



THE USE OF FREIGHT ADVISORY COMMITTEES IN RESPONDING TO FREIGHT SUPPLY CHAIN DISRUPTIONS

Final Report

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16. Abstract <i>The objective of this research project was to develop approaches for the Tennessee Department of Transportation (TDOT) to consider that would empower its state and regional freight advisory committees (FACs) to serve as coordinating bodies in the event of disruptions that would have an adverse impact on the supply chains of shippers critical to the vitality of Tennessee's economy. The research activity was comprised of three tasks: 1) review existing supply chain response coordination efforts, 2) develop supply chain disruption scenarios applicable to Tennessee, and 3) facilitate discussions with TDOT's state and regional FACs to formulate a list of strategies that would engage these groups in improving future supply chain disruption response. Based on these findings, TDOT is encouraged to take the following actions:</i> <ul style="list-style-type: none"> • <i>Appoint one or more FAC members as representatives to participate in TDOT/TEMA operations planning and to attend/present at TDOT's annual incident management conference. In this manner, FAC members will be able to provide input and serve as a liaison to freight community.</i> • <i>Share TDOT's route diversion plan with the FACs for comment. Feedback received could prove instrumental in maintaining supply chain continuity and in providing food, water and supplies to areas of immediate need.</i> • <i>Ask FACs to identify routes that need to be repaired/reopened in the event of a supply chain disruption. This would consist of a prioritized list of critical freight infrastructure that could have the greatest impact on saving lives and maintaining economic vitality following an event. This could also impact planning in terms of how projects are prioritized to improve response/recovery.</i> • <i>In concert with TDOT and TEMA, have FACs help develop a communications plan so that the freight industry is fully aware of the status of transportation disruptions during a hazard event.</i> <i>These recommendations can be achieved through a follow-up project implemented as part of TDOT's research program.</i>			
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EXECUTIVE SUMMARY

The objective of this research project was to develop approaches for the Tennessee Department of Transportation (TDOT) to consider that would empower its state and regional freight advisory committees (FACs) to serve as coordinating bodies in the event of disruptions that would have an adverse impact on the supply chains of shippers critical to the vitality of Tennessee's economy.

The research activity was comprised of three tasks: 1) review existing supply chain response coordination efforts, 2) develop supply chain disruption scenarios applicable to Tennessee, and 3) facilitate discussions with TDOT's state and regional FACs to formulate a list of strategies that would engage these groups in improving future supply chain disruption response.

At an early stage of this project, it was confirmed that the freight industry in Tennessee is concerned about supply chain disruptions stemming from impairment to the transportation infrastructure, including the following:

- Depending on scenario impact severity, there could be long term disruptions in the supply chain, ranging from local to international consequences.
- The private sector generally has contingency plans that enable decisions to be made based on impact severity (e.g., hang tight, reroute, change mode or manufacturing location).
- Disruptions in rural areas are often overlooked but can have important supply chain implications.
- The lead response agency is typically the Tennessee Emergency Management Agency (TEMA), often with assistance provided by the local office of emergency management; however, FAC members are not typically consulted in response planning or incident management.
- If TEMA included the freight component in its response plans, there could be immediate benefits in terms of improving the ability of freight providers to distribute food, water, and supplies to needed areas.
- The longer term benefit of TEMA consultation with freight providers would be in restoring the freight network back to normal operations more quickly, reducing delays and costs associated with the disruption.
- Communication is critical. Information dissemination to the freight industry needs to leverage availability of variable message boards, social media, cell phones (including text messages), delivering a consistent message, and providing height, weight and other cargo restrictions on suggested diversion routes.

Based on these findings, TDOT is encouraged to take the following actions:

- Appoint one or more FAC members as representatives to participate in TDOT/TEMA operations planning and to attend/present at TDOT's annual incident management conference. In this manner, FAC members will be able to provide input and serve as a liaison to freight community.

- Share TDOT’s route diversion plan with the FACs for comment. Feedback received could prove instrumental in maintaining supply chain continuity and in providing food, water and supplies to areas of immediate need.
- Ask FACs to identify routes that need to be repaired/reopened in the event of a supply chain disruption.¹ This would consist of a prioritized list of critical freight infrastructure that could have the greatest impact on saving lives and maintaining economic vitality following an event. This could also impact planning in terms of how projects are prioritized to improve response/recovery.
- In concert with TDOT and TEMA, have FACs help develop a communications plan so that the freight industry is fully aware of the status of transportation disruptions during a hazard event.

These recommendations can be achieved through a follow-up project implemented as part of TDOT’s research program.

¹ Within this recommendation, it is recognized that TEMA and TDOT’s highest priority is to open main roads and corridors with respect to safety for the general public.

INTRODUCTION

Supply chains are a complex web of private and public enterprises. The private sector includes producers, shippers, receivers, retailers, freight providers, and all manners of intermediaries, including warehouse/terminal operators and virtual transaction managers like forwarders and brokers. In the public sector, there are the owners and managers/maintainers of much of the transportation infrastructure from all levels of government – federal, state, and local. All of this occurs across geographically dispersed and interconnected multimodal networks.

The formation of state freight advisory committees (FACs) is a direct result of federal law enacted under the FAST (Fixing America’s Surface Transportation) Act. This legislation directed the Federal Highway Administration to encourage each state to establish a freight advisory committee, consisting of a representative cross-section of public and private freight stakeholders. Each FAC is expected to:

- advise the state on freight-related priorities, issues, projects, and funding needs
- serve as a forum for discussion for state transportation decisions affecting freight mobility
- communicate and coordinate regional priorities with other organizations
- promote the sharing of information between the private and public sectors on freight issues
- participate in the development of the state freight plan

When supply chain disruptions occur, whether the result of manmade or natural events, FAC members need to effectively engage before, during, and after the events. Unfortunately, there is no good model for their effective engagement as part of the response effort. This project explored the extent to which response to supply chain disruptions could be addressed by FACs.

The objective of this research project was to develop approaches for the Tennessee Department of Transportation (TDOT) to consider that would empower its state and regional freight advisory FACs to serve as coordinating bodies in the event of disruptions that would have an adverse impact on the supply chains of shippers critical to the vitality of Tennessee’s economy.

The research activity was comprised of the following tasks: 1) review existing supply chain response coordination efforts, 2) develop supply chain disruption scenarios applicable to Tennessee, and 3) facilitate discussions with TDOT’s state and regional FACs to formulate a list of strategies that would engage these groups in improving future supply chain disruption response.

REVIEW OF EXISTING FAC SUPPLY CHAIN RESPONSE COORDINATION EFFORTS

The project began with the conduct of a national scan of states that had or were in the process of developing state freight plans, and the extent to which FACs had been established and had a defined role related to supply chain disruption. The results are presented in Appendix A.

