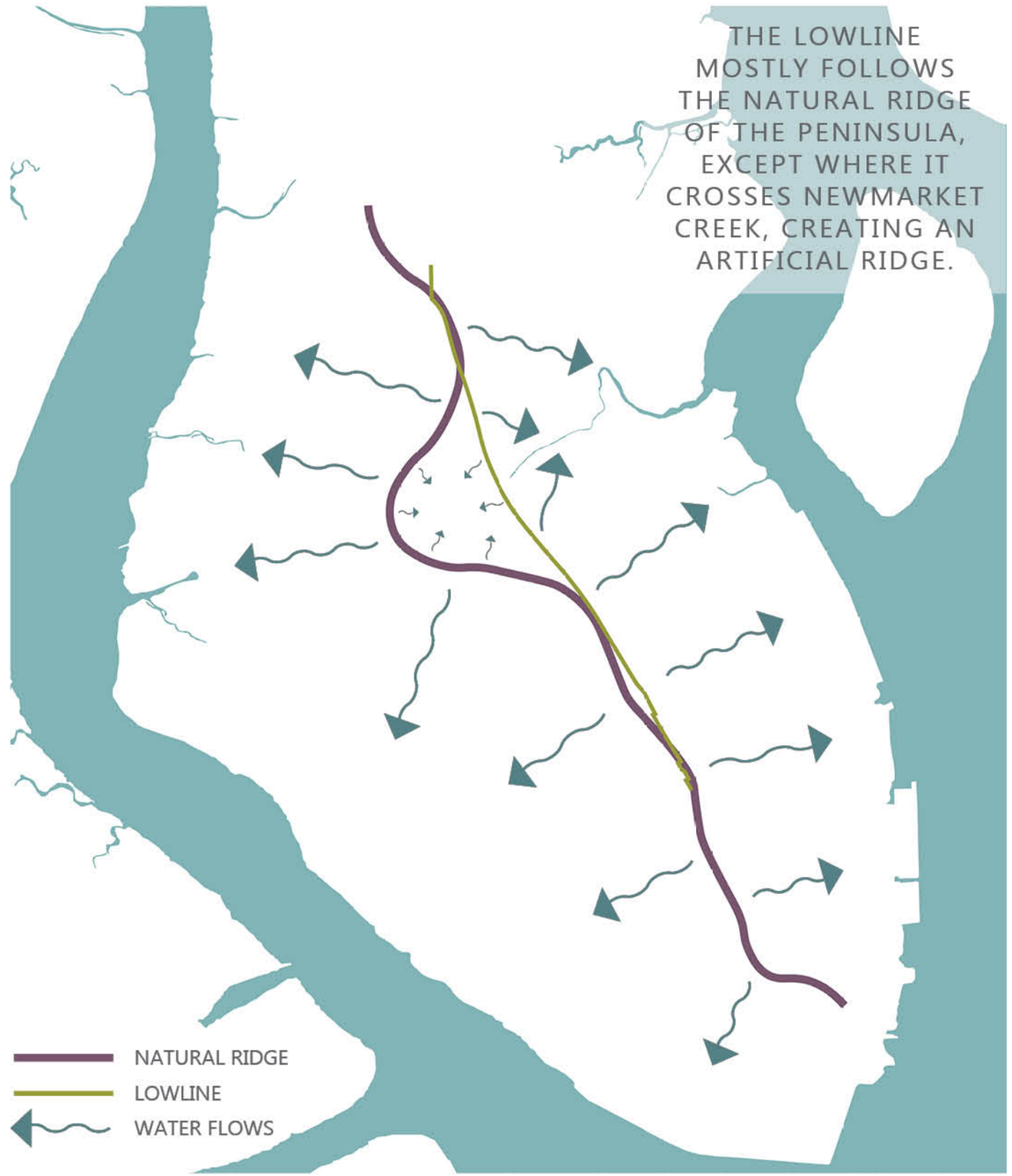
1948 MAP OF CHARLESTON

2019 MAP OF CHARLESTON

ELEVATION



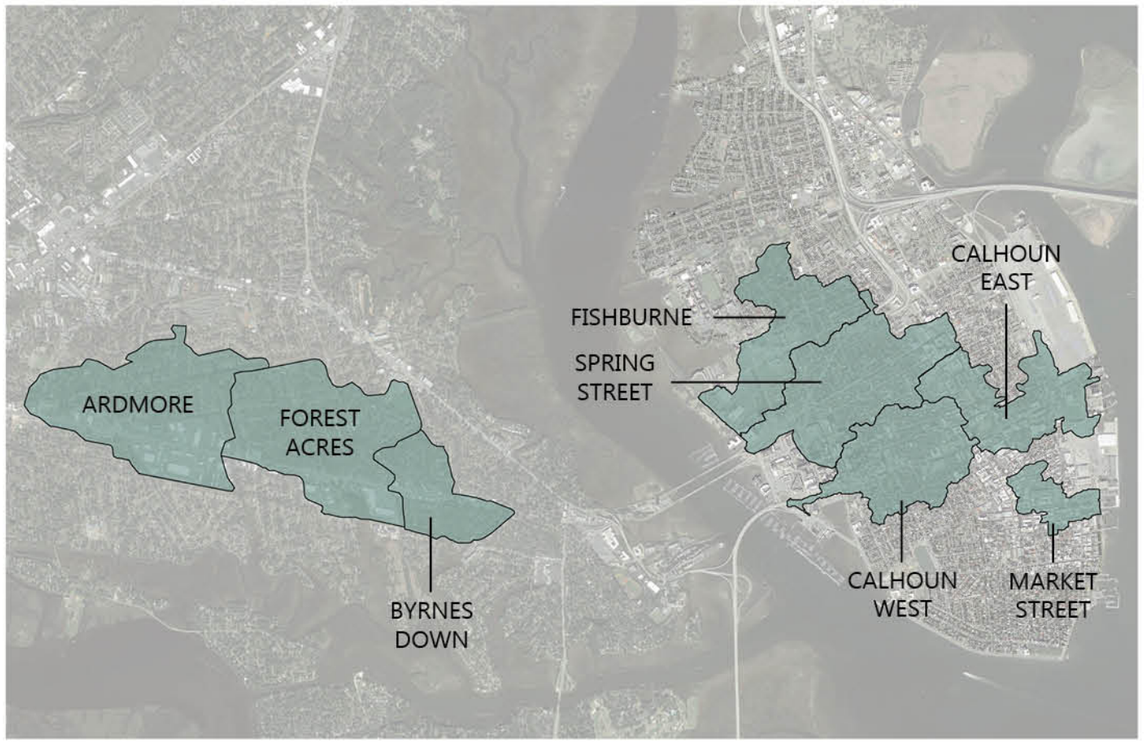
WATER FLOWS



ONGOING DRAINAGE PROJECTS

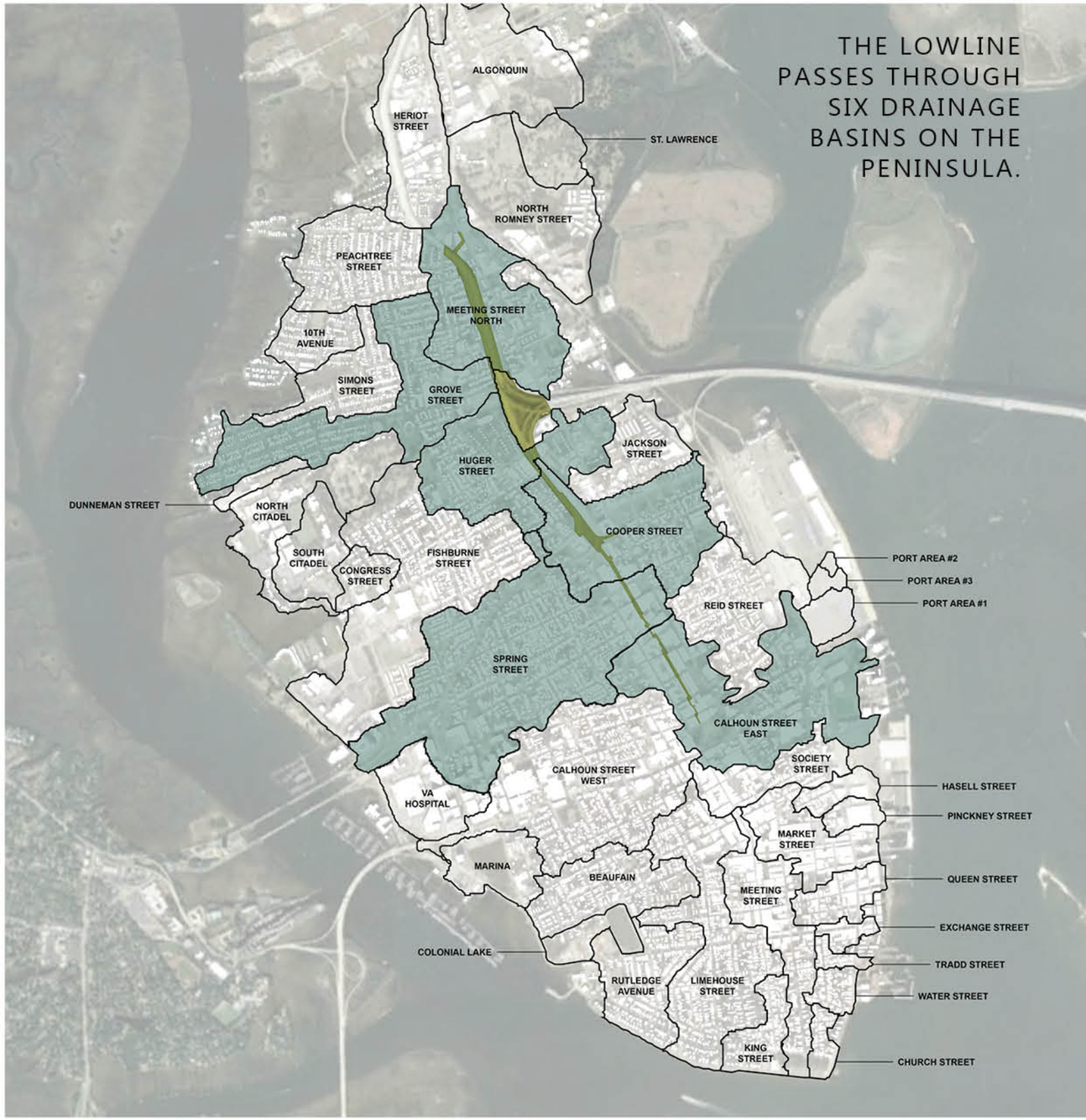
Since the early 2000's the City has invested millions of dollars making