What's Going on? Improving Situational Awareness

James Lewis

Solutions Engineer Lead D&I / SOF

James.Lewis2@l3harris.com

ENVIpalooza
An Insider's Guide to GEOINT

The Need for Situational Awareness

- For many, the best intelligence is still boots on the ground

- Unfortunately, we can't be everywhere at the same time nor, do we all pay the same level of attention to detail about our surroundings

- Blind spots can mask the view of exactly what is happening on the ground

- How do we compliment traditional information to solve localized threat problems?

  Existing or future camera systems
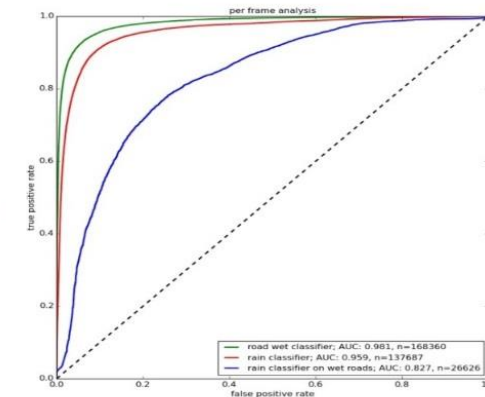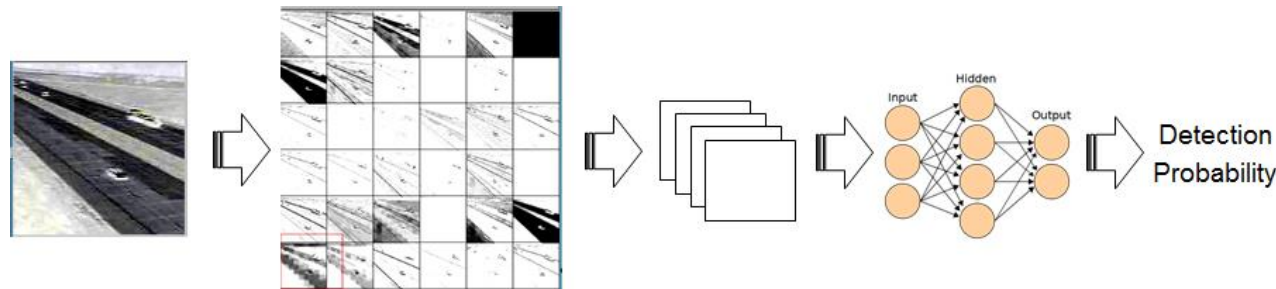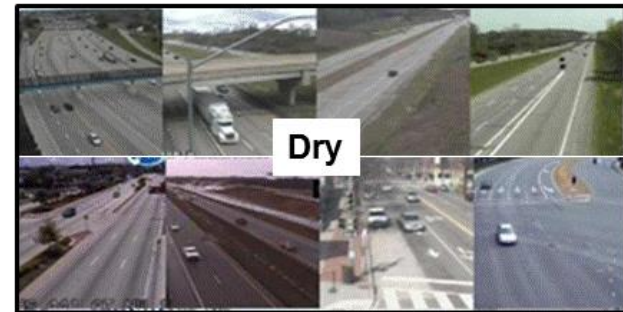
Enter The Internet of Things (IoTs)
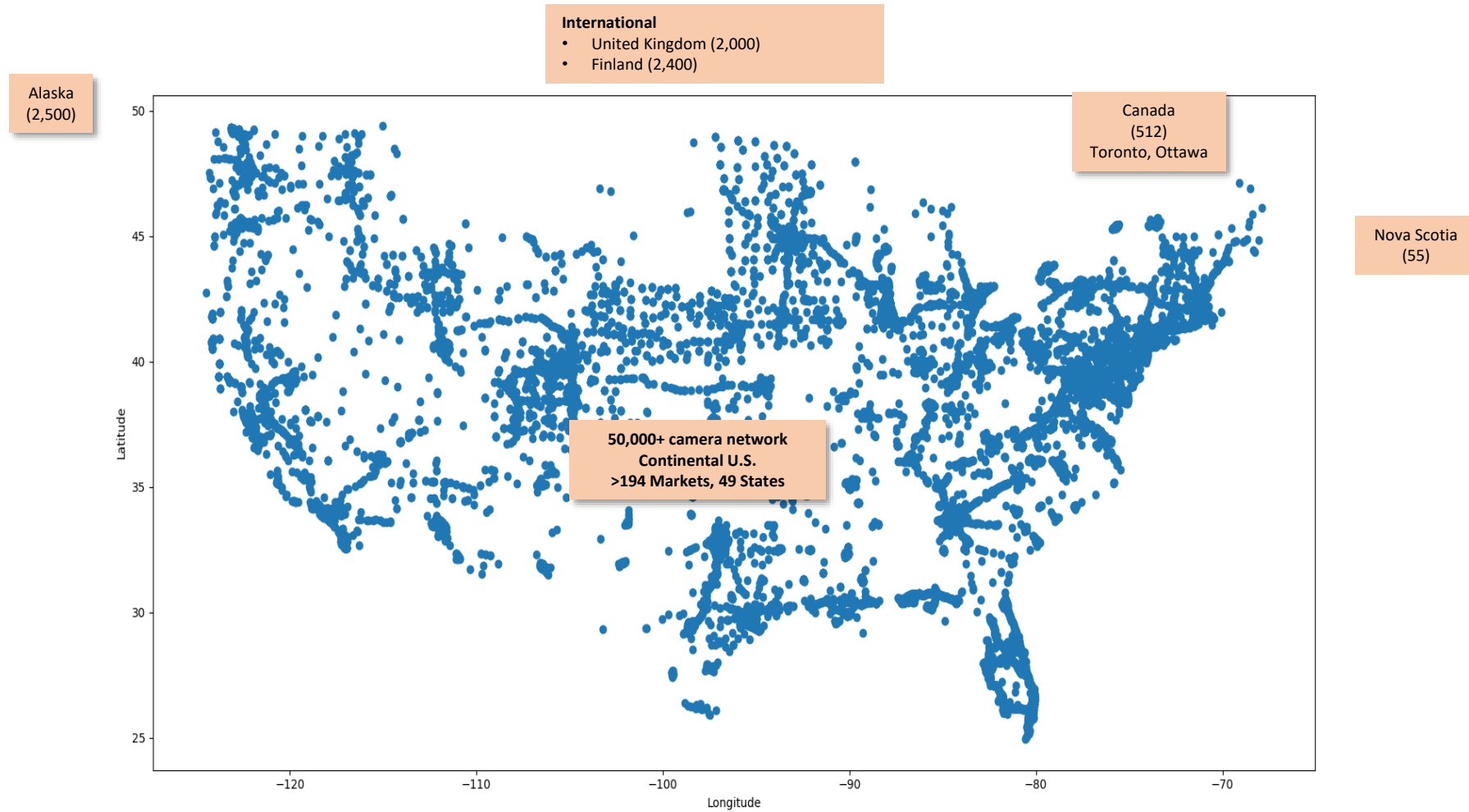

