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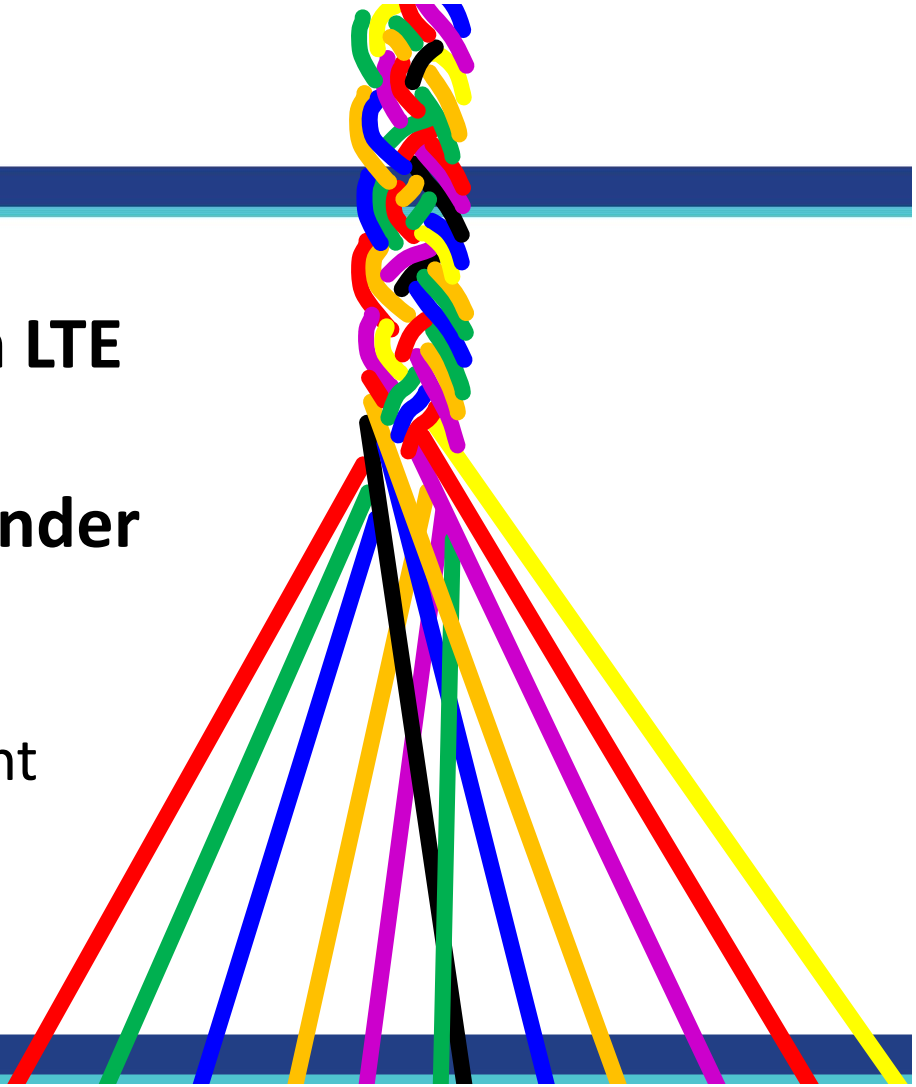
How Connected Devices With LTE Can Improve Situational Awareness for the First Responder

Mark Tesh
Director of Product Management
L3Harris



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Synopsis

In a world narrowing in on “connected” technology and “smarter devices,” the most critical use case is often overlooked: first responders and communications *in emergency situations*.

With *converged* LTE Land Mobile Radios, the game has changed on the possibilities for real-time connection, enhanced safety measures, and *seamless device integration* for on-the-ground communications.

Learn more about applications including integration with self-contained breathing apparatus, biometric sensors, and live video streams to inform decision making *at the edge*. This presentation will provide a look into the life-saving implications, potential, and *future of the connected first responder.*

