

EMERGENCY MANAGEMENT LOGISTICS PLANNING

Transitioning the
Enhanced Logistics Intra-theater Support Tool (ELIST)
from the
Department of Defense
to the
Emergency Management Community



The Federal Emergency Management Agency's mission is to lead the effort to prepare our nation to effectively manage federal response-and-recovery efforts following a national disaster (either natural or manmade). An important aspect in carrying out these responsibilities is logistics planning and execution in an ever-changing environment. Using a modeling and simulation tool, such as ELIST (Enhanced Logistics Intra-theater Support Tool), can aid in supporting FEMA's mission.



Why ELIST?

ELIST is a logistics simulation tool developed by Argonne National Laboratory for the Surface Deployment and Distribution Command Transportation Engineering Agency. The agency has used ELIST since 1993. Here's what ELIST supports:

- *Logistics Planning for the Department of Defense*
 - ELIST is a mature model with a proven capability for handling elaborate real-world situations
 - ELIST performs structured analysis that can be consistently applied
- *Logistics Planning for the Emergency Management Community*
 - ELIST assists emergency managers in providing efficient and effective logistical analysis for domestic incident management
 - ELIST facilitates the implementation of a proactive response-and-recovery posture and the delivery of pre-positioned emergency supplies
- *Modeling Provides a Foundation for Public Confidence*
 - ELIST assists planners in evaluating and understanding the implications and impacts of conflicting priorities
 - ELIST instills trust in the public affairs information disseminated by emergency managers, thus helping to earn public confidence in response-and-recovery capabilities

Why Argonne National Laboratory?

Argonne National Laboratory has worked with the emergency management community to advance its logistics response capabilities. The laboratory has extensive experience in this area and an enviable track record:

- *Experienced in Supporting Emergency Management Services Programs*
 - Supported federal, state, and local emergency management agencies for 30 years
 - Provided personnel to support emergency managers, planners, and responders to counter technological and natural disasters and other emergencies
- *Years of Experience and a Proven Track Record*
 - An exemplary history of developing decision tools, models, and information systems to resolve issues of regional, national, and global significance; these are useful, usable, and used
 - A strong foundation in systems-based emergency services planning, training, and exercises for emergency management activities

Logistics Planning for the Department of Defense

More than 10 years ago, the Chairman of the Joint Staff directed that the “Transportation Feasibility Analysis of all OPLANs must include ELIST analysis.”



ELIST answers questions like:

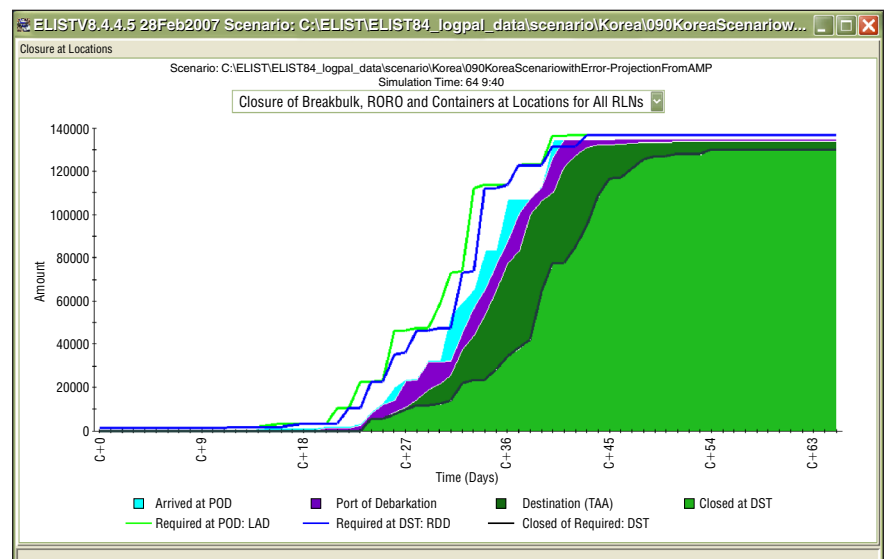
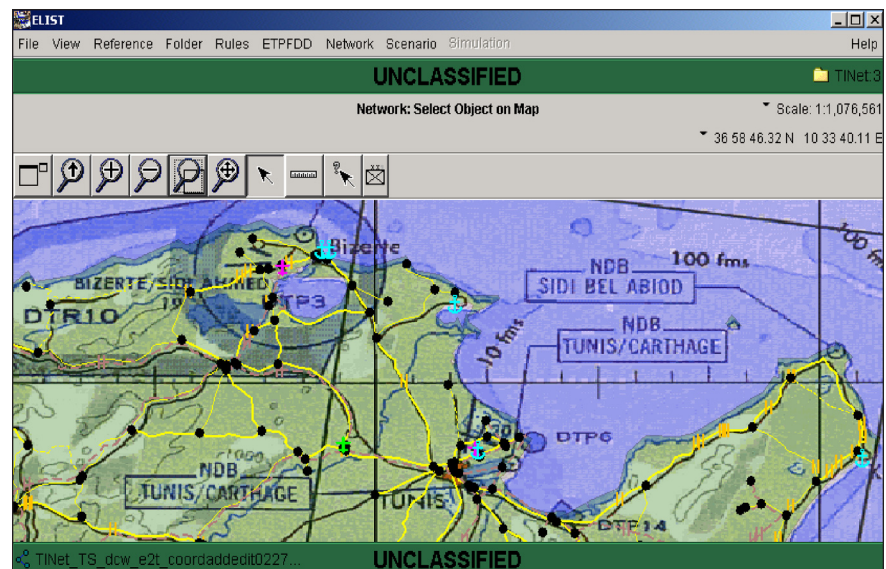
- Will the force arrive on time?
- Is there enough infrastructure capability for the deployment?
- Have enough assets been assigned to the deployment?
- Are there any bottlenecks that could be alleviated?

