Advanced Mobile Broadband For Public Protection & Disaster Relief Professionals

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www.projectmesa.org

By
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- **Project MESA is an International Standardization Project for mobile broadband technologies, between TIA (N. America) and ETSI (Europe).**
  - Final Partnership Agreement ratified January, 2001 in the City of Mesa, AZ.
  - MESA = **M**obility for **E**mergency and **S**afety **A**pplications
  - Observer Members include TSACC (Canada) and TTA (South Korea)
- **Focusing initially on the advanced "user" requirements of the Public Protection (Safety) & Disaster Relief/Response sector (*i.e.*, PPDR)**
  - Police/Law Enforcement/Anti-terrorism, National and International
  - Advanced Surveillance and Security (Airports, Nuclear Power Plants, etc)
  - Emergency and Medical Services (including Telemedicine)
  - Advanced Firefighting
  - Civil Defense and Disaster Response, etc.

MESA goals include implementation of advanced digital services based on a very high bit-rate mobile platform (2-200 Mb/s). Requirements and services will be defined in the MESA Statement of Requirements (SoR).

MESA Statement of Requirements (SoR)

- **First such document to specifically involve direct (trans-atlantic) user input, within an International Standardization Partnership Project.**
- **Intended to describe functional requirements and technical specifications (needs) for future broadband PPDR communications systems**.
  - A realized system could be installed as either a private system owned by the government or a governmental/commercial partnership that provides priority service to PPDR-related agencies.
  - Includes all criminal justice services, emergency management, emergency medical services (EMS), fire, land management, natural resource management, military, transportation (*i.e.*, ITS), wildlife management, and other similar governmental functions that have a need for aeronautical and terrestrial, high-speed, broadband, digital, mobile wireless communications.

MESA Statement of Requirements (SoR)

- **Developed as part of a global effort to create uniform specifications and eventually a suite of open standards that could be used for the creation of the next generations of wireless equipment/systems that will be needed to achieve the objectives of the PPDR community.**
  - Planning for the future, ***NOW!***
  - SoR requirements are also intended to clearly chart a migration path from today's analog systems to the next generations of PPDR wireless, high-speed, digital transport system specifications/standards.
- **Involves ad-hoc, rapidly deployed, mobile broadband networks**:
  - Specifically, the SoR involves the PPDR community's technological needs for the transport and distribution of rate-intensive data, high resolution digital video, infrared video and digital voice for both service-specific and general applications.
  - Emphasize transparent and seamless applications, including multiple levels of security and encryption; available on an individual or system-wide basis.

MESA Statement of Requirements (SoR)

- **It is about PPDR users driving technology, not technology (standards) driving users**
  - Direct user input before standardization activities begin.
  - Will leverage existing technology and systems.
  - Interoperability with advanced ad-hoc networks and equipment is key.
- **MESA Steering Committee endorsed/approved SoR (working version #9) at April 2002 MESA #5 Meeting.**
- **MESA Technical Specification Groups/industry will utilize the SoR as a blueprint for future emergency communications specification and standardization work that is part of Project MESA.**
- **For more information and to view the latest SoR document (version #10), please go to: *http://www.projectmesa.org/SoR.htm***

PPDR Users in the Driver's Seat

The unique MESA Sequence of processes: The 5 S's principle

PPDR USERS

SoR → Scenarios

- Users' input & requirements
- Build scenarios
- Study them
- Describe them
- Maintain SoR

REGULATORS

Spectrum

- National/ Regional Spectrum assessment
- Support WRC-03 Agenda Item 1.3

INDUSTRY

Specifications

- Market assessment
- Elaboration of technical specifications in MESA Technical Specification Groups (TSGs)
  - Core Network
  - Radio Access
  - Terminals

PARTNERS

Standards

- Draft, approve, and maintain national/ regional standards
- R&D/Demos
- Launch products in standardized, multi-vendor environment

Some Key MESA Requirements:

- **Independent of public infrastructures and public supply of electrical power**
  - Can be complementary to and interwork with wireline/other infrastructure components
- **Independent of public radio frequency spectrum**
  - A reasonable tuning capability must be included in the key technology to accommodate regional requirements
    - For example: 4 GHz band (4.2, 4.4 or 4.9)
- **Ultra fast deployment**
  - Integral part of equipment deployed
- **Globally/Regionally deployable and interoperable**
  - Globally/regionally agreed spectrum allocation(s) is goal
- **Auto establishing/self-healing/re-establishing wireless ad-hoc network elements**
  - “Plug and play;” Resilient

