FHWA Resilience & Durability to Extreme Weather Pilot Program

presented to
LMS Working Group

presented by
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Hillsborough MPO
Marshall Flynn
Tampa Bay Regional Planning Council

December 2018
Agenda

» Project Overview
» Stakeholder Survey Results
» Representative Projects
» Next Steps
Project Overview
Resilient Tampa Bay – Transportation: Project Team Leads

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Executive Director

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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
- MassDOT
- PennDOT
- Atlanta Regional Commission
- Corpus Christi MPO
- Mid-America Regional Council (Kansas City, MO & Johnson Co, KS)
- UDOT
- Quad Cities - Iowa/Illinois MPO
- Houston-Gaveston Area Council
- Navel Facilities Engineering Command (East and Gulf Coast)
Resilient Tampa Bay – Transportation: Background

» Tampa Bay TMA
  • 2.8M Population
  • 2nd largest pop. In FL.
  • 1000+ miles of shoreline
  • 58% pop. in flood zones

» Regional vulnerability assessment of surface transportation assets
  • Incorporate into LRTPs, hazard mitigation, emergency mgt, and PDRP plans
» Provide information and recommendations to ensure the region’s transportation system meets the near and long term functional, economic, and quality of life goals of Tampa Bay’s residents, businesses, and visitors in the face of weather and climate changes
Purpose

» Address FAST Act requirements for MPO long range transportation planning:
  • Consider projects/strategies to improve the resilience and reliability of the transportation system; stormwater mitigation
  • Consultation with agencies and officials responsible for natural disaster risk reduction

» Focus on inland flooding, storm surge, and sea level rise
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

Timeline:
- Fall 2018
- Winter 2019
Modeling Scenarios

» Sea Level Rise – 2045 NOAA
  • High and Intermediate-Low curves.

» Storm Surge - Current
  • Categories 1, 3, and 5

» Sea Level Rise plus Surge
  • Cat 1 High, Cat 1 Int-Low, Cat 3 High, Cat 3 Int-Low

» Precipitation
  • 9 inches, 1 day; 33 inches, 3 days

» Transportation – 2040
  • Adopted network and socio-economic data

» Econometric – 2040
Critical Transportation Facilities

Transportation Facilities

<table>
<thead>
<tr>
<th>Criticality</th>
<th>Counties</th>
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<tbody>
<tr>
<td>High</td>
<td>Outside Study Area</td>
</tr>
<tr>
<td>Moderate</td>
<td>Hillsborough</td>
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<tr>
<td>Low</td>
<td>Pasco</td>
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<td></td>
<td>Pinellas</td>
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<td></td>
<td>Water Bodies</td>
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</table>
Incorporating stakeholder input into quantitative assessment

Criticality Determination

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
1. What factors should determine criticality of a transportation asset?

Rank the following with #1 being the most important

- Evacuation from the beaches and the Pinellas Peninsula must be the highest priority for Pinellas County.
- Emergency Operation Center is on the route.
- Projected build/improvement schedule
- Parking for volume
- Roadways are our largest means of transporting commerce. For every minute there is traffic, it has the ability to affect the whole community from schools to ALFs, hospitals, etc. Evacuation Routes are critical 2nd because this will be called upon in an emergency and evacuation routes become the Number 1 traveled roads.
- My assumption may be incorrect, however, I placed Evacuation Route as a lower ranking because I believe prioritizing the top 3 of my selections will also simultaneously address the evacuation route system.
- The utter gridlock of traffic concerns me should there be a hazard event. This issue relates not only to the interstates, but to major roads like Bruce B. Downs, where limited highways mean that there is no place to travel other than the one main road. The bigger problem is that we build roads and then build more houses near the roads, thereby making the problem worse.
2. What factors should determine criticality of a geographic area (traffic analysis zone)?

Rank the following with #1 being the most important.

<table>
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<tr>
<th>Factor</th>
<th>0%</th>
<th>10%</th>
<th>20%</th>
<th>30%</th>
<th>40%</th>
<th>50%</th>
<th>60%</th>
<th>70%</th>
<th>80%</th>
<th>90%</th>
<th>100%</th>
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<tbody>
<tr>
<td>Projected Population density</td>
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<td>Projected Employment density</td>
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<td>Percentage of Zero-Car Households</td>
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<td>Equity areas</td>
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**Other/Comments**

- Critical facilities (i.e. water distribution plants, electric power plants, water pumps, hospitals, critical care facilities, etc.)
- Proximity and existing connections to larger community/municipalities.

The population in the area will most likely have a vehicle and they will need to travel their nearby roads at least once a day. Employment density is important for the same reason but was rated second because the roads are not traveled every day, it is solely dependent upon work schedules.

This list was more difficult to rank because I would link my 4th selection as a planning consideration or subset of the first two selections; furthermore, I believe all options are equally as critical.
3. What facilities/activity centers or destinations do you consider critical from an access provision perspective?

Rank the following with #1 being the most important.

<table>
<thead>
<tr>
<th>Facility Type</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
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<tbody>
<tr>
<td>Hospitals and trauma centers</td>
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<td>Tourist destinations</td>
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<td>Military locations</td>
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<td>Community Centers</td>
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</table>

Other/Comments

Other - Emergency Operations Centers
Access on/off of the peninsula (Pinellas County)

Hospitals are used everyday for emergent needs compared to power plants. Now, if a power plant were to fail the roads around that would be a major issue.

Grocery Stores and gas stations

Other = Command, Control, and Communication facilities (C3) Without C3 capabilities response let alone recovery is severely hindered.

Other = Command, Control, and Communication facilities. Without C3 facilities, local ability address local issues and exercise management and response control within their jurisdiction, they essentially relinquish the ability to communicate need from the injured to first responders at any level.

My planning assumption for military locations is that those type of facilities have the ability, more so than the other facilities, to be self-sufficient and/or have COOP plans that address these issues better than the rest of the list.
4. Type of Agency Representatives?

Notes:
1. There are survey respondents from all three counties’ planning, public works, and city departments/agencies.
2. State, Transit, and Non-profit agencies each accounts for 1/3 of the total respondents in the category of “State/Transit Agency/Non-profit”.

- County Planning: 17%
- County Public Works: 26%
- City: 9%
- County/City/Regional Economic Development Agency or a Chamber: 11%
- Regional Organization: 17%
- State/Transit Agency/Non-profit: 20%
Adaptation Strategies

» Physical asset adaptations
  • Design changes

» Natural landscapes
  • Topographical changes
  • Vegetation
  • Wave mitigation

» Water management
  • Drainage and flood control
Integration into LRTPs

» Regional and per-county representative projects

» Cost estimates for planning purposes
Representative Projects

» Pasco County

US 19 from S.R.54 to S.R.52
Ridge Rd from US 19 to Suncoast Pky
Representative Projects

» Pinellas County

Gulf Boulevard/SR 699 from 150th Avenue/Tom Stuart Causeway to the Pinellas Bayway

Roosevelt Boulevard/SR 686 from Ulmerton Road/SR 688 to Gandy Boulevard
Representative Projects

Hillsborough County
Next Steps
Next Steps

» Transportation modeling
» Econometric modeling
» Adaptation strategies
» On-going coordination
Contact Information

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813.273.3774 x351
Thank you!
east of US 19 in Palm
8/3/2015. JIM DAMASKE
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