Mayo Nissen

- The Internet of Things promises better decision-making tools using current investments to improve efficiencies, effect the bottom line or improve safety

- Leverage existing sensor assets - the foundation of the Internet of Things

- Deep learning is revolutionizing image and object recognition

- Decision-makers don't always know the data they have or how to transform it

- Technology is now enabling these large sensing systems to solve problems in spaces never envisioned

"People only see what they are prepared to see"
- Ralph Waldo Emerson

ENVIpalooza
An Insider's Guide to GEOINT

Repurposing terrestrial infrastructures

- Re-purposes a dumb traffic or other CCTV camera into a smart weather sensor without retrofitting

- Machine learning analytics are reframing the ability to extract relevant data from general imagery sources

- L3Harris "students of weather" in machine learning

- Deliver highly accurate micro-weather ground observations, trending and predictive analytics for modeling and decision making

Terrestrial persistent surveillance

International
- United Kingdom (2,000)
- Finland (2,400)

Alaska
(2,500)

Canada
(512)
Toronto, Ottawa

Nova Scotia
(55)

**50,000+ camera network
Continental U.S.
>194 Markets, 49 States**

ENVIpalooza
An Insider's Guide to GEOINT

Helios Background – Machine learning

L3Harris developed plug-n-play detectors for a number of features found in traffic camera images through its Helios framework:

Fog

Fog at night

Snow covered roads

Wet roads

Raindrops on lens

Heavy traffic

"Strange"

