Drivers and Opportunities –
Emergency Management, Security and Resilience
March 2019
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EXECUTIVE SUMMARY
With the recent Fixing American’s Surface Transportation (FAST) Act requirements, State Departments of Transportation (DOTs) are now incorporating emergency management, security and resilience into their long range transportation plans. As a result, NCDOT is using new opportunities to plan and collaborate with the NC Department of Public Safety’s Emergency Management Division (NCEM), increase multi-agency security efforts and strengthen the state’s institutional and transportation resilience.

Operational collaboration between NCDOT and NCEM is extensive. In large part, this partnership was borne in response to an increasing number of natural disasters, including the recent effects from Hurricanes Matthew and Florence.

NCDOT also staffs a Statewide Traffic Operations Center (STOC), one of three Traffic Management Centers (TMCs) in the State. This is important since NCDOT maintains one of the largest highway systems in the country, second only to Texas.¹

In the same building, NCEM staffs a 24/7 Emergency “Watch Station,” which can be transformed into the State Emergency Operations Center (SEOC) at any time. The NC National Guard (NCNG) and State Highway Patrol (SHP) also staff 24/7 operation centers in the same facility, resulting in efficient and effective communication and collaboration, particularly during disasters.
NCDOT collaborates with multiple federal and state agencies on emergency management and transportation security. Federal partners include the Department of Homeland Security (DHS), under which are the Federal Emergency Management Agency (FEMA), Transportation Security Agency (TSA), United States Coast Guard (USCG) and the Cybersecurity and Infrastructure Security Agency (CISA), the Federal Bureau of Investigation (FBI) and other agencies. Federal agencies can assist when requested by the Governor per the Stafford Act.²

At the state level, NCDOT coordinates with the NCNG, SHP, NCEM, NC Forest Service (NCFS) and the State Bureau of Investigation (SBI), which administers the NC Information Sharing and Analysis Center (ISAAC) to develop and share intelligence on immediate and emerging threats.

“Transportation resilience” is the ability to prepare and plan for, absorb, recover from, or more successfully adapt to actual or potential adverse events.”³ North Carolina is developing a North Carolina Risk Assessment and Resiliency Plan, in response to an Executive Order for cabinet agencies to explore hazards and assess meteorological stressors based on past weather events and future trends. Resilience planning complements emergency management and security planning because it illustrates the need to develop mitigation plans to prepare for future disasters and adverse events.
INTRODUCTION
Preparing for Uncertainty

Successful implementation of NC Moves 2050 requires an understanding of what the future holds for transportation. NC Moves 2050 enables NCDOT and its partners to:

- Identify emerging topics, trends and disruptors to lay the groundwork for possible transportation futures;
- Identify threats and opportunities;
- Develop and test strategies;
- Forecast potential impacts of action and inaction; and
- Craft an actionable plan to reach the State’s goals.

NC Moves 2050 will facilitate expansion of partnerships that are central to emergency management, security and resilience. These three plan elements are inter-related and provide opportunities for improved collaboration between NCDOT and other state agencies.

In response to the increasing frequency of natural disasters and man-made incidents, NCDOT is paying more attention to emergency management. In response to these threats, NCDOT is enhancing security across all modal transportation divisions in collaboration with federal, state and local law enforcement agencies.

More transportation planning and funds will be required with the Department of Public Safety’s Emergency Management Division (NCEM) and other state agencies to manage hazards when they occur. This will help to address future needs by coordinating federal and state government actions.
### Collaborating Across New Long Range Plan Elements

<table>
<thead>
<tr>
<th>Emergency Management</th>
<th>Transportation Security</th>
<th>Resilience</th>
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</table>
| NCDOT and NCEM share a joint 24/7 emergency and traffic operations center. There are opportunities for NCDOT to collaborate more in planning for the State Emergency Operations and State Hazard Mitigation Plans. | NCDOT actively promotes transportation modal and facility security across federal, state and local law enforcement agencies.  
- Highways (SHP)  
- Airports (TSA)  
- Freight and Passenger Rail  
- Ferry System  
- Transit Systems  
- Ports |  
- Required by FAST Act in State Transportation Plans  
- Need to plan for more resilient transportation systems and infrastructure  
- Increasing hazards create supply chain disruptions which require a coordinated response |

**Introduction**
WHERE ARE WE TODAY?
Threats and Hazard Categories

Threats and hazards are organized into three categories, including **natural hazards** (acts of nature), **technological hazards** (accidents or the failures of systems and structures) and **human-caused incidents** (intentional actions of an adversary). States use a combination of emergency management, security and resilience planning to prepare for these threats and hazards.

