

# Volpe Tool Evaluates Freight and Fuel Transport Options

## The Challenge

Government agencies are seeking a better understanding of changing transportation needs and impacts as the U.S. expands domestic fuel production of petroleum, natural gas, and alternative fuels in order to use federal policies and regulations to foster a supply chain that minimizes environmental and safety impacts.

To analyze potential fuel options, the Federal Aviation Administration (FAA), the Department of Energy (DOE), and the U.S. Navy's Office of Naval Research have turned to Volpe to develop a national model for evaluating optimal freight and fuel transport patterns, costs, and impacts.

## The Solution

Volpe has developed the Freight and fuel Transportation Optimization Tool (FTOT) in support of FAA, DOE, and the Navy's Office of Naval Research.

This tool is designed to analyze the transportation needs and constraints associated with fuel and raw material collection, processing, and distribution in the continental United States.

## How it Works

FTOT is a flexible scenario-testing tool<sup>1</sup> designed to **analyze a variety of commodities, datasets, and assumptions**, and is customizable to the particular needs of a user. The tool analyzes local, regional, and national scenarios based on raw material origins, destinations, transportation cost estimates, weightings, and parameters for converting or refining materials (see illustration below).

Optimal routing and flows are evaluated through an optimization module and a geographic information system (GIS) module that enable powerful mapping and display capabilities.

The tool uses a **unique intermodal network** constructed at Volpe from private and public data sources on truck, rail, water, and pipeline links.

Outputs of optimized scenarios for transporting material include material/commodity flows, costs, CO<sub>2</sub> emissions, fuel burn, number of vehicle trips, and distance by mode for each link in the network, which can then be aggregated in various ways. The model also takes into account temporal schedules for facilities to assess how variations in demand, production, or processing operations influence the overall scenario results.

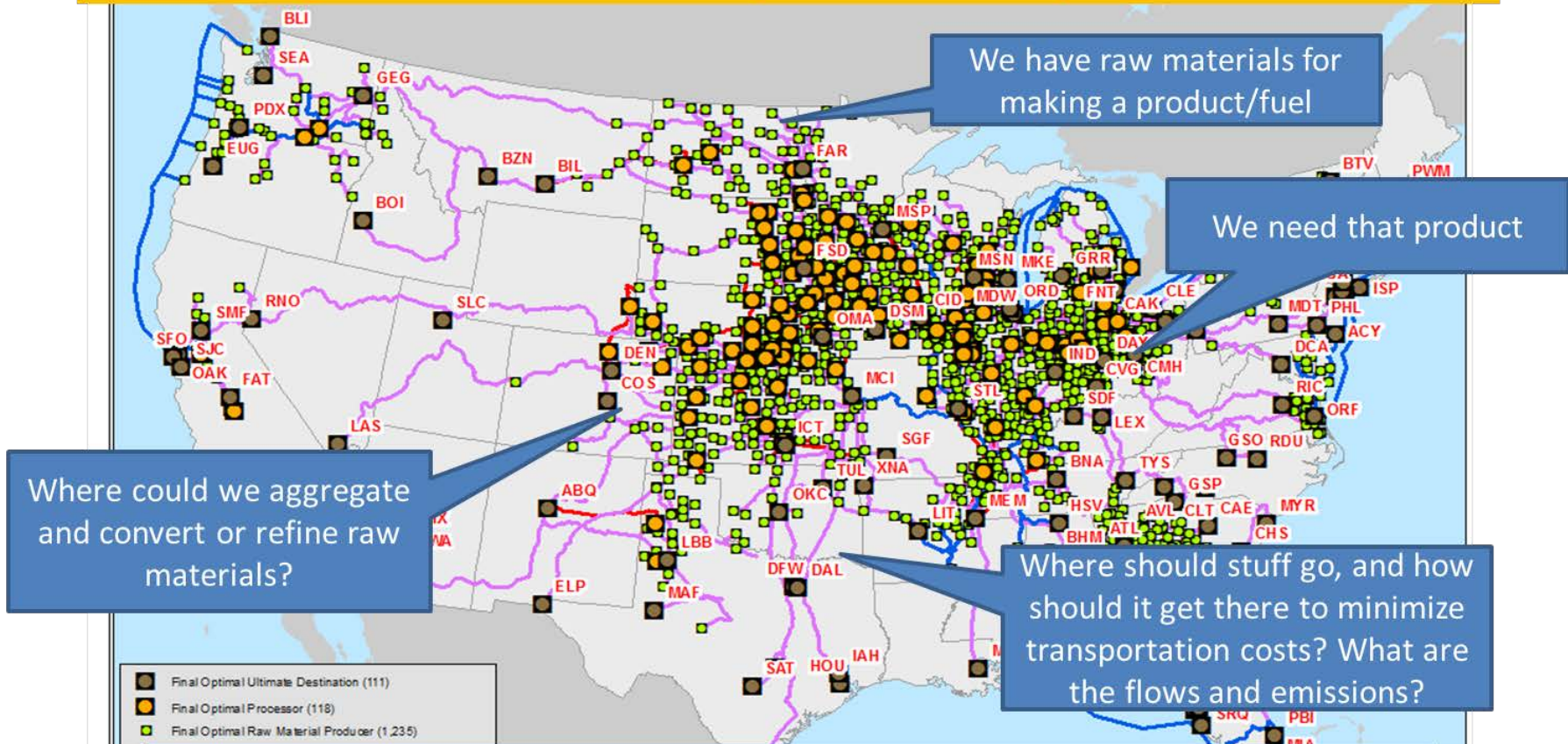
## The Impact

FTOT will provide FAA, DOE, and other government agencies the ability to test various freight and fuel transportation scenarios and their impact on the nation's transportation system. Longer term, Volpe seeks to expand the tool to address other scenario-related impacts, including safety implications, environmental impacts (of both crashes and spills), resilience/vulnerability, and infrastructure needs or shortcomings.

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<sup>1</sup> A scenario-testing tool does not predict future conditions but is used to test effects of potential future scenarios.

# The Freight and fuel Transportation Optimization Tool



- Final Optimal Ultimate Destination (111)
- Final Optimal Processor (118)
- Final Optimal Raw Material Producer (1,235)

