Homeland Security
Science and Technology

Summary

U.S. Department of Homeland Security
SAVER
System Assessment and Validation for Emergency Responders

The U.S. Department of Homeland Security (DHS) established the System Assessment and Validation for Emergency Responders (SAVER) Program to assist emergency responders making procurement decisions.

Located within the Science and Technology Directorate (S&T) of DHS, the SAVER Program conducts objective operational tests on commercial equipment and systems and provides those results along with other relevant equipment information to the emergency response community in an operationally useful form. SAVER provides information on equipment that falls within the categories listed in the DHS Authorized Equipment List (AEL).

The SAVER Program is supported by a network of technical agents who perform assessment and validation activities. Further, SAVER focuses primarily on two main questions for the emergency responder community: "What equipment is available?" and "How does it perform?"

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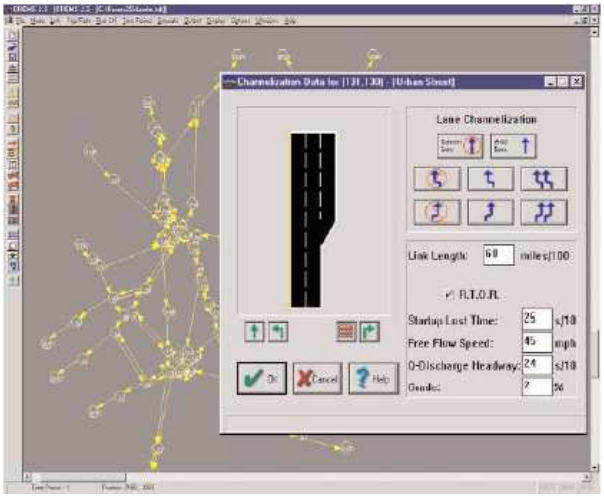
Vehicle Escape Route Modeling Software Study Comprehensive Report

Vehicle escape route modeling software tools can be an important resource to public safety and emergency management agencies. These software products can assist in the preplanning for large-scale evacuation as well as moving portions of the populations out of areas of immediate danger during an emergency. Vehicle evacuation modeling uses scenarios and simulations that seek to move large amounts of traffic while minimizing human loss and hazards to emergency personnel. These tools may also facilitate the management and release of emergency data and information, which could improve decision making and emergency response. However, identifying and applying the right tools can be challenging.

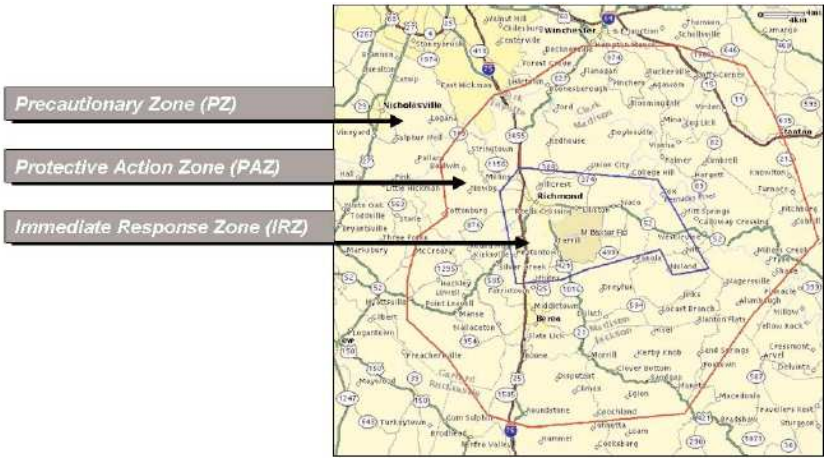
The Space and Naval Warfare Systems Center (SPAWARSYSCEN), Charleston conducted a study on escape route modeling software to identify commercially available software solutions supporting vehicle routing during emergencies. The most capable vehicle escape route modeling solutions are available as custom or government off-the-shelf (GOTS) software applications derived from traffic simulation models. These software products are often installed and operated by senior managers or information technology managers within the public safety, emergency operations, law enforcement, and state Department of Transportation and can require extensive knowledge of characteristics, parameters, and data needs of the software to apply, operate, and validate for a particular area or region.

