Responder Innovations and Applications

Public Safety Broadband Stakeholder Meeting

David Buchanan
First Responder Network Authority
First Responder Network Authority Innovation Activities

The First Responder Network Authority is focused on efforts to serve the public safety community by engaging innovators, developers, industry, and others. Our role is to facilitate productive dialogue among these communities to ensure the best broadband products and services are available to public safety.

- **Identify Existing Solutions**
  Seek to identify existing solutions that could be modified for public safety and brought to the FirstNet platform.

- **Engage Public Safety**
  Provide venues for public safety to identify specific operational needs and use cases.

- **Inform Developers**
  Provide developers with information and tools to guide development of relevant innovations.

- **Promote Collaboration**
  Connect developers directly with public safety practitioners to produce innovative solutions.

- **Conduct Outreach**
  Introduce new organizations to FirstNet to drive innovation from all avenues.
Innovation Landscape

First Responder Community

Funders

Developers / Entrepreneurs

Innovation Leaders
“FirstNet will provide a platform for innovative companies and government groups to come up with new applications that improve response and citizen safety.”

-- Tom Snyder, Executive Director, RIoT
FirstNet AT&T Collaboration
Public Safety Broadband Stakeholder Meeting
Tracy McElvaney
First Responder Network Authority
Collaborative Evolution

First Responder Network Authority

Targeted engagements with Public Safety on the desired future state of technology

AT&T

Collaborative engagements with FirstNet subject matter experts through the product lifecycle

Innovation – Evolution – Implementation - Operation
December 2017
All U.S. states & territories opt in.

Today
We are developing the tools that advance public safety with you.

February 2012
The FirstNet Authority was authorized to develop and oversee the dedicated nationwide network for first responders.

March 2017
AT&T awarded contract to provide the capabilities for FirstNet to be built.

December 2017
All U.S. states & territories opt in.

Today
We are developing the tools that advance public safety with you.

Over 100 years in emergency response solutions.

March 2010
FCC follows the 911 Commission’s recommendation to create a nationwide public safety network.
Coverage Expansion
A “network of tomorrow” designed to reach more than 99% of U.S. population with $40 billion of planned investment.

In-Building Solutions
Over 6,000 distributed antenna systems in place providing enhanced connectivity, capacity and coverage in multi-story buildings.

Deployable Program
An unprecedented set of deployable LTE capabilities available to serve first responders.

First Priority™
With First Priority™ on Band 14 and AT&T existing LTE, first responders are always on, always first in line.
CONTROL

Customer Support
Dedicated 24/7 x 365 customer care desk based in the U.S.

Local Control
Provides control over and visibility into the FirstNet network operational status and site conditions through an administrative hub.

Training
Access to a variety of flexible training and educational tools.

Incident Management Portal
Allows a local resource to elevate priority levels for public safety users as needed to meet the challenge.
INNOVATION

Apps & Solutions
Advanced, customized apps developed for first responders.

App Developer Program
Everything developers need to build, deploy and maintain applications.
SECURITY

Cybersecurity
Multi-layered defense to help ensure a highly secure platform. Features a dedicated Security Operations Center enhanced with AT&T global cybersecurity assets.

Identity, Credential, and Access Management
Single Sign-On capability across all FirstNet and agency applications.
DEVICES

Service Plan & Procurement
Accessible and competitive rate plans at or below existing commercial pricing.

Wireless Devices
Access to an increasingly expansive catalog of standard and rugged LTE devices with aggressive pricing.
FirstNet & The Texas Public Safety Broadband Program

Jared VandenHeuvel
Lead Coordinator
Texas Public Safety Broadband Program
Texas Department of Public Safety
FirstNet Adoption in Texas

• September, 2017: Texas opts-in to FirstNet

• January, 2018: Brazos County Sheriff’s Department becomes first Texas subscribing agency

• June, 2018: Texas Department of Public Safety becomes the largest FirstNet customer
FirstNet and Texas DPS

- In-vehicle modems for most officers
- 6,000 smartphones cached for emergencies
- Border security sensors
- Changes to staffing and future strategy
Operational Effects

