

NJDOT Comments on September 18, 2020 PACT Rulemaking Meeting

NJDOT is in the process of developing an agency-specific resiliency plan in coordination with NJDEP under the EO 89. NJDEP should recognize that resiliency plans are under development and the regulations should enable agency-specific resiliency plans to be recognized and implemented under proposed regulations.

1. What does resiliency mean to you?

We have adopted Federal Highway Administration's definition of resiliency: *the ability to anticipate, prepare for, and adapt to changing conditions and withstand, respond to, and recover rapidly from disruptions*. We are utilizing accepted climate science as a basis to understand the *changing conditions* we must *prepare for, anticipate and adapt to* as well as maintaining a strong emergency management plan to be able to *respond and recover rapidly* to occurrences. Through tools and efforts described below we are pursuing ways to enable NJDOT's infrastructure to *withstand* the consequences of the changing conditions predicted to occur as a result of climate change. Whereas our focus has been on sea level rise, precipitation increases and resulting flooding potential, effects of predicted temperature increases will also be considered.

2. What steps have you taken to increase resiliency of your infrastructure considering the threats of climate change?

While we currently have not taken steps to increase resiliency of our infrastructure on a broad scale, resiliency can be a secondary benefit of utilizing the design process discussed in the response to question #3. As described in the response to question #5, tools are under development to enable the NJDOT to assess the need for resiliency as we address transportation needs going forward.

3. When expanding existing operations or siting new facilities, how do you assess the potential vulnerability of the site to climate threats?

We use the requirements of the NJDOT Roadway Design Manual, the NJDOT Bridge Design Manual, and the NJDEP regulations regarding roadway elevations and bridge/culvert capacity. Bridge design is based on the 100-year design storm or the critical flood. Bridge scour depths are calculated using the 100-year design storm or a lesser event, such as the overtopping event, depending on which event causes a greater stress on the bridge. The 500-year design storm serves as a scour design check in accordance with HEC-18. Design criteria indicate that the low chord of a bridge should be above the 100-year storm. These criteria are balanced with the project *purpose and need* and other design criteria and limitations to arrive at a design. For example, if the *purpose and need* is to extend the pavement life of a roadway for the next 5 to 7 years by sealing the roadway surface, then evaluation of climate threats is not generally a factor. If the *purpose and need* is to reduce the frequency of roadway flooding, then the elevation and frequency of the design flood is a critical design factor in the project.

NJDOT is currently exploring utilizing a bottom up approach to assess the vulnerability of assets. This analysis would look at the rating curves of structures to calculate flows at which a structure would become vulnerable in order to determine how climate changes on design flows will impact the structure. For example, the flow that causes incipient overtopping could be correlated with increased flows due to climate change to determine the future frequency that the structure is anticipated to be overtopped. This method will allow the NJDOT to better analyze vulnerable infrastructure within the state's roadway network.

4. What challenges do you face when making necessary resiliency improvements?

Since most of our projects are improvements to existing roadways, drastic changes in alignments cannot typically occur. There are requirements for horizontal and vertical roadway geometry to provide safe passage for the traveling public while minimizing impacts to adjacent roadways and businesses. As more fill is required to elevate roadways, the width of the disturbance area increases. This results in additional right-of-way impacts, additional disturbance to environmentally sensitive areas, riparian zones, and the floodplain, and more extensive measures to meet Stormwater Management regulations. Since the state's roadway network is part of a system, the resiliency of a particular project will have to be viewed in the context of the overall system and the context of the local constraints.

5. What tools do you currently use to assess the vulnerability of your investments?

Tools are currently under development to first give a visualization of assets that will be exposed to sea level rise and precipitation increases throughout the state, as well as rating the system from a criticality perspective. These tools can assist the NJDOT in prioritizing investments that address established transportation needs and contribute to the resiliency of our network. In addition, we are developing a methodology to assess the vulnerability of bridges, roadways and culverts that can further assist our project decision-making process.

6. Are there specific regulatory changes that NJDEP can make to facilitate resiliency improvements while ensuring protection of the environment, public health, safety and welfare?

The NJDEP can consider standards that factor in the project intent as opposed to applying resiliency standards to all projects in the same way. For public roadway projects, implementation of resiliency standards should be related to the *purpose and need* of the project. For example, smaller scope projects similar to those described under Permits-by-Rule in the Flood Hazard Area Control Act Rules, should not be required to address the resiliency standards.

Wetlands, Riparian Zones, and other Environmentally Sensitive Areas: If resiliency regulations will necessitate additional fill, the other regulatory criteria that will be triggered must be recognized and adjusted. For example, elevating a roadway will require fill at the roadway and beyond the roadway footprint to tie into existing grade. These typically result in impacts to wetlands, riparian zones and other environmentally sensitive areas that often require mitigation. The NJDEP can consider removing the limits of allowable disturbance for resiliency projects.

In addition, elevating or improving structures for resiliency may result in flood elevation impacts to upstream or downstream properties or structures. Consideration should be given to specifying acceptable limits of impacts (i.e., contained within the channel banks, or no impacts to offsite structures, roadways, parking lots, etc.), to permit flexibility in safely implementing resiliency improvements.

The regulations should establish a general hierarchy for environmental protection to enable the regulatory agency to prioritize which criteria to implement when compliance with all the standards cannot be achieved.

Understanding that the resiliency efforts may be part of a larger network/system, resiliency may have to be applied differently depending on the location within the system, the criticality of the roadway network and the overall vulnerability due to climate change. NJDEP should consider public entities that have adopted resiliency plans in place to serve as their guidance to incorporate climate change and resiliency into their systems. During the permit application process, the applicant would have to demonstrate how they are in compliance with their adopted resiliency plan instead of utilizing a uniform Statewide standard.