improvements to the stormwater drainage system. They have made progress, but there is still much to be done. The Lowline will function as both public infrastructure to manage flooding and usable park space.

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**



DRAINAGE BASINS

THE LOWLINE PASSES THROUGH SIX DRAINAGE BASINS ON THE PENINSULA.



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?

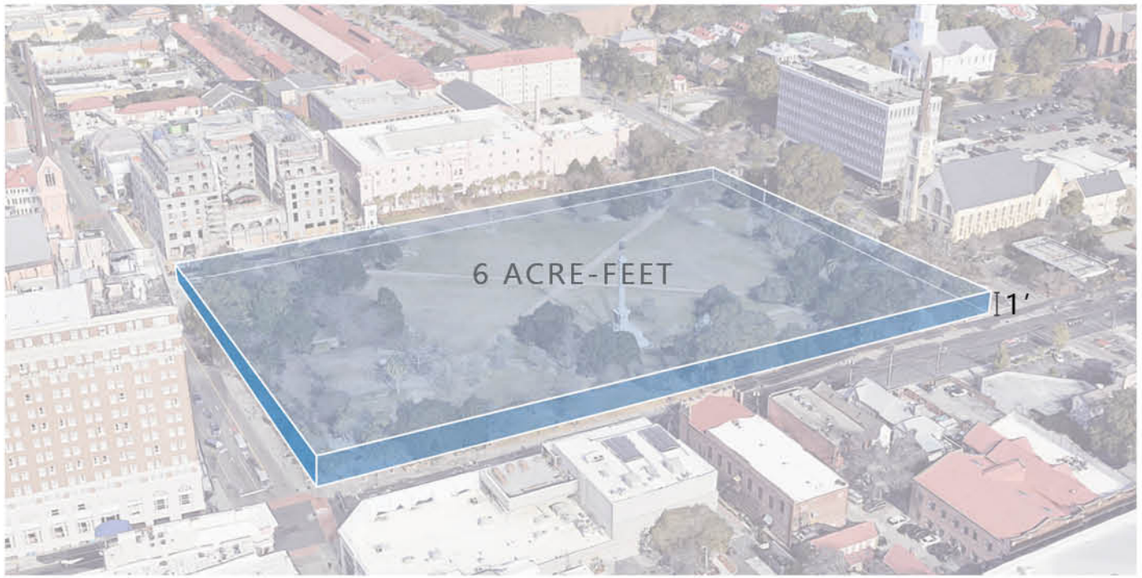
In Charleston, the 10-year, 24-hour storm means that there is a 10% chance every year that within a 24-hour period, we will have 6.41" of rain.