- Hurricane Harvey
- Sulphur Springs church shooting
- McDannald wildfire
- Mallard wildfire
- Santa Fe High School shooting

AT&T CoLT assisting Texas DPS and firefighters during Mallard fire.
• Joint outreach with FirstNet

• Input into the buildout of the network

• Working with FirstNet on new technologies and policies

2018 Outreach event in Houston, TX
Virtual Reality Heads-Up Display Navigation Challenge – Live Results

Friday, June 8, 2018
PSCR’s User Interface/User Experience Portfolio & Open Innovation Team
psprizes@nist.gov
DISCLAIMER

Certain commercial entities, equipment or materials may be identified in this document in order to describe an experimental procedure or concept adequately.

Such identification is not intended to imply recommendation or endorsement by the National Institute of Standards and Technology, nor is it intended to imply that the entities, materials, or equipment are necessarily the best available for the purpose.

*Please note, all information and data presented is preliminary/in-progress and subject to change.
Acronym Glossary

- HUD = Heads-Up Display
- LIDAR = Light Detection and Ranging
- UI = User Interface
- UX = User Experience
- VR = Virtual Reality
UI/UX OPEN INNOVATION VIDEO
AGENDA

- Challenge Overview
- Solutions Showcase
- Announce the Winners

Note: Audience Demonstrations & Q&A Available in the Demonstration Hall from 1-5pm
AR/VR Environment for Improved UI – Finalist
User interface design has rarely targeted Public Safety. This 4-stage challenge is designed to advance UI for first responders to complete navigational tasks.

- Prize awards up to $125k for top 7 designs.
- Create prototype heads-up display in a VR environment
- Evaluate the heads-up display via UI/UX & Navigation capabilities
  - Functional settings menu
  - Key operational data
  - Options for map
  - Navigational modes
STAGE 1: CONCEPT PAPER

• Goal:
  • Concept papers and HUD mockup

• Timeframe:
  Jan 2\textsuperscript{nd} - Jan 29\textsuperscript{th} 2018
STAGE 2: WORKING CONCEPT & PROTOTYPE

• Goal:
  • Develop HUD in VR environment
  • 8 participants invited

• Timeframe:
  Feb 2\textsuperscript{nd} - Mar 9\textsuperscript{th} 2018
STAGE 3: ROUND 1 - HEADS-UP DISPLAY PROTOTYPE EVALUATION

- Goal:
  - Contestants integrate HUD solution to address navigation task
  - PSCR provided VR environment
  - 7 participants invited
- Timeframe:
  Mar 19th - May 11th 2018
STAGE 3: ROUND 1 - HEADS-UP DISPLAY PROTOTYPE EVALUATION
STAGE 4: LIVE COMPETITION

• June 4th - June 9th 2018
• Head-to-head, live competition among contestants
• SME and Judge panel
  • Test & evaluate Demos
  • Q&A / Pitch with panel
Judges:
• Jeff Bratcher, FirstNet
• Dereck Orr, PSCR

Subject Matter Experts:
• Charlie Sasser, Senior Officer for Data Governance, Georgia Technology Authority
• Barry Luke, National Public Safety Telecommunications Council
• Ken Link, Lieutenant of the Monroe Township Fire Department and State of New Jersey’s USAR
• Yee-Yin Choong, NIST’s Visualization and Usability Group at ITL
## Scoring Criteria

<table>
<thead>
<tr>
<th>Scoring Criteria</th>
<th>Points (100 total)</th>
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<tbody>
<tr>
<td>Compliance Testing (Pass/Fail)</td>
<td>P/F</td>
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<tr>
<td>Heads-Up Display Functionality Indicators</td>
<td>20</td>
</tr>
<tr>
<td>Heads-Up Display Navigation Function</td>
<td>20</td>
</tr>
<tr>
<td>Responsive to Scenario</td>
<td>50</td>
</tr>
<tr>
<td>Q&amp;A with Judge Panel</td>
<td>10</td>
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</tbody>
</table>
CONTESTANT: SCREEN DOOR LABS

- Team members:
  - Kari Wu, CEO
  - Seth Persigehl, CTO
  - Tricia Stokes, Creative Director

- Team Attributes & Focus Areas:
  - Creates Software Solutions for public safety officers using real-time video, drones, GPS & geotags into augmented reality.
  - Utilizes eye-tracking technology to display data when user needs it.