Some Key MESA Requirements:

- **Wireless interconnection/switching to dedicated Global Broadband Infrastructures**
  - *I.E., F*iber and/or Broadband satellite constellations
- **Crypto transparent communications protocol hierarchy**
  - System does not care about the content of the actual "payload" data, which can be encrypted exactly to the specification of the network owner
- **From single site ”hot-spot” to ”street-level” services**
  - MESA routers/repeaters can be applied as part of a mobile rescue squad (hot spot) or fixed mounted to accommodate coverage along a street, etc. (*i.e*., mounted on lamp posts or on building walls)
- **Large bandwidth requirements to facilitate broadband 2-way communications, data transfer, etc.**
  - Draft CPM text indicates up to 60 MHz
  - Other spectrum assessments available; support this spectrum range
- **Interoperability with existing/other PPDR systems**

Next Steps

- **Users have done first part of their homework (Draft SoR is here)**
  - Users' input will continue to be crucial (scenarios, additional requirements, next version, etc.)
- **MESA #6, September 25-27, 2002 in Copenhagen, Denmark**
  - Latest version of SoR to be finalized/approved
    - SDOs will begin official adoption/publication process
  - Industry Members to take the first step in response to the approved SoR
  - Technical Specification Groups will continue to be chaired and staffed
    - Open discussions of spectrum and technologies
- **For more information on MESA, visit http://www.projectmesa.org**
- **To join Project MESA, visit: http://www.projectmesa.org/IE/gen_info/join.htm**
  - Public Safety (PS) member, Individual Member (IM), Observer, Guest, Organizational Partner (OP)-*Standards bodies*
- **MESA Members to continue assisting regulators in preparation for the WRC-2003**
- **Promotion of MESA: Continues to increase membership/interest**
- **MESA #7, Spring 2003, TBD in U.S.A.**

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The End!

Thank you for your time!
Merci beaucoup!

