In this study, we modeled three types of climate risks ("Stressors"), Sea Level Rise (SLR), Storm Surge (SS), and Nuisance Flooding (NF). Based on their different characteristics, the three climate stressors are modeled differently. SLR and SS are modeled with GIS (Geographic Information System) based approach, while NF is predicted for a random future day using the Monte Carlo Simulation. The results of the climate stressors modeling are shown in maps to the right.

We defined six scenarios based on two conditions - severity of climate change and weather. Overall, the more severe the climate change, the worse the travel condition will be. Storm scenarios are projected with notably worse travel condition than sunny-day ones. Very-high climate change coupled with storm (Scenario 6) results in exceedingly high delay.

**Key Take-aways**
- Increase Redundancy to provide more viable detour alternatives
- Spatial Difference - different regions require different strategies
- Critical Facilities - identify vulnerable segments and install protection measures
- Science-based Planning - adopting science-based, region-specific climate change analysis

**Results by Scenarios**
Overall influence, N. Coast experiences stronger influence
Inaccessible TAZs, N. Coast experiences more inaccessible TAZs
Congestion, Roadway congestion, especially under storm condition, is more concerning for S. Coast

**Results by Geographic Region**
Overall Comparison, difference between the N. and S. Coast likely lies in different land cover and roadway configuration

*Climate change* will cause significant system failure to road transportation in *North Carolina* in 2050.

- **0.93%** TRIPS UNDERSERVED
- **10.82%** VEHICLES DRIVING ON SPEED <10 MPH (SOUTHERN COAST)

**Scenario 1**
- Sea Level Rise
- Storm Surge
- Nuisance Flood

**Scenario 2**
- Permanent Road Closure
- Temporary Road Closure
- Speed Reduction

**Scenario 3**
- Permanent Road Closure
- Speed Reduction

**Scenario 4**
- Temporary Road Closure
- Speed Reduction

**Scenario 5**
- Temporary Road Closure

**Scenario 6**
- Permanent Road Closure
- Speed Reduction

CLIMATE STRESSORS MODELING
In this study, we modeled three types of climate risks ("Stressors"), Sea Level Rise (SLR), Storm Surge (SS), and Nuisance Flooding (NF). Based on their different characteristics, the three climate stressors are modeled differently. SLR and SS are modeled with GIS (Geographic Information System) based approach, while NF is predicted for a random future day using the Monte Carlo Simulation. The results of the climate stressors modeling are shown in maps to the right.