

3. Selected Key Issues for Emergency Response to MVCs for Each Functional Step

Emergency Management

Functions

Issues

Capabilities/Technologies

Detect/Characterize Problem



- Delays in crash detection for un-witnessed crashes
- Inadequate info on scene conditions until first responders arrive

- Advanced Automatic Crash Notification (AACN) system detects crash, records crash event data, number of occupants, etc.
- Scene characterization data acquired in real time from vehicles & roadway sensors at or near the scene

Notification/Dispatch



- Delays in detection & problem definition lead to delays in dispatch of appropriate emergency services
- Witness reports often inaccurate

- AACN alert with accurate crash location & event data displayed for 9-1-1 dispatcher
- High fidelity crash visualization model(s) use AACN data to provide real-time prediction of injuries & needed resources
- Scene characterization data communicated to dispatcher via V2V & V2I pathways**
- Fusion algorithms use data from fixed infrastructure sensors, mobile self-organizing sensor networks & system databases to create actionable info for dispatcher(s)

Responder Travel to Scene



- Travel to scene via air or ground ambulance is dangerous because of inadequate information on roadway and weather conditions

- En route weather and road surface conditions obtained in real time using vehicles along route as weather probes communicating via V2V & V2I**
- Arriving responders wear protective clothing equipped with electronic devices which send signal that approaching vehicles sense
- Unmanned Aerial Vehicles (UAVs) & expanded network of off-airport automated weather stations provide improved flight weather
- Emergency Vehicle Signal Preemption (EVP) becomes widely deployed using V2I**

Scene Mgmt & Operations



- Dangerous scene environments
- Difficulties locating, extricating and treating injured victims
- Lack of patient medical history
- Inadequate documentation tools

- Wearable computers provide responders with augmented reality capabilities (e.g., virtual info projected into responder's field of view) as well as internet-enabled 'point-of-care access' to medical records, medications, etc.
- Motes (combined sensor/computer/wireless link) with speech recognition support hands-free data recording & patient monitoring
- Depth perception feature of 3D telepresence enhances telemedicine in the field
- Robots aid in search & rescue

Patient Transport



- Inadequate info on hospital staffing/status to aid in transport decisions
- Need for improved communication to support en route medical direction and patient care

- Info on medical staffing & bed availability at surrounding hospitals support transport decisions
- Mobile telemedicine available during transport
- Synthetic vision supports travel in low visibility for air & ground ambulances

**V2V = Vehicle-to-Vehicle, V2I = Vehicle-to-Infrastructure