*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.*

**Time-Phased Force Deployment Data (TPFDD)*

ELIST is a Department of Defense (DOD) transportation forecasting simulation tool that can model the movements of troops, equipment, and cargo. These unit types are conveniently similar to (and can be easily converted to) emergency management needs; for example, troops easily translate to emergency management personnel or evacuees; equipment to buses, tractors, trailers, etc.; and cargo to water, ice, and MREs.

Movement can be modeled within the United States or overseas. ELIST simulates organic and external lift movements over a detailed model of the infrastructure with constrained transportation assets. It uses a GIS infrastructure that represents roads, rail lines, waterways, airports, and seaports.



Logistics Planning for the Emergency Management Community

ELIST provides logistics planners with the ability to compare the effects of many types of decisions in setting up the movement of people, cargo, and assets within a defined geographic area. Emergency management logistics planning has unique transportation requirements that can benefit from ELIST's capabilities. ELIST includes:

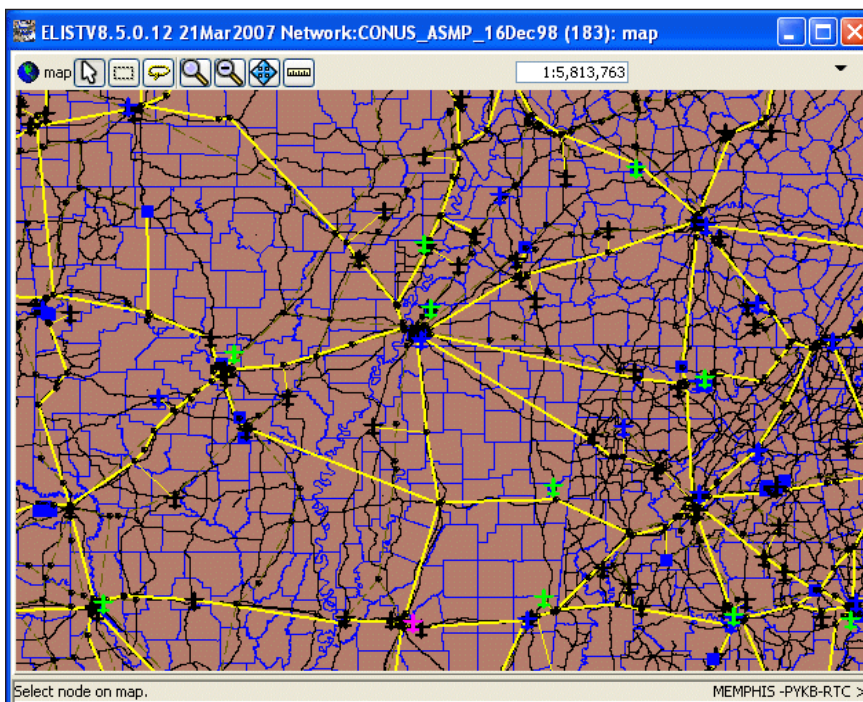
- *Flexible simulation rules:* specify rules to add or modify commodities and how they can be moved
- *Transport asset location:* evaluate control issues by limiting when and where companies and personnel can work in the disaster area
- *Detailed airport and seaport modeling:* assign berths and tracks individual ships and barges at both intrawater and strategic ports
- *What-if analysis:* add events to the system to interdict any infrastructure to determine their impacts
- *Event implications:* Losing a bridge may seem to be a simple rerouting problem; however, various cascading, or ripple, effects must also be considered, such as:
 - Changes in routing
 - Need for additional assets
 - Longer turnaround time
 - Infrastructure congestion
 - Changing fuel requirements



