



City of Miami Beach, 1700 Convention Center Drive, Miami Beach, Florida 33139, www.miamibeachfl.gov

Item 9.
COMMITTEE MEMORANDUM

TO: Land Use and Sustainability Committee

FROM: Jimmy L. Morales, City Manager

DATE: May 6, 2020

TITLE: DISCUSSION REGARDING FINDING A PLAN, A LIST OF LOCATIONS WHERE BLUE AND GREEN INFRASTRUCTURE SOLUTIONS CAN BE APPLIED TO, IN AREAS PRONE TO FLOOD DURING HEAVY RAIN.

HISTORY:

To meet its stormwater needs, the City of Miami Beach is investing over \$650 Million in various infrastructure improvements, over an estimated span of 10 years. The infrastructure improvements include installing larger pipes, building pump stations, and raising roads to ensure that the roads do not flood in future tidal and rainfall events.

During King Tide events, to prevent localized street flooding in low areas such as upper North Bay Road, Orchard Park, Indian Creek, Tatum Waterway, and other North Beach areas, temporary pumps have been installed to assist in mitigating standing water.

At its January 27, 2020 Commission Workshop on Resilience, the Public Works Department offered the Commission members a presentation on Temporary Pumps (attached), which depicts citywide locations where temporary pumps are deployed.

Two scenarios were offered to the Committee members for discussion: A 14 pump deployment (which would allow for some standing water to remain, as recommended by the Urban Land Institute) or a 28 pump deployment (which would provide a higher level of service), to be tested for a period of six months at a cost of \$454,000 or \$890,000 respectively.

ANALYSIS:

At its February 18, 2020 meeting, the Land Use and Sustainability Committee held a discussion regarding properties in areas that continuously flood during rain events or King Tides. While there is a resiliency program that will identify these needs, many neighborhoods will not be included for another five to ten years. Committee members inquired whether there was an interim solution for such homes not included, perhaps with the inclusion of blue/green initiatives. Public Works offered alternatives to be considered for discussion.

At the end of the discussion, the Committee made a motion to bring forth a plan, a list of locations where blue/green infrastructure solutions may be applied to, a ballpark cost and funding alternatives for these initiatives and to bring it back to the Committee. It was noted that these initiatives would be in addition to the proposed 14 pump deployment.

BLUE/GREEN INFRASTRUCTURE

A typical blue/green infrastructure installed within the right-of-way is a manmade swale (bioswale) typically vegetated and/or mulched with engineering soils below the surface. It can improve water quality by allowing water to collect naturally in the bioswale depressions and drain through the engineered soils beneath the surface rather than passing into storm sewers. It is designed to capture the first 1.5 inches of rainfall during storm events.

The City will be considering implementing a pilot project as means to test the efficacy and value of this type of technology. The La Gorce neighborhood, West 59th Street between Alton Road and Biscayne Bay, has been targeted for this pilot project.

A bioswale can provide the following benefits and limitations:

BENEFITS	LIMITATIONS
Effective removal of suspended solids, nutrients (nitrogen and phosphorus) and other pollutants before it enters the bay.	Bioswales are not intended to solve water quantity issues; thus, flooding would not be completely addressed by a bioswale.
Allows stormwater infiltration to replenish the fresh water lens beneath the ground	Periodic maintenance is required to preserve vegetation, grading, and permeability.
Captures the first flush (1.5 inches) of runoff from every rain event to remove contaminants and attenuates the intensity of rainfalls especially for high frequency, low volume rains.	Only the first 1.5 inches of large rain events will be captured – excess water will bypass the bioswale due to limited capacity; however, this adequately treats contaminated runoff per County and State regulations.

Beautifies the area with attractive landscape and utilizes a variety of native plants to minimize maintenance requirements.

Potential loss of parking if bioswales are placed in right-of-way areas currently being used by property owners for parking.

FLOODING AREAS IDENTIFIED

There are currently about 25 properties that have been identified and categorized as nuisance flood prone areas (see map attached). These are areas of ponding water where the deployment of a temporary pump is not an option. A property located on 50th Street is being considered for an additional test case to implement a blue/green initiative to assist in removing standing water from the driveway apron by reshaping the swale to alleviate and help infiltrate the standing water.

Through the construction of a sub-surface water detaining "tank" comprised of a series of silva cell structures arranged in such a manner so as to maximize the collection and dissipation of standing water from the above-ground swale into the ground through gradual infiltration.

The cost of the proposed installation can run anywhere from \$15k to \$30k per property, depending on the size of the swale. Below are the estimated costs for the above property:

Estimate of Probable Construction Costs

770 W 50th Street

Source RS Means /Wade Trim

Item	Quantity	Unit	Unit Cost	Subtotal
ASHTO #57 stone	6	CY	83	\$498.00
Excavation	37	CY	56	\$2,072.00
Restoration	480	SF	1	\$480.00
Plantings	1	LS	2500	\$2,500.00
Silva Cell 2 - 1x System includes 1 Base, 1 Deck, and 6-1x posts	7	EA	105	\$735.00
Silva Cell 2 Strongbacks	10	EA	41.52	\$415.20
Silva Cell Cable/Zip Ties 25" (635mm) long, ~100 per bag	1	EA	15.96	\$15.96
10" long X 19/64" diameter galvanized Spiral timber spikes. ~225 per carton (Item# 33272)	1	EA	120	\$120.00
35% MOB-DEMOB, MOT, ESC, INS, PERMITS				\$2,392.66
SUBTOTAL				\$10,000.00
engineering inspection and construction management 25%			0.25	\$3,000.00
Budget contingency			0.1	\$1,000.00
TOTAL				\$14,000.00

A budgetary cost for the areas identified to receive similar treatment would be in the \$150,000 to \$200,000 range. If the proposed test case is constructed and proves successful, additional properties could be designed, cost estimates developed, and abutting property owner contacted for concurrence.

Results from the 2019 Resident Survey show that 50% of residents rated efforts to manage stormwater drainage and flooding as excellent/good, and 59% of residents rated Stormwater & drainage improvements as excellent/good. In order to continue maintaining excellent standards in this area, the City is considering increasing the usage and funding of temporary pumps.

CONCLUSION:

The following is presented to the members of the Land Use and Sustainability Committee for discussion and further direction.

Applicable Area

North Beach

Is this a "Residents Right to Know" item, pursuant to City Code Section 2-14?

Yes

Does this item utilize G.O. Bond Funds?

No

Departments

Public Works

ATTACHMENTS:

Description

- ☐ [Bioswales 02-28-20 770 W 50th ST 2](#)
- ☐ [Bioswales MAP Layout2 \(1\)\(1\)](#)

Type

- Other
- Other

☐	Temp. Pumps - Workshop - January 27 2020	Other
☐	AgendaItem (3 4 2020 5 38 37 PM)	Other
☐	GIS Elevations- 770 w 50th (black)	Other