Overall, since enactment of the FAST Act, 28 FACs have been formally established, with some FACs organized by metropolitan planning organizations (MPOs) to manage freight planning, though separate from their respective state department of transportation (see Table 1). Four out of the eight states bordering Tennessee have formed FACs - Arkansas, Virginia, Alabama and Mississippi.

In terms of their mission and activities as they relate to managing supply chain disruptions, only FACs located in Idaho and Oregon explicitly addressed this topic. In the case of Idaho, the state freight plan references risk mitigation and risky decisions and behaviors with an objective to, “improve resiliency through improving segments with elevated risk of failure and important freight impacts”.

Oregon’s approach is more comprehensive. Its state freight plan recognizes the following:

- Lack of highway system redundancy makes the state freight system vulnerable to disruptions caused by weather, the need to move non-divisible loads in key corridors, and congestion/safety related delays
- Monitoring of where clusters of industries that require permitted loads are locating will reduce disruptions in the flow of goods
- Congestion and unreliable travel time on roads to access major intermodal facilities can cause disruptions to freight movement and industry supply chains

Several recommendations were made to address these concerns, including:

- Creating a statewide emergency management plan that identifies critical vulnerable points from a freight mobility perspective and places where there is a lack of system redundancy; establishing freight movement emergency plans for disruptions at these locations that include information about possible alternative routes.
- Developing and maintaining transportation models that account for freight logistics and routing behavior in order to evaluate effects of disruptions on freight movement at the state, regional and urban levels.
- Retaining critical existing redundancy elements (e.g., rail lines currently not in use, but parallel to a highway facility), as infrastructure that is currently underutilized may become the primary link in the case of serious disruption on the primary facility.

Although Oregon’s state freight plan acknowledges the importance of managing supply chain disruptions and makes institutional and operational recommendations for how to address this concern, no mention is made for who will be responsible for implementing the recommended actions, nor is the Oregon FAC identified as a key stakeholder in this regard. Consequently, the overarching conclusion reached from undertaking this national review is that Tennessee has the opportunity to pioneer an effort to utilize its FACs as key participants in effectively managing supply chain disruptions.

Region	State	Active FAC	Comments
New England (Region 1)	Connecticut	N	
	Maine	N	
	Massachusetts	Y	
	New Hampshire	N	
	Rhode Island	Y	
	Vermont	N	
Region 2	New Jersey	Y/N	Utilizes MPOs
	New York	Y/N	Utilizes MPOs
Midatlantic (Region 3)	Pennsylvania	Y/N	Utilizes MPOs
	Delaware	Y	
	Maryland	Y	
	West Virginia	N	
	Virginia	Y	
Southeast (Region 4)	Georgia	Y/N	Utilizes MPOs
	Alabama	Y	
	Mississippi	Y	
	Tennessee	Y	
	Florida	Y	
	South Carolina	N	
	North Carolina	N	
	Kentucky	N	
Midwest (Region 5)	Minnesota	Y	
	Indiana	Y	
	Ohio	N	
	Michigan	Y/N	Interior Committee
	Illinois	Y	
	Wisconsin	Y	
Southwest (Region 6)	Texas	Y	
	Arkansas	Y	
	Louisiana	N	
	Oklahoma	Y	
	New Mexico	N	
Region 7	Missouri	N	
	Iowa	Y	
	Kansas	Y	
	Nebraska	N	
Great Plains (Region 8)	North Dakota	N	
	South Dakota	N	
	Wyoming	Y	
	Utah	Y	
	Colorado	Y	
	Montana	N	
West Coast (Region 9)	California	Y	
	Arizona	Y	
	Nevada	Y	
	Hawaii	N	
Pacific Northwest (Region 10)	Idaho	Y	
	Oregon	Y	
	Washington	Y	
	Alaska	Y	

Table 1 – Status of FAC Formation by State

TENNESSEE REGIONAL FAC SURVEY

To better understand how FAC members in each region of Tennessee view their potential roles and responsibilities in the face of supply chain disruptions, a survey was created and administered. It included the following questions:

1. What has been your involvement with TDOT Freight Advisory Committees?
2. What is your role in freight supply chains?
3. What role do you play in the face of freight supply chain disruption in your organization?
4. What plans or strategies have been helpful in responding to freight supply chain disruptions?
5. What aspects of the recovery effort were not considered and should be implemented in the future?
6. Do you think the FAC's could serve a useful role in supply disruption planning, response and/or recovery?

A complete form of the FAC Participant Survey is provided in Appendix B, with the survey respondent results presented in Appendix C.

Responses were received from 63% of West Tennessee, 40% of Middle Tennessee, and 73% of East Tennessee FAC members, respectively. This yielded the following results:

- Roughly one-half of the respondents agreed that FACs and collaborative efforts involving FAC members could serve a useful role in supply chain disruption planning, response and recovery.
- Coordination between public and private sectors was identified as a critical element in effectively mitigating supply chain disruptions.

Based on these responses, regionally-based supply chain disruption scenarios were developed with the intent of utilizing the respective scenario to facilitate an interactive exchange of ideas with FAC members as part of upcoming regional FAC meetings. The goal behind this effort was to:

- Provide a narrative of a realistic supply chain disruption scenario with the potential for it to occur in the respective region of Tennessee
- Engage FAC members to discuss the impacts of this event without a coordinated effort
- Solicit ideas/strategies for how a coordinated effort could mitigate a supply chain disruption
- Identify actions that Tennessee FAC members could undertake to improve preparedness, response and recovery.

The scenarios were developed based on historical events that have occurred in each respective region or have been identified as a potential future threat. This resulted in scenario selection of an earthquake affecting West Tennessee, a flooding event in Middle Tennessee, and a wildfire in East Tennessee. Each scenario narrative is presented below.

WEST TENNESSEE SCENARIO: EARTHQUAKE ALONG NEW MADRID SEISMIC ZONE

At 3:30 a.m., a magnitude 7.7 (Mw7.7) earthquake occurred on the southwest segment of the New Madrid Seismic Zone (NMSZ). The epicenter, in Mississippi County, Arkansas, was 50 miles north-northwest of Memphis and 6 miles southwest of the town of Blytheville, AR. The earthquake caused serious damage in 37 critical counties in West and Central Tennessee, including Davidson and Shelby counties (see Figures 1 and 2).

The earthquake severely impacted a variety of transportation lifelines. Of the 3,815 bridges in the 37-county region, 330 bridges were completely destroyed, nearly 900 bridges suffered at least moderate damage, and an additional 875 were closed to freight traffic. Railway facilities were also impacted, with 54 sites experiencing at least moderate damage, and another 50 temporarily closed until a structural inspection could be performed. Additionally, 71 ports and 37 airports were rendered non-operational immediately following the earthquake. Oil and gas pipelines also ruptured, although the impact was limited to the local distribution network rather than main transmission lines.

