

## CTP – Goals and Objectives Survey (Resilience)

### Description

The purpose of this guidance is to assist transportation planners and community leaders in developing the Goals and Objectives (G&O) Surveys that incorporate resilience consideration to understand resilience needs in the community, and inform the evaluation / development of resilience related community vision, goals and objectives, measure of effectiveness (MOEs), and performance targets. The inputs from the survey will inform the identification of resilience needs and evaluation of transportation alternatives in later steps of the Comprehensive Transportation Plan (CTP).

### Responsibility

For non-Metropolitan Planning Organization (MPO) areas, the Transportation Planning Division (TPD) planning engineer is responsible for the G&O survey within an assigned transportation planning area. For MPO areas, the MPO is responsible for the G&O Survey, as well as all aspects of their public involvement process. The Transportation Planning Division (TPD) planning engineer will work with the MPO in developing the survey and evaluating the results.

### Procedure

Step	Action
1	<p><b>Include questions about resilience related issues or needs in the Goals and Objectives Survey, such as known hazards and frequently impacted locations. Leverage engagement tools, CTP basemap or other interactive NCDOT maps obtain inputs on problem areas, such as where flooding occurs. Coordinate with local emergency planning staff to obtain related information and streamline survey questions.</b></p> <p><u>Sample Questions:</u></p> <ul style="list-style-type: none"> <li>• Do you experience the impact from extreme weather or climate events (such as flooding, rockslides, and landslides) in your area? If yes, please list them.</li> <li>• Are you impacted by flooding, wildfires, rockslides, landslide? If so, please list the road(s) impacted?</li> <li>• Do you know of locations where there are frequent flooding problems (more than two times in a year)?</li> <li>• Do you know of locations where there is water in the ditches? If so, please list the road name(s).</li> <li>• Do you have any other comments or concerns regarding transportation system resilience in your area? (Use response to this question via an open text box with prompts to solicit detailed feedback such as "road was closed for X days", "road under bridge Y has standing water after storms").</li> <li>• Would you like to include resilience as a goal of the CTP?</li> </ul> <p><b>Examples of incorporating resilience related questions to current survey software:</b></p> <p><b>Priorities Screen:</b> <i>What is most important to you?</i></p> <ul style="list-style-type: none"> <li>• Add 'resilience to natural hazards' as a priority option.</li> </ul> <p>Include a description of resilience priority:</p>

Step	Action
	<ul style="list-style-type: none"> <li>○ It is important that the transportation network in my community is able to withstand and recover quickly from the impacts of natural hazards <i>such as flooding, rockslides, and landslides.</i></li> </ul> <p><b>Mapping Screen: <i>Where are your concerns?</i></b></p> <ul style="list-style-type: none"> <li>● Add option to map “Natural Hazard.”</li> </ul> <p>If there are known concerns, more specific options can be included:</p> <ul style="list-style-type: none"> <li>○ Flooding</li> <li>○ Rockslide/landslide</li> </ul> <p><b>Strategies Screen: <i>Do you agree or disagree?</i></b></p> <ul style="list-style-type: none"> <li>● Add ‘Resilience’ as a goal.</li> </ul> <p>Sample statements:</p> <ul style="list-style-type: none"> <li>○ Should CTP development include a resiliency related goal and objective(s)?</li> </ul>
2	<p><b>Include questions to help define and identify critical transportation infrastructure that should be operational during extreme weather and climate events in the Goals and Objectives Survey.</b></p> <p><u>Sample Questions:</u></p> <ul style="list-style-type: none"> <li>● In your experience, is there any road that is the only way for you to get to the places you want to go during extreme weather and climate events (such as shelters, locations with fuel, food, medicine, or places to evacuate to)? If so, please list the road name(s).</li> <li>● Is there any road that you think is critical and should remain open during extreme weather and climate events? If so, please list them and state why.</li> </ul>
3	<p><b>Include questions about vulnerable population that might be disproportionately impacted by extreme weather and climate events.</b></p> <p><u>Sample Questions:</u></p> <ul style="list-style-type: none"> <li>● Have you or others in your community experienced any difficulty carrying out daily activities due to transportation disruptions caused by a natural disaster or hazard events (e.g., flooding, rockslides, landslides)?</li> <li>● Have you or others in your community experienced evacuation challenges before, during, or after a natural disaster or hazard event?</li> </ul> <p>If necessary, the team can leverage available tools to conduct screening of these population to assist in developing questions customizing to their potential needs.</p> <ul style="list-style-type: none"> <li>● <a href="#">Environmental Justice / Transportation Disadvantage Index Tool</a></li> <li>● <a href="#">The Transportation disadvantaged tool</a></li> <li>● <a href="#">The Climate and Economic Justice Screening Tool (CEJST)</a></li> </ul>

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### **Record of Revision**

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## CTP – Establish Resilience Goals and Objectives (Resilience)

### **Description**

The purpose of this guidance is to assist transportation planners and community leaders in integrating resilience into their goals and objectives to:

- Meet state and federal resilience requirements.
- Better manage the lifecycle costs of the transportation system.
- Prepare for current and future increases in extreme weather events.