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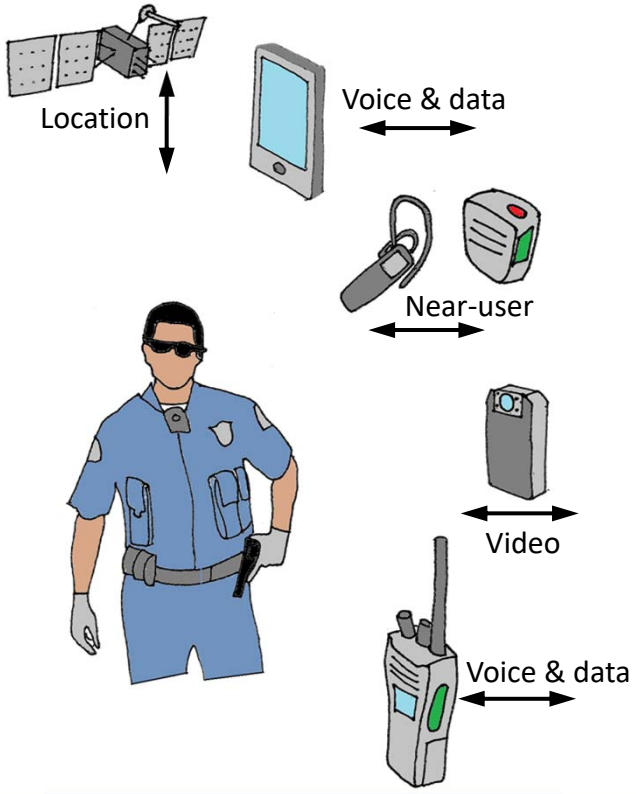
Synopsis

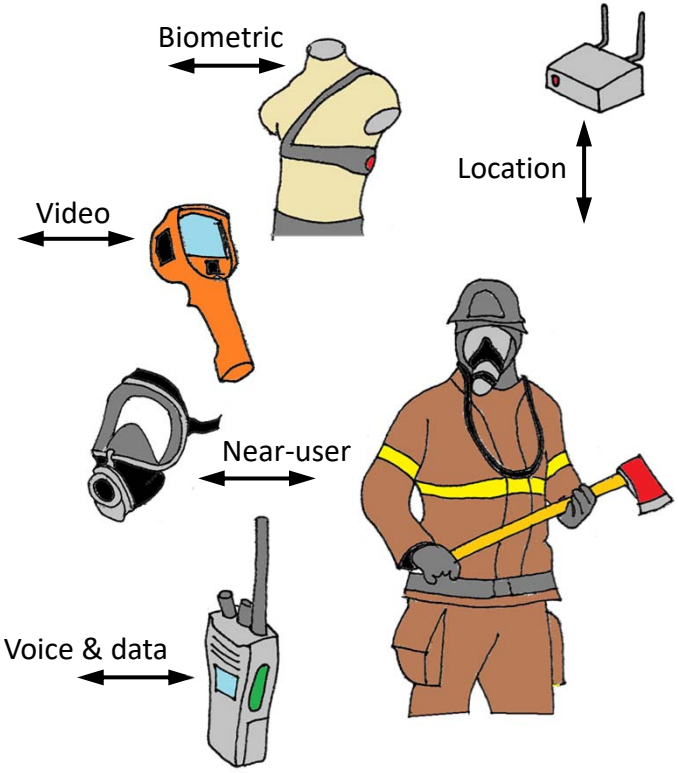


"…connected first responder"

"…in emergency situations"

"…converged LMR and LTE…"

"…and seamless device integration"



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Three Topics:

1. Design for Users in Stressful Situations
2. Today's Anti-Convergence of RF Pathways
3. Useable Real-World Solutions

Goal:

Bring usable and manageable safety features
To challenged users who cannot subtly interact with a device
Using the new available RF toolkit

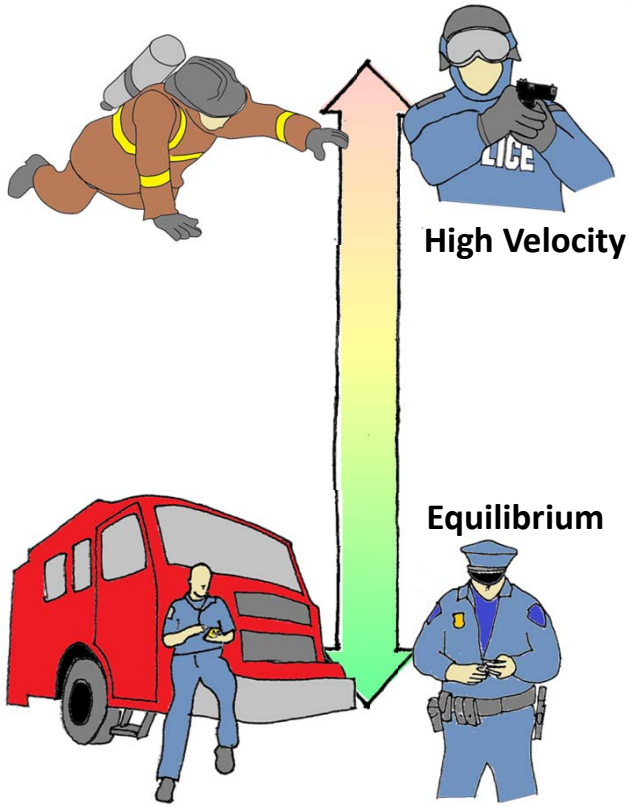
Topic 1:

Users in Stressful Situations

The difference between *Human Factors* and *High Velocity Human Factors

*

Users in Stressful Situations



High Velocity

Equilibrium

High Velocity Human Factors

Insufficient comprehension of the situation and rapid decision-making

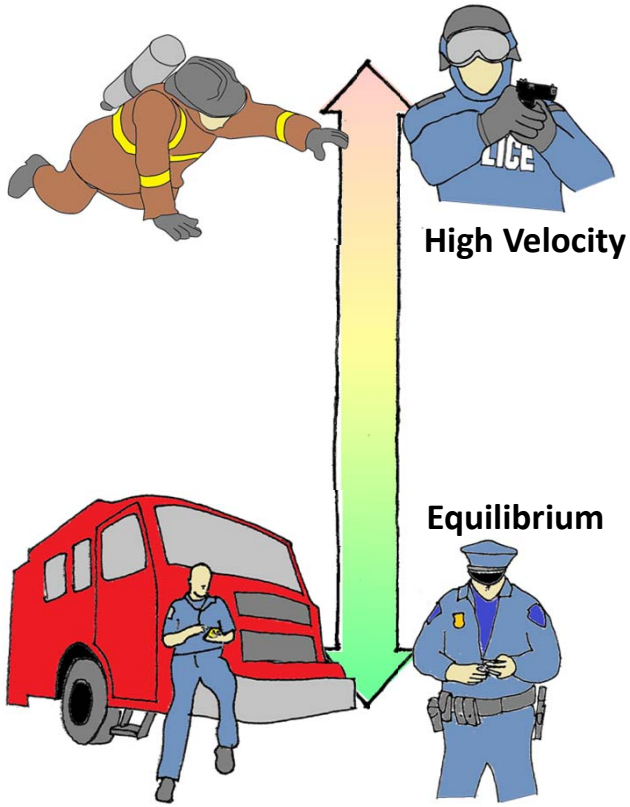
High stakes, physical danger, incomplete information and an unpredictable future

Observation, Decision and Action proceed steadily and smoothly

Interactions are compatible with human capabilities and limitations, in normal operating conditions

Human Factors Sciences

Users in Stressful Situations



First responder/
Warfighter evolved

High Velocity

Insufficient comprehension of the situation and rapid decision-making

Equilibrium

Observation, Decision and Action proceed steadily and smoothly

Consumer evolved

Not a one-size-fits-all space

Equilibrium users can interact with a device. Stressed users may not

**Consumer product focused designs may not be appropriate….
in durability or user interface**

**Usable convergence merges consumer evolved tech….
with *custom-designed-for-stressed-first-responders* specialty engineering**

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Topic 2:
RF Anti-Convergence

Today's reality of ad-hoc networked devices

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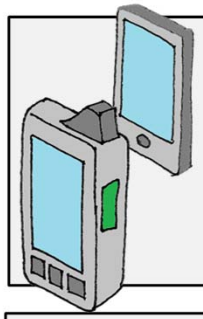
RF Anti-convergence

Land Mobile Radio

VHF 136-174 MHz
UHF 378-522 MHz
700/800 MHz
900 MHz

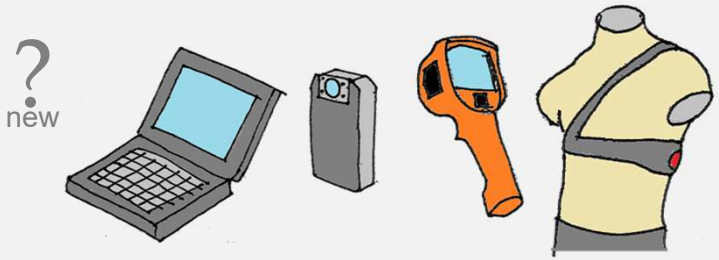
Bluetooth

2.4 GHz



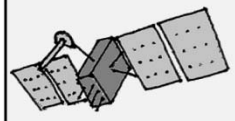
LTE

B1, B2, B3, B4, B5, B7, B8, B9, B12, B13, B14, B18, B19, B20, B26, B29, B30, B32, B41, B42, B43, B46, B48, B66
700 MHz thru 5.9 GHz



