



# PROJECTS UPDATE

TSAG MEETING

MINNEAPOLIS, MN

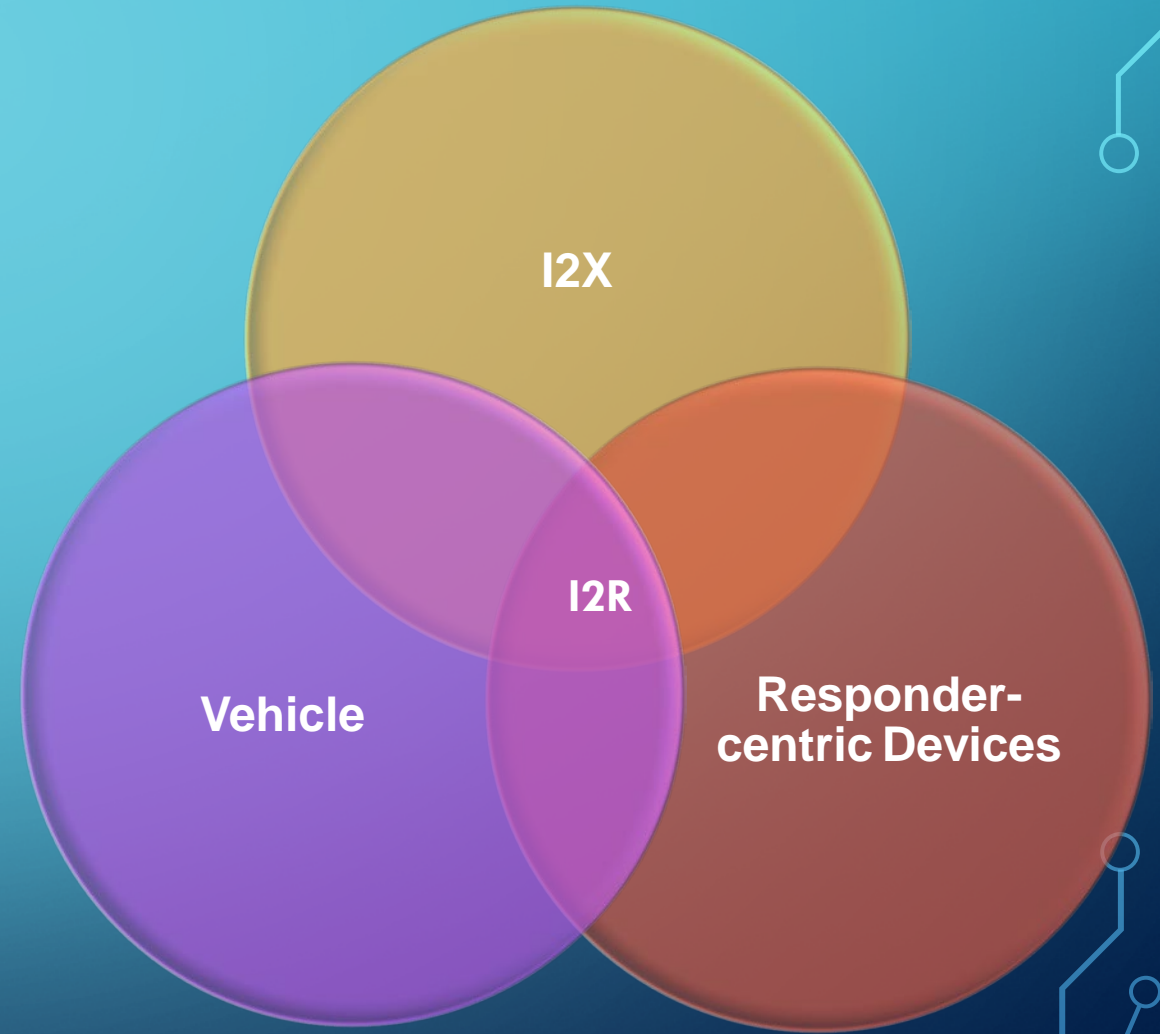
AUGUST 20, 2018

# I2R PROJECT

- Project goals
  - Improve safety through situational awareness
  - Reduce risk during high-risk operations
  - Enhance delivery of life-saving services
- Approach
  - Bring together thought leaders to consider responder needs and technical capabilities using virtual meeting capabilities
  - Identify priority technologies – existing, emerging and future
- Final products
  - Technical memo outlining research and development needs
  - Whitepaper summarizing findings
  - PowerPoint presentation with speaker notes
  - Boilerplate article that can be adapted to different disciplines with examples

