



# Water and Sanitary Sewer Infrastructure Plans Update

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**Land Use and Sustainability Committee**  
February 11, 2022



- 1 Water and Sewer Plan History
- 2 Completed Improvements
- 3 5-Year Critical Needs Plan Update
- 4 Plan Adjustments
- 5 Questions?

# MIAMI BEACH RISING ABOVE

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## Water & Sewer Plan History





# Our City, Our Infrastructure

- We **Own, Operate** and **Maintain** our Water and Sewer Infrastructure
- It is **Critical** for the health and safety of our residents, visitors and the environment.
- Reliability is **necessary** for our economy and wellbeing.
- Compliance with all federal, state and local **regulations**.



**Stress:** Aging **water** infrastructure, low water pressure.

**Shock:** Water main break. Service interruption.



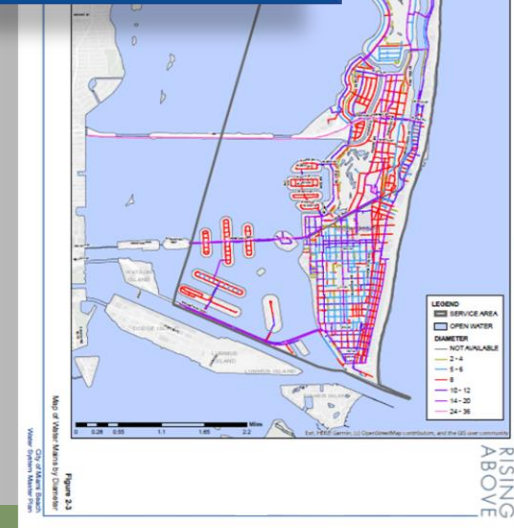
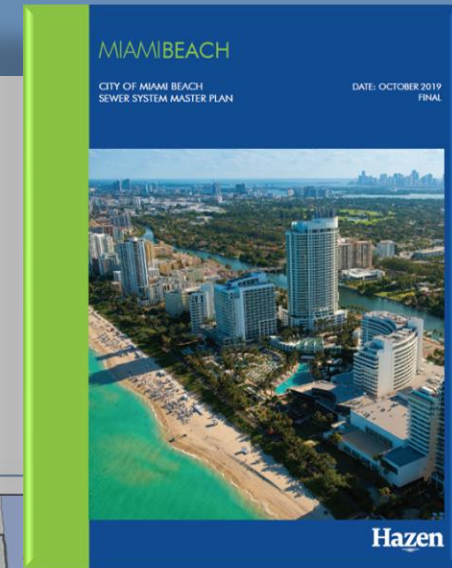
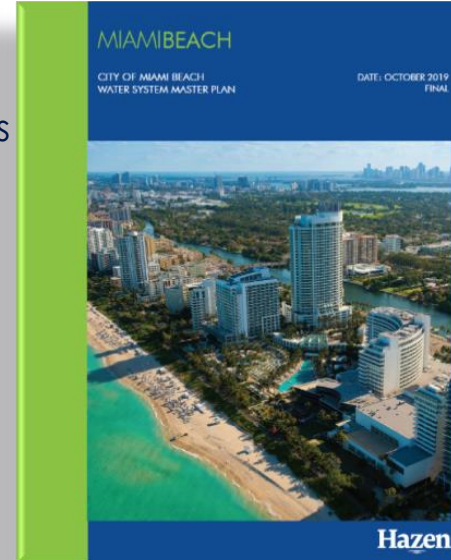
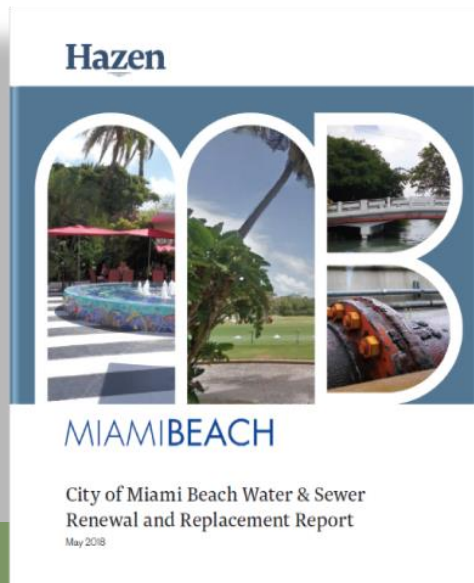
**Stress:** Aging **sewer** infrastructure, infiltration.

