

Planning for the Future of Regional Transportation Resilience



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NYSAMPO Conference – Syracuse, New York

May 10, 2023



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Presentation Outline

- **Policy and Guidance**
 - ❑ **Federal**
 - ❑ **State**
 - ❑ **Regional/MPO**
- **GTC Resilience Improvement Plan**
 - ❑ **Scope and anticipated outcomes**
- **Data Sources and Applications**
- **Challenges and Opportunities**



Mitigation

Efforts to reduce future climate changes, such as greenhouse gas emissions reduction

Adaptation

Efforts to reduce the vulnerability of society to climate change impacts

Resilience

The ability to bounce back from disruptions



Vehicle Electrification • Buyouts • Living Shorelines • Climate-Ready Infrastructure • Waste-to-Energy • Better Infiltration • Green Infrastructure • Carbon Sequestration • Resilient Building Techniques • Improved Drainage or Retention

Greenhouse Gas (GHG) Mitigation

- **Transportation Sector**
- **GHG Inventory**
- **Climate Action Plans**



VEHICLE FLEET



LOCAL POLICY



FACILITIES

ACTIONS

- Fleet Inventory
- Fleet Rightsizing
- Alternative Fuel Vehicles
- Fleet Efficiency Policy
- Solar & Wind Energy Installations
- Renewable Power Purchase Agreement
- Land Use Law for Environmental Protection
- Conservation of Open Space
- Tree Planting
- Power Down Policy
- HVAC Upgrades
- Green Building Standards
- Interior Lighting Upgrades
- LED Street Lights & Traffic Signals
- Clean Heating & Cooling Technology
- Green Roofs

Federal Policy and Guidance

- **Executive Order 13653**
 - ❑ **Enhance climate preparedness and resilience**
- **FHWA Order 5520**
 - ❑ **Identify risks of climate change and extreme weather**
 - ❑ **Integrate consideration of these risks into planning, operations, policy, and programs**
- **Vulnerability Assessment and Adaptation Framework, 3rd Edition**
- **Bipartisan Infrastructure Law (BIL)**



PROTECT Program

- **Promoting Resilient Operations for Transformative, Efficient, and Cost-saving Transportation (PROTECT)**
 - ❑ **Provide funds for resilience improvements**
 - ❑ **Formula and Discretionary**
- **Eligible Activities**
 - ❑ **Planning Activities**
 - ❑ **Resilience Improvements**
 - ❑ **At-Risk Coastal Infrastructure**
 - ❑ **Community Resilience and Evacuation Routes**
- **Resilience Improvement Plan (RIP)**
 - ❑ **Non-Federal share reduction**



RIP Contents (1)

- **“Shall” include:**
 - ❑ **Immediate and long-range planning activities**
 - ❑ **Systemic approach**
 - ❑ **Consistent with state and local mitigation plans**
 - ❑ **Risk-based assessment of assets and system to current and future weather events**
 - ❑ **Geographic scale**



RIP Contents (2)

- **“Shall” include as appropriate:**
 - ❑ **Impacts of weather events and natural disasters**
 - ❑ **Codes, standards, and regulatory framework**
 - ❑ **Natural infrastructure**
 - ❑ **Resilience of community assets**
 - ❑ **Same timeframe as Long-Range Transportation Plan**



RIP Contents (3)

- **“May” include:**
 - ❑ **Designate evacuation routes**
 - ❑ **Plan for response to anticipated emergencies**
 - ❑ **Describe resilience improvement policies**
 - ❑ **Investment Plan**
 - ❑ **Science and Data**



New York State Policy – Beyond Transportation

- **Climate Leadership and Community Protection Act**
 - ❑ **Carbon-Free Electricity by 2040**
 - ❑ **Carbon Neutral Buildings and Transportation**

- **PE7 Action: Climate Vulnerability Assessment**
 - ❑ **Community infrastructure**
 - ❑ **Socio-Economic assets and systems**
 - ❑ **Natural and working lands**
 - ❑ **Other community assets and systems**

Regional Policy – LRTP 2045

➤ Adopted June 2021

- ❑ Region and System Profile**
- ❑ Emerging Issues and Opportunities**
- ❑ System Needs**
- ❑ Recommendations**
 - Health and Safety**
 - Access and Equity**
 - Management and Maintenance**
 - Sustainability and Resilience**
 - Economic Development**



Regional Policy – LRTP 2045

- **Applicable Recommendations – Sustainability and Resilience**
 - ❑ **SR-1: Minimize anticipated climate change and hazard impacts by implementing vulnerability assessment recommendations**
 - ❑ **SR-8: Prevent hazard impacts**
 - ❑ **SR-9: Protect vulnerable assets**
 - ❑ **SR-10: Redundancy considerations**
 - ❑ **SR-11: Recovery considerations**