Wi-Fi

2.4 GHz or 5GHz

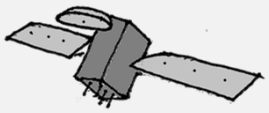


GPS

1.1 GHz -1.6 GHz

SATCOM

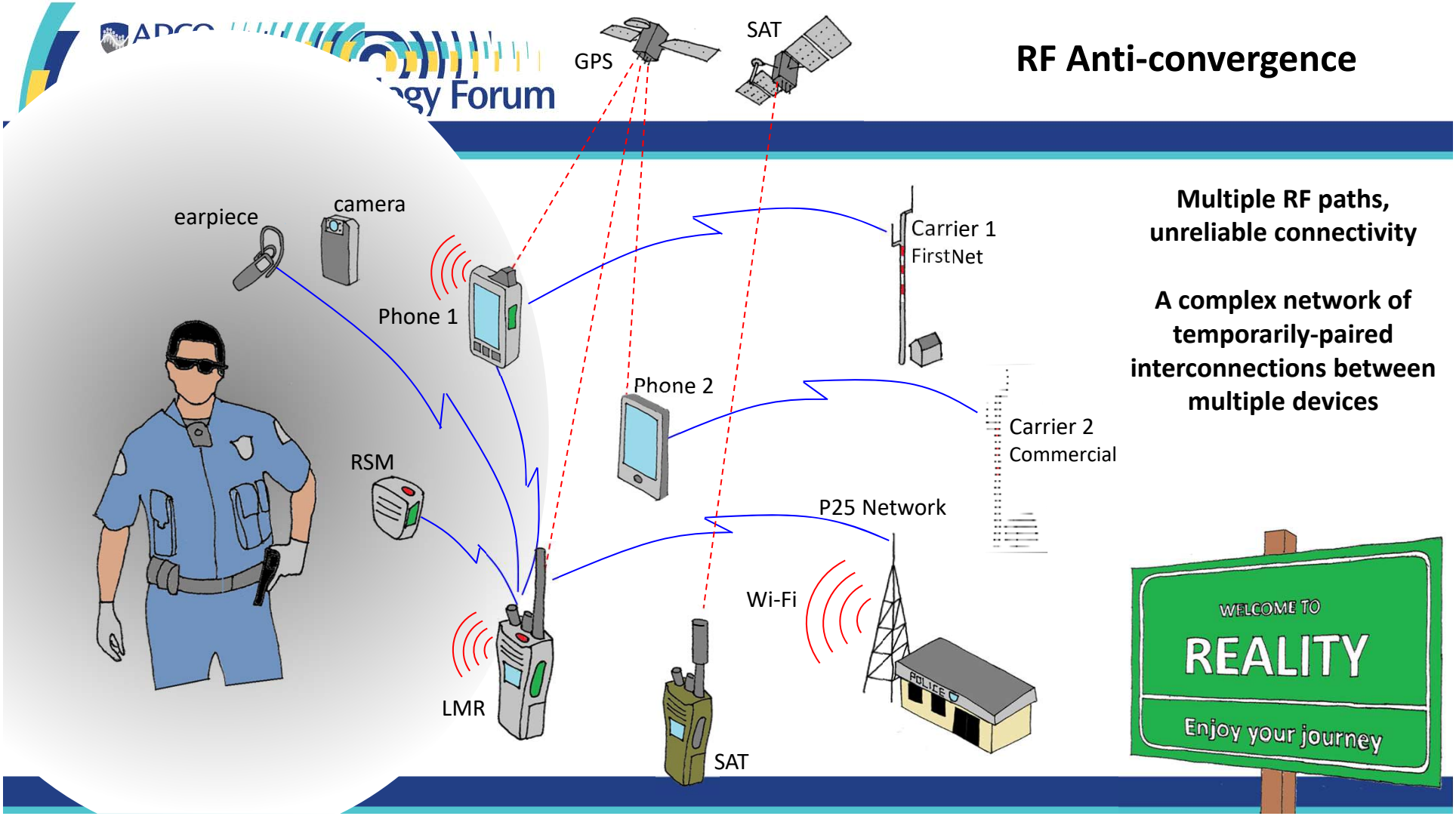
1.5 GHz – 1.6 GHz



Paging

VHF
UHF

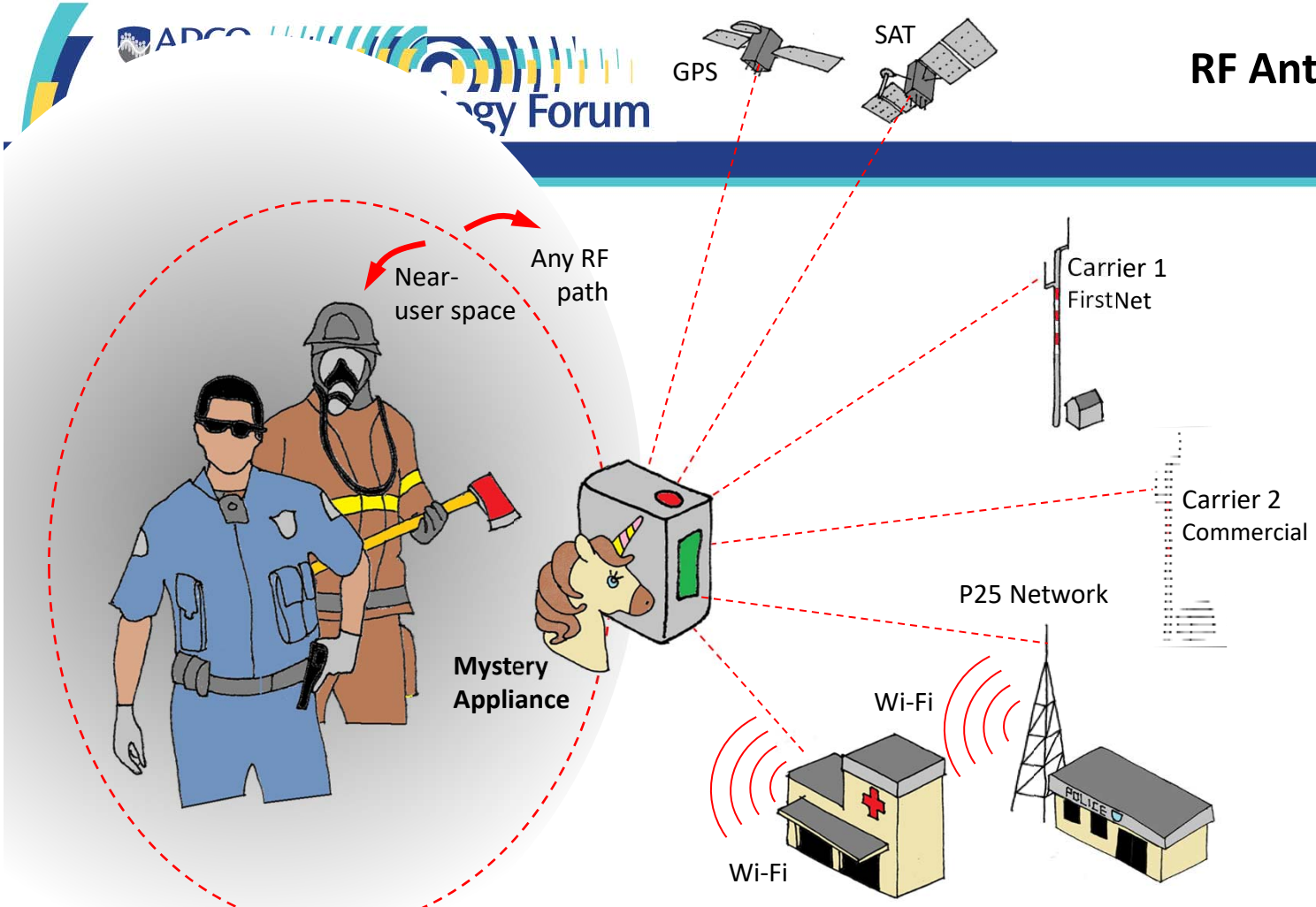
RF Anti-convergence



Multiple RF paths, unreliable connectivity

A complex network of temporarily-paired interconnections between multiple devices

RF Anti-convergence



Free user from managing multiple RF backhauls

Simplify near-user space, especially worn-device networking

Prioritize RF path based on user needs*

Enable convergence for stressed users

*Big topic

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Topic 3:
Evolution of Usable Real-World Solutions