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.

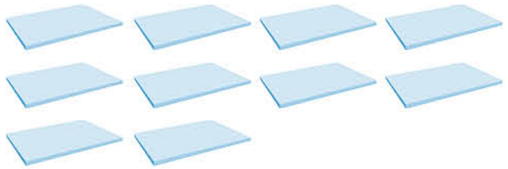
MARION SQUARE:



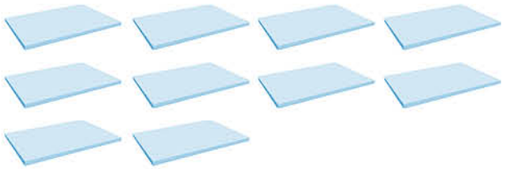
1 LOWLINE = 7 MARION SQUARES

THIS PAGE ILLUSTRATES THE RUNOFF VOLUME 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.

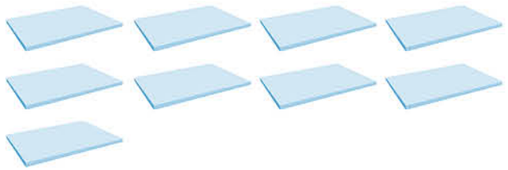
MEETING STREET NORTH
60 Ac-ft = 10 Marion Squares (1 foot deep)



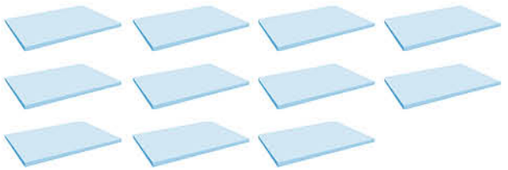
GROVE STREET
60 Ac-ft = 10 Marion Squares (1 foot deep)



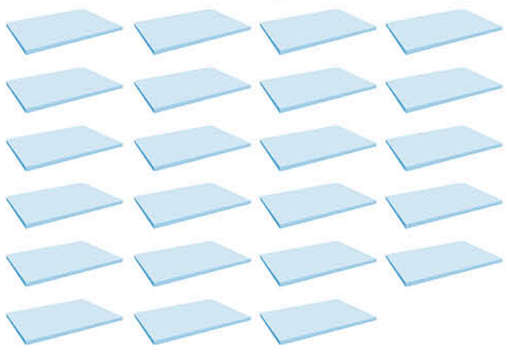
HUGER STREET
52 Ac-ft =~9 Marion Squares (1 foot deep)



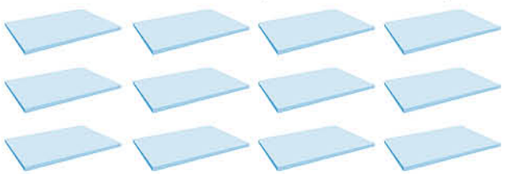
COOPER STREET
65 Ac-ft =~11 Marion Squares (1 foot deep)



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



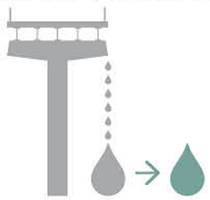
CALHOUN STREET EAST
87 Ac-ft =~15 Marion Squares (1 foot deep)



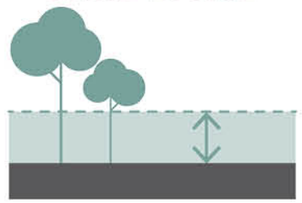
THROUGH SEVERAL DIFFERENT STRATEGIES THE LOWLINE HAS THE POTENTIAL TO ALLEVIATE SOME OF THIS RUNOFF.

