

Supply Chain Resilience: Analysis and Solutions

Keeping Critical Commodities Flowing Before, During, and After Disasters

Over the past 10 years, CNA has pioneered methods for regional analysis of supply chains and delivery networks for food, fuel, water, and other lifeline commodities to support emergency management planning and operations—because keeping these commodities flowing to survivors can help prevent a disaster from becoming a catastrophe.

Lifeline commodities:



Groceries



Fuel



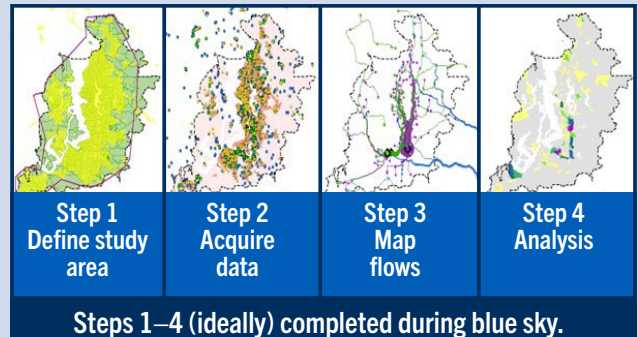
Water

CNA SCOPE™ Method

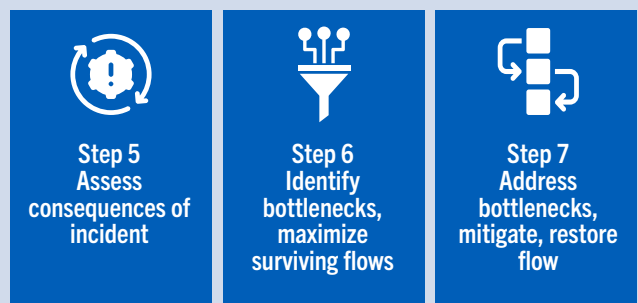
CNA developed the CNA Supply Chain Operational Engagement (CNA SCOPE) method, a geospatial-based approach to supply chain analysis that characterizes lifeline commodity networks and informs both public and private sector decision-makers. The CNA SCOPE method is unique in providing holistic, region-wide, network-informed views of flows of commodities during “blue sky” and disruptions. Through this method, we provide jurisdictions with material insights and benefits, including the following:

- A common map of lifeline commodity (food, fuel, water, etc.) flows into and through the region, leading to a shared understanding of supply chain networks, including critical dependencies, players, and bottlenecks
- A process for developing and validating network characterizations that productively engages both the public and private sectors
- Improving public and private sector disaster preparedness by uncovering significant vulnerabilities within networks and for specific populations; identifying key network resources and monitoring points; and building relationships to quickly detect disruptions and develop solutions to restore and maximize flow during incidents

CNA SCOPE™ Method Illustrated

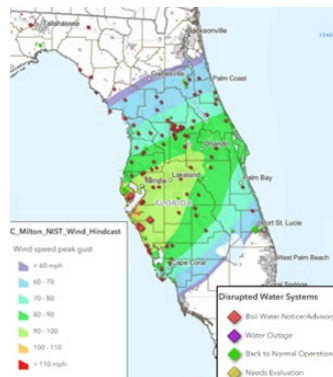
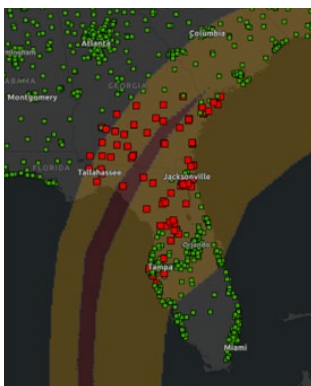
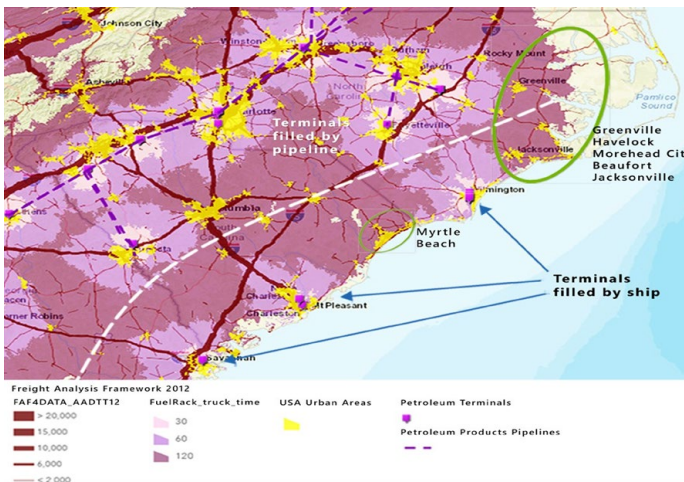