**Shock:** Sewer main break, wastewater overflows.

# We have been working on a plan...

- **2018 Renewal and Replacement Report** of all major above-ground water and wastewater assets. (Pump Stations, Storage Tanks, and Aerial Crossings).
- **2019 Water and Sewer hydraulic models and master plans** address current and future needs based, condition, age, capacity and criticality of the assets.
- March **2020** Commission accepts Resolution for **Five-Year Critical Needs Capital Plan for Water and Sewer Systems**

Inspection Report → Mapping → Modeling → Technical Review → Planning  
2017                      2018                      2018                      2019                      2019/2020





# MIAMI BEACH RISING ABOVE

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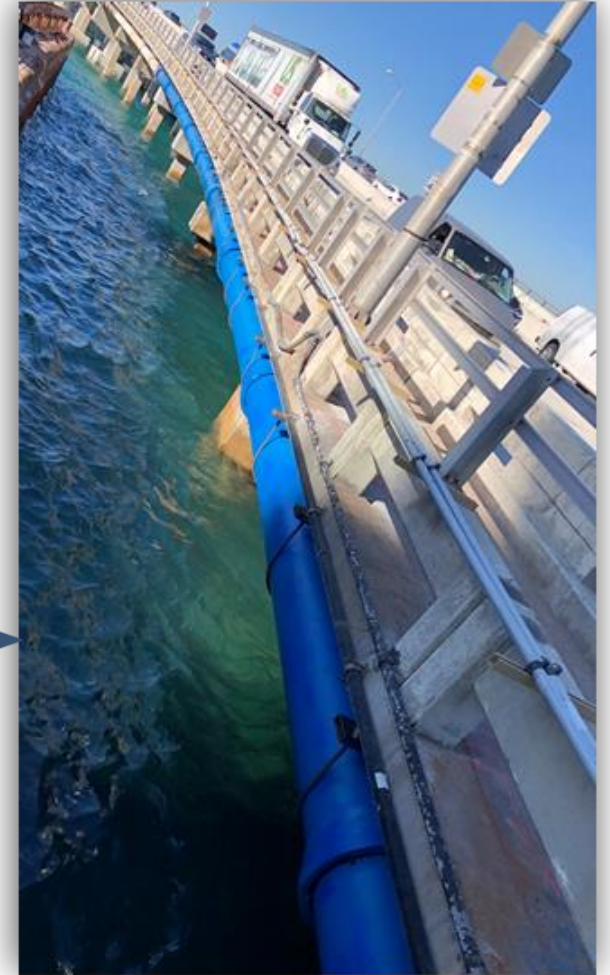
Improvements  
Completed to Date





