

New Tool Evaluates Alternative Fuel Transport Options

As significant fuel consumers, the military and commercial aviation sectors have a strong need for reliable supplies of sustainable alternative aviation fuels that can be distributed throughout supply chains in the continental United States and elsewhere. However, there is currently little U.S. production of alternative jet fuel.

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

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.

The Solution

Volpe has developed the **Alternative Fuel Transportation Optimization Tool (AFTOT)** in support of the FAA and the Navy's Office of Naval Research. The 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

AFTOT is a **flexible scenario-testing tool¹ 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, public, and restricted-access data sources on truck, rail, water, and pipeline links.



Customer

Federal Aviation Administration

U.S. Navy Office of Naval Research

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Related Links

[Biofuel Transportation Analysis Tool: Description, Methodology, and Demonstration Scenarios](#)

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

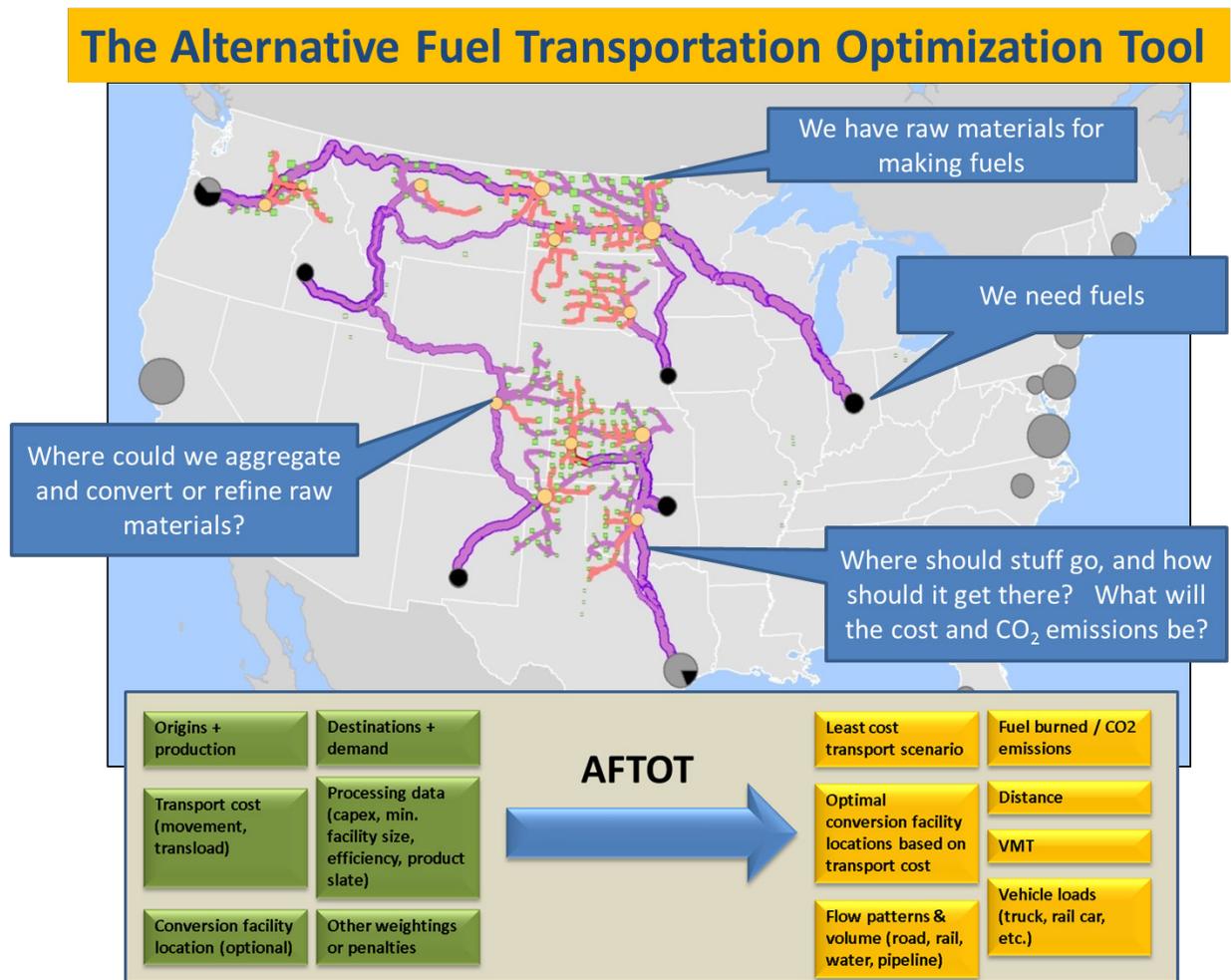
Outputs of optimized scenarios for transporting material include material/commodity flows, costs, CO₂ emissions, fuel burn, number of vehicle trips, and distance by mode for each link in the network, which can then be aggregated in various ways.

Currently, Volpe is expanding the tool to address commodity flow seasonality for alternative fuels, which will enable identification of potential transportation bottlenecks where capacity may be exceeded at certain times.

The Impact

AFTOT will provide the FAA and other government agencies the ability to test various 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 (both of accidents and spills), resilience/vulnerability, and infrastructure needs or shortcomings.



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