Disaster occurs



Real-Time Disaster Activation Support

As a founding member of the **Supply Chain Analysis Network (SCAN)**, CNA provides decision-makers in FEMA's Logistics Management Directorate with timely intelligence analysis of flows of critical life-sustaining commodities and utilities, such as groceries, fuel, water, and electrical power, as well as the status of the critical enablers of these commodities, such as transportation and freight movement infrastructure, the electrical power grid, pipelines, and telecommunications and banking systems. Since its founding in 2019, the SCAN team has activated for 16 major disasters, including Hurricanes Dorian (2019), Ian (2022), and Helene and Milton (2024) as well as the COVID-19 pandemic. SCAN also developed two National Strategic Supply Chain Resilience Assessments (ahead of the 2022 and 2023 hurricane seasons).

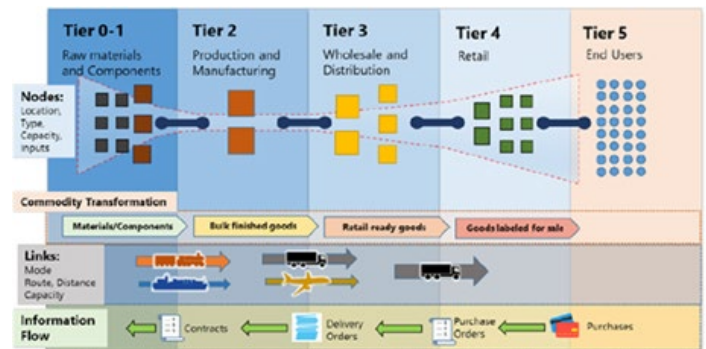


SCAN monitoring of fuel supply chains (top), grocery status (left) and water system status (right) during hurricane activations.

Methods Development and Technical Assistance

CNA has led the development of methods to conceptualize and analyze supply chain vulnerabilities to critical hazards for the National Risk Management Center of the Cybersecurity and Infrastructure Security Agency (CISA), delivering both a proof-of-concept project culminating in a public-private exercise and a methodology report and tools for CISA analysts.

Since 2015, CNA has also provided the lead subject matter expert for FEMA's Supply Chain Resilience Technical Assistance program, which supports development of local supply chain analytic capabilities in Boston, Chicago, Dallas, Los Angeles, Memphis, Philadelphia, San Diego, San Francisco, Puget Sound (Washington), Utah, and Washington, DC. CNA supports these jurisdictions through in-person workshops, targeted expert assistance, and opportunities for peer-to-peer learning.



Blue-Sky Characterization of Supply Chains

In addition to incident response support, CNA conducts baseline assessments to characterize supply chains and infrastructure systems that provide essential commodities under blue-sky conditions, often to prepare for large-scale exercises. Since 2020, SCAN has conducted a National Fuel Ecosystem Assessment (2021) and five regional assessments: the Wasatch Fault Zone (2020); the Cascadia Subduction Zone (2021); Pacific States and Territories (2023); the New Madrid Seismic Zone (2024); and Southern California (2025).

