TECHNOLOGY DRIVEN. WARFIGHTER FOCUSED.

MCAP

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Report Documentation Page

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MCAP Operational View

Mobile Computing Application Platform

Maps
Email & Chat Server
Videos / Pictures
User Directory
MCAP App Store

Perimeter Security & Location Tracking

Remote sensing and control

Leverage Cellular Networks

In-Vehicle Computers

Leverage Embedded WiFi Technology

Command Center

Video Streaming

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MCAP Potential Exploratory Areas

- 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

Sensing Technology

Safety Considerations

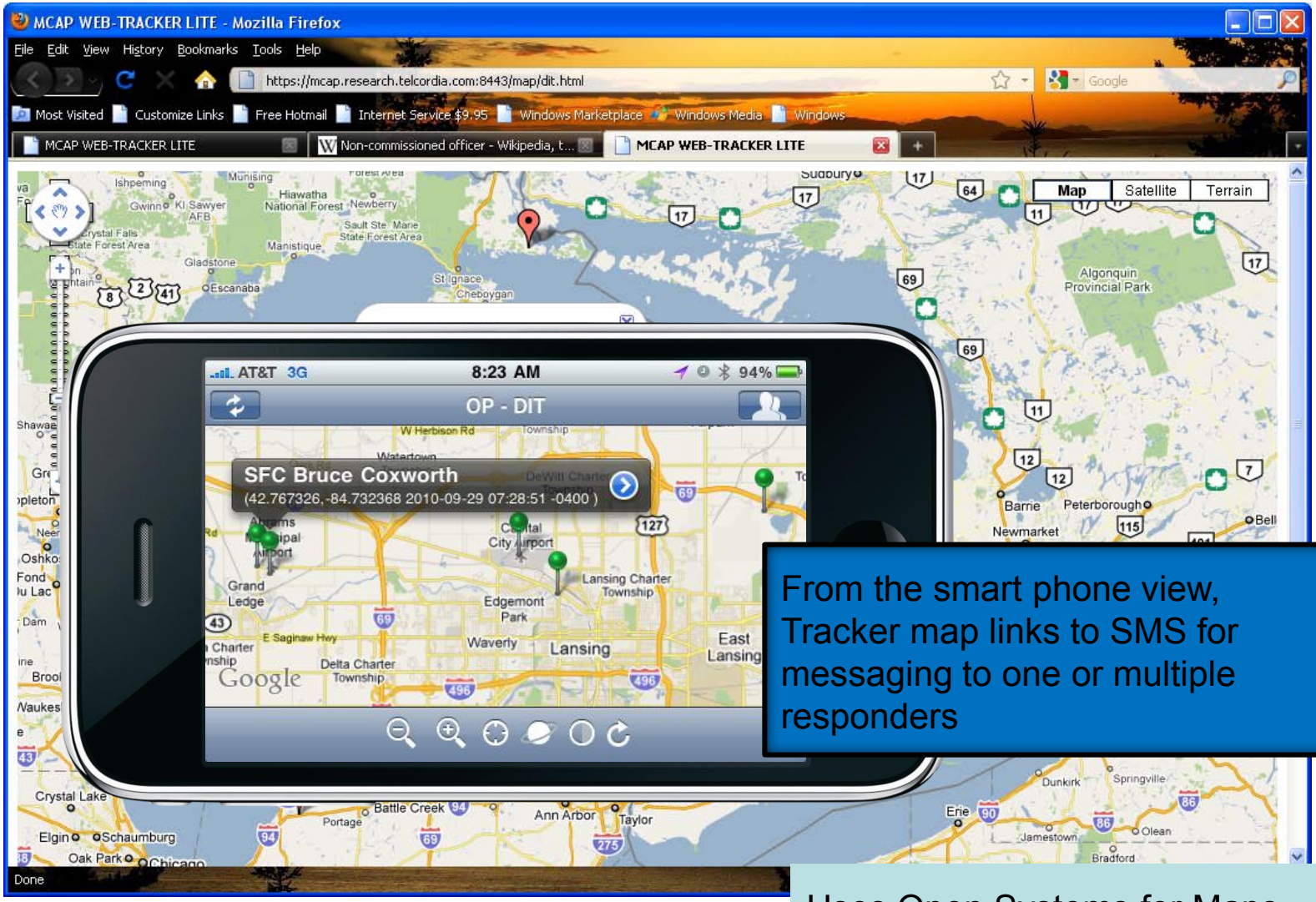
Connected, Autonomous Vehicle

Infotain./ Telematics

Also, Safety Critical Systems, Wireless Technologies, and Ad-hoc vehicular systems

Back -up

MCAP Tracker: Web (for EOC Display)



