NORTH CAROLINA
Department of Transportation

NC MOVES 2050

Drivers and Opportunities –
Emergency Management, Security and Resilience

March 2019

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EXECUTIVE SUMMARY

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.

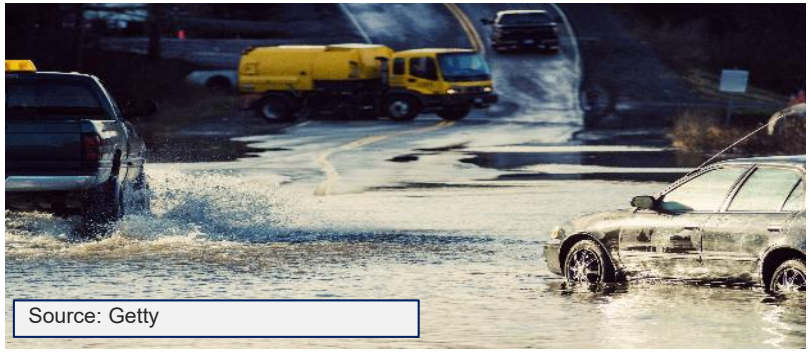
NCDOT also staffs a Statewide Traffic Operations Center (STOC), one of three Traffic Management Centers (TMCs) in the State. This is important since NCDOT maintains one of the largest highway systems in the country, second only to Texas.[1]


Source: Getty

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.

Executive Summary (con't)

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]



Source: Getty

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

Emergency Management

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.

Transportation Security

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

Resilience

- 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

WHERE ARE WE TODAY?

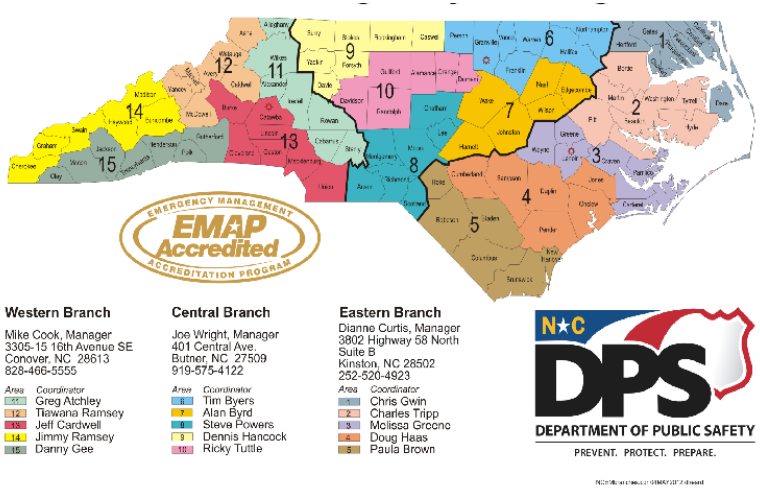
Threats and Hazard Categories

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).[13] States use a combination of emergency management, security and resilience planning to prepare for these threats and hazards.

Natural	Technological	Human-caused
Avalanche	Dam failure	Active shooter incident
Drought	Hazardous materials release	Armed assault
Earthquake	Industrial accident	Biological attack
Epidemic	Levee failure	Chemical attack
Flood	Mine accident	Cyber-attack against data
Hurricane/Typhoon	Pipeline explosion	Cyber-attack against infrastructure
Space weather	Radiological release	Explosives attack
Tornado	Train derailment	Improvised nuclear attack
Tsunami	Transportation accident	Nuclear terrorism attack
Volcanic eruption	Urban conflagration	Radiological attack
Winter Storm	Utility Disruption	

Source: CPG 201, DHS 2018

Emergency Management



Source: NC Department of Public Safety

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 is organized into 14 **Divisions** that do not correspond to DPRs. NCDOT Division Engineers coordinate resources during emergencies.

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

Resilience Defined

"The ability to prepare and plan for, absorb, recover from, or more successfully adapt to actual or potential adverse events" (TRB 2018).[6] 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.

I-40, between Raleigh and Wilmington, after Hurricane Florence, 2018.

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.*[7]
- Implications for coordination short- and long-range planning, operations and maintenance and project-level design.