Transportation routes, airports and ports in counties closest to the source of seismic activity were most heavily damaged, and would take several weeks to repair. Moreover, nearly all communication and utility services in western Tennessee were moderately or substantially reduced for the first few days after the earthquake. The majority of the affected facilities were located in Shelby, Tipton, Lauderdale, Dyer, Haywood, Crockett, Obion, Weakley and Gibson Counties in western Tennessee. A total of 800,000 truckloads of debris needed to be removed from the highway infrastructure. Total direct economic loss was estimated to be \$56.6 billion (transportation, buildings, and utility) and \$1.75 billion for transportation alone.

The Hernando de Soto Bridge, carrying I-40 across the Mississippi River between West Memphis, Arkansas, and Memphis, Tennessee, was closed indefinitely following the earthquake. The Memphis & Arkansas Bridge, carrying I-55 across the Mississippi River between West Memphis and Memphis, was closed for 3 days. The Frisco and Harahan bridges, carrying the Burlington Northern and Union Pacific rail lines, respectively, across the Mississippi River, were also closed for 3 days following the earthquake. Port and airport closures varied, depending on the amount of damage incurred, with some operational within a matter of days and others requiring several weeks of reconstruction to restore normal operations.

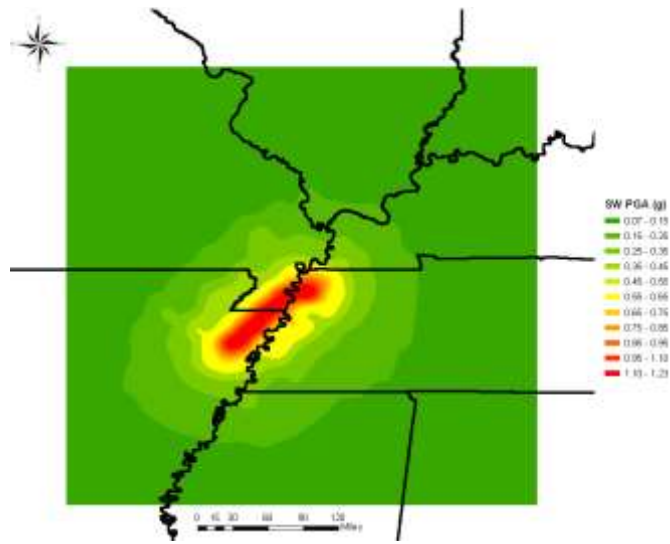


Figure 1 – Southwest Segment of Middle Fault PGA (g)
 [Source: MAE Center, 2008]



Figure 2 – NMSZ Event Loss Ratio (% of Total Building Assets) for State of Tennessee
 [Source: MAE Center, 2008]

MIDDLE TENNESSEE SCENARIO: HEAVY RAINS CAUSE OVERTOPPING OF PERCY PRIEST DAM

At around noon, heavy rains approached Nashville from the southeast due to a tropical storm that previously passed over Florida and Alabama. Approximately 25 inches of rain fell over a two-day period as the storm hovered around Nashville. Flooding occurred in low lying areas in East Nashville, Donelson, Antioch, and Murfreesboro. Percy Priest Dam overtopped due to high reservoir elevations and threatened to fail.

Percy Priest Dam is located on the Stones River, a tributary of the Cumberland River, and is located about ten miles east of downtown Nashville. The reservoir behind the dam, Percy Priest Lake, is one of four major flood control reservoirs for the Cumberland. The dam can hold flood waters up to 504.50 ft. (14.5 ft. above summer – April to October – pool levels). The dam takes about 28 hours of discharging up to 9,000 cu ft/s for the reservoir elevation to recede one foot (see Figure 3).

I-40 crosses the Stones River with eastbound and westbound bridges that are about 100 feet above normal river levels. After the dam's spillway was released to limit damage from dam failure, concerns of structural damage to the bridges as a result of scouring and a possible dam collapse caused closure of I-40 for three days (see Figure 4).

U.S. Highway 70 was also closed for two days as a result of flooding from Mills Creek and the Cumberland River near the intersection of Briley Parkway, TN-155. The road also crosses Stones River.

The storm caused Mill Creek to flood in two locations, Curreywood Acres and Antioch, spilling over parts of I-24, which was closed as a result for two days while flood waters receded. Flooding in Gladeville and Lebanon caused I-840 to effectively shut down as drivers took refuge in neighboring towns to escape rising creek levels (see Figure 5).

Nearly all communication and utility services in the Nashville area were moderately or substantially reduced for one to two days during and after the flood. Minor roads and arterials suffered sporadic damage from rain and flooding, with varying closings/openings throughout the event (see Figure 6).

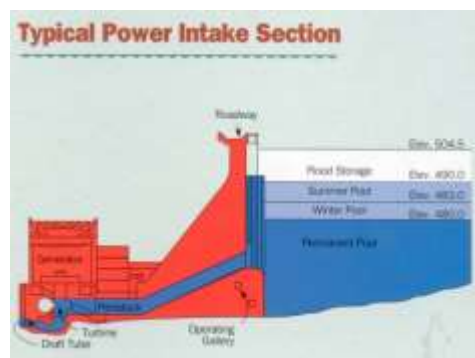


Figure 3 – Schematic of J. Percy Priest Dam



Figure 4 – Percy Priest Dam and Spillway



Figure 5 – Mills Creek and Stones River



Figure 6 – Critical Locations

EAST TENNESSEE SCENARIO: WILDFIRE NORTH OF KNOXVILLE ON I-75

At around midnight, a fire of unknown origin started in the Sundquist Unit of the North Cumberland Wildlife Management Area (NC-WMA), a heavily wooded area approximately 35 miles northwest of Knoxville, TN, in Campbell County (see Figures 7 and 8). No suppression activities were initiated during the first day, allowing the fire to spread. After 24 hours of burning, the fire approached I-75, which was subsequently closed, and cut off movement between Knoxville and Lexington.

Drought in recent months caused the wildfire to spread rapidly and move west across the interstate to the Royal Blue Unit of the wildlife management area. After four days of burning, the wildfire affected nearly 20 square miles of forest with potential to affect an additional 10 square miles. The fires lasted twelve days before being extinguished and an additional four days were needed to recover before traffic returned to I-75.

During the first four days of the wildfire, interstate traffic was rerouted to U.S. 25W, east of the NC-WMA, adding an additional ten miles (see Figure 9). When the route became too dangerous, traffic was then rerouted to U.S. 27 which connected to I-40 west of Knoxville, adding an additional 55 miles compared to driving on I-75 (see Figure 10). Because these roads are not equipped to handle regular interstate traffic, long queues and extended travel times were common.

The fires downed trees that hit power lines, causing electrical fires. Power outages to some pumping stations caught in the blaze caused hydrants to dry up, making firefighting efforts more difficult. Fortunately, regular communication methods remained functional.