# I2R DEFINED

- Interface between the infrastructure and the responder
- Requires smart infrastructure that communicates with responders directly or through cloud applications
- Provides information or warnings directly to on-scene responders from the infrastructure or provides response related information to response vehicles



# I2R APPLICATIONS: RESPONDER CENTRIC EXAMPLES

- Information on change of conditions such as freezing temperatures on the roadway surface
- Notification of structural damage or instability
- Vehicle incident scene intrusion warnings using geofencing
- Signal override for scene management
- Changes to dynamic message signs
- Information on the proximity of hazards such as storm water inlets or hazardous materials storage facilities

# I2R APPLICATIONS: RESPONSE VEHICLE EXAMPLES

- Location of and distance to a hydrant
- Notification of hydrant function and rated capacity
- Scene intrusion monitoring
- High speed vehicle notification
- Location of predetermined staging areas
- Predetermined medivac locations
- Location of emergency crossovers or access points
- Roadway hazard warning
- Notification of non-functional signal preemption
- Smart route guidance to the scene and en route to receiving facilities

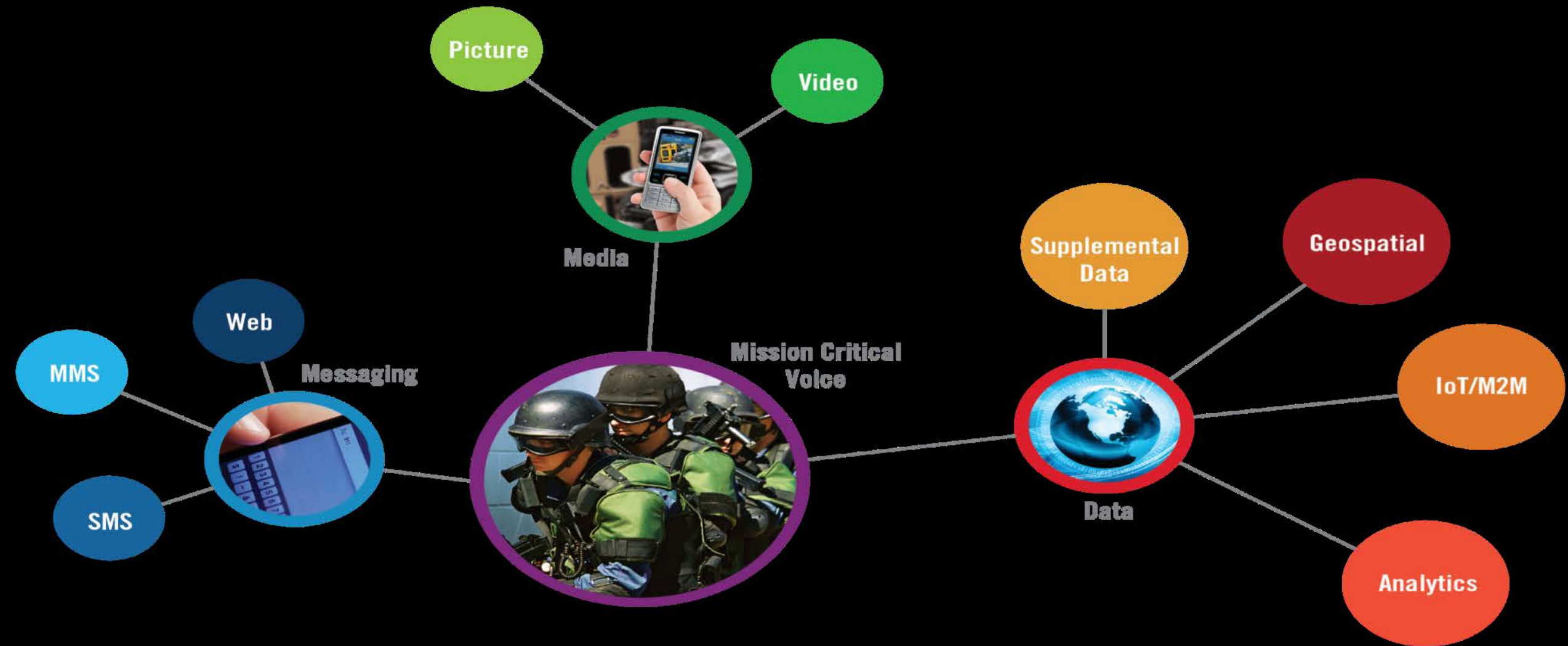
# M2M, IOT AND CLOUD COMPUTING

| M2M   | IOT  | Cloud Computing  | Edge Computing  |
|---|--|--|---|
| Point-to-point communication usually with embedded hardware                 | Devices communicate using IP networks, incorporating with varying communication protocols (sensor focus) | Storage, retrieval and analysis of data over the internet (sensors, apps, databases, etc.) | Distributed retrieval and analysis of data over the internet (sensors, apps, databases, etc.) |
| Many devices use cellular or wired networks                                 | Data generation and delivery through the internet  | Allows internet data and shared computing  | Stores and processes data in close proximity to data source/user                              |
| Devices do not necessarily rely on internet connection                      | Devices generally require an active internet connection  | Requires internet connection, independent of communication system                          | Requires internet connection and is typically part of a cellular network                      |
| Limited integration options requiring corresponding communication standards | Unlimited integration options, requiring a communication manager   | Open ecosystem for app developers and device manufacturers                                 | Middleware application and infrastructure services  |

# EMERGING TECHNOLOGY OPPORTUNITIES

- IoT integration of device and sensor data with big data analytics
- Highway automation to support CAV
- Smart Cities initiatives providing data lakes and data warehouses for the physical environment (natural and built)
- The Cloud provides a device agnostic platform for data access and analytics
- Applications access data lakes/warehouses and apply analytics and contextual awareness for on-scene responders
- Cloud-based architecture is scalable and removes need for additional hard-wired connections and M2M SIM cards

