COASTAL STRATEGIES FOR DRAINAGE RESILIENCE

FDOT’S APPROACH AND VISION

2017 AASHTO SCOE-SCOD Joint Meeting
TODAY’S TOPICS

✓ Current Concerns and Trends
✓ Risk Tolerance and Design Criteria
✓ Long-Term Coastal Planning

2017 AASHTO SCOE-SCOD Joint Meeting
Indian Creek Drive serves as the Southbound Lanes for S.R. A1A
Between 24th Street and 39th Street
Existing Intra-Coastal Area is connected to Biscayne Bay
Existing channel is lined with Seawall and Mangroves
Existing roadway elevation for Indian Creek Drive varies between 1 and 3-feet, NAVD

2017 AASHTO SCOE-SCOD Joint Meeting
KING TIDE FLOODING
Indian Creek Drive at 34th Street
Miami Beach, September 2015

✓ Infra-Structure Impacts
✓ Traffic Impacts
✓ First Responder Coordination
✓ Maintenance & Cleanup
✓ Damage Assessment

2017 AASHTO SCOE-SCOD Joint Meeting
Three regions can be observed:

- 1914-1954 – 0.8 ft/100 yr
- 1954-1994 – 0.05 ft/100 yr
- 1994-2014 – 1.5 ft/100 yr

In the last 10 year there is acceleration

- 2004-2014 – 3.3 ft/100 year

If only 2013-2014 year is considered the trend is 4 ft/100 years
The analysis of the PE data indicates that the rate of increase in the last 20 years was 1.45 ft/100 years however only in the last 10 years the rate more than doubled to 3.0 ft in 100 years.

The observed rate of increase is greater than the predicted for this period which is a scenario of 4 ft/100 years and corresponds to 6.6 ft/100 years if the exponential trend holds.

Next 10 years will be critical to determine if the increase continues to be exponential or will linearize.
RISK ALLOWANCE

✔ Site Specific
✔ Extent of Inundation
✔ Temporary Utility Impacts
✔ Importance of Protection versus Environmental Impacts
✔ Business/Tourism Impacts
✔ Agricultural Impacts
✔ Estimated Costs to Upgrade the Infrastructure, which includes roadways, utilities, right-of-way, etc.

2017 AASHTO SCOE-SCOD Joint Meeting
DESIGN CRITERIA CONSIDERATIONS

- Desired Service Life
- Appropriate Design Frequency, i.e. 10, 15 or 25-Year
- Tailwater Considerations, i.e. MHHW, MHW
- Consistency (LOS) for Shared Outfall Systems
- Tropical Systems and Storm Surge
- Coastal FEMA Floodplain Map Updates
- Criteria for Pressurized Storm Sewer Systems
RESILIENCE PLANNING AND CONSIDERATIONS

U.S. 98 along the Gulf of Mexico in Franklin County

2017 AASHTO SCOE-SCOD Joint Meeting
LONG-TERM PLANNING STRATEGIES

✓ Collaborative Regional Coastal Planning to address Protection Areas, Vulnerable Areas and Mitigation
✓ Planning for Registered Estuaries
✓ Seawall Protection
✓ Back-flow Prevention Devices
✓ Dikes/Levees
LONG-TERM PLANNING STRATEGIES

- Stormwater Management Designs to Protect Against Landward Saltwater Intrusion
- Multi-purpose designs, i.e. Parks and Recreation Areas
- Phased Designs to allow for adjustments in response to the localized Sea Level Rise
- Restore Coastal Inlets and Relief Passes

2017 AASHTO SCOE-SCOD Joint Meeting
LONG-TERM PLANNING STRATEGIES

✓ Utility Relocations
✓ Infra-Structure Improvements and Relocations
✓ More Robust Land Development Codes (LDC)
✓ Consistency Amongst the Regulatory Agencies
✓ Greater Stakeholder Engagement

Wastewater Plant on Virginia Key, Miami

2017 AASHTO SCOE-SCOD Joint Meeting
Thanks!!!!!!

Carlton Spirio, P.E.
State Drainage Engineer
Florida Department of Transportation
605 Suwannee Street
Tallahassee, Florida 32399
(850) 414-4351
Carlton.Spirio@dot.state.fl.us