In its early stages, smoke from the wildfire caused moderate delays in air traffic from Knoxville's McGhee Tyson Airport. A significant wind traveling in a southerly direction on the fourth and fifth days caused inbound flights to be rerouted to Chattanooga Metropolitan Airport and grounded all outbound flights. During this same period, the smoke severely restricted visibility on the Tennessee River, particularly where it intersects with the Pellissippi Parkway (I-140).

Rail traffic on the Knoxville District Jellico Line travelling north alongside I-75 carrying Norfolk Southern trains was discontinued from the second day of the wildfire to the end of the recovery period. Rail traffic travelling north on the line east of the NC-WMA carrying CSX trains was discontinued from the fourth day of the wildfire to the end of the recovery period.

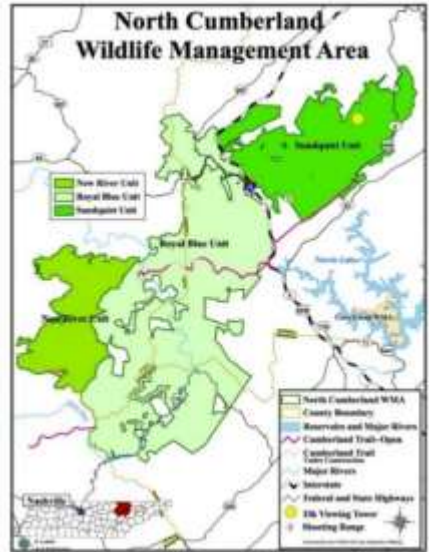


Figure 7 – North Cumberland Wildlife Management Area



Figure 8 – Wildfire Location



Figure 9 – Route 1: U.S. 25W



Figure 10 – Route 2: U.S. 27 to I-40

SCENARIO FINDINGS

Prior to each of the regional meetings, FAC members were sent the supply chain disruption scenario corresponding to their area. During the regional meetings, the research team made a formal presentation describing the scenario and answered any clarifying questions. A facilitated discussion was subsequently held during which FAC members were able to offer commentary on the scenario itself and as well as roles that FACs could serve in helping to manage the supply chain disruption. This produced the following summary observations:

- Depending on scenario impact severity, there could be long term disruptions in the supply chain, ranging from local to international consequences.
- The private sector generally has contingency plans that enable decisions to be made based on impact severity (e.g., hang tight, reroute, change mode or manufacturing location).
- Disruptions in rural areas are often overlooked that can have important supply chain implications.
- The lead response agency is typically TEMA (often with assistance provided by the local office of emergency management); however, FAC members are not typically consulted in response planning or incident management.
- If TEMA included the freight component in its response plans, there could be immediate benefits in terms of improving the ability for freight providers to distribute food, water, and supplies to needed areas.
- The longer term benefit of TEMA consultation with freight providers would be in restoring the freight network back to normal operations more quickly, reducing delays and costs associated with the disruption.
- Communication is critical. Information dissemination to the freight industry needs to leverage availability of variable message boards, social media, cell phones (including text messages), delivering a consistent message, and providing height, weight and other cargo restrictions on suggested diversion routes.

RECOMMENDED ACTIONS

Based on the aforementioned findings, TDOT is encouraged to take the following actions:

- Appoint one or more FAC members as representatives to participate in TDOT/TEMA operations planning and to attend/present at TDOT's annual incident management conference. In this manner, FAC members will be able to provide input and serve as a liaison to freight community.
- Have TDOT send out its route diversion plan to FACs for comment. Feedback received could prove instrumental in maintaining supply chain continuity and in providing food, water and supplies to areas of immediate need.
- Ask FACs to identify routes that need to be repaired/reopened in the event of a supply chain disruption.² This would consist of a prioritized list of critical freight infrastructure that could have the greatest impact on saving lives and maintaining economic vitality during an event. This could also impact planning in terms of how projects are prioritized to improve response/recovery.
- In concert with TDOT and TEMA, have FACs help develop a communications plan so that the freight industry is fully aware of the status of transportation disruptions during a hazard event.

These recommendations can be achieved through a follow-up project implemented as part of TDOT's research program.

² Within this recommendation, it is recognized that TEMA and TDOT's highest priority is to open main roads and corridors with respect to safety for the general public.

ACKNOWLEDGEMENTS

This project was sponsored by the Tennessee Department of Transportation, managed by its Research Office. The authors are appreciative of the support and cooperation provided by TDOT staff as well as members of the state's regional FACs.

REFERENCES

Center for Earthquake Research and Information, *CERI* (2017). "New Madrid Zone Earthquake Map." Available at: <http://folkworm.ceri.memphis.edu/REQ3/html/index2.html> (Accessed April 2017)

Federal Railroad Administration (2017). "Geographic Information System." Available at: <https://www.fra.dot.gov/Page/P0053> (Accessed June 2017)

Mid-America Earthquake Center (2008). "Impact of Earthquakes on the Central USA." *New Madrid Seismic Zone Catastrophic Earthquake Response Planning Project*. MAE Center Report No. 08-02

State Transportation Web Sites (accessed April 2017): Alabama Department of Transportation; Alaska Department of Transportation; Arizona Department of Transportation; Arkansas Highway and Transportation Department; California Department of Transportation; Colorado Department of Transportation; Connecticut Department of Transportation; Delaware Department of Transportation; Florida Department of Transportation; Georgia Department of Transportation; Hawaii Department of Transportation; Idaho Transportation Department; Illinois Department of Transportation; Indiana Department of Transportation; Iowa Department of Transportation; Kansas Department of Transportation; Kentucky Transportation Cabinet; Louisiana Department of Transportation & Development; Maine Department of Transportation; Maryland Department of Transportation; Massachusetts Department of Transportation; Michigan Department of Transportation; Minnesota Department of Transportation; Mississippi Department of Transportation; Missouri Department of Transportation; Montana Department of Transportation; Nebraska Nebraska Department of Roads; Nevada Department of Transportation; New Hampshire Department of Transportation; New Jersey Department of Transportation; New Mexico Highway and Transportation Department; New York State Department of Transportation; North Carolina Department of Transportation; North Dakota Department of Transportation Ohio Department of Transportation; Oklahoma Department of Transportation; Oregon Department of Transportation; Pennsylvania Department of Transportation; Rhode Island Department of Transportation; South Carolina Department of Transportation; South Dakota Department of Transportation; Texas Department of Transportation; Utah Department of Transportation; Vermont Agency of Transportation; Virginia Department of Transportation; Washington Department of Transportation; West Virginia Department of Transportation; Wisconsin Department of Transportation; Wyoming Department of Transportation

Tennessee Wildlife Resources Agency (2017). "North Cumberland OHV Riding Area." Available at: <https://www.tn.gov/twra/topic/north-cumberland-ohv-riding-area> (Accessed June 2017)

United States Geological Survey, *USGS* (2016). "The New Madrid Seismic Zone." Available at: <https://earthquake.usgs.gov/learn/topics/nmsz/> (Accessed April 2017)