WATER STRATEGIES

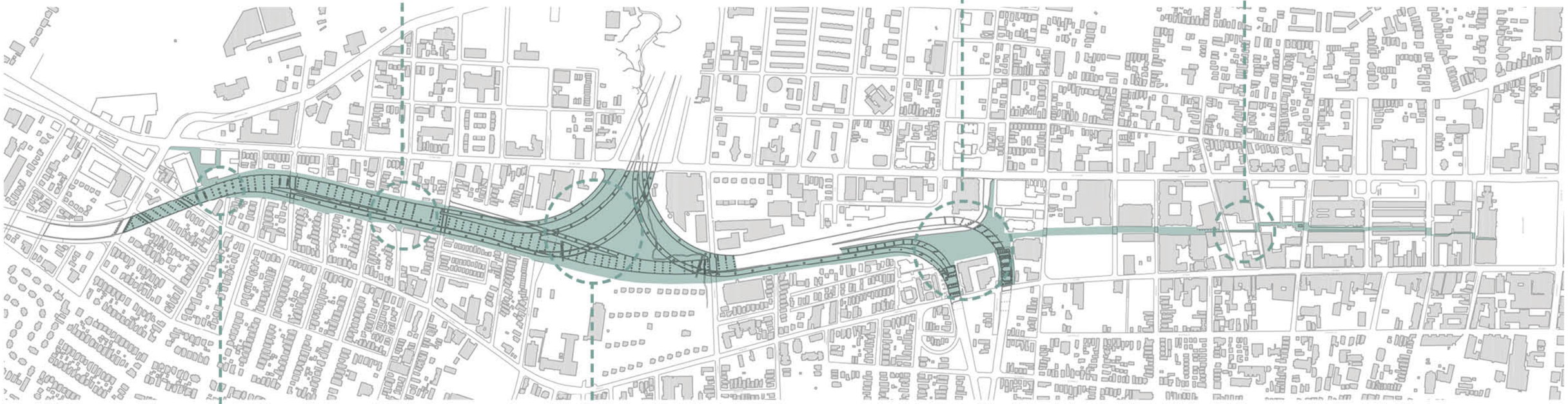
CAPTURE AND TREAT RUNOFF FROM ELEVATED ROADWAYS.