# We have completed many improvements...

| Year                                  | Project   | Location                               | Cost                    |
|---------------------------------------|---|--|-------------------------|
| 2017                                  | Sunset Isles 1 - Bridge Water Main Replacement  | Sunset Isle 1                          | \$ 417,832.00           |
| 2017                                  | West Ave/Bay Rd Neighborhood Improvements Phase I   | West Ave Bay Rd                        | \$ 3,294,000.00         |
| 2018                                  | Sunset Isles 3 and 4 Water and Sewer Improvements   | Sunset Isles 3 and 4                   | \$ 2,426,000.00         |
| 2018                                  | Bayshore Neighborhood, Sunset Isles 1 and 2   | Sunset Isles 1 and 2                   | \$ 3,825,362.93         |
| 2018                                  | Pump Station No. 30 Improvements  | Terminal Island                        | \$ 77,656.22            |
| 2018                                  | 11th Street - Flamingo Water and Sewer Improvements                                       | 11th Street/Flamingo Neighborhood      | \$ 2,534,000.00         |
| 2018                                  | Replacement of Variable Frequency Drives  | City Wide                              | \$ 1,470,655.87         |
| 2018                                  | Replacement of Critical Valves art Pump Stations No. 1 and No. 2 (water)                  | 25th Street and 75th Street            | \$ 47,965.52            |
| 2019                                  | Force Main Replacement on LaGorce Island Bridge   | LaGorce Island                         | \$ 247,280.00           |
| 2019                                  | Inspection and Rehabilitation of Water Storage Tanks                                      | 25th Street and 75th Street            | \$ 434,115.22           |
| 2019                                  | Purchase of replacement motors for water and sewer pump stations                          | City Wide                              | \$ 514,189.00           |
| 2019                                  | Purchase of essential inventory for pump stations (Impellers, pumps, by-pass pumps, etc.) | City Wide                              | \$ 1,001,996.55         |
| 2019                                  | Emergency Repairs subaqueous force main - Venetian Draw bridge                            | Venetian Isles                         | \$ 38,500.00            |
| 2019                                  | Replacement of 16-inch water main along venetian causeway                                 | Venetian Isles                         | \$ 732,215.00           |
| 2019                                  | Palm and Hibiscus Water and Sewer Improvements  | Palm and Hibiscus Isles                | \$ 11,020,000.00        |
| 2019                                  | Venetian Isles Water and Sewer Improvements   | DiLido, San Marino and San Marco Isles | \$ 9,613,000.00         |
| 2019                                  | Electric repairs and upgrades to Sewer Pump Station No. 28                                | Bayshore 28th street and Pine Tree     | \$ 153,620.00           |
| 2020                                  | Diesel Storage Tanks for Generators (No. 27, 28, 29 and 19)                               | City Wide                              | \$ 295,844.07           |
| 2020                                  | Replacement of 180' segment of 20" WM on MacArthur Bridge                                 | MacArthur Causeway                     | \$ 599,830.00           |
| 2020                                  | Rehabilitation of Pump Station No. 31   | 3rd Street and Washington Ave          | \$ 417,862.79           |
| 2020                                  | Replacement of Critical Valves PS No. 28 - Non Emergency                                  | Pine Tree and 28th Street              | \$ 449,825.50           |
| 2020                                  | Emergency Valve Repairs at PS No. 28  | Pine Tree and 28th Street              | \$ 726,559.60           |
| 2020                                  | Emergency Repairs and Valve Replacement at 72nd Street Parking Lot                        | 72nd Street and Collins Ave            | \$ 237,752.59           |
| 2020                                  | Replacement of 16-inch Water Main along Venetian Causeway                                 | Belle Isle to Dade Blvd                | \$ 379,545.69           |
| 2021                                  | Installation of Odor Control Structures - PS 10, 15 and 28                                | Belle Isle, LaGorce and Bayshore       | \$ 850,600.00           |
| 2021                                  | Pump Station No. 18 improvements and invert correction                                    | LaGorce Island                         | \$ 348,885.04           |
| 2021                                  | Water Storage Tanks Re-Inspection (Pending Rehabilitation)                                | 25th Street and 75th Street            | \$ 25,000.00            |
| 2021                                  | Fire Hydrant Density Evaluation   | City Wide                              | \$ 150,000.00           |
| 2021                                  | Emergency Repairs to Dade Blvd Force Main   | Dade Blvd                              | \$ 57,400.00            |
| 2021                                  | Replacement of FM w/ temporary subaqueous pipe - Sunset 2 to 3                            | Sunset Isles                           | \$ 314,200.00           |
| <b>Total Water and Sewer (5-year)</b> |   |  | <b>\$ 42,701,693.59</b> |







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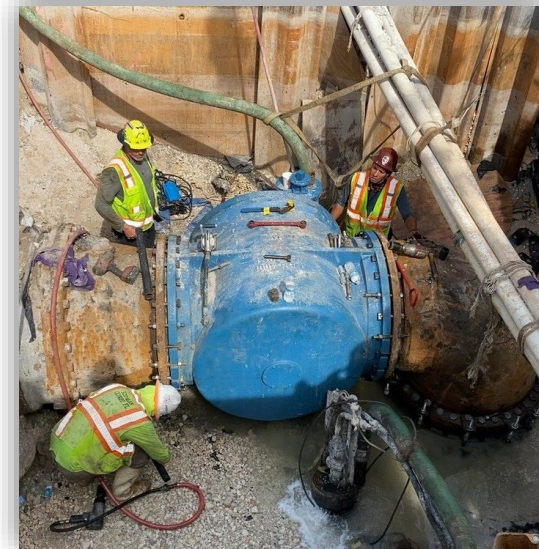
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Water Main Replacement Venetian Isles