US Army Corps of Engineers (2017). "J. Percy Priest Dam." Available at: <http://www.lrn.usace.army.mil/Locations/Dams/J-Percy-Priest-Dam/> (Accessed May 2017)

APPENDIX A - OTHER STATE FREIGHT PLANS AND FACS

ALABAMA

Formations - Alabama has an FAC, does not appear to have an FAC website

O Does have a freight planning page and a statewide freight plan where FAC summaries and other info can be found

Activities - Alabama's FAC has had three meetings: two in 2015 and one in 2016

ALASKA

Formations - Has formal AKDOT FAC and is divided amongst MPOs

Activities - Municipality of Anchorage FAC - Fairbanks Metropolitan Area Transportation System FAC

ARIZONA

Formations - Has a clear FAC and role

Activities - Arizona State Freight Plan in development

ARKANSAS

Formations - Arkansas has a website dedicated to its state freight plan - Arkansas FAC has a section

Activities - FAC has been meeting since August 2015

O "Improve resiliency through improving segments with elevated risk of failure and important freight impacts"

O Freight plan does not appear to be finished, but FAC seems to be heavily involved

CALIFORNIA

Formations - CalTrans California Freight Advisory Committee (CFAC)

O Organized and well established

Activities - California Freight Mobility Plan (2014)

COLORADO

Formations - CDOT's Colorado Freight Advisory Council

O Clear purpose and organizational structure

Activities - FAC agenda packet and charter

CONNECTICUT

Formations - Does not appear to have a formal FAC

O Does have a freight program page on CTDOT's website

Activities - Has a private stakeholder survey - CT State Rail Plan

DELAWARE

Formations - Delmarva Freight and Goods Movement Working Group formed under Wilmington Area Planning Council (WILMAPCO)

O Serves as FAC for Delaware

Activities - Delmarva Freight Plan (2015) serves as Delaware's state freight plan with regional coordination from VA and MD

- O Delmarva is the large peninsula consisting of Delaware and Maryland and Virginia's Eastern Shores
- O Freight plan mentions the Delmarva Freight Summit and the Delmarva Freight and Goods Movement Working Group meetings

DELEWARE VALLEY REGIONAL COMMISSION

Formations - Serves nine counties: Bucks, Chester, Delaware, Montgomery and Philadelphia in Pennsylvania; and Burlington, Camden, Gloucester and Mercer in New Jersey

O Delaware Valley Goods Movement Task Force serves as the FAC for the Commission

O Co-chaired with PennDOT

Activities – Does not actually include the State of Delaware

O Serves Philadelphia and the surrounding area

O Very sophisticated; could serve as a model

FLORIDA

Formations - Appears to be formed under the Florida Metropolitan Planning Organization Advisory Council (Florida MPOAC)

O Created the Florida MPO Advisory Council Freight Committee to foster and support sound freight planning and freight initiatives

Activities - MPOAC Freight Committee Vision & Mission

O Understand the economic effects of proposed freight - supportive projects

O Foster relationships between public agencies with responsibilities for freight movement and private freight interests

O Reduce policy barriers to goods movement to, from, and within Florida

O Meets once or twice a year

GEORGIA

Formations - Georgia DOT does not have a formal FAC, but a version of one was used in the Georgia Statewide Freight & Logistics Action Plan

Activities - Freight Plan developed by government organizations and a private sector stakeholder advisory committee (PSAC)

O "The PSAC met throughout the project to ensure industry input was obtained and integrated into technical decision making associated with planning analysis and development of project recommendations"

HAWAII

Formations - Does not appear to have a formal FAC under HDOT

Activities – Hawaii Statewide Transportation Plan (2011)

IDAHO

Formations - Freight in Idaho, Has page on ITD website for their FAC

Activities - FAC performed statewide freight study (2013)

O Has heavy focus on risk mitigation and risky decisions/behaviors

ILLINOIS

Formations - IDOT has a “Freight Advisory Council” with a page on the IDOT website

Activities - Freight mobility plan (2012)

○ IDOT is working with the Illinois State Freight Advisory Council to update the existing plan

○ Long Range Transportation Plan is supposed to be released later in 2017

INDIANA

Formations - Has a form of an FAC, constituted by Conexus, Indiana’s transportation and logistics development group that is separate from INDOT

Activities - Indiana’s most recent state freight plan: 2014 Multimodal Freight and Mobility Plan

KENTUCKY

Formations - Does not have an active FAC, but is planning to form one as described in its June 2016 State Freight Plan press release

Activities - Kentucky’s State Freight Plan

○ Does not seem to mention disruption mitigation

○ Apparently various freight stakeholders convene on project basis

MAINE

Formations – Maine DOT Office of Freight and Business Services

○ Does not appear to have a formal FAC

Activities - Maine's Integrated Freight Strategy Final Report

○ Serves as state freight plan

○ Mentions a freight transportation advisory committee; however, couldn’t find documentation or website

MARYLAND

Formations - MDOT'S Office of Freight and Multimodalism: Freight Planning

○ Freight planning page is the landing for the FAC - Details vision, mission and membership

Activities - Strategic Goods Movement Plan (Maryland state freight plan – 2015)

○ Does not really mention risk or disruption mitigation

MASSACHUSETTS

Formations - Freight Advisory Committee formed under MassDOT to help create the state freight plan

Activities - Met for the first time in January 2017

MINNESOTA

Formations - The Minnesota Freight Advisory Committee is well established and is one of the first FACs in the nation (established in 1998)

○ MFAC has a tab on Minnesota’s Statewide Freight System Plan webpage

Activities - MFAC played an active role in the Statewide Freight System Plan (May 2016)

○ MnDOT and MFAC work closely for freight planning and development

MISSISSIPPI

Formations - MDOT has a webpage for its FAC

Activities – Mississippi Statewide Freight Plan (February 2015)

O Outlines purpose of the FAC consistent with FHWA guidance

O “In the future, the envisioned principal role of FAC would be to facilitate strategic information exchange and coordination among Mississippi’s diverse group of freight stakeholders regarding freight needs and potential solutions in the state”

O Neither the FAC webpage nor the freight plan really mention risk or disruption mitigation

MISSOURI

Formations - Does not have a freight advisory committee, but does have an internal committee including Department of Natural Resources, Missouri Economic Development that meets with freight stakeholders on a project basis

Activities - They do have a Freight Plan (2014) that mentions the need for an FAC

MONTANA

Formations – Does not appear to have an FAC

Activities - 2010 Montana State Rail Plan

NEVADA

Formations - Nevada DOT has shared page for their state freight plan and FAC

O FAC involved in SFP development

Activities - State Freight Plan (2015)

O Details FAC bylaws and membership

NEW HAMPSHIRE

Formations – Does not have a FAC, does have a Bureau of Rail and Transit

O Freight focuses on rail

Activities - New Hampshire State Rail Plan

O References a technical advisory committee

NEW JERSEY

Formations - Appears to be divided into three metropolitan planning organizations