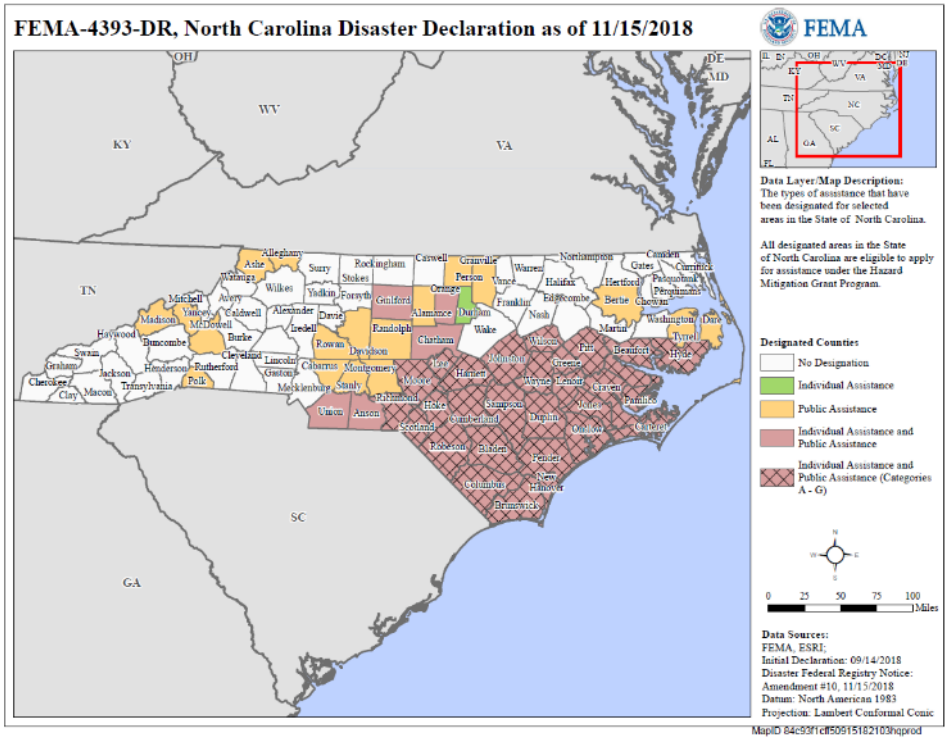
Hurricane Florence Case Study

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. [8]

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.[9]

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.



Source: FEMA

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

Source: *NOAA*

WHERE WE ARE GOING

How Do Threats Impact NCDOT?

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

NCEM Preparedness Planning

National Preparedness Goal

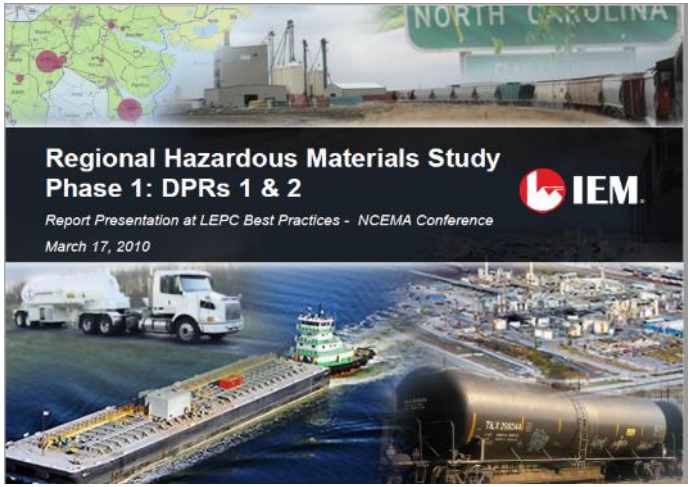
The National Preparedness Goal is to be "a secure and resilient nation with the capabilities required across the whole community to prevent, protect against, mitigate, respond to and recover from the threats and hazards that pose the greatest risk."[10]

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]

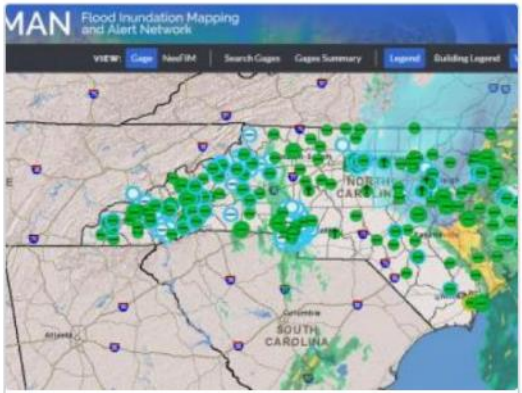


Source: North Carolina Emergency Management

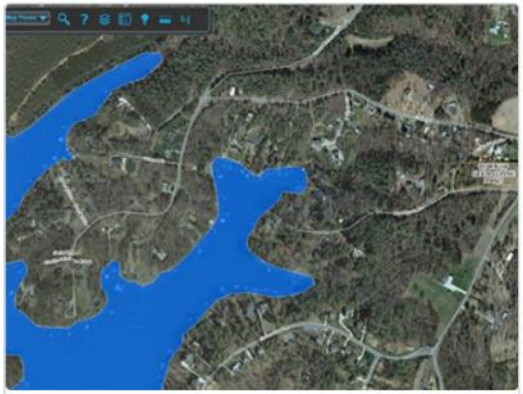
NCEM Risk Management

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]

Floodplain Mapping and Management (flood.NC.gov)



Flood Inundation Mapping and Alert Network (FIMAN)



Flood Risk Information System (FRIS)

Source for all photos: North Carolina Emergency Management

Emergency Management

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:

