Atlantic Basin Satellite Image

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Florence

Isaac

Helene

Developing Low

95L
FHWA Resilience & Durability to Extreme Weather Pilot Program

Resiliency Practices for Long Range Transportation Planning Session

presented to
APA Florida Conference

presented by
Hillsborough MPO
Allison G. Yeh, AICP, LEED GA

September 13, 2018
Resilient Tampa Bay – Transportation: Background

» Tampa Bay TMA
  • 2.8M Population
  • 2nd largest pop. In FL.
  • 1000+ miles of shoreline
  • 39% pop. in flood zones

» Regional vulnerability assessment of surface transportation assets
  • Incorporate into LRTPs, hazard mitigation, emergency mgt, and PDRP plans
FHWA 2018-2020 Pilot Program: Resilience & Durability to Extreme Weather

• 1 of 11 Pilot projects looking at integrating into agency practices, tools & resources, or deployment & monitoring.

- Tampa Bay TMA
  - Caltrans

- Atlanta Regional Commission
  - Corpus Christi MPO
  - Quad Cities - Iowa/Illinois MPO
  - Houston-Gaveston Area Council

- MassDOT
  - Mid-America Regional Council (Kansas City, MO & Johnson Co, KS)
  - Navel Facilities Engineering Command (East and Gulf Coast)

- PennDOT
  - UDOT
Resilient Tampa Bay – Transportation: Project Team Leads

Allison Yeh, AICP, LEED GA
Executive Planner

Rodney S. Chatman, AICP
Planning Division Manager

John Villeneuve
Pasco MPO Director

Roger Roscoe
FDOT District 7 Liaison

Sean Sullivan
Executive Director

Karen Kiselewski, AICP
Senior Project Manager
Purpose

» Address FAST Act requirements for MPO long range transportation planning

• “…improving the resiliency and reliability of the transportation system and reducing or mitigating the stormwater impacts of surface transportation…”
Work Plan

Climate & Weather
- Obtain Data
- Identify Vulnerable Areas
- Identify at risk Transportation

Critical Linkages
- Stakeholder Engagement
- Quantitative Analysis of Critical links

Adaptation Strategies
- Econometric Analysis
- Adaptation/ Mitigation Strategies
- Include in Decision Making

Final Report
- Winter/ Spring 2019
- Summer/Fall 2019
Incorporating stakeholder input into quantitative assessment

Weighting facilities/locations based on stakeholder input

Qualitative Assessment

- Stakeholder and practitioner input
- Persistent flooding locations
- Leveraging prior planning work (Current LRTP, hazard mitigation and local mitigation strategies)

Quantitative Assessment

- GIS-based Quantitative Analysis
- Context Sensitive Criticality Construct (Transportation disadvantaged population, social & economic importance)
- Sensitivity, exposure level and adaptive capacity

Supporting Image Sources: Sustainable Convos, Northern Arizona Healthcare
If you are completing the **online survey**, you should be on screen 2

If you are completing the **paper survey**, you should be at section 2
Hillsborough MPO
2040 LRTP Performance Measures

**Preserve the System**
- Road resurfacing schedule
- Bridge repair schedule
- Vehicle replacement schedule

**Reduce Crashes & Vulnerability**
- Total crashes, fatal crashes, and walk/bike crashes
- Economic impact of a major storm