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Odor Control



Pump Station No. 28 Valve Replacement



# MIAMI BEACH RISING ABOVE

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Update on the 5-Year  
Critical Needs Plan  
Implementation





# Water System Critical Needs 2020-2024

| Project Name  | Location  | Begin Date | Total                   |
|---|---|------------|-------------------------|
| ✓ W-2 Booster Station Rehabilitation                      | 75th Street and Dickens Ave                         | 2020       | \$ 1,200,000.00         |
| ✓ Fire Hydrant Density Evaluation                         | City Wide   | 2020       | \$ 150,000.00           |
| ✓ Replacement of WM aerial crossings Venetian Isles       | Venetian Isles                                      | 2020       | \$ 4,420,000.00         |
| ✓ Rehabilitation of WM aerial crossings on MacArthur      | MacArthur Bridge                                    | 2020       | \$ 2,271,478.00         |
| ✓ <b>Water Main PoF/CoF Priority 1</b>                    | <b>41st St., Collins Ave, Dade Blvd, others TBD</b> | 2020       | <b>\$ 25,127,797.70</b> |
| ✓ Fire Flow Project 1                                     | 10th Street between Lenox Ave and Washington Ave.   | 2020       | \$ 520,000.00           |
| ✓ Fire Flow Project 3                                     | Meridian Ave and 13th Street                        | 2020       | \$ 250,000.00           |
| ✓ Fire Flow Project 5                                     | Locations vary.                                     | 2020       | \$ 150,000.00           |
| ✓ Meter Replacement                                       | City Wide   | 2020       | \$ 11,104,893.40        |
| ✓ Surge and Water Hammer Analysis                         | City Wide   | 2020       | \$ 200,000.00           |
| ✓ Installation of additional pressure monitoring devices. | City Wide   | 2020       | \$ 100,000.00           |
| ✓ Installation of additional Blow Off valves.             | City Wide   | 2020       | \$ 50,000.00            |
| ✓ Development of a Distribution System flushing plan.     | City Wide   | 2020       | \$ 200,000.00           |
| ✓ Valve Assessment and Replacement Program                | City Wide   | 2020       | \$ 1,081,815.00         |
| ✓ SCADA Water   | City Wide   | 2020       | \$ 406,312.50           |
| ✓ Fire Flow Project 7                                     | Locations vary                                      | 2021       | \$ 72,100.00            |
| ✓ Fire Flow Project 13                                    | Michigan and 7th Ave                                | 2021       | \$ 484,100.00           |
| ✓ Fire Flow Project 16                                    | Alton Rd. and Michigan Ave                          | 2021       | \$ 638,600.00           |
| ✓ Fire Flow Project 17                                    | Terminal Island                                     | 2021       | \$ 175,100.00           |
| ✓ Construction of New Booster Station                     | North Beach   | 2021       | \$ 5,592,900.00         |
| ✓ Aerial Crossing Water Main Replacement                  | 41st Street between Meridian Ave and Chase Ave      | 2021       | \$ 72,100.00            |
| ✓ Aerial Crossing Water Main Replacement                  | 41st Street between Pine Tree Dr and Indian Creek   | 2021       | \$ 206,000.00           |
| ✓ Aerial Crossing Water Main Replacement                  | 71st Street and Bonita Dr.                          | 2021       | \$ 185,400.00           |
| ✓ Water Main on MacArthur Causeway                        | MacArthur Causeway                                  | 2022       | \$ 4,105,683.00         |
| ✓ Belle Isle Booster Station Rehabilitation               | Belle Isle  | 2022       | \$ 4,710,396.00         |
| ✓ Fire Flow Project 2                                     | West Ave and Flamingo                               | 2022       | \$ 456,187.00           |
| ✓ Fire Flow Project 4                                     | Euclid and 14th Pl                                  | 2022       | \$ 169,744.00           |
| ✓ Fire Flow Project 15                                    | Euclid and 14th Street                              | 2022       | \$ 307,661.00           |
| ✓ Fire Flow Project 6                                     | Collins Park  | 2023       | \$ 98,345.43            |
| ✓ Fire Flow Project 8                                     | Meridian and 15th Street                            | 2023       | \$ 131,127.24           |
| ✓ Fire Flow Project 10                                    | 20th Street and Collins Ave                         | 2023       | \$ 87,418.16            |
| ✓ Fire Flow Project 11                                    | 18th Street and Collins Ave                         | 2023       | \$ 109,272.70           |
| ✓ Fire Flow Project 12                                    | Collins and 17th Street                             | 2024       | \$ 87,418.16            |
| ✓ Fire Flow Project 9                                     | N. Bay Rd between 41st and 43rd St                  | 2024       | \$ 821,621.43           |
| ✓ Fire Flow Project 14                                    | North Beach, Varies                                 | 2024       | \$ 855,386.70           |
| <b>Total Water</b>  |   |            | <b>\$ 66,598,857.41</b> |