Current Regional Vulnerability Assessments

- **Genesee-Finger Lakes Regional Critical Transportation Infrastructure Vulnerability Assessment (2016)**
 - ❑ **Federal-aid roads, bridges, and facilities**

- **Genesee-Finger Lakes Regional Local Bridge Vulnerability Assessment (2019)**
 - ❑ **Bridges on non-federal aid roads**



GTC Resilience Improvement Plan (RIP) Process

- **Steering Committee**
- **RFP/Consulting Services**
- **Inventory**
 - ❑ **Assets**
 - ❑ **Hazards**
- **Asset Ranking**
- **Strategies**
- **Priority Projects**
- **Draft & Final Plan**



Inventory – Critical Transportation Assets

- **Assets which are essential to the functioning of a community's transportation system**
 - ❑ **Support Safety, Efficiency, and Reliability**
- **Four categories:**
 - ❑ **Infrastructure – *Roads, Bridges, Overpasses, Tunnels, Culverts***
 - ❑ **Facilities – *Operations Centers, Highway/Public Works Garages, Fuel Storage, Transit Garages, Police/Fire Stations***
 - ❑ **Equipment – *Traffic Signals, Signage, ITS Field Devices, Communications Network, Fleet Vehicles***
 - ❑ **Personnel – *Employees, Contractors, Vendors***

Hazards Data Sources

- **Hazard Mitigation Planning**
 - ❑ **Limit risk and exposure to hazards**
 - ❑ **Short and long term strategies**

- **Disaster Mitigation Act (DMA) 2000 - All-Hazard Mitigation Planning**
 - ❑ **Five-year update cycle**
 - ❑ **NYS Hazard Mitigation Planning Standards**
 - ❑ **FEMA 2023 Policy Guidance**



Natural Hazards

- **Monroe County All-Hazard Mitigation Plan (2023)**
 - ❑ **Coastal Erosion**
 - ❑ **Earthquakes**
 - ❑ **Extreme Temperatures**
 - ❑ **Floods (*riverine, lakeshore, ice jams, flash flooding*)**
 - ❑ **Land Subsidence**
 - ❑ **Landslides**
 - ❑ **Severe Storms (*windstorms, hail, tornadoes*)**
 - ❑ **Severe Winter Storms (*snow, blizzards, ice storms*)**
 - ❑ **Wildfires**

Hazard Mitigation - Considerations

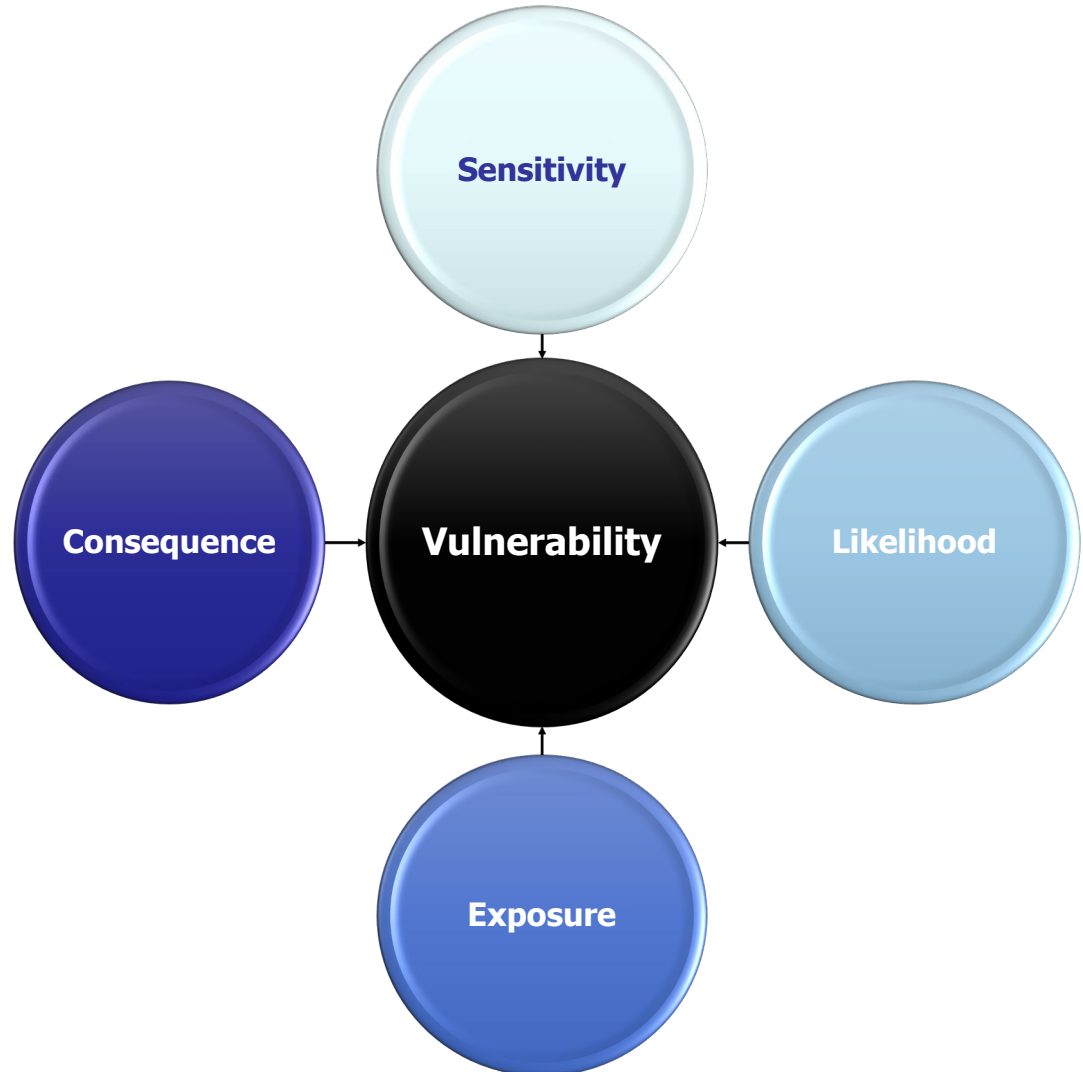
- **Expanded representation**
 - ❑ **Underserved communities**
- **Identify future climate conditions**
- **Address mitigation plan requirements**
- **Analyze building code and land use plans/regulations**