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Additional Information

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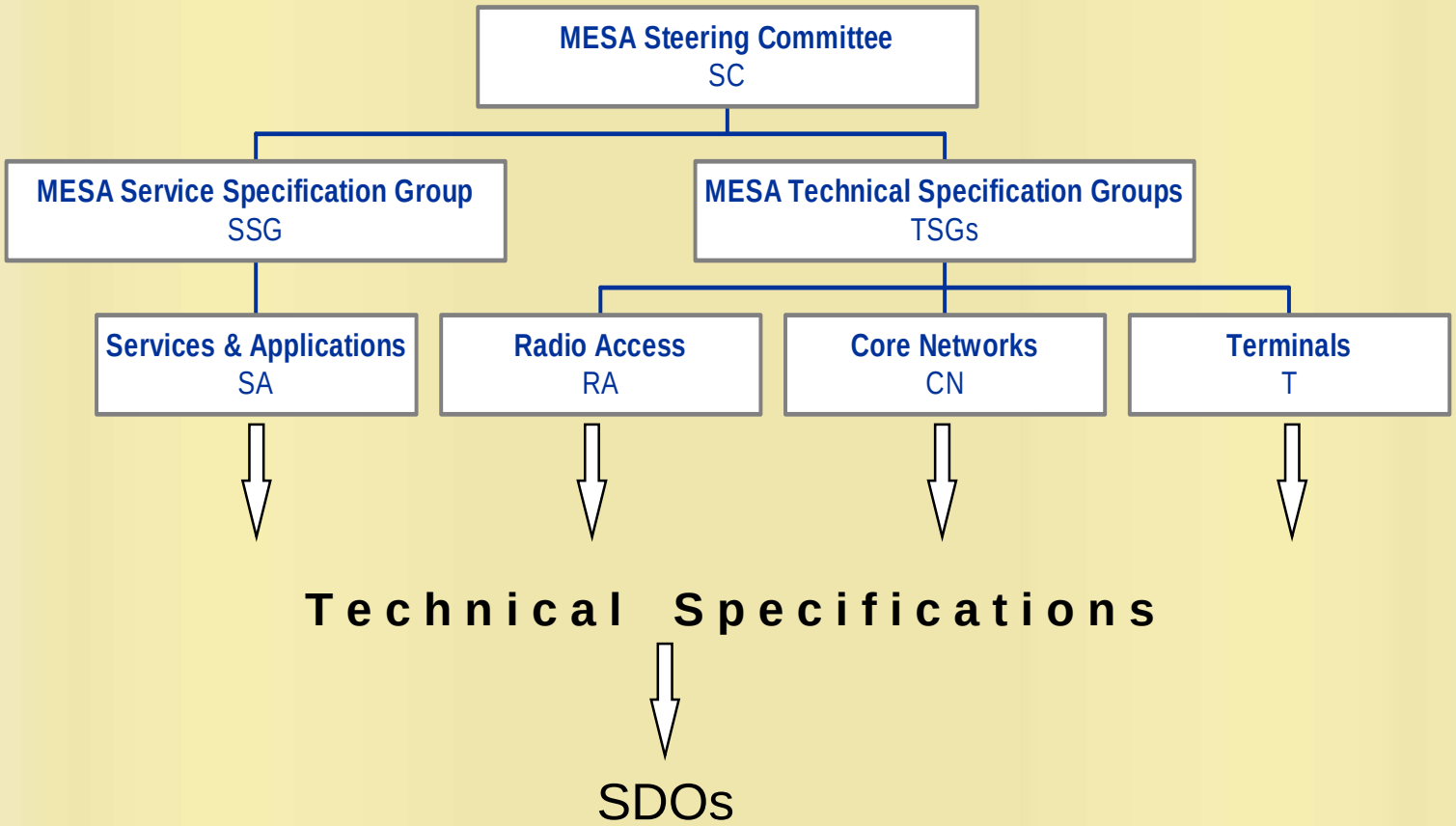