✓ Design and Permitting Phase

✓ Construction Phase

✓ Complete



8-inch Water Main under bridge,  
41<sup>st</sup> Street between Chase and Meridian  
Ave.



# Sewer System Critical Needs 2020-2024

Design  
Construction  
Complete

| Project Name  | Location  | Begin Date | Total                   |
|---|---|------------|-------------------------|
| <b>Gravity Main Replacement - Priority 1</b>              | <b>Basin 18, La Gorce Island, others TBD</b>              | 2020       | \$ 4,916,259.76         |
| <b>Gravity Mains I/I Reduction - Priority 1 (1/2)</b>     | <b>04 (Hibiscus), 05 (Palm), 02 (Star), others TBD</b>    | 2020       | \$ 2,256,357.00         |
| Gravity Siphon inspection and capacity evaluation         | City Wide   | 2020       | \$ 30,000.00            |
| Venetian Way aerial crossing replacement in kind          | Venetian Causeway   | 2020       | \$ 770,000.00           |
| Valve assessment and replacement                          | City Wide   | 2020       | \$ 1,699,995.00         |
| Pump Station No. 2 force main replacement                 | Star Island to 10th Street and West Ave.                  | 2020       | \$ 2,550,000.00         |
| <b>Force Mains PoF/CoF Priority 1</b>                     | <b>Terminal to Star Island, Normandy Isles, other TBD</b> | 2020       | \$ 9,813,027.17         |
| Pump Station No. 18 force main replacement                | La Gorce  | 2020       | \$ 550,000.00           |
| Odor Control System                                       | PS 11, 15 and 28 completed                                | 2020       | \$ 850,600.00           |
| SCADA Sewer   | City Wide   | 2020       | \$ 1,218,937.50         |
| Manhole inspection and rehabilitation                     | City Wide   | 2020       | \$ 7,963,703.72         |
| Pump Station 6, 7 and 8 rerouting                         | Belle Isle  | 2021       | \$ 1,194,800.00         |
| Aerial crossing Pine Tree Drive 51st Street to 47th St.   | Pine Tree Drive   | 2021       | \$ 700,400.00           |
| Pump Station No. 28 Rehabilitation                        | 28th Street and Pine Tree                                 | 2021       | \$ 11,103,400.00        |
| Pump Station No. 1 Rehabilitation                         | 11th Street   | 2022       | \$ 3,140,264.00         |
| Pump Station No. 30, well lining, and electrical upgrades | Terminal Island   | 2022       | \$ 2,068,755.00         |
| Pump Station No. 4 force main replacement                 | Between Palm and Hibiscus Island                          | 2022       | \$ 477,405.00           |
| Pump Stations No. 5 force main replacement                | Palm Island   | 2022       | \$ 413,751.00           |
| Pump Station No. 14 force main replacement                | Sunset Island 3   | 2022       | \$ 901,765.00           |
| Pump Station No. 23 force main replacement                | 75th Street and Dickens Ave                               | 2022       | \$ 53,045.00            |
| Pump Station No. 27 force main replacement                | Collins Ave and 52nd Street                               | 2022       | \$ 53,045.00            |
| <b>Gravity Mains I/I Reduction - Priority 1 (2/2)</b>     | <b>City Wide</b>  | 2023       | \$ 3,643,452.32         |
| <b>Total Estimated Sewer</b>                              |   |            | <b>\$ 56,368,962.47</b> |

