

## ELIST – Mature Macro-level (Network) Logistics and Transportation Planning Model

### What is ELIST?

Enhanced Logistics Intra-theater Support Tool (ELIST) is a transportation forecasting simulation tool developed by Argonne National Laboratory for the Department of Defense to analyze force deployments. It models user-defined transportation assets (e.g., trucks, trains, etc.), people, and cargo to be moved utilizing (1) existing transportation infrastructure (roads, rail, air, etc.) and (2) user-defined priorities of movement. ELIST provides logistics planners with the ability to compare the effects of many types of decisions in setting up the movement of transportation assets within a defined geographic area within the United States or overseas.

ELIST performs a simulation of the required transportation plan and generates detailed reports and graphs that summarize movement requirements and asset and resource utilization; it also provides 2D animation of vehicle movements.

### What data are needed by ELIST?

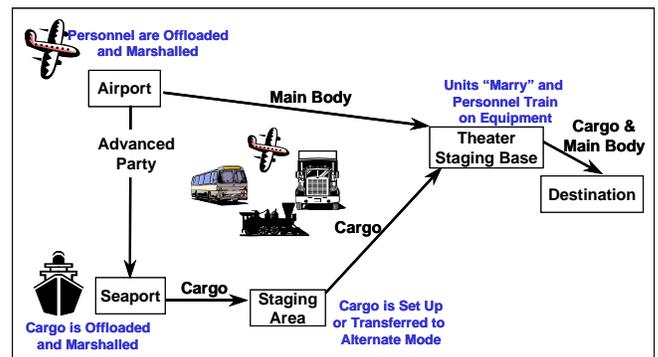
ELIST uses standardized data inputs, an interactive mapping system, and customized local data to perform a vehicle-level discrete event simulation to determine if a logistics plan is feasible, and if not, why not. All infrastructure and asset resources can be displayed in either graphic or table formats.

Types of data include:

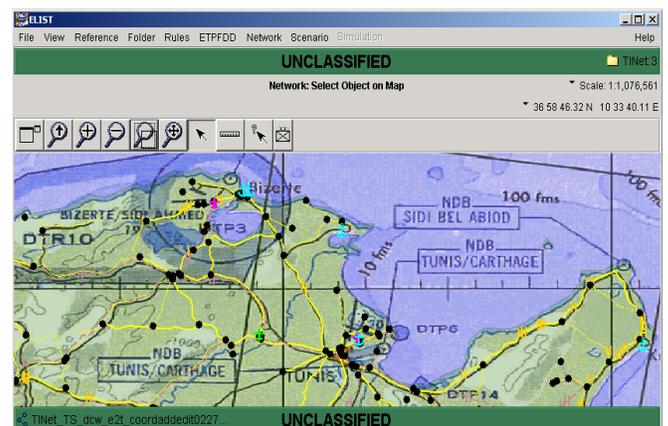
- Vehicle characteristics
- Networks of the road, rail, air, water, and pipeline (e.g., gas, oil) infrastructure. These can be generated by external models or edited by the user in ELIST
- Unit and resupply movement requirements
- Commercial assets assigned to the theater, as well as military assets arriving in the theater to move units and resupply existing units

### What does ELIST do?

ELIST performs a detailed vehicle-by-vehicle simulation of the deployment into a theater of operation, including all of the reception, staging, onward-movement, and integration processes.



Sample cargo and personnel flow in a theater of operations



Sample ELIST network depiction on a map

### ELIST answers questions like:

- Will personnel and supplies arrive on time?
- Is there enough infrastructure capability for their movement?
- Have enough assets been assigned to accomplish the undertaking?
- Are there any bottlenecks that could be alleviated?

### Has ELIST been used?

ELIST has been used extensively by the military to support their logistics planning needs. A representative list includes:

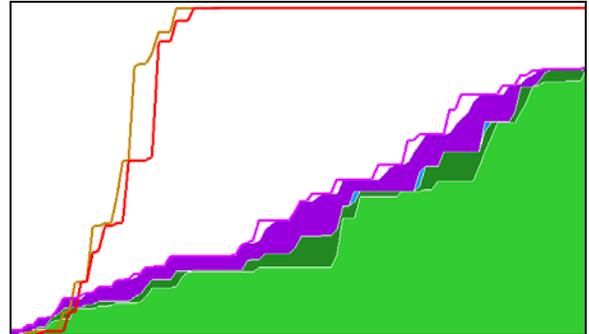
- Department of Defense's Quadrennial Defense Review
- Mobility Requirements Study 2005
- Army Force Modernization (Army After Next, Strike Force)
- Deliberate planning for various commands

*The Chairman of the Joint Staff stated that the "Transportation Feasibility Analysis of all operation plans (OPLANs) must include ELIST analysis".*

ELIST is currently being adapted to meet the needs of emergency management and public health professionals and can assist response planners to analyze and develop an efficient, transparent, and flexible logistics system for transporting people, goods, and services during an emergency.

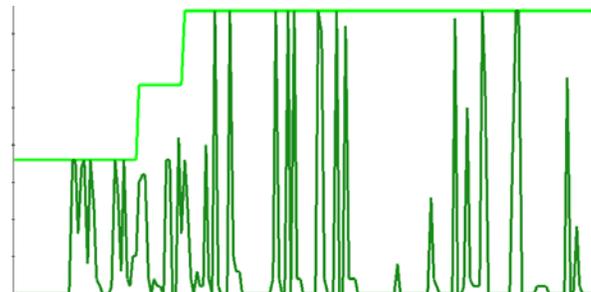
### What output can ELIST generate?

- Closure of the force (red line - required at the destination, purple line - strategic assets arrived at the port, purple area - unloaded at port, cyan area at staging area, dark green - early to the destination, and light green - closed at the destination).



Closure of requirements for a force

- Use of all infrastructure and assets defined for the scenario.



Graph of truck availability and usage of trucks in a simulation

- Detailed descriptions of the events each item has performed during the simulation

### Learn more about ELIST and other Argonne-developed models at:

<http://www.dis.anl.gov/>

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