The software products mentioned in the report provide various levels of analysis. The output information can be used in decision making during preplanning, response, or post-analysis purposes. The different software products and applications can provide various levels of information on various geographic scales and transportation network configurations. The software products can simulate basic traffic flow for single vehicle types on primary routes to complex traffic flows for many vehicle types on primary and secondary routes. The software products also can simulate vehicle lane changes, various vehicle speeds, and effective road rerouting as a result of accidents.



GOTS Software Product User Interface for Model Parameters

For these reasons, the comprehensive report focuses on the current state of the vehicle escape route modeling software market, current uses and capabilities, selection and implementation considerations, data requirements, supporting technologies, and future trends. The report also covers the software features, functions, or capabilities that emergency responders would find most useful. In technology's future directions and ways to make vehicle escape route modeling technology more useful and cost effective for potential users. The report dies not provide an exhaustive list of products available for addressing vehicle escape route modeling nor does it provide comparative assessment and validation information across multiple software products.



GOTS Software Product Emergency Response Zones

This summery contains excerpts from the Vehicle Escape Route Modeling Software Study Comprehensive Report. The report should be reviewed for the full discussion and recommendations. The complete report can be found on the SAVER Web site (https://www.rkb.us/saver)

Background

Emergency responders can benefit from escape route modeling information to aid decision making for population evacuation through vehicle routing. Emergency evacuation involves complex operations that require interaction among various federal, state and local agencies. Consideration must be given to the combination of policy and technical issues, along

with the integration of operational management and model applications to increase the likelihood of effective escape modeling software utilization.

The comprehensive report can assist agencies in understanding, identifying, and selecting software products and/ or technologies that satisfy their transportation evacuation planning or response needs. The report includes an overview of vehicle escape route modeling software capabilities, approaches data inputs, and a process for selecting an escape route modeling product or alternative solutions, such as route finder software products or traffic or transportation monitoring and control systems (i.e., Intelligent Transportation Systems [ITS] technology). The software product information included in the report is based on vendor-supplied data or publicly available literature.

Collaboration

Small- and medium-sized agencies may consider using vehicle escape route modeling capabilities available from other organizations such as the Federal Emergency Management Agency (FEMA), Federal Highway Administration (FHWA), or a state Department of Transportation (DOT). It also may be beneficial for several small agencies to form a regional escape route modeling capability to facilitate emergency traffic planning and management. In man cases, smaller traffic management organizations may find route finder software products or ITS technologies to be more useful and accessible options to meet individual agency requirements.

National Standards

Due to the numerous data requirements of currents traffic simulation software products, standards to aid in the interchange of escape route modeling data between emergency traffic software products could be beneficial. A standardized markup language for the exchange of data among a wide variety of software products could assist in developing a data exchange format for escape route modeling data. If a standard was developed, it may offer opportunities for agencies wishing to use multiple software products, and allow easier migration to new and improved software products over time.

Data Sharing

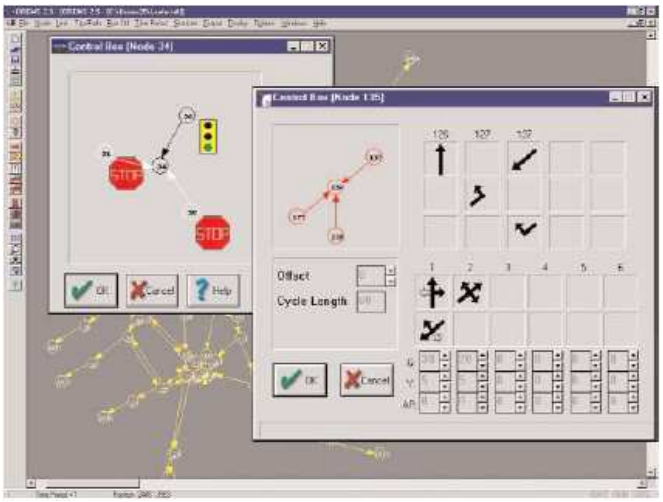
One of the major obstacles preventing widespread adoption of escape route modeling software is the difficulty of correctly using and acquiring the required data and databases. This includes route data, population density data, vehicle type data, etc. To be most effective, the data would have to be developed or converted to a standard format or design to maximize utility with minimal data translation issues.