CREATE **FLOODABLE PARK SPACE**



INFILTRATE STORMWATER

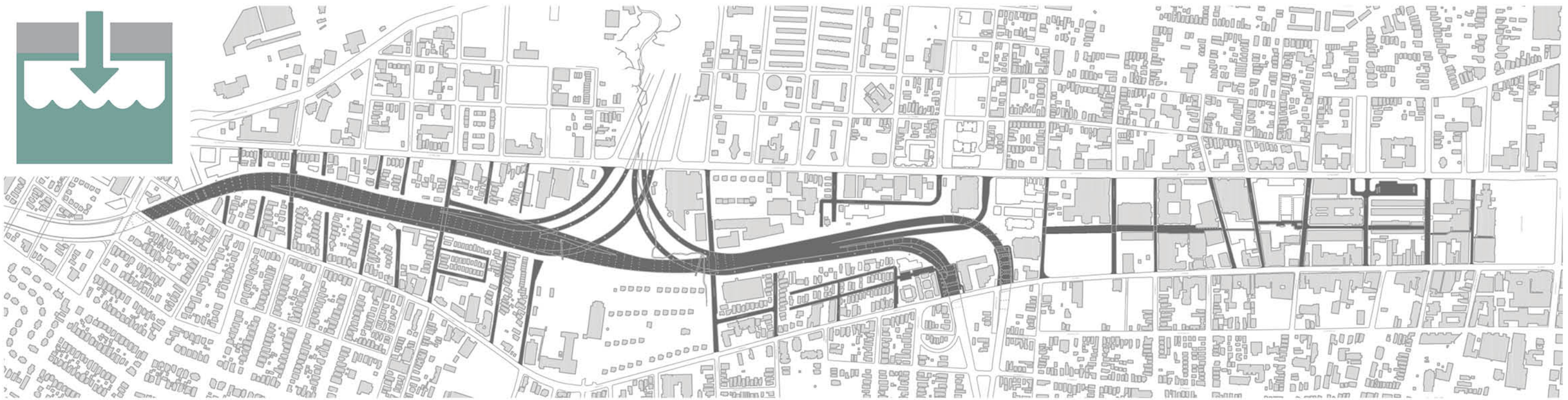


TEMPORARILY **STORE WATER**

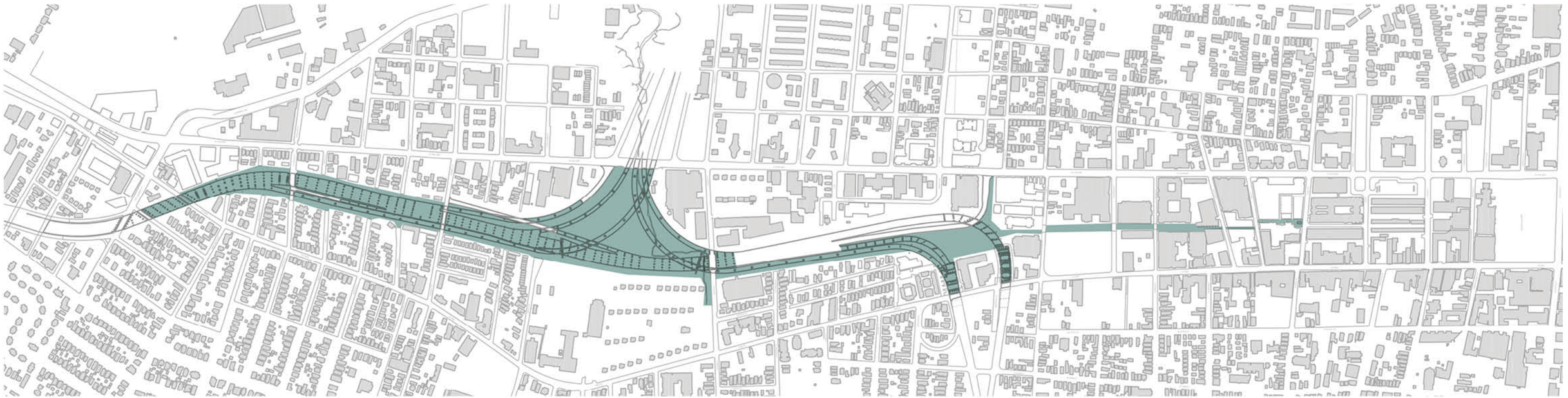
EXPAND CAPACITY AND QUALITY OF EXISTING **STORMWATER WETLANDS**

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

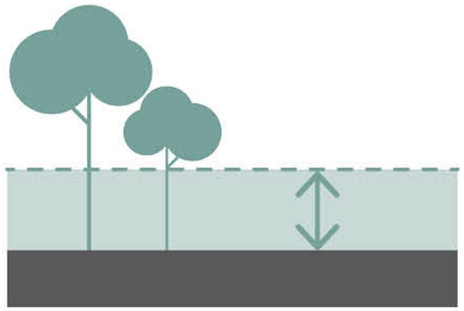
STORMWATER WETLANDS: NEWMARKET PARK

The proposed Newmarket Park on the Lowline is a stormwater wetland that functions to detain and retain 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 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: POINSETTE PARK

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

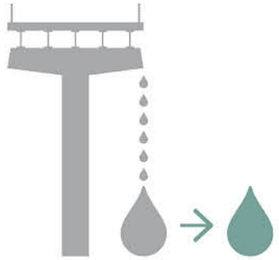


Poinsette Park provides the opportunity to create a large, open park space with typical park amenities that is allowed to flood in heavy rains to become temporary stormwater infrastructure.

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

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

CAPTURE AND TREAT RUNOFF



Capturing and treating all runoff created by the elevated roadways is a priority for the Lowline. this would reduce runoff in the adjacent basins. With additional improvements, the goal is to also improve flooding within the drainage basins through which the Lowline passes.

Runnel

Rain gardens

Bioswales

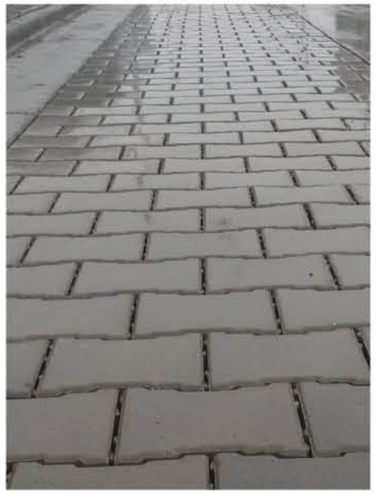
Site Conditions: Runoff from the overpass

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

Site Conditions: Stormwater from Hurricane Dorian