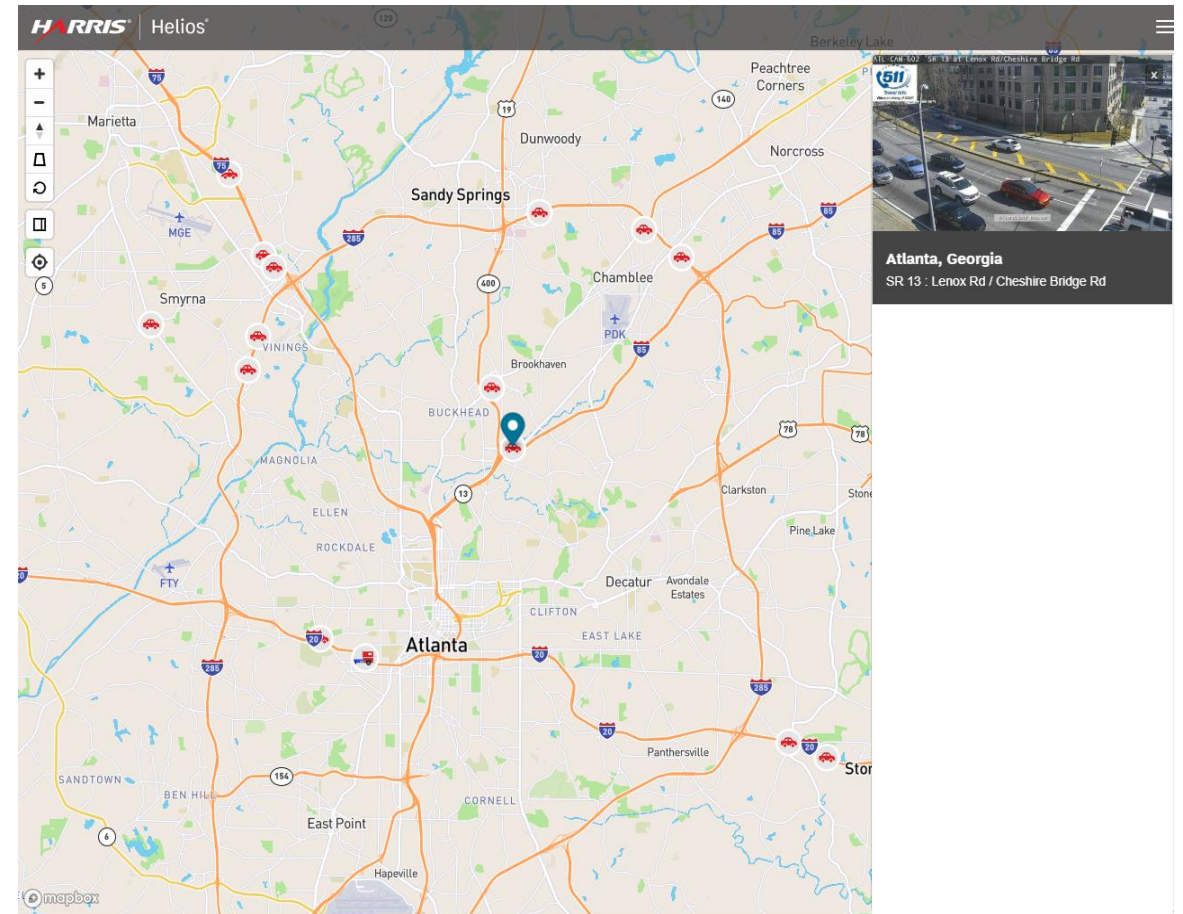Incident

What is ATMS?

Automated Traffic Management System-ATMS

- Repurposes existing technology

- Saves time and effort

- Flexible enough to evolve for changing needs

- Uses existing or new camera infrastructure

- Can be Integrated with ESRI technology

ENVIpalooza
An Insider's Guide to GEOINT

Automated tracking – The IoT & machine learning

- The sheer numbers of traffic and other surveillance cameras make them attractive as a method for applying machine learning

- Machine learning makes very difficult tasks, such as a human monitoring thousands of cameras to detect any changes quickly into a reliable simple clear picture

- Automatic detection limit the need for human observation to only those areas of interest

