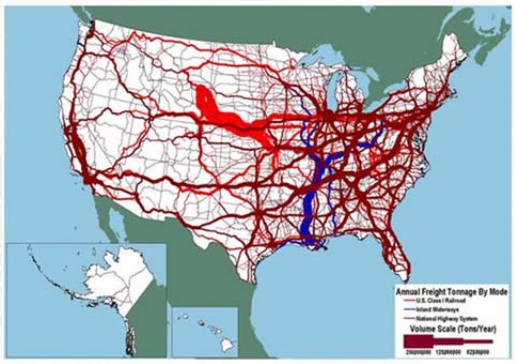
Center for Transportation Analysis (CTA) Overview

The mission of the Center for Transportation Analysis (CTA) at Oak Ridge National Laboratory (ORNL) is to provide solutions for assuring the safe, efficient and secure movement of people and goods on resilient transportation systems. Staff expertise is extensive and diverse, ranging from risk assessment, to policy analysis and military mobilization. At any one time, staff are advancing transportation science through 30-40 different research projects.

CTA has delivered 20+ years of Research Excellence in critical areas of national significance, including the fusion of security, safety, energy efficiency and transportation system performance. CTA has seven major focus areas for our research: Freight and Passenger Flows, Transportation Energy Efficiency, Transportation Safety and Security, Supply Chain Efficiency, Climate Change, Vehicle Technologies, and Enterprise Modeling. CTA is in the Energy and Transportation Science Division (ETSD).

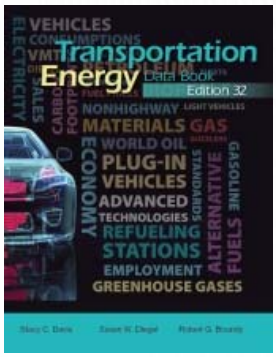
Freight and Passenger Flows

Freight and passenger flows use the ORNL Intermodal Network (rail, highway, and waterway) and freight and passenger flow models to generate routes and schedules over the intermodal network. These networks can be used for individual routes or large scale route planning. The US Department of Transportation's Freight Analysis Framework (http://ops.fhwa.dot.gov/freight/freight_analysis/faf/index.htm) and the National Household Travel Survey (http://nhts.ornl.gov/) are two of the major products that have been developed from the ORNL Intermodal Network and models.



Transportation Energy Efficiency

Transportation energy efficiency involves the analysis of energy efficiency technology adoption rates, such as plug-in hybrids and planning for transportation sustainable infrastructure. ORNL hosts the www.fueleconomy.gov web site and the Fuel Economy Guide brochure that provides gas mileage (MPG), greenhouse gas emissions, air pollution ratings, and safety information for new and used cars and trucks sold in the United States. The Transportation Energy Data Book and its associated web site (http://cta.ornl.gov/data/index.shtml) are published annually for the US Department of Energy (DOE). Transportation Transition projects have included developing a model of consumer choice among advanced vehicle technologies and assessing of the potential for policies and advanced technology to reduce emissions of greenhouse gases from the U.S. transportation sector.



Transportation Safety and Security

Transportation safety and security focuses making the transportation system and the vehicles using it secure and safe. This includes work in motor carrier and passenger vehicle safety analysis. CTA works closely with the Department of Homeland Security and Department of Energy to develop technologies to increase the security of freight and passenger movements. Research in this area includes work to enhance the security of transit systems, air cargo, motor carriers, railways, hazardous materials shipments, and inland waterway barge shipments.

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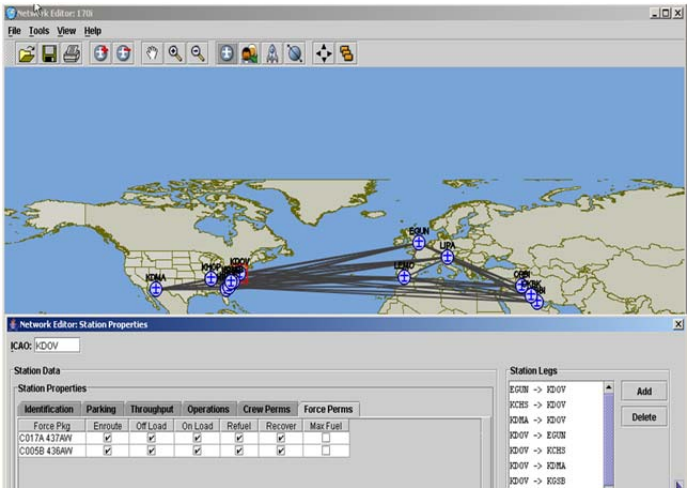
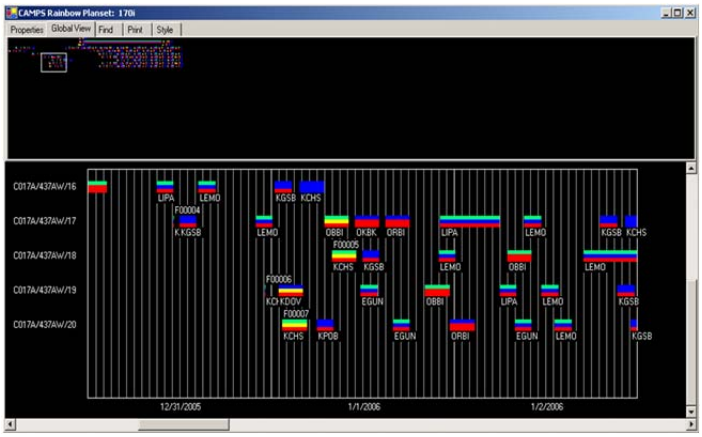
Experience

