MCAP

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Report Documentation Page

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Standard Form 298 (Rev. 8-98)
Prescribed by ANSI Std Z39-18
• Vehicle to Vehicle (V2V) Collision Avoidance
  – Fault detection of failed transponder (device)
  – Communication failure (network)
  – “Hacker”
• Examples:
  – Two or more vehicle entering a common intersection from different directions
  – Leader-follower convoy
  – Traffic signal pre-emption
From the smart phone view, Tracker map links to SMS for messaging to one or multiple responders.

Uses Open Systems for Maps.
MCAP In-Vehicle

Vehicle Health Assessment
- Vehicle vital signs - talking on the CAN bus
- Assess ability of vehicle to execute response

Vehicle Asset Tracking and Control
- Assessment of additional capability to serve mission
- Adding functionality for remote control of vehicle assets

Vehicle to X
- V-2-V Collision detection and avoidance
- V-2-Traffic signals and control, navigation
- V-2-I for asset sharing

Vehicle as a Communications Cond
- More power / longer range to back-end
- More power / longer range from dismounted Soldiers / Responders
- Alternate schemes for comm denied to back end including satellite, hardwired, portable cell towers
System Architecture Example
Technology Development and Transition

- **Develop / Transition Advanced 360 SA Capabilities**
  - For Now, Develop and Integrate Initial 360 SA Capability w/ COTS Items
  - Transition Relevant Technologies Upon Input from Soldiers in the Field

- **Develop / Transition Autonomy to Sensor Inputs**
  - For Now, Simply Feed Sensory Data to Soldier for Direct Analysis
  - Transition Autonomous Technologies that Improve Soldier Cognition and Decision-Making
    - Slew-to-Cue, Target / Obstacle Detection, Road Edge Detection, etc.

- **Develop / Transition Advanced Sensors Upon Platform**
  - Current Focus is on Visual (Daytime, IR) Sensors
  - Transition New or Upgraded Sensors as Requirements Warrant
    - Laser Range Detectors, Millimeter Wave RADARs, etc.
    - Upgraded Cameras, Displays, Digital Backbone Architecture, etc.
Vehicle Technology Development Areas

**UGV Technology Development and Integration**

**Demonstrating UGV Control**
Utilizing SOSCOE and Battle Command Software

- Autonomous Navigation System (ANS) and RSTA
- Hardware and Software Integration
- Integrated Computer System and Vehicle Management System

**UGV Platform**

**FCS Like Comms Network**

JTRS-GMR

**MGV With Embedded UGV Control**

*Technology Driven. Warfighter Focused.*
# Portfolio

## Combat Vehicles
- Heavy Brigade Combat Team
- Strykers
- MRAPs
- Ground Combat Vehicles (Future)

## Tactical Vehicles
- HMMWVs
- Trailers
- Heavy, Medium and Light Tactical Vehicles

## Force Projection
- Fuel & Water Distribution
- Force Sustainment
- Construction Equipment
- Bridging
- Assured Mobility Systems

## Robotics
- Technology Components
- Demonstrators
- Military Relevant Test & Experimentation
- Transition & Requirements Development

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TARDEC Engineers Provide Cradle-To-Grave Engineering Support
System & Simulation Integration Laboratories

- Concept Development
- Modeling & Simulation Environment
- System Evaluation
- MRAP Systems Integration Lab

Physical Simulation Laboratories

- Reconfigurable N-Post Simulator
- Multi-Axial Simulator
- Vehicle Inertial Properties Evaluation Rig

Fuels & Lubricants Laboratories

- Coolant Lab
- Grease & Hydraulic Fluid Lab
- Fuel & Lube Lab
- Analytical Lab

Survivability Laboratories

- Ballistic Testing

Prototype Integration

- Center for Ground Vehicle Development & Integration
- Large Robotics Integration Cell

Power & Energy Laboratories

- Ground Systems Power & Energy Lab
- Propulsion Laboratories

TARDEC’s Warren, MI operations has a resource value of over $950M and occupies 12 facilities on the Detroit Garrison totaling over 840,000 square feet of laboratory space.
### Advanced Concepting

- JLTV
- MRAP
- Future Force

### Analytics

- Thermal / CFD
- Crew Safety
- Structures/Durability
- Blast
- Dynamics

### Hardware & Man-In-The-Loop Simulation

- Characterization
- Durability
- Turret Testing
- Human Dimension
- Virtual Environments

### Prototype & Demonstrators

- FTTS
- FED
- TWVS
- APD

### HPC & Data Management

- High Performance Computing (HPC)
- Computer Aided Virtual Environment (CAVE)
- Advanced Collaborative Environment (ACE)

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**Providing rapid assessment and integration services throughout the Life Cycle of both Technology and System/Platform Development Programs.**