O North Jersey Transportation Planning Authority – Freight Planning - Freight Initiatives Committee serves as their FAC - Meets roughly every two months

O Delaware Valley Regional Planning Commission – Freight Planning

O South Jersey Transportation Planning Organization - Has a technical advisory committee, not necessarily an FAC

Activities - Most recent state freight plan was 2007

O Mentions “freight plan advisory board”

NEW MEXICO

Formations – Does not appear to have a formal FAC under NMDOT

O NMDOT Statewide Planning Bureau

Activities - NMDOT's Long Range, Multi-Modal Transportation Plan (2015)

O Mentions need for FAC, responsibilities and stakeholder status

O New Mexico Freight Plan (2015)

NEW YORK

Formations - NYDOT does not have formal FAC

O Utilizes MPOs

Activities - Capital District Transportation Committee – Freight Advisory Committee (Albany)

O Meets quarterly

O Future CDTC freight planning studies

NORTH CAROLINA

Formations - North Carolina Association of Metropolitan Planning Organizations appears to be in charge of an FAC

O NCDOT's Statewide Logistics Plan does not appear to be the state freight plan that FHWA requires per the FAST Act

Activities - Freight, the FAST Act and State and Regional Planning Efforts in North Carolina (May 2016) – from NCAMPO

NORTH DAKOTA

Formations - North Dakota freight planning

Activities - NDDOT State Freight Plan (2015)

O No mention of FAC

OHIO

Formations - Does not appear to have a FAC

O ODOT does have a Maritime and Freight Program under their Division of Planning

Activities - Transport Ohio is Ohio's FAST Act compliant freight plan (2017)

O Only mentions an FAC once, not really consequential

OREGON

Formations - Formed under ODOT and has a webpage for both its FAC and State Freight Plan

O FAC bylaws and mission – Does not mention supply chain disruption

O Focuses on freight mobility - State Freight Plan adopted by Oregon Transportation Commission in 2011

Activities - Focused on freight highway bottlenecks - State Freight Plan recognizes the following:

O Lack of highway system redundancy makes the state's freight system vulnerable to disruptions caused by weather, the need to move non-divisible loads in key corridors and congestion/safety related delays

O Monitoring of where clusters of industries that require permitted loads are locating will reduce disruptions in the flow of goods

O Congestion and unreliable travel time on roads to access major intermodal facilities can cause disruptions to freight movement and industry supply chains

O Strategy 11.1: Create a statewide emergency management plan that identifies critical vulnerable points from a freight mobility perspective and places where there is a lack of system redundancy. Create freight movement emergency plans for disruptions at these locations that include information about possible alternative routes.

O Strategy 11.2: Develop and maintain transportation models that account for freight logistics and routing behavior in order to evaluate effects of disruptions on freight movement at the state, regional and urban levels.

Strategy 11.3: Retain critical existing redundancy elements (for example, rail lines currently not in use, but parallel to a highway facility). Infrastructure that is currently underutilized may become the primary link in the case of serious disruption on the primary facility.

PENNSYLVANIA

Formations - Has well established Rail Freight Advisory Committee (RFAC)

O Specific to rail, not freight in general

Activities - Pennsylvania Comprehensive Freight Movement Plan

O Mentions FACs but focuses on existing RFAC

RHODE ISLAND

Formations - Rhode Island Freight Planning

O Has informal FAC

Activities - Rhode Island State Freight & Goods Movement Plan (2016)

O Details FAC and claims it will be formally established in 2016

SOUTH CAROLINA

Formations - SCDOT does not appear to have a formal FAC, though it mentions it in their Statewide Freight Plan

Activities - South Carolina's Statewide Freight Plan (August 2014)

O Details purpose, duties and responsibilities of the FAC

SOUTH DAKOTA

Formations – Does not appear to have an FAC

Activities - State Rail Plan

TEXAS

Formations - Texas Freight Advisory Committee is well established and has specific website for freight and the FAC

O Includes FAC Framework

Activities - Texas Freight Mobility Plan (January 2016)

O FAC involved with development of state freight plan and other activities

UTAH

Formations - Freight Planning - Utah's FAC is called Utah Freight Mobility Group

O No clear website or page

Activities - State Freight Plan (2015)

O Cites its FAC mentioned above

VERMONT

Formations – Does not appear to have an FAC

O Freight seems to focus on rail

Activities - Freight Plan (2015)

O Included a “study advisory committee”

O Vermont State Rail Plan (2015)

VIRGINIA

Formations - Virginia’s Office of Intermodal Planning and Investment, or VTrans

O Is located within the Office of the Secretary of Transportation, not VDOT

O Contains the Virginia FAC

Activities - VTrans created the Virginia Multimodal Freight Plan (2014)

O Increase coordinated freight safety and security planning

O Minimize supply chain disruption

O FAC mentioned with relevant planning/advisory roles - FAC has been active since approximately 2008 and has produced five different narratives:

- Truck driver labor shortage
- Freight technologies
- Dual on-dock rail access at the Port of Virginia
- America’s marine highway initiative: short-sea shipping
- Freight impacts on the environment and energy usage

WASHINGTON

Formations - Has a page for its FAC on Freight Mobility Strategic Investment Board site

O Details provided on roles, participation and membership

Activities - 2017 update to Washington State Freight System Plan

O Confirms FAST Act requirement to consult FAC

WEST VIRGINIA

Formations - Does not appear to have an FAC

O Have set up consulting contracts, however

Activities - West Virginia State Freight Plan (2016)

O How West Virginia is being aligned with MAP-21 (2014)

WISCONSIN

Formations - Wisconsin DOT has FAC and a page on its DOT website

O Each member serves for a period of up to two years

O *Activities* - State Freight Plan, Draft Chapters (2017)

O Details purpose and members of Wisconsin’s FAC

O FAC is cited throughout the plan for its input on various subjects

O Disruption consequences and future possibilities are mentioned

WYOMING

Formations - Has had informal FAC since 2014

O no website or page on WyDOT; seems sophisticated however

Activities - Statewide Freight Plan (2015)

O Details Wyoming State Freight Advisory Committee, bylaws, membership, etc.