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

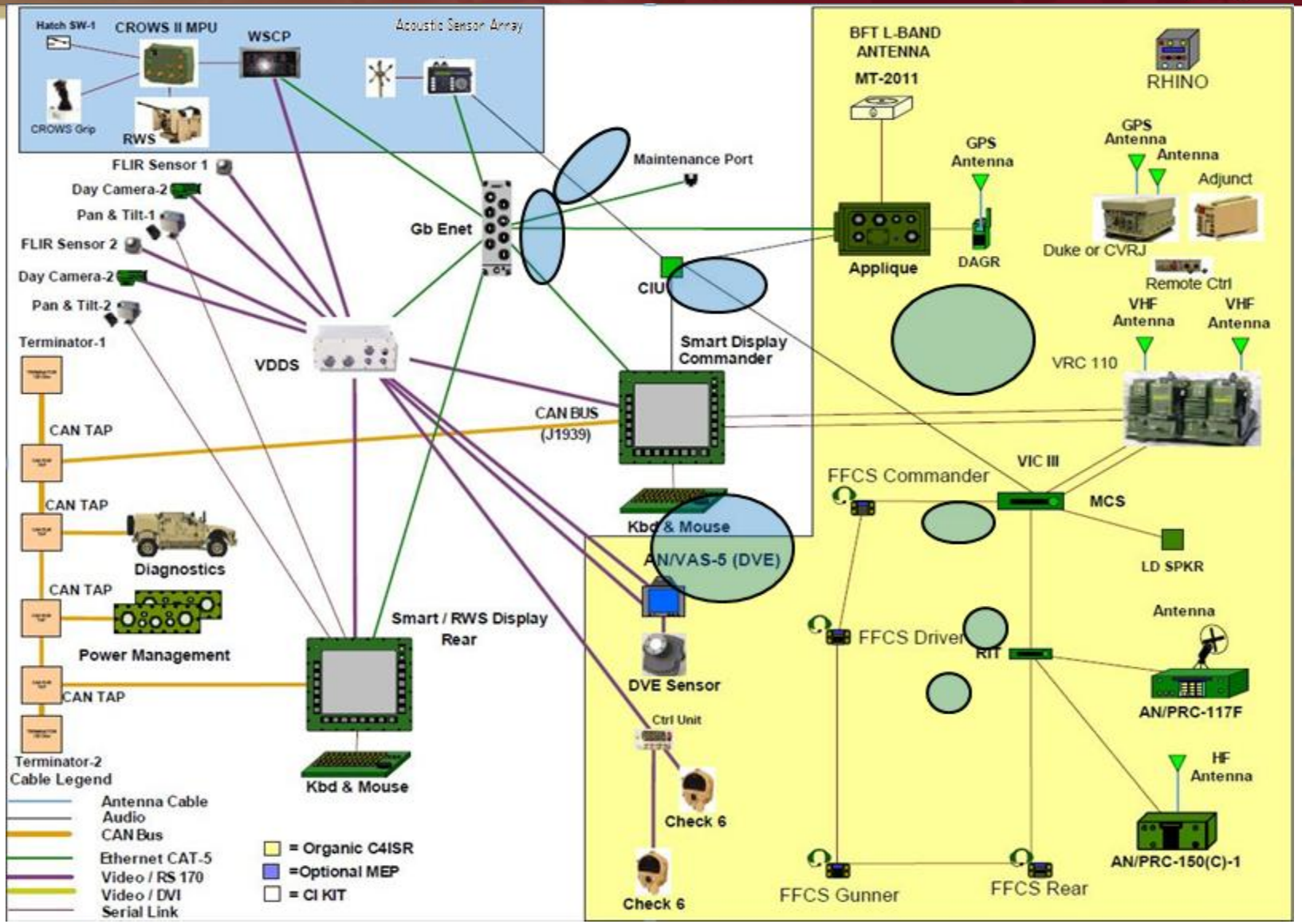
Vehicle to X

- 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

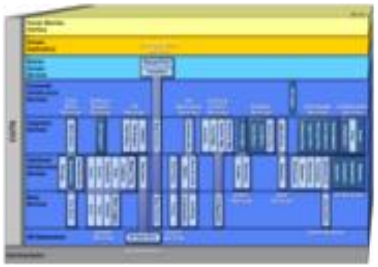


Technology Development and Transition

- **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

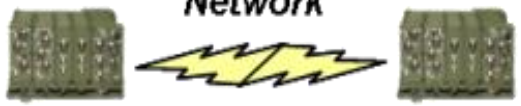
Autonomous Navigation System (ANS) and RSTA

Hardware and Software Integration

Integrated Computer System and Vehicle Management System

UGV Platform

FCS Like Comms Network



JTRS-GMR JTRS-GMR

MGV With Embedded UGV Control

TECHNOLOGY DRIVEN. WARFIGHTER FOCUSED.

Portfolio

Combat Vehicles

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

Force Projection

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

Tactical Vehicles

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

Robotics

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

TARDEC Engineers Provide Cradle-To-Grave Engineering Support

Laboratory Capabilities

System & Simulation Integration Laboratories

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

Survivability Laboratories

Ballistic Testing

Physical Simulation Laboratories