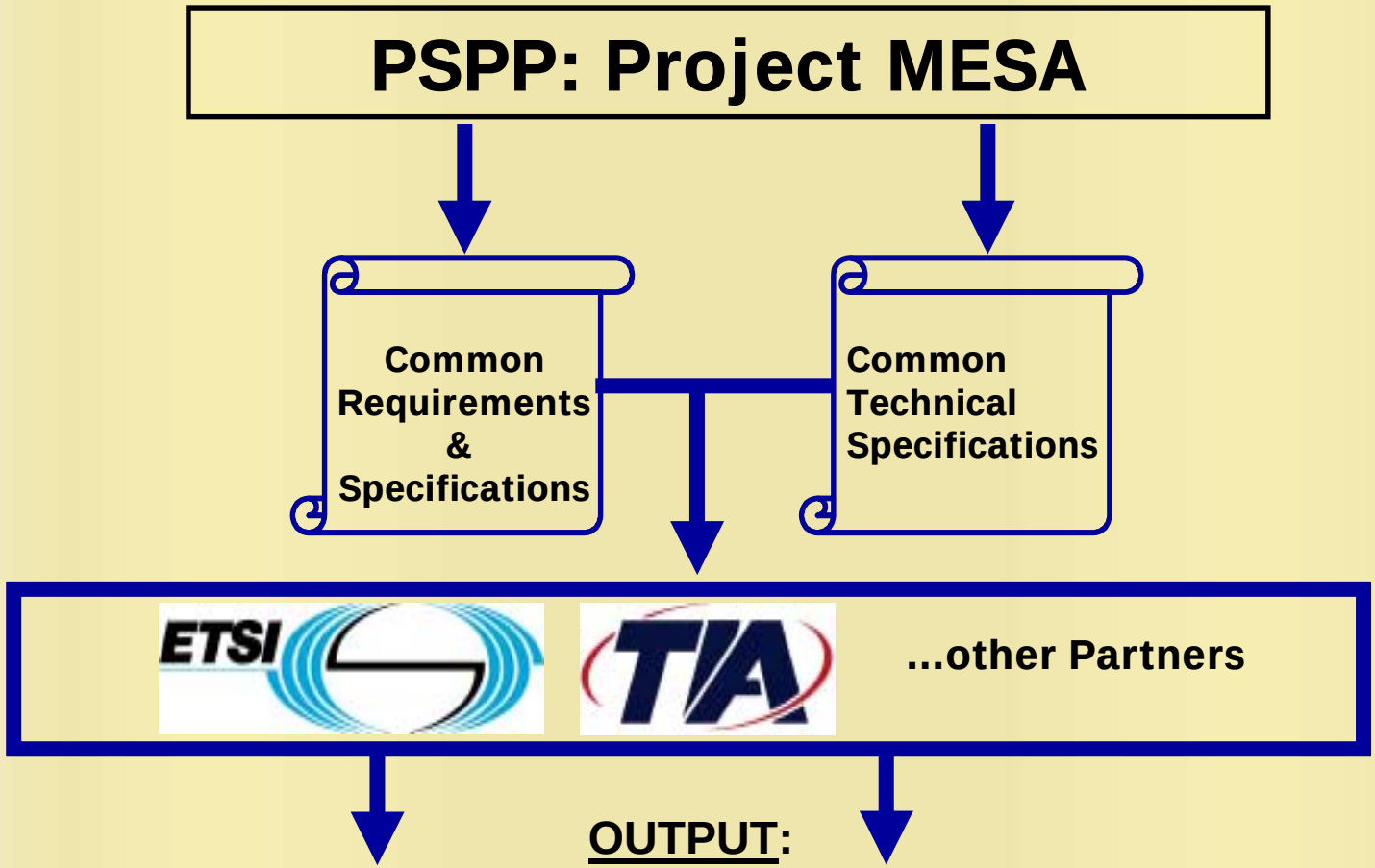
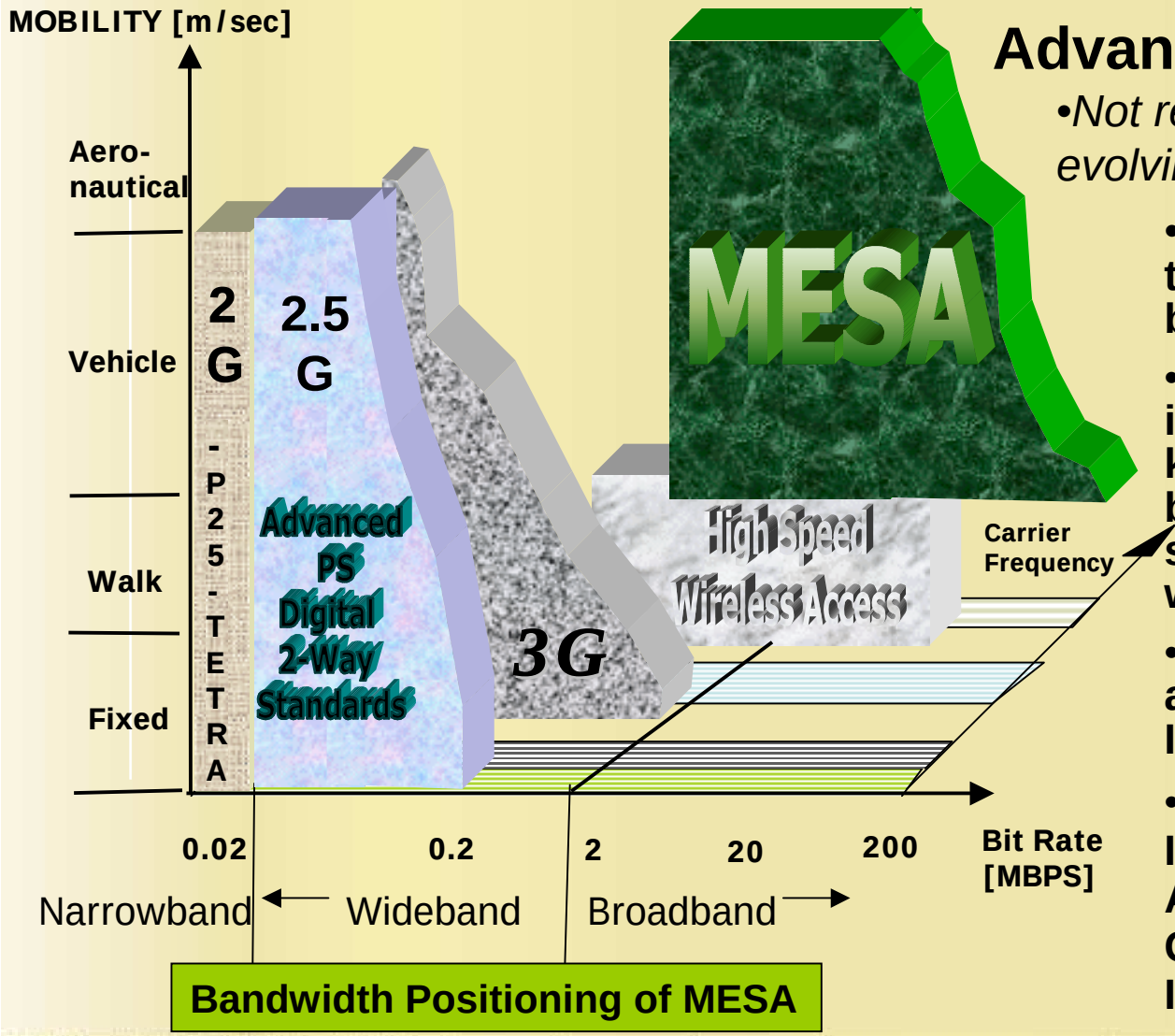
Project MESA Structure