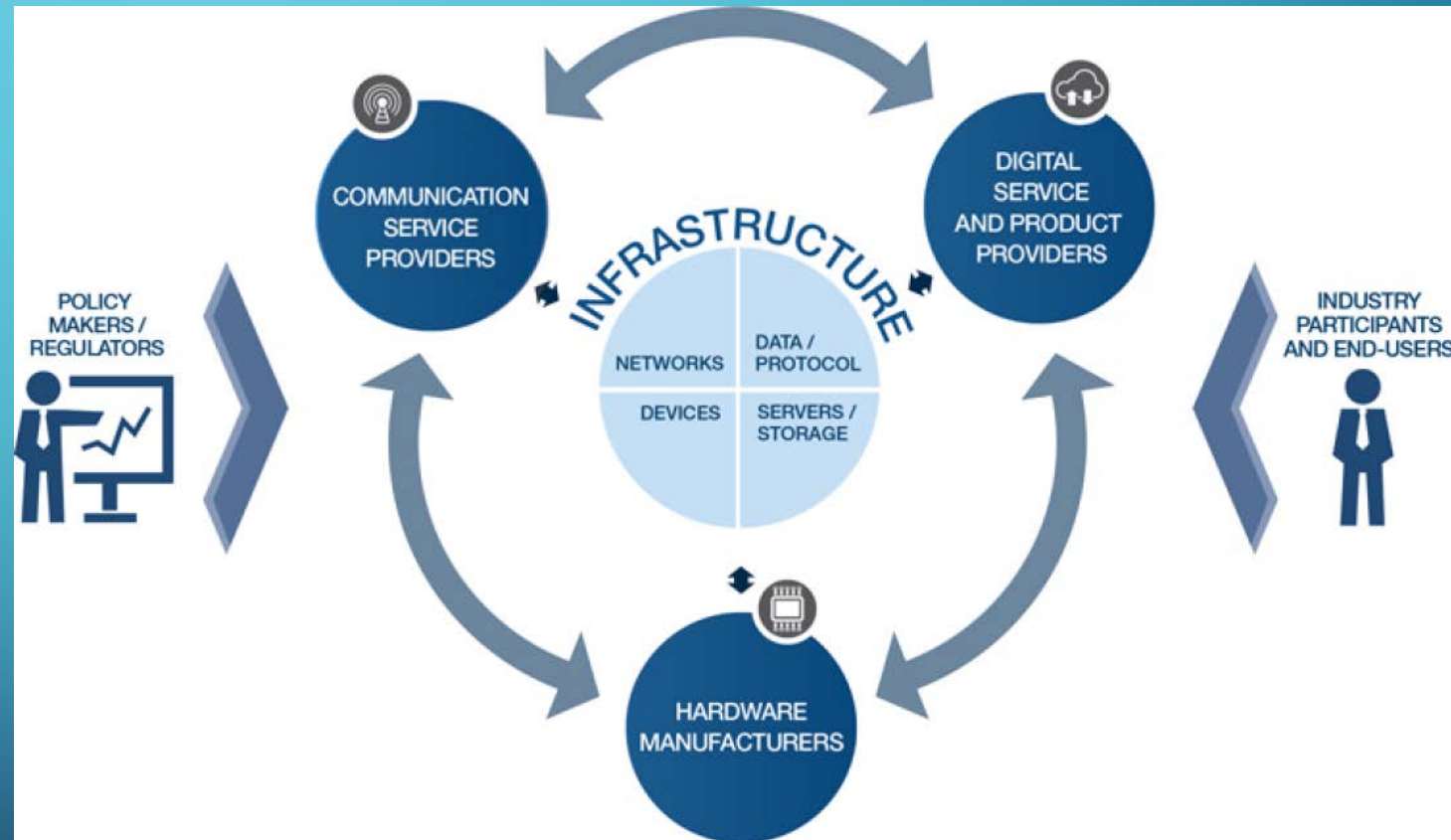
# NEXT GENERATION PUBLIC SAFETY SERVICES





# TRANSPORTATION DIGITAL INFRASTRUCTURE

- Physical environment (built and natural)
- Identification of other entities within that environment (e.g. vehicles, pedestrians, cyclists)
- Information and communications technologies (ICT), including traffic control information
- Temporal information such as incidents, work zones, weather, and traffic



Source: World Economic Forum

<http://reports.weforum.org/delivering-digital-infrastructure/introduction-the-digital-infrastructure-imperative/>



# NEXT STEPS

- Complete literature search – Need input today
- Identify expert panel – Need input today
- Plan expert panel webinar
- Hold expert panel webinar
- Identify technologies (priority and emerging)
- Develop products (Tech memo, whitepaper, PowerPoint presentation, boilerplate article)
- Present webinar

# POTENTIAL EXPERT PANEL MEMBERS

| Company                                      | Representative     |
|--|--------------------|
| Amazon Web Services, Smart Cities & Mobility | Hardik Bhatt       |
| FHWA CAV Program                             | John Corbin        |
| West Safety Services (formerly Intrado)      | Christian Militeau |
| IoT+LTE Consulting Group                     | Dean Skidmore      |
| Urban Systems                                | Wilfred Pinfold    |
| NPSTC IoT Working Group                      | Barry Fraser       |
| AT&T Smart Cities                            | Mike Zeto          |
| Open Geospatial Consortium                   | Josh Lieberman     |
| FirstNet and EMS                             | Kevin McGinnis     |
| Law enforcement                              |                    |
| Fire-rescue                                  |                    |
| Panasonic                                    |                    |
| Intel  |                    |
| Cisco  |                    |
| IBM  |                    |

# AACN PROJECT

- Project goals
  - Review the benefits of AACN
  - Identify current and future opportunities for AACN deployment
  - Identify and address institutional challenges to implementing AACN
- Products
  - Whitepaper
  - PowerPoint presentation
  - Boilerplate article



# NEXT STEPS

- Literature search – Need input today
- Outreach to industry representatives – Need input today
- Develop case studies and recommendations
- Develop products
- Present webinar