Solution Functions/Highlights:

- **Eye-tracking technology paired with Expandable Icons:** user activates each UI by staring at icons - no more info blocking users’ view.

- **Navigation Updates:** Reroutes upon triggered events or victim rescue; Provides fastest route to user.

: www.screendoorlabs.com
TEAM SCREEN DOOR LABS’ DEMONSTRATION
CONTESTANT: TEAM ENGRDYNAMICS

• Team members:
  • Tim Kaniss, Computer Scientist
  • Dave Kaniss, Systems Engineer
  • Julie Fennell, Ph.D. Sociologist

• Team Attributes & Focus Areas:
  • Making advanced technology easy for regular people to use
  • Using affordable/commercially available technology

Solution Functions/Highlights:
• Provide visual warning of high temperature areas using thermal imaging
• Illuminate areas of reduced visibility (dark/smoke) using LIDAR
• Display life-saving info, such as O2 remaining, with minimal distractions
• Provide detailed environmental info with available virtual wrist display

: engrdynamics.com
TEAM ENGRDYNAMICS’ DEMONSTRATION
CONTESTANT: FACTUAL VR

Team members:
- Eduardo Neeter, Founder | CEO
- Virgile Grob, Programmer

Team Vision: to improve justice!
To allow anyone to inspect a crime scene

Team Mission: A VR platform to help law enforcement and prosecutors to accurately replicate and communicate the facts around a crime scene

Solution Functions/Highlights:
- **Replicability**: Solutions allows ability to capture and reproduce crime scenes
- **Navigation Updates in Real-Time**
- **Multiple UI Included**: police, firefighter, victim location included with ability to interact through map.

: www.factualvr.com | @FactualVR
TEAM FACTUAL VR’S DEMONSTRATION

UI Features
CONTESTANT: IFIVR GUARDIAN AIRWAVES

Team members:
• Lisa Revelli, Founder
• Herb Love, Adviser, Tactical Firefighting
• Casey Seitz, Programmer
• Anupam Das, Technical Director & Software Engineer

Solution Functions/Highlights:
• **Multiple UI Elements:** HUD includes location, thermal and night vision views and elements for user.
• **Focus on UI Safety:** Vital Signs of UI included.
• **Detailed & Clear Training Video**

: www.secure.guardianairwaves.com
CONTESTANT: NEXTGEN INTERACTIONS

• Team members:
  • Jason Jerald, Co-Founder
  • Blake Boyd, Firefighter
  • Luke Tannenbaum, Developer
  • Simon Mangiapelo, Developer

• Team Attributes & Focus Areas:
  • VR/AR Consulting & Product Development
  • VR/AR Speaking & Training

Solution Functions/Highlights:

• Multiple UI Elements: User interacts with UI elements, such as air supply, breadcrumb trail, alerts, smart watch through head gaze and controller input.

• Navigation Map: can be interacted with at waist level, placed on ground or viewed on wrist.

: www.nextgeninteractions.com
CONTESTANT: LOOKON VRTU

Solution Functions/Highlights:

- **Streamlined HUD**: Only the critical information included.
- **Voice Activated** or Manual Commands.
- **Real-Time Navigation**: updates based on user’s locations and helpful compass in HUD.
- **Focus on UI Safety**: Oxygen Readout and temperature sensor that alerts and adjusts based on hazards.

Team members:  
- Brian Mahoney  
- Jonathan Powell  
- Zeljko Strakalj

Team members:  
- Hurriyet A. OK  
- Selim Yargici

: www.lookonmedia.com | www.vrt-u.com
TEAM LOOKONVRTU’S DEMONSTRATION
ANNOUNCEMENT OF THE CHALLENGE
COMPETITION WINNERS

- Sixth Place: $5,000
- Fifth Place: $7,500
- Fourth Place: $10,000
- Third Place: $15,000
- Second Place: $20,000
- First Place: $25,000
THANK YOU