OUTPUT:

Harmonized/coordinated specifications, for Broadband Terrestrial Mobility and SatCom applications and services, driven by common scenarios, requirements and spectrum allocations.



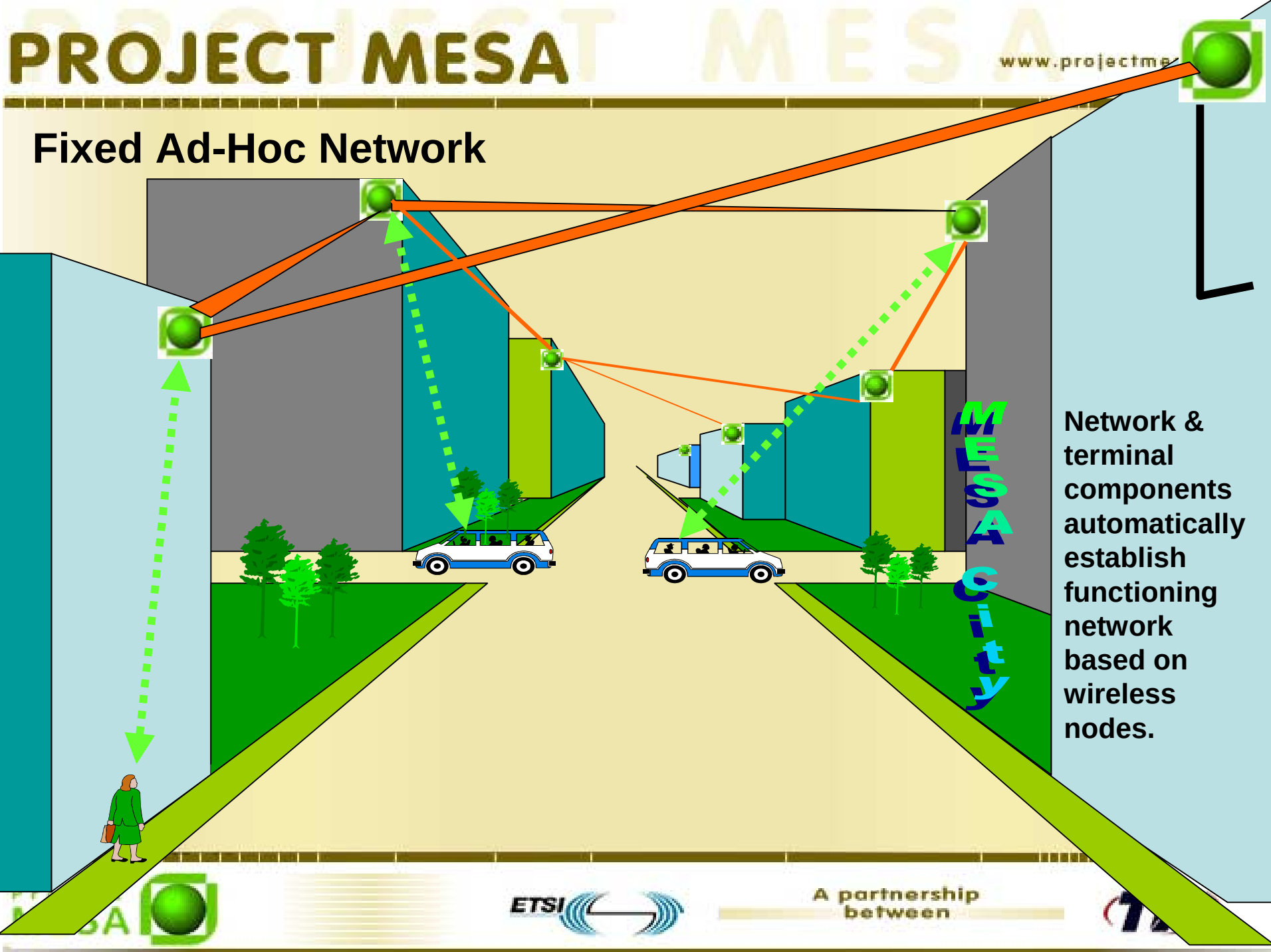
Bandwidth Positioning of MESA

Advanced/Future System

•Not replacement for existing and evolving systems

- **MESA combines mobility up to aeronautical speeds with broadband data rates**
- **Complements and interworks with known/planned narrow to broadband wireless standards & projects around world**
- **Calls for a variety of advanced research (*e.g.*, Industrial, Academic)**
- **Recoginized by entities like ITU, UN, NATO, FBI, NTIA, APCO, EU Commission, GSC/RAST (GTSC/GRSC), Industry Canada**

Fixed Ad-Hoc Network



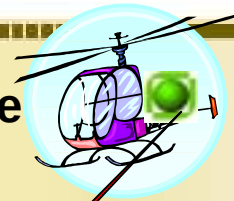
Network & terminal components automatically establish functioning network based on wireless nodes.

Mobile Ad-Hoc Network

" The Moving Hot-Spot"

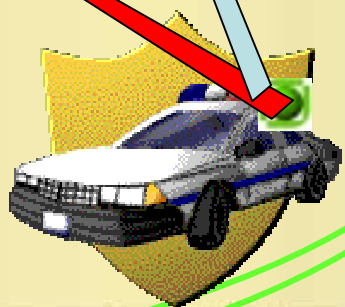
- Fast, deployable, Compatible
- Auto-est. network
- Recognize terminals