Seeking the Unicorn

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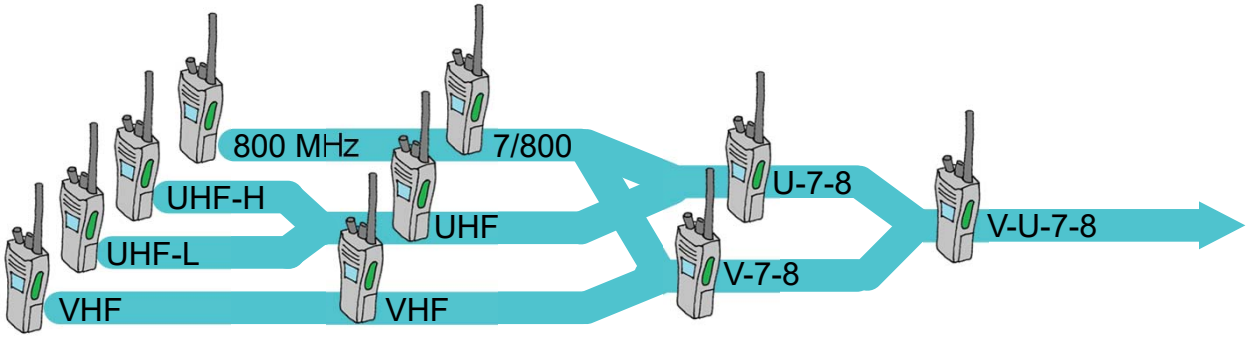
Real-World Convergence



Single band — Dual band — Tri band — All band

Raintight — IP67 — IP68

Analog — Digital — Bluetooth / GPS — Wi-Fi

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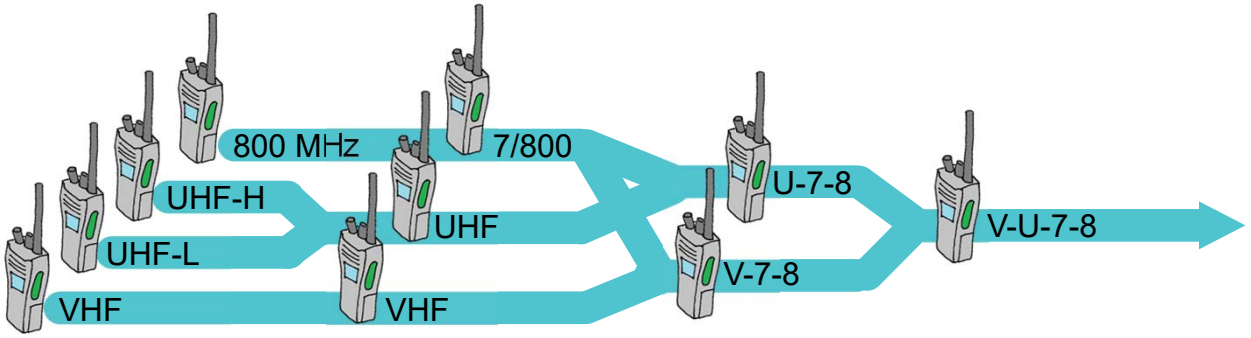
Real-World Convergence



Single band — Dual band — Tri band — All band

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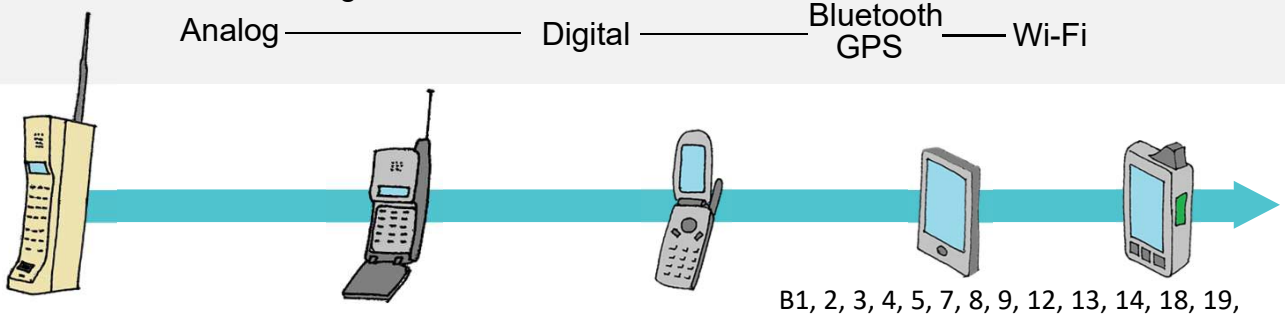