- Uses for Public Safety
  - Improved emergency asset response (police, fire, etc.)
  - Surveillance and monitoring
  - Object tracking (vehicle, BOLO, Amber alerts, people)
  - Activities and crowd patterns
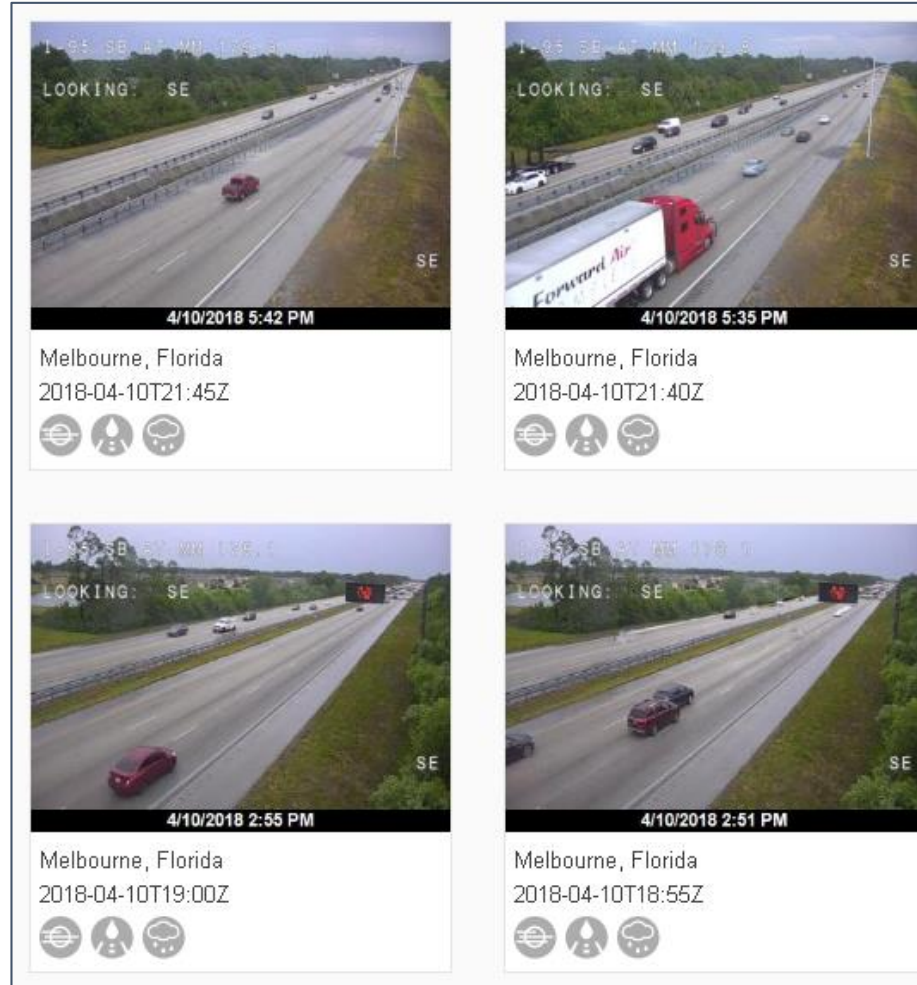 - Environmental conditions
  - Usage profiles

Scene and Object Activity

Scene Activity
(incident/congestion)

Detection & Tracking
(red vehicles)

Red Car / Red Truck – on live ATMS system

The United States is a "hard target" but "tasty target" for extremists despite the difficulties presented by geography and the American counterterrorism apparatus put in place after the Sept. 11, 2001, attacks, a former Homeland Security Department analyst commented during an interview.

Washington D.C. has a very large contingent of embassies and international diplomats which have made them a high target for terrorist

(Fictional)

We will use ATMS to track and locate suspected terrorist after a failed embassy attack plot. Witnesses alerted federal agencies that POI jumped into a red car and headed in the direction of the highway.

LIVE DEMO

Despite the intense security in the area, a man recently parked his pickup next to the Reflecting Pool and told police he was carrying a bucket of anthrax.
LISA CORSON/GALLERY STOCK

The view from Freedom Plaza in Washington, D.C. Officials at the Washington Field Office of the FBI say D.C. is a prime target for terrorists. (WTOP/J.J. Green)

ENVIpalooza
An Insider's Guide to GEOINT

Questions?

Summery
- In use today
- Can uses existing or future camera infrastructures
- Has an API
- Flexible object detectors - static or moving objects
- Ongoing R&D – ex: Radio alerts and vehicle-based sensors

ENVIpalooza
An Insider's Guide to GEOINT