APPENDIX B – TENNESSEE FAC PARTICIPANT SURVEY

Name:

Organization:

Title:

1. What is your role in freight supply chains?

- ◆ Shipper
- ◆ Carrier
- ◆ Government
- ◆ Other: _____

2. What has been your involvement with TDOT Freight Advisory Committees?

- ◆ Statewide
- ◆ West
- ◆ Middle
- ◆ East
- ◆ Other: _____

3. What role do you play in the face of freight supply chain disruption in your organization?

4. What plans or strategies have been helpful in responding to freight supply chain disruptions?

5. What aspects of the recovery effort were not considered and should be implemented in the future?

6. Do you think the FAC's could serve as a useful role in supply disruption planning, response and/or recovery?

If you'd like to receive additional information about this research please provide your email:

APPENDIX C – PARTICIPANT SURVEY RESULTS

Title	Role	Region	Role in FSC Disruptions	Helpful Plans or Strategies	Recovery Aspects Not Considered	How could FACs be useful in FSC disruption planning, response and/or recovery?
MTPO Coordinator	Government	East	Planning, Research	Collaborative efforts such as FAC meetings	Coordination between public and private sectors, emergency traffic management	Promote trail to rail options, economic development; provide plan for alternative corridors during disruptions, funding for truck to rail; FACs could provide and manage coordination with all agencies to minimize disruption, truck to rail plans and funding
Transportation Planning Coordinator and Executive Secretary to the Executive Board	Government	East	Planning	Establishment of new EOC for Washington County and First Tennessee Homeland Security District for I-26; Working with TEMA, local EMAs and TDOT Incident Management to assist in training for local first responders for TIMS	Coordination between public and private sectors; Continued education/training is needed at the local level for incident management on the interstate	I think it is vital for government and private sector to collaborate on "keeping freight moving." Specifically, first responders learning how to manage incidents on the Interstate system and major highways; Education and identification of problems in the transportation network. Government officials do not understand logistics of freight movement and thus do not understand freight transportation delays.
Sr Transportation Engineer	Government	East	Planning	Collaborative efforts such as FAC meetings		
Sr. Logistics Mgr., II	Shipper	East	Planning, Response, Recovery, Operations	Learning on the job, Internal efforts by my organization, partnering with local suppliers		
	Research	East	Research	TRB materials, internal projects for USDOT		The FAC, plus additional public and private sector leaders should conduct table top exercises dealing with disruptions of several types to better prepare; A network of public and private partners can better respond to a natural or terrorist disaster. The FAC can take a lead role in educating and convening the freight community for this purpose; Continued communication regarding needs, encouraging of mode shift to make sure that critical commodities move
MTPO Coordinator	Government	East	Planning	Learning on the job, Collaborative efforts such as FAC meetings	Inputs on non-transportation infrastructure (utilities like power, water and sewage)	Doing surveys
Captain	Shipper	East	Sales	Collaborative efforts such as FAC meetings	Inputs on non-transportation infrastructure (utilities like power, water and sewage)	
Director	Engineer	East	Response, Operations, Sales	Learning on the job, Internal efforts by my organization		Planning for future supply chain disruptions will rarely apply to a real world disruption... Possibly develop the process to work through disruptions; Studying how each possible disruption can be managed; Developing a process that could be followed for specific disruptions such as a major infrastructure disruption such as IBS in Atlanta recently
President	Shipper	East	Response, Recovery, Operations	Disruptions have mostly been weather related. Strategy of routing around weather has been primary solution	No	I believe the FAC team has experience and skills to plan useful disruption strategies
Dir. Existing Biz Dvlp.	Government	East		Collaborative efforts such as FAC meetings	Inputs on non-transportation infrastructure (utilities like power, water and sewage)	
Planning Supervisor	Government	East	Planning	Internal efforts by my organization, Collaborative efforts such as FAC meetings	Inputs on non-transportation infrastructure (utilities like power, water and sewage)	
Vice President of Planning and Development	Airport	East	Planning, Response, Operations; Handle air cargo disruptions, provide ramp and equipment to transfer between modes	Internal efforts by my organization; Development of 3 air cargo handling areas on the airport	Coordination between public and private sectors	Actually utilize the talents of the FAC members to put this in place; Great deal by ensuring infrastructure is in place. Consider infrastructure as a whole (statewide) and not think another entity (highways, rail, airports, waterways) is responsible. Collaboration and working together to put statewide infrastructure in place; Having plans, resources, and infrastructure in place with a communications line established. Who to contact and how; Develop a Command Center to manage response actions
RPO Coordinator / Regional Planner	Government	East	Our agency has not been involved in freight planning		Coordination between public and private sectors	Assist local governments and development districts with freight planning, study, analysis.
Knox County Trustee	Government	East	Planning	Learning on the job, Internal efforts by my organization, Collaborative efforts such as FAC meetings	Coordination between public and private sectors	
MPO Coordinator	Government	East	Planning	No experience other than closure of US 64/74 by rock slide		Planning for system redundancy in areas of heavy freight demand; Contact list of people for DOT to advise on the emergency response to protect transportation routes; advise on needed improvements
Government Relations Manager	Carrier	East	Communications and Networking	Internal efforts by my organization, notices of disrupters (accidents, weather related closures) and advance notices when possible (construction, etc)	Coordination can always be better with locals and non-transportation world	Develop alternative freight routes and real time communication channels to freight haulers through on board computers, gps, etc. based on data. Continue to support driver assisted technology; Communication to TN based carriers of alternative routes, and information
GM	Shipper	Middle	Planning, Response, Recovery, Operations, Sales	Learning on the job, Internal efforts by my organization		As much notice as one can give to allow other plans to take place; As more people move to TN, traffic flow is critical to maintaining our freight.
Senior Transportation Planner	MPO	Middle	Planning	Collaborative efforts such as FAC meetings	Coordination between public and private sectors, Inputs on non-transportation infrastructure (utilities like power, water and sewage)	By fully engaging private sector carriers, manufacturers, planners, and elected officials, the FAC can help develop plans, policies and strategies to be adopted/implemented across various levels of government. The FAC can also serve to give a greater voice to the needs of the users of the system (truckers, carriers, etc.); The FAC could help facilitate regional response and recovery strategies across multiple jurisdictions and levels of government. Achieving the buy in or singular or complementary strategies across counties and jurisdictions (and between the state and localities) can help improve efficiency and response time.
Region 3 Director of Project Development	Engineer	Middle	Engineering	Learning on the job, Collaborative efforts such as FAC meetings	Coordination between public and private sectors, Inputs on non-transportation infrastructure (utilities like power, water and sewage)	
Dale Hollow RPO Coordinator	RPO	Middle	Planning	Learning on the job	Coordination between public and private sectors, Inputs on non-transportation infrastructure (utilities like power, water and sewage)	Communication
Executive Director	Government	Middle	Economic Development	Learning on the job, Collaborative efforts such as FAC meetings		
Director, Aftermarket Distribution	Shipper	Middle	Planning, Recovery, Operations	Internal efforts by my organization	Coordination between public and private sectors	I believe that the people involved in FAC have the outreach and contacts to forward plan and assist in recovery operations; There are many small organizations that don't have the expertise to work through a major disruption and FAC could assist in that manner; to play a facilitator role
Account Manager	Carrier	Middle	Sales	Learning on the job, Internal efforts by my organization	Coordination between public and private sectors	
Center Hill RPO Coordinator	Government	Middle	Planning	Learning on the job		Inventory of current issues and potential growth; Addressing local traffic issues and implementing road safety plans