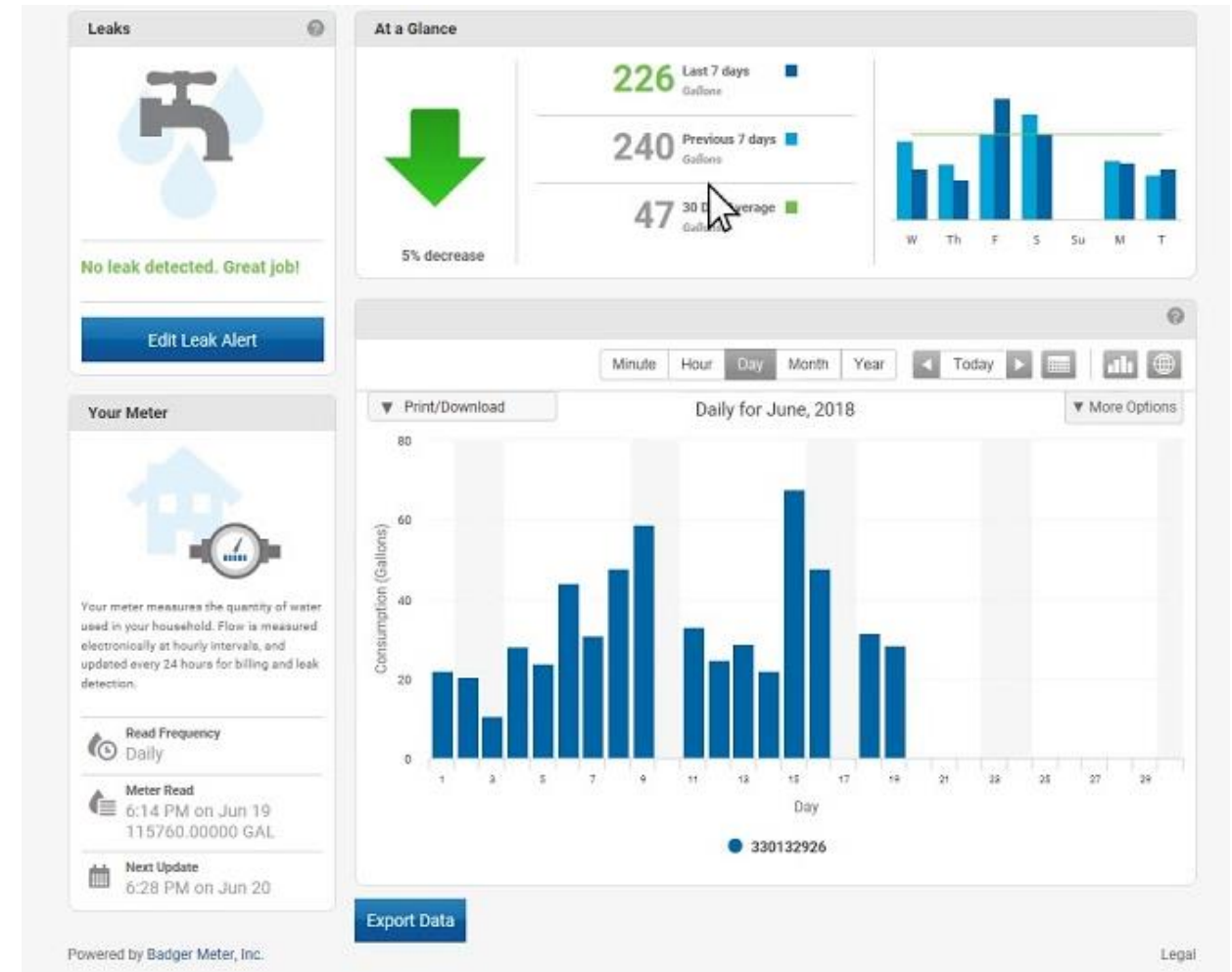


Pump Station No. 28 –  
Project Currently in Design



# Automatic Metering Infrastructure

- 350 meters installed
- Integration and testing underway
- Mass deployment scheduled to begin March 2022
- Completion estimated mid 2023
- Budget **\$ 11,104,893.40**





# Trenchless Pipe Rehabilitation

- City contracted with three vendors Vortex, National Water Main Co and Envirowaste for the performance of City-Wide trenchless pipe rehabilitation and manhole repairs.
- Budget **\$ 7,963,703.72**
- **This project will:**
  - **Reduce I/I**
  - **Reduce sewer overflows**
  - **Allow for regulatory compliance**