Asset Ranking

Four Key Factors:

- **Sensitivity** – Can the transportation system operate with this asset impacted?
- **Likelihood** – What is the likelihood/ frequency of a hazard impacting the asset?
- **Exposure** – Is the asset exposed to multiple hazards and for long durations of time?
- **Consequence** – What is the severity of the hazard impact on the asset?



Strategies

- **Identify and prioritize critical transportation assets**
- **Obtaining/pre-planning easements/access/right-of-way documents for emergency response**
- **Staging material, equipment, personnel**
- **Preparing for temporary closures and alternative routes**
- **Preparing contingency plans for equipment and material needed to repair damage**
- **Documenting previous hazard events and impacts**

Challenges

- **Hazards
Data**
- **Equity**
- **Community
Integration**
- **Community
Engagement**



Opportunities

- **Community Funding**
 - ❑ **Building Resilience Infrastructure and Communities (BRIC)**
- **Infrastructure Asset Management**
- **Integration with other community plans and programs**



Access to Funding – Non-Transportation



Safety & Security



Law Enforcement/
Security



Fire Services



Search & Rescue



Government Services



Community Safety



Food, Water, Shelter



Food



Water



Shelter



Agriculture



Health & Medical



Medical Care



Patient Movement



Public Health



Fatality Management



Medical Supply Chain



Energy (Power & Fuel)



Power (Grid)



Fuel



Communications



Infrastructure



Alerts, Warnings,
& Messages



911 and Dispatch



Responder
Communications



Finance



Transportation



Highway/Roadway



Mass Transit



Railway



Aviation



Maritime



Hazardous Material



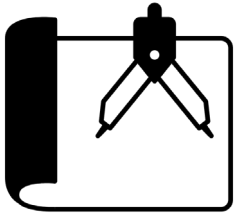
Facilities



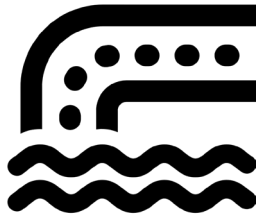
HAZMAT, Pollutants,
Contaminants

Infrastructure Asset Management

- **Sustainable**
- **Resilient**
- **Equitable**



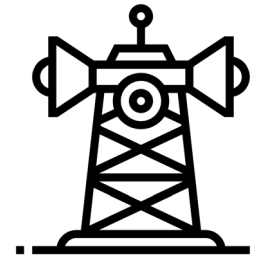
Architecture,
Engineering, and
Construction



Water
Utilities



Energy
Utilities



Telecommunications



Transportation
Systems and
Services

Resources I

- **Vulnerability Assessment and Adaptation Framework, 3rd Edition**
 - ❑ https://www.fhwa.dot.gov/environment/sustainability/resilience/adaptation_framework/

- **Climate Resilience Toolkit**
 - ❑ <https://toolkit.climate.gov/>

- **PROTECT Program**
 - ❑ <https://www.transportation.gov/rural/grant-toolkit/promoting-resilient-operations-transformative-efficient-and-cost-saving>

Resources II

- **FEMA National Risk Index**
 - ☐ <https://hazards.fema.gov/nri/>
- **NYS Climate Act**
 - ☐ <https://climate.ny.gov/>
- **NYS Hazard Mitigation Planning**
 - ☐ <https://www.dhSES.ny.gov/hazard-mitigation>
- **NYSERDA Disadvantaged Communities**
 - ☐ <https://www.nyserda.ny.gov/ny/Disadvantaged-Communities>



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