### 5.4.2 Towards Secure Transportation Corridors: A GIS-based Framework for Knowledge Discovery

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In US domestic nuclear defense, a “dirty bomb” incident poses one of the greatest threats to high value targets. Radioactive materials, illegally entering the US, can be transported on commercial carriers through our highway systems. Development of wide-area sensor networks at truck weigh stations along the interstates has emerged as one of the leading strategies to ensure transportation security. In addition, since illicit radioactive materials can be camouflaged within naturally occurring radioactive materials or shielded in containers, the best hope of detecting an abnormal truck is to investigate not just the radiation signatures, but an array of disparate data gathered from multiple, disparate sensors. Consequently, increasing deployment of sensor technologies will lead to generation of high volumes of dynamic and disparate observed data that need to be quickly analyzed. However, the goal is to detect, with high probability but low false alarms, trucks that may represent potential security hazards without costly or time-consuming secondary inspections; thus minimizing disruption to commerce. We have been investigating novel approaches for utilizing a GIS-based framework for efficient integration, analysis, and visualization of disparate transportation data. Utilizing data from a truck weigh station in Tennessee; we have developed a proof-of-concept end-user knowledge discovery tool, which facilitates faster and reliable decision making. We will demonstrate how disparate, multi-sensor information from historical truck records can be utilized to detect patterns and actionable insights into normal behavior of trucks, which in turn can be utilized for detecting anomalies in new trucks in near real-time. Integration and visualization of analytical results within a GIS framework can provide effective situational awareness and decision support for transportation corridor security.