B1, 2, 3, 4, 5, 7, 8, 9, 12, 13, 14, 18, 19, 20, 26, 29, 30, B32, 41, 42, 43, 46, 48, 66

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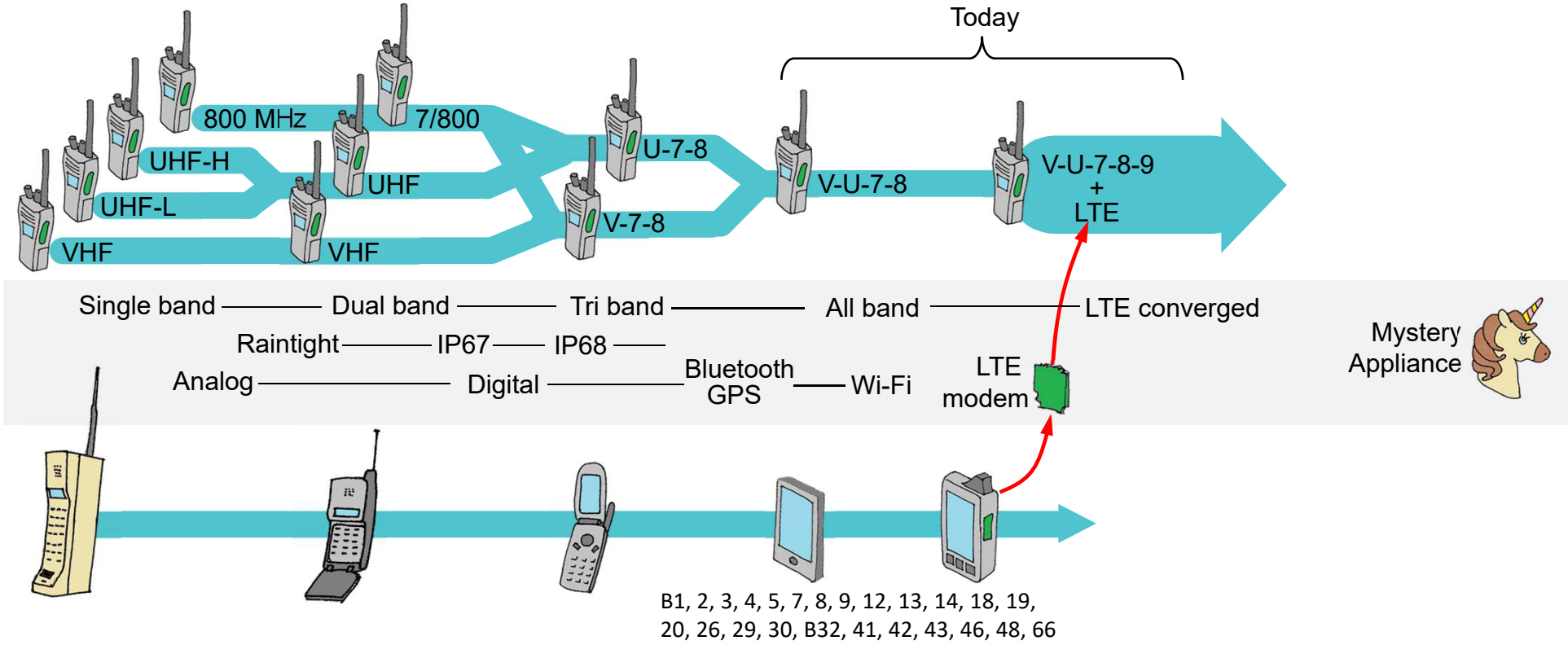
Real-World Convergence



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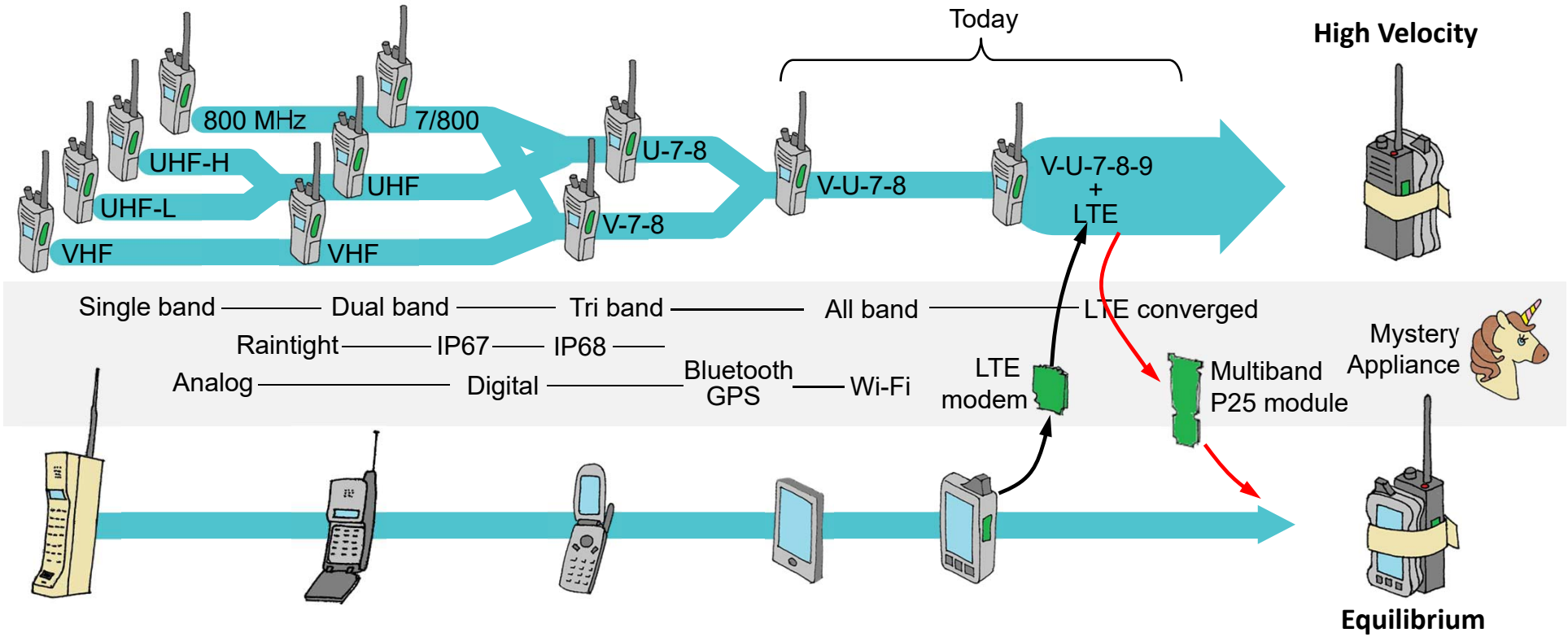
Real-World Convergence



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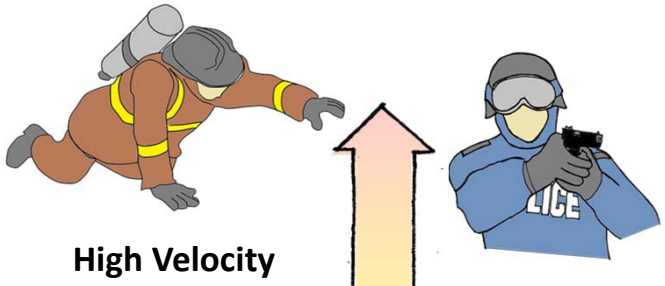
Useful and Manageable Convergence

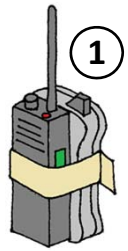


High Velocity

Specialized hardware and user interface for stressed users

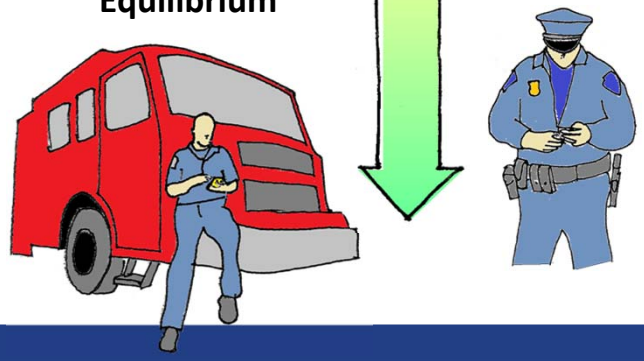
- **Minimizes user involvement in RF path selection and managing ad-hoc local pairing**
- **Maintain reflexive/muscle memory training**

High Velocity



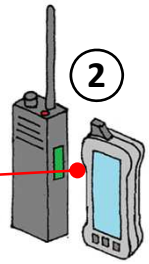
Not a one-size-fits-all space

Equilibrium

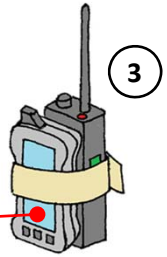


Consumer-like subtle user interfaces for non-stressed conditions

- **Multiple devices, user manages RF paths and ad-hoc local pairing**
- **Converged device automatically manages RF path selection and ad-hoc local pairing**
- **Reduced reflexive/muscle memory training**



Equilibrium

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Thank you
Mark Tesh
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I get *paid* to do this!