Connected and Automated Vehicles and the Cybersecurity Threat

Prevention or Management?
Battelle

**HISTORY**
- Established 1908
- 22,000 employees, 13 countries
- World’s largest nonprofit independent R&D organization

**AUTOMOTIVE HISTORY**
- Anti-lock brakes
- Cruise control
- NEM: Automotive Anomaly Detection System
- Automotive security architecture services
- Cyber Auto Challenge

**SECTORS**
- Energy
- National security
- Health and life sciences,
- Chemical and pharmaceutical
- Cyber security
The need for connected cars

• To make cars safer and more reliable

• To optimize performance

• For convenience and luxury of passengers
The connected space

• Vehicle to Backbone
  - Backbone infrastructure, dedicated telematics, private networks

• Vehicle to Vehicle
  - Active transportation network, other connected cars

• Vehicle to everything
  - Consumer devices, POS, ATM
Most critical threats

- Intra car
  - Intrusions, cyber threat
  - Fraudulent warranty claims
  - Safety
  - Theft
- V2X (V2V & V2I)
  - Malware
  - False data injection
  - Misbehavior
  - Data leakage
  - PII Data privacy
Prevent or Manage?

• 100% Prevention is Mission Impossible
• Controlling the resulting damage is practically achievable through effective threat management
EFFECTIVE THREAT MANAGEMENT
Effective Threat management

Combination of techniques balanced with risks
How the ecosystem can contribute

**Standards development**

- V2X standards must leverage inherent existing distributed system properties, existing robust feedback control and active systems
- Best building blocks for misbehavior detection
- Data protection and privacy through compartmentalization, time bound storage, anonymization, hardware based security (TPM based) as needed

**Increased pre-competitive cooperation**

- Government, infrastructure operators, OEMs, tier 1 manufacturers, research institutions must work together
- Major automotive involvement
- Commitment to adoption
How the ecosystem can contribute

• We may not get it right in the first attempt
• But the first comprehensive multi party attempt is the right approach
Contact

Contact:
✉️ sonalkera@battelle.org
📞 240-426-8731

Battelle Vehicle Cybersecurity Webpage: