New York State has one of the largest, most complex transportation networks in the United States. This vast network includes transportation by land, water, and air. New York’s transportation systems enable people and goods to move across the state—and around the country and world—safely and efficiently. They support a large workforce, contribute to domestic and global economies, and improve communities’ quality of life. Modern and well-functioning transportation systems are vital to New York State’s people and their livelihoods.

Climate Change Impacts on New York State’s Transportation

New York’s transportation network consists of roads and highways; mass transit like subways and buses; rail lines; maritime transportation; air transportation; and micromobility, such as bikes, scooters, and skateboards. Climate hazards—including increased precipitation, more frequent and intense storms, rising sea level, and extreme temperatures—pose risks to all these modes of transportation. The impacts of these hazards include:

- **Impacts on the physical transportation system**, such as flooding from heavy precipitation and saltwater corrosion of equipment and infrastructure from sea level rise.
- **Impacts on the movement of people**, such as longer travel times during climate-related disruptions and health concerns for passengers if the air conditioning, heating, and ventilation on a bus, commuter train, or subway car cannot function in extreme weather conditions.
- **Impacts on the movement of goods**, such as supply chain delays during extreme weather events.

Flooding from more intense storms, storm surge, and rising sea level is a particular threat to transportation. Floods can damage transportation facilities and equipment, cause power outages, shut down services, block routes, and pose safety risks. For example, storm surge from Superstorm Sandy flooded several subway stations and tunnels and caused a power outage in lower Manhattan, leading to suspended subway services.

New York State’s roadways are especially vulnerable to climate hazards because they are some of the oldest in the nation. Climate change can further stress aging infrastructure, causing it to deteriorate more quickly. For example, asphalt softens in extreme heat, which can affect the surface of a road and shorten its lifespan.

Because New York’s transportation network includes multiple modes of transportation (i.e., different ways to transport people and goods between locations), there is also potential for climate impacts to spread from one mode to another. For example, power outages or floods that disrupt mass transit systems can create a surge of demand for other modes of transportation, increasing traffic congestion and delays. Impacts on transportation...
can also cascade to other sectors. Disruptions to roadways and mass transit can cause commuter delays, affecting schedules, income, and economic activity. Disruptions can also create challenges for agriculture, such as delays transporting perishable food.

These impacts could also worsen existing inequities in the transportation network. For example, some communities located in “transit deserts” lack adequate mass transit service. This means there are fewer alternatives for transit-dependent residents when climate hazards shut down one bus or train service.

Adaptation and Resilience Strategies

Strategies to improve the resilience of New York’s transportation systems include:

- Expanding connections between different modes of transportation so there are alternatives if other modes fail during a climate-related event.
- Flood protection infrastructure for roadways, airports, underground subways, bridges, railway tracks, critical electrical equipment, and other components of transportation systems.
- Capital projects that address current inequities, better serve neighborhoods, and help rectify unjust past planning decisions while also preparing for climate impacts.
- Ensuring local governments and transportation departments have access to resources that help them fund, staff, and implement resilience projects.

The transportation sector is also evolving due to advancements in technology such as electric vehicles, rideshare services, and intelligent transportation systems. These advancements can provide mobility and environmental benefits. However, they are also vulnerable to climate change because they make transportation more dependent on electric power and telecommunications grids. As advancements continue to develop, transportation planners will benefit from understanding how climate change will affect future transportation technologies, as well as considering the uncertainties and vulnerabilities that come with new technologies.

Learn More

Explore the New York State Climate Impacts Assessment at [https://nysclimateimpacts.org/](https://nysclimateimpacts.org/).