CNA also regularly characterizes supply chains for regional catastrophic planning projects, including food and water systems for Houston, the San Francisco Bay Area, Puget Sound, and the National Capital Region. In these projects, we produce seminars, geospatial analysis tools, planning reports, and incident playbooks and organize workshops and exercises for public and private sector key players.

Critical Commodity Catastrophic Resilience Plans

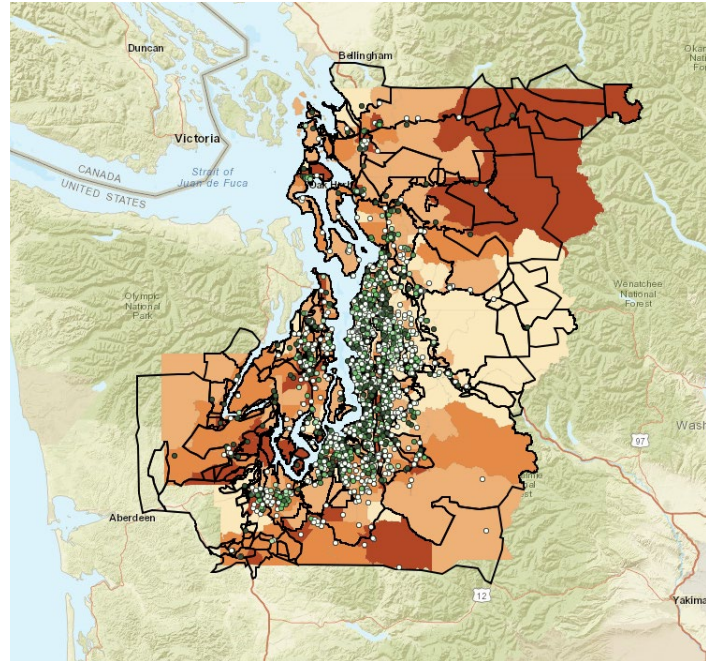
Our clients turn to CNA for resilience planning when standard emergency management planning methods aren't sufficient.

Community point of distribution (CPOD) planning.

In Puget Sound, we adapted traditional CPOD methods to account for planning for islanded populations after a Cascadia Subduction Zone earthquake, included hazard screening, and developed a multi-indicator prioritization method (including logistics considerations, food access, population density, and other local data) to ensure sites selected were best-suited to meet the community's needs. A follow-up project built relationships with local food processors that could supply CPODs post-earthquake.

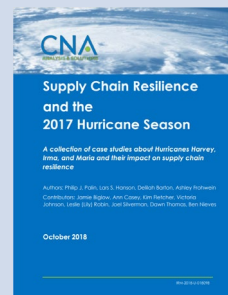
Public sector fuel plans and fuel point of distribution (FPOD) planning.

A project for the Oregon Department of Energy mapped statewide energy flows and developed a site evaluation method for selecting emergency fuel storage locations resilient to catastrophic earthquakes. We have also helped local governments in the Portland (Oregon) and Philadelphia regions calculate critical fuel needs (e.g., emergency vehicles, generators) and develop emergency fuel allocation and distribution plans.



CPOD site prioritization modeled population islands in Puget Sound to plan for the Cascadia Subduction Zone Earthquake Scenario

Supply Chain–Focused After-Action Reports



CNA completed a series of supply chain [case studies](#) after the 2017 hurricane season that informed a National Academies consensus report on the topic.

About CNA

CNA is a not-for-profit analytical organization dedicated to the safety and security of the nation. With nearly 700 scientists, analysts, and professional staff across the world, CNA's mission is to provide data-driven, innovative solutions to our nation's toughest problems. It operates the Center for Naval Analyses—the Department of the Navy's federally funded research and development center (FFRDC)—as well as the Institute for Public Research. The Center for Naval Analyses provides objective analytics to inform the decision-making by military leaders and ultimately improve the lethality and effectiveness of the joint force. The Institute for Public Research leverages data analytics and innovative methods to support federal, state, and local government officials as they work to advance national and homeland security.

To learn more about supply chain resilience at CNA, contact Lars Hanson at hansonl@cna.org.