Title	Role	Region	Role in FSC Disruptions	Helpful Plans or Strategies	Recovery Aspects Not Considered	How could FACs be useful in FSC disruption planning, response and/or recovery?
VP Strategic Planning and Sustainability	Government	Middle	Planning	Collaborative efforts such as FAC meetings	Coordination between public and private sectors, Inputs on non-transportation infrastructure (utilities like power, water and sewage)	Planning safe routes for truck traffic will assist with de-congestion and improve supply chain delivery; Understanding problematic areas of travel and developing ways to resolve; Having systems in place for resiliency
	Government	Statewide	Planning	Internal efforts by my organization	Inputs on non-transportation infrastructure (utilities like power, water and sewage)	
Associate Professor	University	Statewide	Planning	Collaborative efforts such as FAC meetings	Coordination between public and private sectors, Inputs on non-transportation infrastructure (utilities like power, water and sewage)	Allow stakeholders to present their freight related activities and research findings at FAC meetings. This will allow discussion of the issues raised and may lead to better improvement of the freight industry in Tennessee
Director	University	Statewide	Planning, Response	Internal efforts by my organization, Industry/agency cooperative agreements	Inputs on non-transportation infrastructure (utilities like power, water and sewage)	Severe supply chain disruptions are likely to occur far outside the borders on the state, or even the country, making it challenging for a state FAC to address them. It could be beneficial in dealing with local disasters that are within the jurisdictional boundaries of state and local agencies in Tennessee; Probably to help state agencies determine appropriate roles and responses to various scenarios. The FAC does provide a networking opportunity to help acquaint public sector officials with supply chain managers from industry. Dialog between the two should be useful in developing response plans; To date, the FACs have not had diverse enough representation to effectively play a useful role. Membership needs to be expanded for the FACs to play a major role in addressing supply chain disruptions, generally.
Director of Project Development	Government	Statewide	Planning, Response	Internal efforts by my organization	Coordination between public and private sectors, Inputs on non-transportation infrastructure (utilities like power, water and sewage)	
Membership Coordinator	Shipper	Statewide	We work to assist trucking companies in freight movement	Collaborative efforts such as FAC meetings	Coordination between public and private sectors	Planning is always good, to know what the plan is before you have the issues also is a great factor as to how you respond to issues; I think it helps to work out different scenarios so when you do have to respond then you already have a good idea of what you need to do;
Planner	Government	Statewide & East	Planning	Internal efforts by my organization	Coordination between public and private sectors	Get more stakeholders to the meetings
President	Shipper	Statewide & East	Planning, Response, Recovery, Operations	Learning on the job	Coordination between public and private sectors	Anything that improves the communication between all parties and the realization of the how essential the supply chain is to everyone's daily lives proves it's usefulness; They serve to build relationships and a network of stakeholders who recognize the importance of coordination and cooperation
Principle Engineer and Rail Security Coordinator	Shipper	Statewide & East	Planning, Response, Operations	Internal efforts by my organization	Coordination between public and private sectors, Inputs on non-transportation infrastructure (utilities like power, water and sewage)	Identifying potential disaster scenarios to consider; Assessing magnitude of freight disruption by looking at different scenarios. Collaboration on alternative freight options; Collaboration on alternative freight options. Some companies may be affected while others not affected. If certain corridors or storage facilities are closed then collaboration and cooperation between FAC member companies might result in a response alternate solution that keeps freight moving
Asst. Chief	Government	Statewide & East	Liason between industry and TDOT	Collaborative efforts such as FAC meetings	Coordination between public and private sectors	Great extent to learn from others
Director of Strategic Long Range Planning	Government	Statewide & East	Planning	Collaborative efforts such as FAC meetings		
Employee		Statewide & Middle	Planning, Recovery	Internal efforts by my organization, Collaborative efforts such as FAC meetings	Coordination between public and private sectors, Inputs on non-transportation infrastructure (utilities like power, water and sewage)	
Professor	University	Statewide & Middle	Planning	Internal efforts by my organization	Coordination between public and private sectors, Inputs on non-transportation infrastructure (utilities like power, water and sewage)	One of the few groups that bring together public and private freight stakeholders; Planning Identification of hotspots; manage ongoing resource allocation
Mayor	Government	Statewide & West			Coordination between public and private sectors	
President and CEO	Carrier	Statewide & West	Planning, Response, Recovery	Learning on the job, Internal efforts by my organization, Collaborative efforts such as FAC meetings	Coordination between public and private sectors, Inputs on non-transportation infrastructure (utilities like power, water and sewage)	
Senior Vice President	Engineer	West	Planning, Response, Operations	Collaborative efforts such as FAC meetings, Identifying potential issues and developing well thought out plans before hand to address them	Coordination between public and private sectors	It is but one cog in the wheel. It can be a forum for issues to be raised and potential solutions to be discussed; Preparation for events; Planning for redundancy
Engineer	Government	West	Support	Learning on the job, Internal efforts by my organization, Collaborative efforts such as FAC meetings	Inputs on non-transportation infrastructure (utilities like power, water and sewage)	
President	Carrier	West	Operations	Learning on the job	Coordination between public and private sectors	
Director of Planning	Government	West	Planning, Operations	Collaborative efforts such as FAC meetings	Coordination between public and private sectors, Inputs on non-transportation infrastructure (utilities like power, water and sewage)	
Regional Planner / RPO Coordinator	RPO	West	Planning, Response	Learning on the job, Collaborative efforts such as FAC meetings	Inputs on non-transportation infrastructure (utilities like power, water and sewage)	Involving locals in the planning process
Transportation/Civil Engineer	Engineer	West	Planning	Internal efforts by my organization		
Sales	Carrier	West	Operations, Sales	Learning on the job, Internal efforts by my organization	Coordination between public and private sectors	Direct communication with carriers; Forecasting and emergency preparedness; Coordinating efforts between shippers/carriers
Public Works Director	Government	West	Response	Learning on the job	Coordination between public and private sectors	
SVP Public Policy	Government	West	Planning	Collaborative efforts such as FAC meetings	Coordination between public and private sectors	Advising on project impact to supply chain disruption to ensure it is incorporated into the planning/review process for projects; Advising on plans to coordinate between public and private sectors
Director Public Private Partnerships	Carrier	West	Planning, Operations	Internal efforts by my organization, Collaborative efforts such as FAC meetings		
Transportation Planner	Government	West	Planning	Collaborative efforts such as FAC meetings		Medium for information exchange
VP/GM	Carrier		Planning, Operations, Sales	Learning on the job	Coordination between public and private sectors	
Vice President	Government		Planning	Learning on the job, Internal efforts by my organization, Collaborative efforts such as FAC meetings	Coordination between public and private sectors, Inputs on non-transportation infrastructure (utilities like power, water and sewage)	Maintain communication between public and private sectors; monitoring both the public sector and private sector operations;
Tenured Assistant Professor	University		Planning	Collaborative efforts such as FAC meetings	Coordination between public and private sectors	