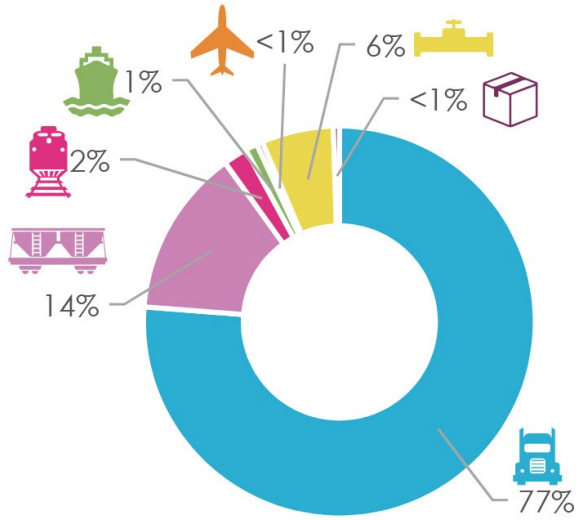
- *North Carolina State Emergency Operations Plan*
- *North Carolina Hazard Mitigation Plan*
- *North Carolina Emergency Management Continuity of Operations Plan*
- *North Carolina State Disaster Recovery Framework*
- *North Carolina Emergency Management Communication Plan*

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.

- Truck
- Rail Carload
- Rail Intermodal
- Water
- Air
- Pipeline
- Other

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.[14]

In addition, the American Association of State Highway Transportation Officials' (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). [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.

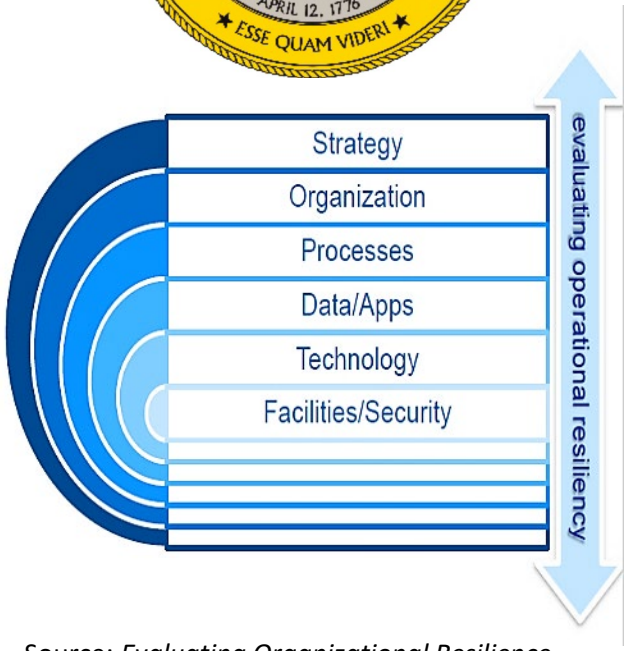
Source: North Carolina Emergency Management

Resilience

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.[16] 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. [17]



Source: *Evaluating Organizational Resilience, VDOT Office of the Secretary, 2018*

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
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
3. NCDOT State Farm® Safety Patrol https://www.ncdot.gov/travel-maps/traffic-travel/state-farm-safety-patrol/Pages/default.aspx
4. Interview with Corey Johnson and Jordan Rink, Feb 8, 2019
5. North Carolina State Bureau of Investigation https://www.ncsbi.gov/NCISAAC
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.
8. National Weather Service Web site, accessed Feb 13, 2019, https://www.weather.gov/mhx/Florence2018
9. Interview with Corey Johnson and Jordan Rink, Feb 8, 2019
10. National Preparedness Goal www.fema.gov
11. North Carolina Department of Public Safety, Emergency Management Division Annual Report, 2012
12. NCEM Web Site: Risk Management Division, accessed February 2019. https://www.ncdps.gov/our-organization/emergency-management/risk-management
13. DHS: Comprehensive Preparedness Guide (CPG) 201, 3rd Edition, May 201: (Threat and Hazard Identification and Risk Assessment (THIRA) and Stakeholder Preparedness Review (SPR) Guide
14. FHWA Office of Operations, Emergency Transportation Operations, https://ops.fhwa.dot.gov/eto_tim_pse/index.htm
15. AASTHO Special Committee on Transportation Security and Emergency Management (SCOTSEM), Five ‘Fundamentals’ Reports, http://sp.scotsem.transportation.org/Pages/SCOTSEMFundamentals.aspx
16. Executive Order No. 80: NC’s Commitment to Address Climate Change and Transition to a Clean Energy Economy: Cabinet Agency Plans for Addressing EO80 Directives; Inaugural Meeting, December 19, 2018 https://files.nc.gov/ncdeq/climate-change/interagency-council/Climate-Change-Council-Dec-19-2018-Mtg-Powerpoint-FINAL.pdf
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

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

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.