The goals and objectives established will inform the identification of resilience needs and evaluation of transportation alternatives in later steps of the Comprehensive Transportation Plan (CTP).

### **Responsibility**

Transportation Planning Division (TPD) Engineer

### **Procedure**

Step	Action
1	<b>Review community inputs from the survey to determine community vision and needs for resilience.</b>
2	<p><b>Developing goals and objectives that reflect community needs, and are consistent with community vision and federal, local, and regional resilience guidelines. The below examples can also be used during discussions with the Steering Committee.</b></p> <p><u>Examples of Goals and Objectives:</u></p> <ul style="list-style-type: none"> <li>• Prepare for, adapt to, and respond to a future of rising tides and extreme storms, embrace equitable and sustainable development, increase economic security, protect public health, and promote its cultural heritage (City of New Bern, North Carolina).</li> <li>• A transportation system that is resilient and can mitigate, adapt to, and respond to chronic and acute stresses and disruptions (New York Metropolitan Transportation Council).</li> <li>• Improve the transportation system’s resiliency to the effects of sea level rise; improve stormwater management and treatment in transportation improvement projects (Cape Cod MPO, MA).</li> <li>• Increase the security and resiliency of the multimodal transportation system (Hillsborough County MPO, Tampa, FL).</li> <li>• Reduce the vulnerability and increase the resiliency of critical infrastructure to the impacts of climate trends and events (Miami-Dade MPO, FL).</li> <li>• Protect critical infrastructure from the effects of climate change and address stormwater runoff and flooding concerns (Northern Middlesex MPO, Lowell, MA).</li> <li>• Implement projects that consider the impacts of climate change and natural hazard mitigation (Regional Planning Commission, New Orleans, LA).</li> </ul>

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Step	Action
3	Document goals, objectives, and survey findings in the <i>Resiliency</i> section of the Transportation Planning Data Appendix so that the information can be carried forward throughout the CTP planning process and for the life of the plan.

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## CTP – Develop Measures of Effectiveness (MOEs) and Performance Targets (Resilience)

### **Description**

The purpose of this guidance is to assist transportation planners and community leaders in developing measures of effectiveness (MOEs) and performance targets for resilience goals and objectives.

The MOEs established will inform the identification of resilience needs and evaluation of transportation alternatives in later steps of the Comprehensive Transportation Plan (CTP).

### **Responsibility**

Transportation Planning Division (TPD) Engineer

### **Procedure**

Step	Action
1	<p><b>Review national and peer agency best practices on developing measures of effectiveness (MOEs) and performance targets for resilience goals and objectives.</b></p> <p><u>Resource:</u></p> <ul style="list-style-type: none"> <li>• <a href="#">FHWA White Paper - Integrating Resilience into the Transportation Planning Process, 6.3.1 Performance Measures and Targets</a></li> <li>• <a href="#">2022-2026 FEMA Strategic Plan Appendix 1 - Performance Measures</a></li> <li>• <a href="#">Examples of Fire Department Performance Measures</a></li> </ul>
2	<p><b>Consider data available to quantitatively measure the effectiveness of resilience progress.</b></p>
3	<p><b>Develop measures of effectiveness (MOEs) for each of the resilience objectives that can be used to track progress and measure success.</b></p> <p><u>Examples of MOEs:</u></p> <ul style="list-style-type: none"> <li>• Number of highway lane and centerline miles within the 100-year floodplain (Miami-Dade MPO, FL).</li> <li>• Number of coastal communities with adaptation plans (Merrimack Valley MPO, Haverhill, MA).</li> <li>• Number of stormwater improvement projects implemented (Northern Middlesex MPO, Lowell, MA).</li> <li>• Number of projects that raise the roadway grade or increase resilience against climate change or natural disasters through other means (Regional Planning Commission, New Orleans, LA).</li> <li>• The percentage of facilities that accommodate two feet sea level rise (Palm Beach MPO, FL).</li> </ul>
4	<p><b>Discuss what is achievable by the end of the planning horizon with stakeholders and community, develop performance targets for resilience goals and objectives.</b></p>

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