<table>
<thead>
<tr>
<th>Natural</th>
<th>Technological</th>
<th>Human-caused</th>
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<tbody>
<tr>
<td>Avalanche</td>
<td>Dam failure</td>
<td>Active shooter incident</td>
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<tr>
<td>Drought</td>
<td>Hazardous materials release</td>
<td>Armed assault</td>
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<tr>
<td>Earthquake</td>
<td>Industrial accident</td>
<td>Biological attack</td>
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<tr>
<td>Epidemic</td>
<td>Levee failure</td>
<td>Chemical attack</td>
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<tr>
<td>Flood</td>
<td>Mine accident</td>
<td>Cyber-attack against data</td>
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<tr>
<td>Hurricane/Typhoon</td>
<td>Pipeline explosion</td>
<td>Cyber-attack against infrastructure</td>
</tr>
<tr>
<td>Space weather</td>
<td>Radiological release</td>
<td>Explosives attack</td>
</tr>
<tr>
<td>Tornado</td>
<td>Train derailment</td>
<td>Improvised nuclear attack</td>
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<tr>
<td>Tsunami</td>
<td>Transportation accident</td>
<td>Nuclear terrorism attack</td>
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<tr>
<td>Volcanic eruption</td>
<td>Urban conflagration</td>
<td>Radiological attack</td>
</tr>
<tr>
<td>Winter Storm</td>
<td>Utility Disruption</td>
<td>Source: CPG 201, DHS 2018</td>
</tr>
</tbody>
</table>
NCDOT is organized into 14 **Divisions** that do not correspond to DPRs. NCDOT Division Engineers coordinate resources during emergencies.

NCEM is organized into Branches (Eastern, Central, Western) and five **Domestic Preparedness Regions (DPRs)** within each Branch to help coordinate emergency planning between counties with similar needs.

NCDOT currently has strong existing roles in operations, security, risk management, communication and disaster management.

NCDOT and NCEM are highly coordinated on a daily basis at the operations level. NCDOT’s **Statewide Traffic Operations Center (STOC)** is co-located with the 24/7 NCEM “Watch Station” until an emergency, when NCEM opens the **State Emergency Operations Center (SEOC)**. In the same facility, the NC National Guard and SHP maintain operation centers for continuous interagency communication and support.

NCDOT deploys over 50 Safety Patrols along major roadways to assist stranded drivers and clear highway incidents.³

NCEM was the first state agency to deploy a **FEMA Integrated Team (FIT)** with six FEMA planners working at NCEM.⁴
Transportation Security

State Level Organization
The NC National Guard as part of its peacetime mission assists the Department of Public Safety in times of emergencies. Within DPS, seven Regional Response Teams (RRTs) can respond 24/7 to statewide hazmat incidents. The State Highway Patrol coordinates with local law enforcement officers. The NC Fire Service comprises three highly-trained Incident Management Teams (IMT). The SBI administers the NC Information Sharing and Analysis Center (ISAAC), which develops intelligence on immediate and emerging threats and shares it with federal, state and local partners.\(^5\)

Federal Level Organization
The DHS includes multiple federal agencies that can assist during disasters, including FEMA, TSA, USCG and CISA. They can assist when requested by the Governor per the Stafford Act.\(^2\) The FBI coordinates closely with the SBI to communicate federal security issues.

In disasters, the Environmental Protection Agency (EPA) and the USCG support Regional Response Teams (RRTs) in each of the 10 FEMA Regions.

Transportation Modal Security
- State Highway Patrol (SHP) provides security to NCDOT’s extensive highway system, including weigh stations.
- TSA provides security at nine of NCDOT’s 60 passenger airports.
- Class I railroads employ up to eight Special Agents to secure railroad operations, protect the right-of-way and monitor military shipments 24/7 while in transit. Amtrak deploys Railroad Police to monitor passenger rail operations.
- Local law enforcement agencies provide security for local rail, bus and ferry transit system security needs. In 2018, NCEM was awarded $10,500 in from FEMA for increased port-wide risk management; to enhance domain awareness; and to conduct training and exercises.
Resilience Defined

“The ability to prepare and plan for, absorb, recover from, or more successfully adapt to actual or potential adverse events” (TRB 2018). Resilience involves behavioral and cultural shifts across organizations. It is about being adaptable and flexible.

Applications vary widely across DOTs – they can include risk management, vulnerability assessments and building system redundancy.

It is now federally required to include resilience in Statewide Long Range Transportation Plans as a planning factor.

Moving beyond responsiveness and crisis planning to system-wide planning and analysis. Creates planning and coordination opportunities with NCEM.