ELIST can integrate DOD resources with those of emergency managers.

“DOD should support DHS development of an analysis and operational planning capability to enable DHS to predict detailed requirements and plan for specific actions needed to respond to future disasters.”

— Region VI Hurricane Preparedness Tabletop Exercise (May 2006)



ELIST contains a complete data library on national-level transportation infrastructure used by DOD – Strategic Highway Network (STRAHNET), rail lines, pipelines, seaports, and international airports. The state-level infrastructure, depicted in this screen shot, can be added to the existing data library.

Modeling Provides a Foundation for Public Confidence

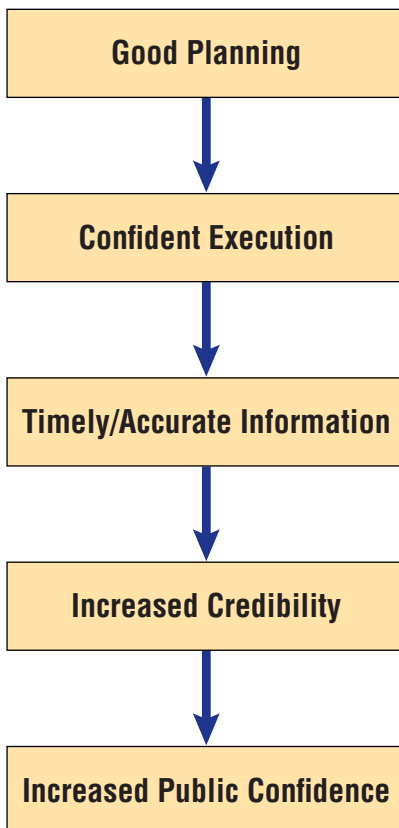
ELIST can assist FEMA in meeting several critical disaster response challenges:

- National preparedness
- Logistics and evacuation
- Collaborative planning with DOD
- Public communications
- Training, exercises, and lessons learned

Adapting the existing ELIST software to meet emergency management requirements can assist response planners in developing an efficient, transparent, and flexible logistics system for delivering people, goods, and services during an emergency. Via its standardized data interface, ELIST can integrate DOD resources with those of emergency managers, thereby leveraging the resources of both public and private sector stakeholders — should such support be requested. The development of these systems can increase and improve cooperation among federal, state, and local emergency management agencies.

The Department of Homeland Security’s goal is to develop and deploy an integrated public communications plan. The experience gained through the ongoing use of ELIST in logistics planning and training exercises can assist public affairs officials in reassuring the American public with timely and accurate response-and-recovery information before, during, and after a disaster.

Logistics Planning Continuum



Logistics Modeling Process:

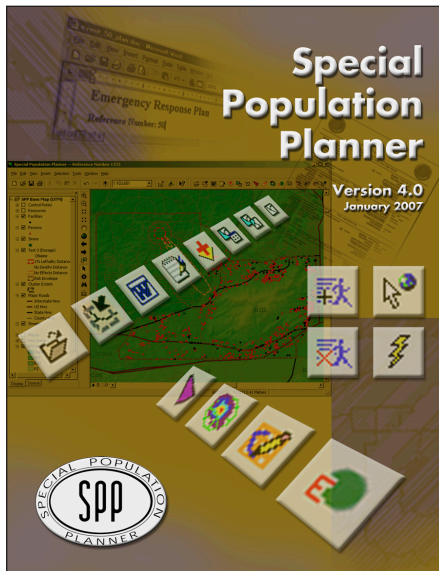


- Provides a bedrock for effective planning
- Defines the range and scale of the response
- Defines the scope of individual plans
- Provides a basis for building capacity



Experienced Emergency Management Services Programs

For almost 30 years, Argonne National Laboratory's multi-disciplinary professionals have stood at the forefront of the field of all-hazard emergency management. Argonne supports all levels of government and the private sector in solving emergency preparedness problems and providing inventive, applied solutions drawn from practice-based research.