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

Prototype Integration

Center for Ground Vehicle Development & Integration	Large Robotics Integration Cell

Fuels & Lubricants Laboratories

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

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

Enabling Integration & Technology Development

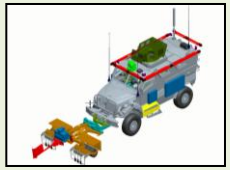
RDECOM

TARDEC

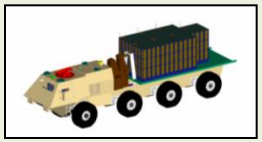
Advanced Concepting

Future Force

JLTV

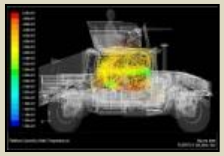


MRAP

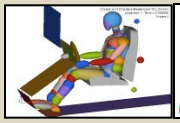


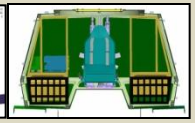
FTTS

Analytics

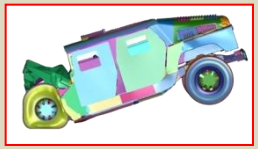


Thermal / CFD

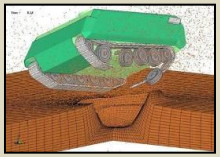




Crew Safety



Structures/Durability



Blast

Dynamics

Hardware & Man-In-The-Loop Simulation

Characterization

Durability

Turret Testing

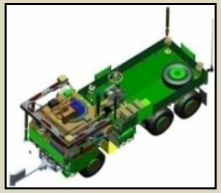
Human Dimension

Virtual Environments

Prototype & Demonstrators

FTTS

FED



TWVS

APD

HPC & Data Management

High Performance Computing (HPC)

Computer Aided Virtual Environment (CAVE)

Advanced Collaborative Environment (ACE)

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