AFTER



BEFORE



BEFORE



AFTER



# MIAMI BEACH RISING ABOVE

4

Our 5-Year Plan is Evolving



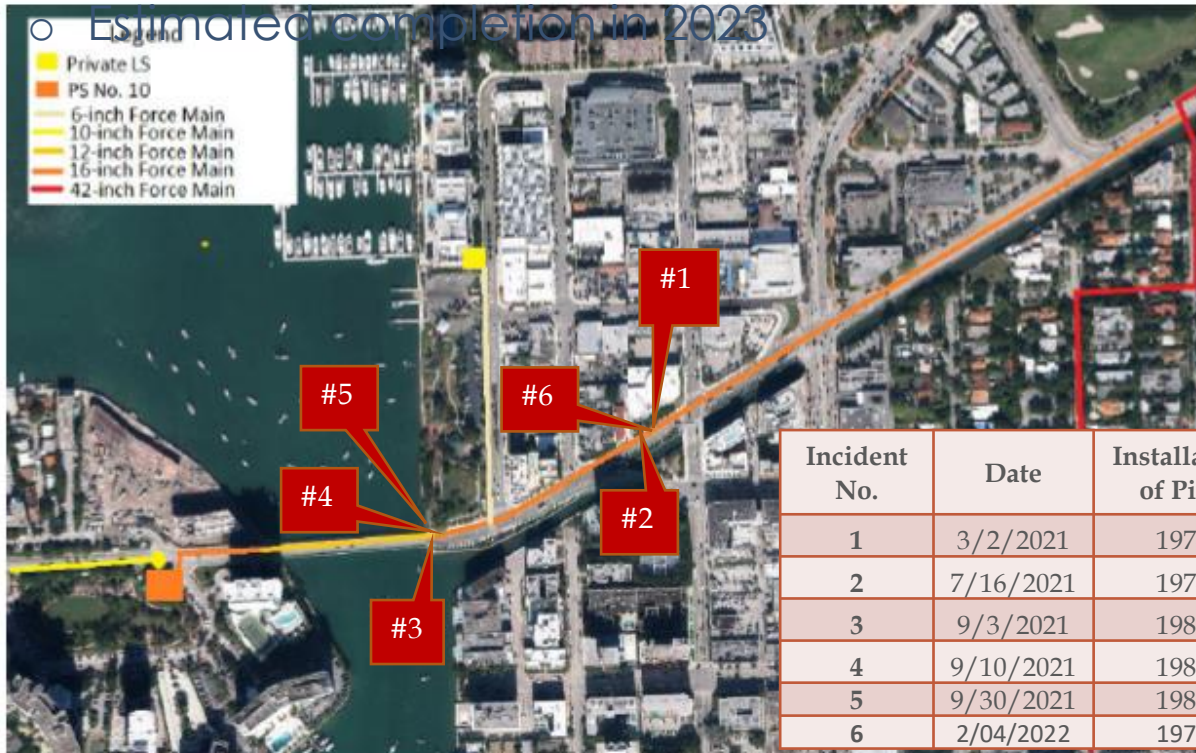


# Additional Needs: Dade Blvd. and Sunset Islands FM Emergencies

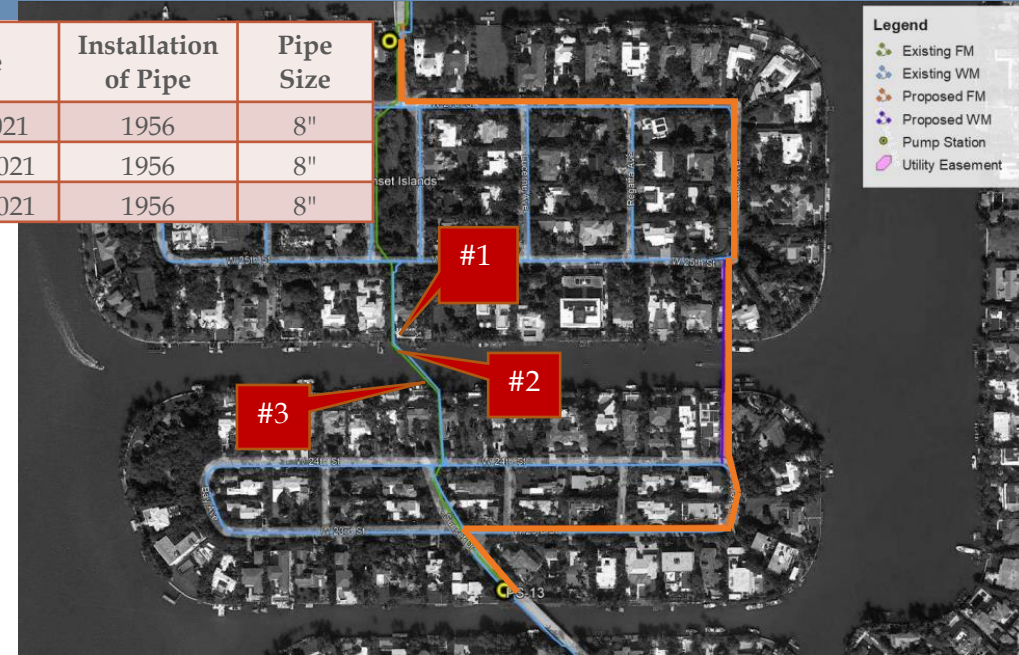
## Dade Blvd. :

- Five breaks since March 2021, resulting in SSOs and significant cost in emergency repairs.
- Emergency replacement of 3,600 LF of pipe
- Est. \$4M unforeseen additional costs
- **Design-Build Project in Procurement**

- Estimated completion in 2023



| Incident No. | Date      | Installation of Pipe | Pipe Size |
|--------------|-----------|----------------------|-----------|
| 1            | 7/9/2021  | 1956                 | 8"        |
| 2            | 8/24/2021 | 1956                 | 8"        |
| 3            | 9/13/2021 | 1956                 | 8"        |



## Sunset Islands:

- Three breaks since July 2021.
- Emergency temporary replacement of subaqueous pipe
- Part of the 5 Yr Needs; **Design currently underway**
- Est. \$1.2 M unforeseen additional costs
- Estimated completion in 2023



# DEO's and FDEP's Intent to Award **Grant Funds** for the Following Projects:

## **DEO - Water and Sewer Pump Stations:**

|  |                     | 5Yr Critical Needs<br>Project | Master Plan Year |
|--|---------------------|-------------------------------|------------------|
| Sewer Pump Station 1 (Jefferson Avenue)          | 700,000             | Y                             | 2025             |
| Sewer Pump Station 28 (West 28th Street)         | 5,000,000           | Y                             | 2021             |
| Sewer Pump Station 29 (Indian Creek/63rd Street) | 2,200,000           | N                             | 2026             |
| Normandy Isles Water Booster Station             | 550,000             | N                             | 2026             |