ORNL staff has developed a number of Transportation Decision Support systems for government customers. The Consolidated Air Mobility Planning System (CAMPS) was developed for the US Air Force's Air Mobility Command (AMC) to schedule cargo and passenger airlift missions and air refueling missions. This system is used 24/7 to schedule AMC's airlift missions for contingencies, exercises, regularly scheduled, and special airlift missions.

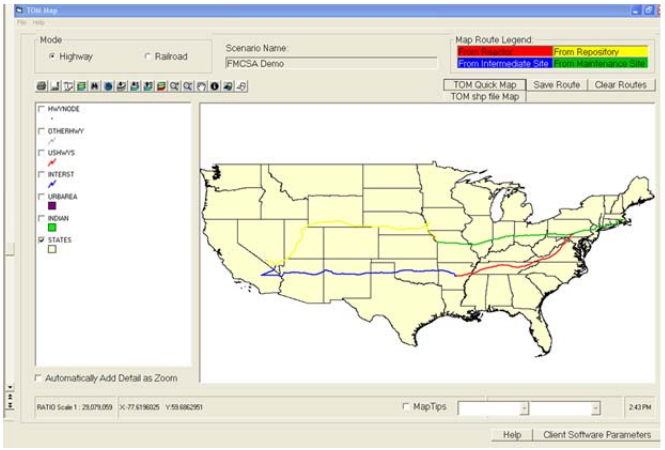


Airlift Network Design

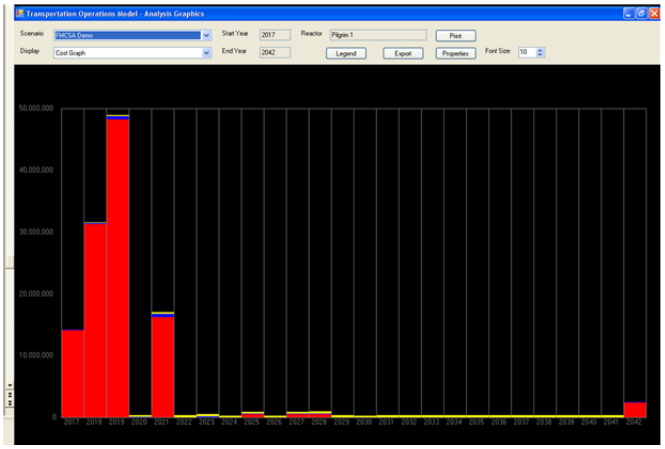


Airlift Schedules with Activities at Each Airfield

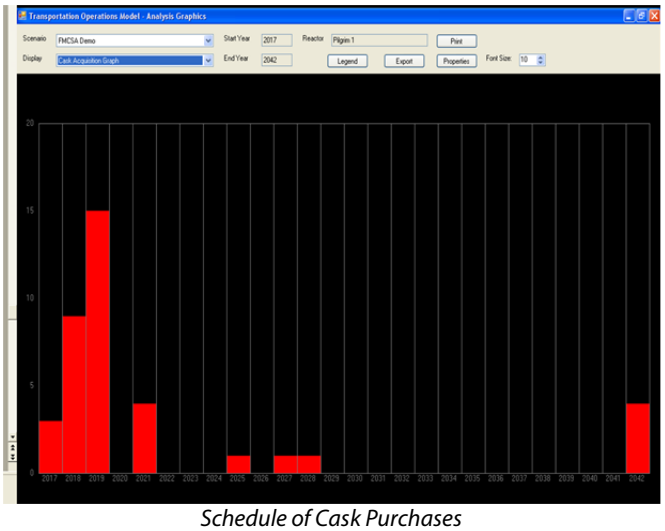
The Transportation Operations Model was developed for the Department of Energy's Office of Civilian Radioactive Waste Management (OCRWM). The purpose of the system is to assist OCRWM in planning for the campaign shipments of spent nuclear fuel and high level waste from the commercial utility nuclear power plants to a repository. The system provides a simulation analysis for cask loading operations at the reactor site, routing and scheduling models for the shipments, a capital equipment module that schedules the purchase of casks and transportation equipment, and a transportation services module that schedules the required transportation associated services that are required. This would include heavy haul, rail carriers, rail yards, cranes, and barges.



Projected Route between Pilgrim Nuclear Reactor and Yucca Mountain Repository Site



Estimated Operation, Capital and Maintenance Expenses



Schedule of Cask Purchases