Additional momentum

Resilience requirements are also part of NC’s Executive Order 80 on a statewide Clean Energy Economy (which includes transportation directives).

Best practices include statewide resiliency plans, as well as plans which guide coordinated regional-level responses.

- Example: 2017 Post Hurricane Sandy Transportation Resilience Study in N.Y., N.J. and C.T.
- Implications for coordination short- and long-range planning, operations and maintenance and project-level design.
Hurricane Florence produced extensive wind damage along the North Carolina coast in September 2018, widespread power outages, a storm surge of 9 to 13 feet and 20 to 30 inches of rain.  

Before landfall, NCEM and NCDOT planned for four days. NCDOT created a medical care document for all employees. Emergency Operations Centers were activated in Raleigh and the Global TransPark in Kinston.  

After landfall, NCDOT provided live-stream photo footage to the EOC to track storm impacts. NCDOT updated Traffic Information Management System (TIMS) and worked with Google and Waze to communicate road closures and detours.  

Challenges included extensive detours (Interstates 95 and 40), US 70’s closure, slow 4G networks and radio interoperability. The hurricane changed course at landfall and slowed down, creating a historic flooding event.  

NCDOT received a National Operations Center of Excellence (NOCoE) Award for the STOC’s performance during Florence (Feb 8, 2019).  

Where are we Today?
WHERE WE ARE GOING
## How Do Threats Impact NCDOT?

<table>
<thead>
<tr>
<th>Sample Threats</th>
<th>Sample Impacts to Statewide Transportation</th>
<th>Role for NCDOT</th>
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<tbody>
<tr>
<td>Biological</td>
<td>• Threatened critical infrastructure&lt;br&gt;Exposure to personnel</td>
<td>• Physical facility security</td>
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<tr>
<td>Chemical</td>
<td>• Truck, rail, port hazmat&lt;br&gt;Threatened critical transportation infrastructure&lt;br&gt;Exposure to the Public</td>
<td>• Secure highway incident scene&lt;br&gt;Coordinate with NCEM, Regional Response Teams (RRT)</td>
</tr>
<tr>
<td>Information Technology Networks and Cybersecurity</td>
<td>• Vulnerability of all intelligent transportation systems&lt;br&gt;Disruption in communications with system users</td>
<td>• State Traffic Control Center, communication with ISAAC&lt;br&gt;Security/emergency response communications&lt;br&gt;Automated systems at risk</td>
</tr>
<tr>
<td>Weather and Natural Disasters</td>
<td>• Long-term asset life-cycles&lt;br&gt;Event-based disaster management (i.e. hurricane evacuation)&lt;br&gt;Evacuations, detours</td>
<td>• Emergency scenario training&lt;br&gt;Highway closures and detours&lt;br&gt;Aircraft and camera surveillance for responders and the public</td>
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NCEM Preparedness Planning

National Preparedness Goal
The National Preparedness Goal is to be “a secure and resilient nation with the capabilities required across the whole community to prevent, protect against, mitigate, respond to and recover from the threats and hazards that pose the greatest risk.”¹⁰

THIRA/SPR Requirements
To be eligible for Emergency Management Performance Grants (EMPG), NCEM prepares a Threat and Hazard Identification and Risk Assessment and Statewide Preparedness Program (THIRA/SPR). This is a three-step risk assessment process that helps communities understand their risks and determine the level of capability they need in order to address those risks. NCEM updates the THIRA/SPR every three years and NCDOT can be more engaged with NCEM in the THIRA/SPR process.

NCEM Hazmat Case Study
In response to the THIRA requirements, NCEM implemented a 5-year comprehensive Statewide Regional Hazardous Materials Study and conducted Risk Assessments in six metropolitan areas from 2009 to 2015 which received USDOT recognition.¹¹

Source: North Carolina Emergency Management

Where we are Going
NCEM Risk Management

**NCEM is the lead state agency** designated to coordinate information and resources for hazard risk management and maintain an extensive flood preparedness program. This includes floodplain mapping and management, flood inundation mapping and alert network (FIMAN) and the flood risk information system (FRIS). These tools assist state and local officials with flood planning and risk management to better prepare for natural disasters. \(^{12}\)

Source for all photos: North Carolina Emergency Management

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Where we are Going [ncdot.gov/ncmoves] NC Moves 2050 Plan Drivers and Opportunities
Within NCDOT’s ongoing operations and communications role, there are opportunities for more integration between NCDOT Divisions and NCEM Preparedness Regions. This can include coordination with NCEM and state emergency response team (SERT).

NCEM can benefit from NCDOT’s expertise analyzing transportation networks for emergency routes and network gaps.

