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

**Actions**

- Fleet Inventory
- Fleet Rightsizing
- Alternative Fuel Vehicles

**Vehicle Fleet**

- Fleet Efficiency Policy
  - Solar & Wind Energy Installations
  - Renewable Power Purchase Agreement
  - Land Use Law for Environmental Protection
  - Conservation of Open Space
  - Tree Planting

**Local Policy**

- Power Down Policy
- HVAC Upgrades
- Green Building Standards

**Facilities**

- 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

- Food, Water, Shelter: Food, Water, Shelter, Agriculture
- Health & Medical: Medical Care, Public Health, Fatality Management, Medical Supply Chain
- Energy (Power & Fuel): Power (Grid), Fuel
- Communications: Infrastructure, Alerts, Warnings, & Messages, 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**

- **Climate Resilience Toolkit**
  - [https://toolkit.climate.gov/](https://toolkit.climate.gov/)

- **PROTECT Program**
Resources II

- FEMA National Risk Index
  - [https://hazards.fema.gov/nri/](https://hazards.fema.gov/nri/)

- NYS Climate Act
  - [https://climate.ny.gov/](https://climate.ny.gov/)

- NYS Hazard Mitigation Planning
  - [https://www.dhses.ny.gov/hazard-mitigation](https://www.dhses.ny.gov/hazard-mitigation)

- NYSERDA Disadvantaged Communities
  - [https://www.nyserda.ny.gov/ny/Disadvantaged-Communities](https://www.nyserda.ny.gov/ny/Disadvantaged-Communities)
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