

Development of an Electronic Freight Theft Management System to Minimize Capture Time, Aid in Cargo Theft Recovery, and Improve State Economic Development-Phase III

PROBLEM STATEMENT

The University of Central Florida's Center for Advanced Transportation Systems Simulation (UCF-CATSS) recently developed an online infrastructure for managing Florida freight theft data in cooperation with the Florida Highway Patrol. This system was first conceived as a result of the successful cargo theft summit hosted by the office of Motor Carrier Compliance (MCCO), a unit of the Florida Department of Transportation (FDOT). The infrastructure refers to the configuration that combines the existing "Fax Alert" system with an electronic freight theft management system including the database and web site.

The "Fax Alert" system allows theft victims to submit freight theft reports by using a fax machine. The infrastructure modification noted above provides an online reporting system that has the potential to increase collaborative efforts among different law enforcement agencies and to reduce response time to freight theft. The data entered into the online system is stored in a database for future access, continuous updating, and cross-referencing by any partnered law enforcement agency.

Upon deployment and assessment of the Electronic Freight Theft Management System, MCCO and the Florida Highway Patrol (FHP) requested the following Geographic Information System (GIS) enhancements to the existing system:

- Theft value distribution by county
- Aggregate theft data by county
- Individual theft locations
- Individual theft data
- Aggregate theft data
- Querying tools

The project results described in this final report profile the processes and steps used to create a GIS system to address the requested enhancements.

OBJECTIVES

1. Create functionality that addresses each of the requested enhancements.
2. Implement a pilot test GIS mapping application that encompasses all of the requested functionalities.

FINDINGS AND CONCLUSIONS

The proof-of-concept GIS component developed under this project presents the possibilities of using mapping as a tool to fight cargo theft within the State of Florida. Visual representation of theft location and analysis tools can be an invaluable addition to existing tools.

In developing the requested enhancements, it was found that:

- Under theft distribution by county, law enforcement officers and officials will have the ability to quickly identify which counties are experiencing higher concentrations of freight. This should allow law enforcement officials to more appropriately allocate resources. To leverage this value, accessing current data is critical.
- Under aggregate theft data by county, law enforcement officers and officials will have the ability to select adjoining counties to compare thefts among adjoining counties.
- Under individual theft locations, law enforcement officers and officials will be able to select a specific theft and receive the theft date and location.
- Under individual theft data, law enforcement officers and officials will be able to select a specific theft and receive pertinent information about the theft including values, vehicle description, theft report control number, and departmental case number.
- Under aggregate theft data, law enforcement officers and officials will be able to select several adjacent theft locations in order to assist in determining if any commonalities exist among them.
- Querying tools will provide law enforcement officers and officials with the ability to search theft data by fields other than purely geographic location. This could include, but would not be limited to: date of theft, value of equipment, cargo value, driver, vehicle style, etc.

The enhancements listed above can increase the toolset used by law enforcement officers when conducting cargo theft investigations.

In the course of developing this proof-of-concept GIS component, additional functional requirements were identified. In order to maximize the effectiveness of this GIS component, the following functional requirements will need to be examined.

1. The historical data used to build this GIS component are static. An active implementation would have to connect to current data. To achieve this end, the use of connector software such as Environmental Systems Research Institute's (ESRI) spatial database engine, ArcSDE, would need to be incorporated. ArcSDE allows live data, stored in the Electronic Freight Theft Management System, to be presented on a map as well as to be queried using built-in analysis tools. Although the data that are presented in this GIS component are static, it represents database views that would be available in a dynamic system.

2. Another item is the geocoding of addresses input by the users. In order to get positive matches using the address locators, specific guidelines for theft and recovery locations will have to be designed and followed. For example, a user that enters a theft location as an intersection might enter “USHWY 441 AND I4”. This would not generate a geocoded location within the GIS system. If it was entered as “United States Highway 441 & I-4”, it would. Other descriptive locations such as “Ramada Inn on 441” would not be allowed. In order to overcome this hurdle, the existing online Electronic Freight Theft Management System (1) will have to be redesigned so that addresses that are entered by the users are verified at the time of reporting.
3. Another item to address would be who would have access to the mapping system. Because private information could be made available using such a site, it is recommended that such a web application be hosted on an intranet or the Internet secured by login.

BENEFITS

Used in conjunction with the existing Electronic Freight Theft Management System (1) online reporting tool, a system such as this could assist in recovering stolen equipment and goods. The benefits of such a GIS system would affect law enforcement, trucking owner/operators, and insurers.

The mapping and trend analysis tools could assist law enforcement in setting up effective sting operations that will help prevent future theft. This, along with stiffer penalties for cargo theft, would reduce the costs to trucking owners/operators and their insurers which will trickle down to the consumers—the ultimate bearer of the costs.

The future integration of the GIS enhancements demonstrated in this proof-of-concept project with the existing online Electronic Freight Theft Management System (1) can provide a more robust technological tool for law enforcement to more efficiently recover stolen equipment and cargo.

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