

Connect 2045 Resiliency Scenario

Background

Resiliency reflects the ability to anticipate, prepare for, and adjust to changing conditions, and recover rapidly after disruptive events such as flooding, hurricane damage, or major traffic incidents. It is important for the transportation system to be resilient in the face of these disruptions to ensure reliable movement of people and goods.

To understand the potential vulnerability of transportation infrastructure to disruptive events and changes, the TPO has participated in assessments of sea level rise (SLR) and 100-year storm surge within the planning area. These studies ([Sea Level Rise Vulnerability Assessment - 2016](#), [Resilient Volusia - 2017](#) and [Resilient Flagler - 2018](#)) have provided useful data to inform planning decisions regarding the impact of SLR and 100-yr storm surge in the future. Florida DOT has also completed a [Risk Assessment on SIS Corridors – 2018](#) to evaluate the vulnerability of Strategic Intermodal System (SIS) facilities related to hurricane storm surge. For a complete list of vulnerable transportation infrastructure facilities, please refer to each report.

Approach

For this evaluation, the [Regional Resiliency Action Plan \(RRAP\)](#), coordinated by the East Central Florida Regional Planning Council (ECFRPC), recommends that the US Army Corps of Engineers (USACE) 2013 High Scenario and the National Oceanic and Atmospheric Administration (NOAA) 2017 High Scenario be used as the lower and upper boundaries, respectively, to evaluate potentially vulnerable areas and/or facilities (Figure 1). The goal of the RRAP, in which the TPO is a partner, is to increase the ability of local and regional stakeholders to implement resiliency and climate adaptation strategies. The plan is guided by a cross-disciplined steering committee, extensive stakeholder engagement and best practice research.

Figure 1. Sea Level Rise Projections

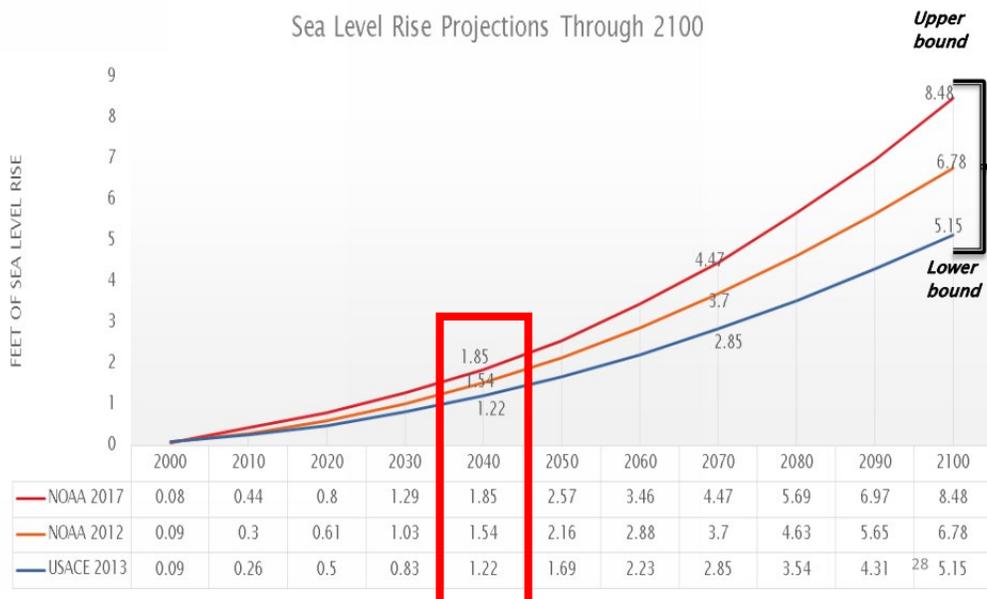


Chart source: East Central Florida Regional Planning Council

The USACE 2013 data, which was also used for the previously approved TPO studies, is available for the full TPO planning area and was used for this evaluation.

The NOAA 2017 data is available for Volusia County through the ECFRPC and was used for this evaluation. The Northeast Florida Regional Council has not yet completed similar data for its planning area so this data is not available for Flagler County.

Therefore, only the lower SLR boundary (USACE 2013) was used for Flagler, while both lower and upper boundaries (USACE 2013 and NOAA 2017) were used for Volusia. The horizon year used in all cases was 2040 because it is the furthest data year within the LRTP horizon. Table 1 provides the estimated change in sea level rise relative to a baseline year of 2000.

Table 1. Estimated Sea Level Rise		
Sea Level Rise Scenario Data	Horizon Year	Estimated Feet of Sea Level Rise Relative to Baseline Year (2000)
USACE 2013 (lower boundary)	2040	1.13 feet
NOAA 2017 (upper boundary)	2040	1.77 feet

Identification of Potentially Vulnerable Roadway Projects

The analysis compared the inundation area(s) of sea level rise scenarios with the projects identified through the Connect 2045 Needs Assessment. The result of this analysis is a set of potentially vulnerable projects that are identified for improvement or development (see Table 2 and Maps A1-A3). *It is important to note that the intersection of an inundation area and an identified needs project does not definitively imply that a given road would be under water.* The impact on travel lanes will be determined by the height of the roadway in the impact location. Nonetheless, even where roadway travel lanes are unaffected, the road structure, bridge facility and/or right of way would be subject to a sustained increase in water levels. All of the above will have implications for the design and engineering of specific improvements or facilities which would be determined at the project development level, and not during this high-level planning evaluation.

Table 2. Potentially Vulnerable Roadway Projects from Connect 2045 Needs Assessment				
Project ID	Project Name	NOAA 2017	USACE 2013	Location
Strategic Intermodal System (SIS) Roadways				
1	I-4 (Seminole C/L to SR 472)	X	X	Lake Monroe/St. Johns River
6	SR 40 (Breakaway Trails to Williamson Blvd)	X	X	Tomoka River
19	I-95 (SR 400 to Old Dixie Highway)	X	X	Tomoka River
Other Arterial Roadways				
42	SR 415 (Seminole C/L to Howland Dr)	X	X	St. Johns River
47	US 1 (Nova Rd. to I-95)	X	X	Tomoka River Dodson Creek
Non-State Major Roadways				
70	Hand Ave Extension (Williamson Blvd to Tymber Creek Rd Ext)	X	X	Tomoka River

Consideration of Other Relevant Studies

- The [Resilient Volusia – 2017](#) and [Resilient Flagler – 2018](#) studies identified corridors as vulnerable to coastal flooding from 100-year storm influenced by sea level rise. *[more information about these studies will be added]* The following projects identified in Table 2 coincide with potentially vulnerable corridor segments identified in those studies:
 - Project 6 – SR 40
 - Project 19 – I-95
 - Project 47 – US 1
- FDOT’s [Risk Assessment on SIS Corridors – 2018](#) was conducted to evaluate Strategic Intermodal System (SIS) facilities at risk during Category 1, Category 3 and Category 5 hurricanes. *[more information about this study will be added]* The following projects identified in Table 2 coincide with potentially vulnerable corridor segments or bridges identified in the FDOT study:
 - Project 1 – I-4
 - Project 6 – SR 40
 - Project 19 – I-95 (I-95 from SR 40 to US 1 is also identified as one of the Top 10 Impacted SIS Facilities during Category 1 Storm Surge)

Recommended Next Steps

Considerations discussed by the LRTP Subcommittee include:

- Document this information in Connect 2045 and include the findings of past TPO studies that provide context regarding impacts to the overall transportation, not just identified needs projects
- Develop a potential strategy for future incorporation of resiliency data into long range planning that is coordinated with the Board’s policy direction