| 25th Street Water Booster Station                | 800,000             | N                             | 2027             |
| 41st Street Water Booster Station                | 900,000             | N                             | 2027             |
| Belle Isle Water Booster Station                 | 2,400,000           | Y                             | 2020             |
| Terminal Island Water Booster Station            | 1,200,000           | N                             | 2026             |
| 75th Street Water Booster Station                | 800,000             | Y                             | 2020             |
| Total DEO  | <b>\$14,550,000</b> |                               |                  |

## **FDEP - Sewer Pipelines:**

|   |                    |   |           |
|---|--------------------|---|-----------|
| City Wide Gravity Sewer Mains Replacement | 7,625,000          | Y | 2020-2025 |
| Total FDEP                                | <b>\$7,625,000</b> |   |           |

**Total Intent of Award** **\$22,175,000**



# Our 5-Yr Plan Continues to Evolve...

- ✓ Significant progress to date to design and construct our approved 5-yr plan
- ✓ Biggest unforeseen costs are due to pipe breaks along the Venetian and Dade Blvd.
- ✓ Our plan continues beyond 2024, addressing other needs identified within the 25-Yr Master Plan.
- ✓ Grants provide funding, but also add unplanned scope and design costs.
- ✓ Construction and materials cost continue to escalate
- ✓ Implementing the Master Plan recommendations will minimize likelihood of future infrastructure failure and resulting
  - SSOs,
  - added emergency repair costs,
  - impacts to residents, local businesses, and tourism within the area
  - impacts to developments



# MIAMI BEACH RISING ABOVE

5 Questions?

Thank you!