NCDOT can encourage MPOs and RPOs to collaborate with North Carolina’s Local Emergency Response Committees (LEPCs) since regional transportation planning can enhance regional emergency management planning.

NCDOT can benefit from becoming familiar with NCEM Plans:
- North Carolina State Emergency Operations Plan
- North Carolina Hazard Mitigation Plan
- North Carolina Emergency Management Continuity of Operations Plan
- North Carolina State Disaster Recovery Framework
- North Carolina Emergency Management Communication Plan
Security

Interagency security coordination between federal and state agencies can help reduce duplication and improve communication. This includes coordinating security between DHS, FBI, TSA at the federal level, NCEM, NCDOT, SHP, and SBI at the state level and with the private sector. This can help to strengthen overlapping security protocols and coordination between jurisdictions. For example, NCDOT can participate in monthly DPS Homeland Security meetings.

Participate in training and exercises between state agencies and the private sector for security, communication and emergency response for both passenger and freight transportation systems.

Expand incident management coordination meetings at the regional level to improve communication between NCEM districts, SHP troopers and NCDOT divisions and lead to more security, emergency management and transportation coordination.

Source: North Carolina Statewide Multimodal Freight Plan

NCDOT and private sector freight partners coordinate regarding freight transportation needs to ensure essential resources and services are provided to disaster victims.
Resilience

NCDOT is already taking steps to address resilience planning requirements under the FAST Act. This includes evaluating transportation system redundancy, coordinating with emergency management officials, conducting vulnerability assessments, examining existing facilities, devising new design standards and making policy revisions.

More guidance is also available at the national level. The Federal Highway Administration (FHWA) provides tools, guidance, capacity building and practices that help State DOTs improve transportation network efficiency and public/responder safety when events overwhelm transportation operations.\(^\text{14}\)

In addition, the American Association of State Highway Transportation Officials\(^\text{4}\) (AASHTO) Special Committee on Transportation Security and Emergency Management (SCOTSEM) is focused on “all hazards” infrastructure protection and emergency management of a resilient surface transportation system.

AASHTO’s Five Fundamentals Reports can serve as guidance to NCDOT, including:
1. Security 101;
2. Guide to Emergency Response Planning
3. Blast Resistant Highway Bridge Design
4. Costing Asset Protection: An All Hazards Guide for Transportation Agencies, and
5. Continuity of Operations Planning (COOP).\(^\text{15}\)

Since SCOTSEM was established, the Transportation Research Board (TRB) has served as a valuable resource to document and publish papers and best practices on emergency management, disaster planning and resilience conferences.
North Carolina is working on a Risk Assessment and Resiliency Plan, a collective effort from all cabinet agencies required to explore hazards and assess meteorological stressors based on past weather events and future trends. In this effort, the state will explore threats, hazards and impacts to public and private value streams and assess risks in incorporating technical and local knowledge. Discussions include opportunities to explore integration with hazard mitigation and comprehensive land use planning. This plan is in response to Executive Order 80, which will enhance state preparation for environmental disruptions and clean energy solutions.

Future resilience planning should include all types of infrastructure. In addition to highways, ports and railroads, planning can also include buildings, telecommunications, electricity, pipelines, power plants and storm water systems.

Examples of other State Transportation Resilience programs include integrated detour plans, Integrated Corridor Management (ICM), advanced towing and recovery programs and Uninterruptible Power Supply (UPS) for signal systems on priority corridors.
FINDINGS AND FUTURE DIRECTION FOR NORTH CAROLINA
FINDINGS

• NCDOT collaborates 24/7 with the NCEM on emergency and traffic operations, as illustrated during Hurricane Florence and other disasters.
• NCEM was the first state agency to deploy a FEMA Integrated Team (FIT) with six FEMA planners at NCEM.
• NCEM prepares a Threat and Hazard Identification and Risk Assessment and Statewide Preparedness Program (THIRA/SPR).
• Security programs have been developed throughout state government, creating duplication.
• North Carolina is working on a Risk Assessment and Resiliency Plan to assess vulnerability and risks by incorporating technical and local knowledge.