The mission of the Center for Integrated Emergency Preparedness is to create, develop, and implement innovative approaches, methods, tools, and applications in emergency planning, preparedness, and response.

The Center has developed a tool, called Special Population Planner, for use in evacuating or sheltering in place persons with special needs.

Emergency preparedness experts in:

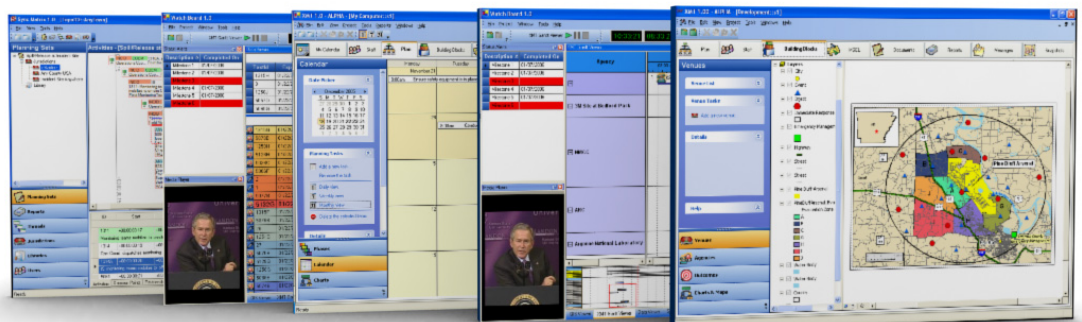
- Emergency Planning
- Emergency Exercise Development, Evaluation, and Control
- Emergency Response Modeling
- Training Course Development
- Risk Communication
- Special-Needs Populations
- Environmental Engineering
- International Arms Control
- Bioterrorism
- Constitutional Law
- International Law
- Public Policy
- Special Software Applications

The Synchronization Matrix Planning Process is the cornerstone of the Center's work with emergency management practitioners. It provides a structured problem-solving approach that facilitates the development of preparedness plans. A key component is the specially designed interactive Sync MatrixSM software tool that facilitates integration of multi-jurisdictional emergency plans. Sync Matrix is one element of a suite of Argonne-developed tools designed specifically for use by emergency managers.

Sync MatrixSM

XMIT
eXercise Management Tool

WB
WatchBoard



Argonne's Suite of Emergency Management Tools

Argonne National Laboratory Experience and Track Record

Argonne National Laboratory is one of the U.S. Department of Energy's premier research and development centers. Today, the laboratory has 21 research divisions, including the Decision and Information Sciences Division (DIS), which includes the Emergency Preparedness Group.

DIS develops state-of-the-art decision tools, models, and information systems. Systems-based emergency services planning, training, and exercises are the foundation of Argonne's emergency management activities. DIS employs 330 professionals, including 242 scientists and engineers, holding more than 160 doctorate or other advanced degrees. With an annual budget of more than \$55 million, DIS supports more than 200 research programs for governmental and non-governmental organizations.

DIS aggressively recruits qualified and innovative professional personnel and project managers for our program management teams. These teams can address the unique needs of both technology and service-driven companies and organizations like FEMA. As a results-oriented organization, DIS is small enough to be fast and flexible, but with a pool of multidisciplinary resources to ensure quick location of information to meet the needs of our clients. DIS prides itself in developing products, services, and technology that are useful, usable, and used.



Why Argonne National Laboratory and ELIST?

- The usability and accuracy of the ELIST software developed by Argonne National Laboratory personnel led the Chairman of the Joint Staff to direct that the *“Transportation Feasibility Analysis of all OPLANs must include ELIST analysis.”*
- ELIST can facilitate the response planner’s ability to manage commodities and equipment that support effective disaster response-and-recovery operations.
- With advanced planning, training, and exercises supported by Argonne National Laboratory, ELIST can assist public affairs officials in providing timely and accurate disaster recovery information critical to communities affected by a disaster, thus achieving and maintaining a high level of public confidence.
- Argonne National Laboratory has 30 years of experience in supporting national, regional, state, and local emergency management activities with systems-based emergency planning, training and exercising: we’ll be here to support you, your needs, and the software.
- The original ELIST project architects and application developers still work at Argonne. The combination of dedicated personnel, experience, resources, and reputation equal a partner that federal, state, and local emergency managers won’t outgrow.



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