Conclusion

The current state of the escape route modeling software market makes implementing these products problematic for many emergency responder organizations. In most cases, it may be more practical and most cost effective for state or national level organizations to operate the software models and distribute the results to local agencies. Another current trend in this area is the convergence of ITS technology with escape route modeling capabilities to achieve real-time traffic flow optimization. ITS technologies, including vehicle motion sensors and cameras, are also invaluable tools in enabling emergency responders to assess situation and respond to them in effective and timely manner without the need for high-end modeling and simulation software.

With increased government support and technology improvements, escape route modeling software is expected to be applied to a greater number of situations for the improvement of preplanning

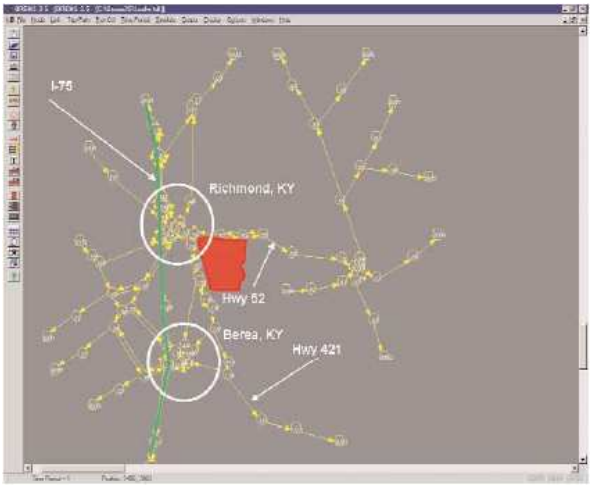
analysis, real-time operation, and post-analysis evacuation operations. In the absence of a true modeling capability, emergency responder organizations may find it advantageous to utilize route finder software as a usual capability to meet mission requirements. The route find functionality coupled with ITS technologies or an often already existing geographic information system (GIS) capability makes these less complex software products a viable option for resolving difficult routing problems in real-time during a crisis.



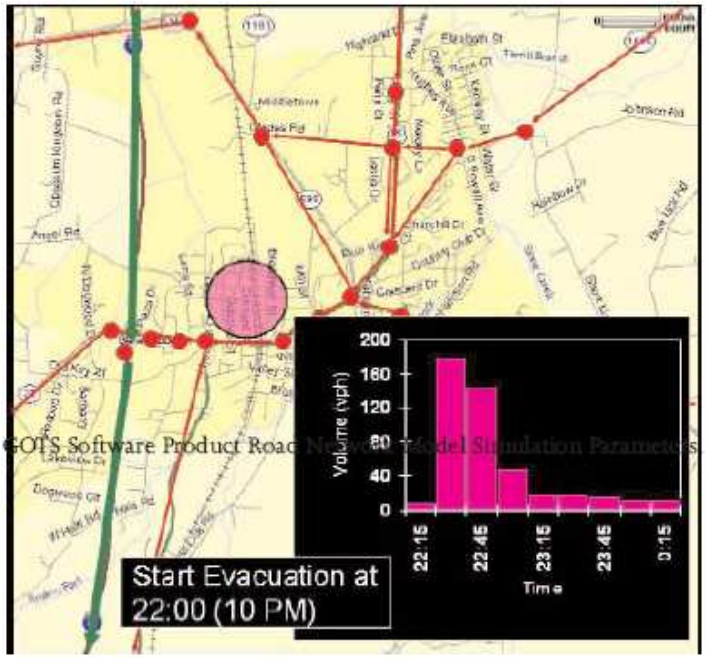
GOTS Software Product User Interface for Model Parameters

For Further Information

The full comprehensive report can be found on the SAVER Web site along with other SPAWARSYSCEN reports dealing with the vehicle escape route modeling software study.



GOTS Software Product Road Network Model



GOTS Software Product Road Network Model Simulation Parameters