FUTURE DIRECTIONS

• NCDOT can benefit from participating in more planning efforts with NCEM, including hazard mitigation planning and participating in the THIRA/SPR process.
• Inter-agency security coordination at the federal, state and local level and with the private sector will help to strengthen overlapping security protocols and coordination between jurisdictions.
• Future resilience planning should include public and private infrastructure. In addition to highways, bridges, ports and railroads, resilience planning should also include storm water systems, pipelines, fuel terminals, buildings, telecommunications, electric and power generation plants.
APPENDICES
End Note Sources

1. North Carolina Division of Highways, [https://www.nc.gov/agency/highways-division](https://www.nc.gov/agency/highways-division)
2. Stafford Act: The Robert T. Stafford Disaster Relief and Emergency Assistance Act of 1988 provides the legal authority for the federal government to provide assistance to states during declared major disasters. [https://www.fema.gov](https://www.fema.gov)
4. Interview with Corey Johnson and Jordan Rink, Feb 8, 2019
6. Transportation Resilience Innovations Summit and Exchange (RISE), Oct 2018, Transportation Research Board
7. Post Hurricane Sandy Transportation Resilience Study in NY, NJ, and CT, FHWA, 2017.
9. Interview with Corey Johnson and Jordan Rink, Feb 8, 2019
15. AASTHO Special Committee on Transportation Security and Emergency Management (SCOTSEM), Five ‘Fundamentals’ Reports, [http://sp.scotsem.transportation.org/Pages/SCOTSEMFundamentals.aspx](http://sp.scotsem.transportation.org/Pages/SCOTSEMFundamentals.aspx)
17. Resilience defined, VDOT Presentation to the Office of the Secretary of Transportation, 2018
Acronyms, Abbreviations

AASHTO  American Association of State Highway and Transportation Officials
CBRNE  Chemical, Biological, Nuclear, Radiological Explosives
CISA  Cybersecurity and Infrastructure Security Agency
DHS  Department of Homeland Security
DPR  Domestic Preparedness Regions
EMPG  Emergency Management Performance Grant
ETO  Emergency Transportation Operations
FAST  Fixing America’s Surface Transportation [Act]
FBI  Federal Bureau of Investigation
FEMA  Federal Emergency Management Agency
FHWA  Federal Highway Administration
FIMAN  Flood Inundation Mapping and Alert Network
FIT  FEMA Integrated Team
FRIS  Flood Risk Information System
ICM  Integrated Corridor Management
ICS  Incident Command System
ISAAC  Information Sharing and Analysis Center
IMT  Incident Management Team
LEPC  Local Emergency Planning Committee
## Acronyms, Abbreviations

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
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<tbody>
<tr>
<td>NCFS</td>
<td>North Carolina Forest Service</td>
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<td>NCNG</td>
<td>North Carolina National Guard</td>
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<td>NCEM</td>
<td>North Carolina Emergency Management</td>
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<tr>
<td>RISE</td>
<td>Resilience Innovations Summit and Exchange</td>
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<tr>
<td>RRT</td>
<td>Regional Response Team</td>
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<tr>
<td>SBI</td>
<td>State Bureau of Investigation</td>
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<tr>
<td>SCOTSEM</td>
<td>Special Committee on Transportation Security and Emergency Management</td>
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<td>SEOC</td>
<td>State Emergency Operations Center</td>
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<tr>
<td>SEOP</td>
<td>State Emergency Response Plan</td>
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<tr>
<td>SERC</td>
<td>State Emergency Response Commission</td>
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<td>SERT</td>
<td>State Emergency Response Team</td>
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<td>SHP</td>
<td>State Highway Patrol</td>
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<td>SPR</td>
<td>State Preparedness Report</td>
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<td>STOC</td>
<td>Statewide Traffic Operations Center</td>
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<td>THIRA</td>
<td>Threat and Hazard Identification and Risk Assessment</td>
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<td>TIMS</td>
<td>Traffic Information Management System</td>
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<td>TRB</td>
<td>Transportation Research Board</td>
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<tr>
<td>TSA</td>
<td>Transportation Security Administration</td>
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<td>UPS</td>
<td>Uninterruptible Power Supply</td>
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<td>USCG</td>
<td>United States Coast Guard</td>
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Appendix
Summary of Interviews

- **Robin Barfield** and **Bill Bryant** (NCDOT Safety and Risk Management), **Larry Cockrell** (NCDOT Division of Motor Vehicles), discussed NCDOT emergency management protocols, existing security activities in NCDOT facilities and operations (Dec 4, 2018).

- **Corey Johnson**, (NC Division of Emergency Management), discussed NCDOT coordination with emergency management activities (Jan 24, 2019).

- **Corey Johnson**, NCEM Deputy Plans Chief, **Jordan Rink**, FEMA Ops Planner, **Josh Modlin**, NCEM Critical Infrastructure/Key Resources Planner (Feb 8, 2019) regarding emergency management EOC coordination.

- **Brian Gunter**, NCDOT STOC Manager and **Chris Tant**, NCEM SEOC Manager (Feb 8, 2019) regarding emergency operation protocols.