Vehicle Inspection for Early Warning (VIEW) – Phase 3

Homeland Security
Science and Technology

VEHICLE INSPECTION

Border-crossings, checkpoints and access to secure facilities present a significant challenge to protecting the nation's critical infrastructure and key resources (CIKR). CIKR resiliency is a shared responsibility among public and private asset owners and operators. Modified vehicles used for explosives and other contraband pose a threat at the borders, infrastructure, special events and locations of national significance.

The Department of Homeland Security's (DHS) Science and Technology Directorate (S&T) is partnering with Customs and Border Protection (CBP) and the Federal Protective Service (FPS) to provide Phase 3 cooperative agreement funding with industry to design, develop and test solutions that are easily deployed at vulnerable locations to provide early warning of contraband smuggling (e.g., drugs, weapons, explosives, money, human trafficking, etc.). The solutions are designed to be low-cost, automated, fast and resilient with both permanent and mobile deployments.

GOVERNMENT AND INDUSTRY INNOVATION

In 2018, DHS S&T awarded cooperative agreement grant funding to three performers for Phase 1 to deliver a functional "Alpha" prototype that demonstrated a distinct approach to satisfying project requirements for under-vehicle inspection. In 2019, Phase 2 was awarded to two of the three performers to deliver "Beta" prototypes that could satisfy field-testing requirements. In 2020, Phase 3 was awarded to a single performer for the final phase of the agreement. In Phase 3, configurations are made of durable materials suitable for automotive applications that include heavy vehicles under load. The VIEW system runs on a standard laptop or workstation with color imaging exceeding 4K pixel resolution and able to display a barcode on a spinning axle at speeds up to 25 mph. Phase 3 will deliver a market-ready, commercially viable capability for transition to DHS components such as CBP or the FPS and private CIKR industry owners/operators.

ENHANCEMENT, EVALUATION AND COMMERCIALIZATION

Further advancements to the unique technological approach of an under-vehicle scanner will include a variety of capabilities, many of which will improve how inspections are performed for under-vehicle scanning. The modular design of the scanner will allow in-field adjustable lane widths and have smooth and symmetrical curved ramp profile with matting and ground anchor installation options for mobile and fixed deployments.

The Phase 3 VIEW under-vehicle scanners are expected to provide operational performance capabilities to include:

1) High definition 2D & 3D scanning visualization for 'behind-the-scenes' detection and 'fly-through' not previously available for vehicle inspections.
2) Artificial Intelligence and deep learning techniques to detect changes in repeat vehicles.
3) Integrated Automated License Plate Reader (ALPR) and mobile application software that can be installed on cell phones and in-dash cameras for law enforcement evaluation.
4) Deliver a low-cost, dual-use capability to transition to components and enter into commercially viable market to provide added levels of security.

SYNTHETIK APPLIED TECHNOLOGIES

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A breakthrough research firm aimed at creating high-impact technologies, Synthetik looks to bridge the gap between purely theoretical research and real-world applications. For VIEW, Synthetik is applying artificial intelligence, deep learning, and pattern recognition to the problem of automating vehicle undercarriage inspection.