**Manage Traffic for Drivers & Shippers**
- Peak-hour travel time reliability
- Affected truck trips

**Real Choices for Non-Drivers**
- People & jobs served by the bus system and trail/sidepath network

**New for 2045 - Major Capacity Projects for Economic Growth**
## Vulnerability Reduction Investment

Assumed in 2040 Plan

<table>
<thead>
<tr>
<th>Investment Level</th>
<th>Benefits and Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Scenario 1</strong></td>
<td><strong>$31 Million per year</strong></td>
</tr>
<tr>
<td><strong>Level 1</strong></td>
<td>Continue today's stormwater drainage improvement programs</td>
</tr>
<tr>
<td></td>
<td>Category 3 storm impacts:</td>
</tr>
<tr>
<td></td>
<td>- 8 weeks major roads may be unusable</td>
</tr>
<tr>
<td></td>
<td>- $266 million economic loss</td>
</tr>
<tr>
<td><strong>Scenario 8b</strong></td>
<td><strong>$39 Million per year</strong></td>
</tr>
<tr>
<td><strong>Level 3</strong></td>
<td>Continue today's stormwater drainage, plus:</td>
</tr>
<tr>
<td></td>
<td>raise road profiles, enhance base, protect shorelines from wave damage</td>
</tr>
<tr>
<td></td>
<td>Category 3 storm impacts:</td>
</tr>
<tr>
<td></td>
<td>- 3 weeks major roads may be unusable</td>
</tr>
<tr>
<td></td>
<td>- $119 million economic loss (cut in half!)</td>
</tr>
</tbody>
</table>

**Economic losses cut in half**

Disrupted Network Map

Legend:
- Disrupted Network (Group 2)
- Disrupted Network (Group 1)
- Disrupted Network (Full Impact)
- 2040 Roadway Network
- Surge
Pilot Project Follow-Up Study (2016)

- Gandy Boulevard critical segment in 2014 Vulnerability Assessment
  - 1/3-mile segment connecting bridge to planned expressway
  - $1.9M estimated for strategies
Strategy Refinement for Implementation

- Refined strategies appropriate Selmon Elevated extension at Gandy Blvd.
- Developed conceptual designs & specific pre-engineering cost estimates
  - Within limit of $1.9M budget
  - Assume strategy mainstreaming as part of a project
- Offer low-risk, high benefit solutions to incorporate into elevated expressway extension PD&E proposal.
Contact Information

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Thank you!
Data/Information Coordination

One Bay
- Hillsborough County Perils of Flood Act Matrix of Impacts Initiative

Tampa Bay RPC
- Pinellas County Restore Act Vulnerability Assessment

Local Government
- Tampa Sea Level Rise Vulnerability Assessment
- Local Mitigation Strategies Post Disaster Redevelopment Plans

Public Works
- Resilient Tampa Bay Transportation: Vulnerability Assessment and Adaptation Pilot Project
- Tampa Bay RPC
- Transit Agency Asset and Operational Plans
- MPO Long Range Transportation Plans

Water Transportation

Resilient Tampa Bay Transportation
Linkages to the Long Range Planning Process

Needs Assessment: Vulnerability Reduction, State & Federal Mandates

Vulnerability Screening and Project Prioritization Framework

Leveraging Emergency Management, Local Hazard Management Plans

Vulnerability Performance Metrics

Regional Vision and Goals

Alternate Improvement Strategies
  - Operations
  - Capital

Evaluation & Prioritization of Strategies

Development of Transportation Plan (LRP)

Development of Transportation Improvement Programs (S/TIP)

Project Development

Systems Operations (Implementation)

Monitor System Performance (Data)

Planning objectives inform Vulnerability and Risk Assessment scope setting

Assets profile and investment portfolio characterize exposure

System level Impact Assessment, MOEs

Develop customized suite of adaptation strategies

Emergency Management and Evacuation Planning

Regional Mobility and Economic Impacts
Saffir-Simpson Hurricane Wind Scale
(1 = least extreme; 5 = most extreme)

**Category 1**
- Winds range from **74 to 95 mph**
- Minor damage to property (roof damage)
- Injuries to humans are isolated
- Short-term power outages

**Category 2**
- Winds range from **96 to 110 mph**
- Significant property damage, flooding
- Increased threat to humans due to falling debris
- Extensive, multi-day power outages

**Category 3**
- Winds range from **111 to 130 mph**
- Mobile and frame homes destroyed, extensive flooding
- Evacuation necessary for human safety
- Electricity, water unavailable for up to several weeks

**Category 4**
- Winds range from **131 to 155 mph**
- Houses, shopping centers irreparably damaged
- Humans at serious risk of death in certain areas
- Long-term power outages, water shortages

**Category 5**
- Winds of **155 mph+**
- Complete destruction of homes, shopping centers
- Trees uprooted, extreme flooding
- Power and water potentially out for months

Source: National Hurricane Center