Airborne Control



Backhaul Satcom Link

The MESA Firefighter

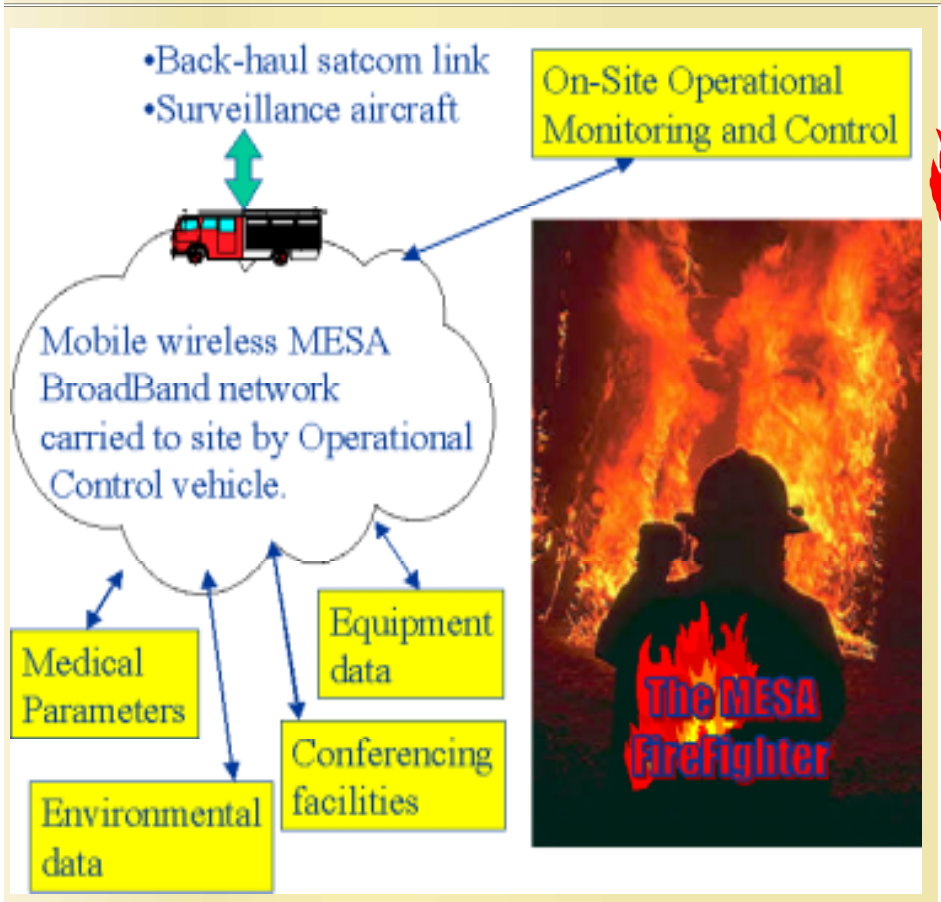


Telemedical Assistance

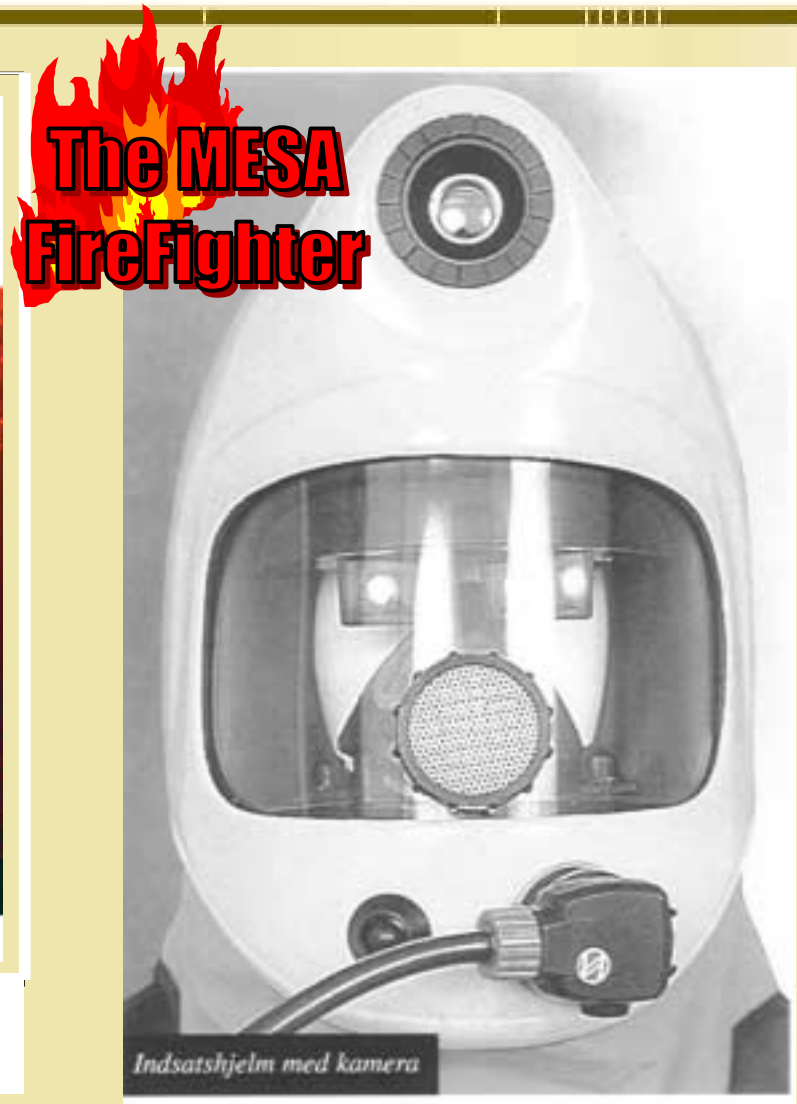
The MESA Firefighter

The MESA FireFighter

- **Full Command, Control, and Communications (C3) to all MESA Firefighters**
- **Online, realtime broadband interlinking**
- **Infra-red as well as visible light video monitoring**
- **Vital parameters surveillance**

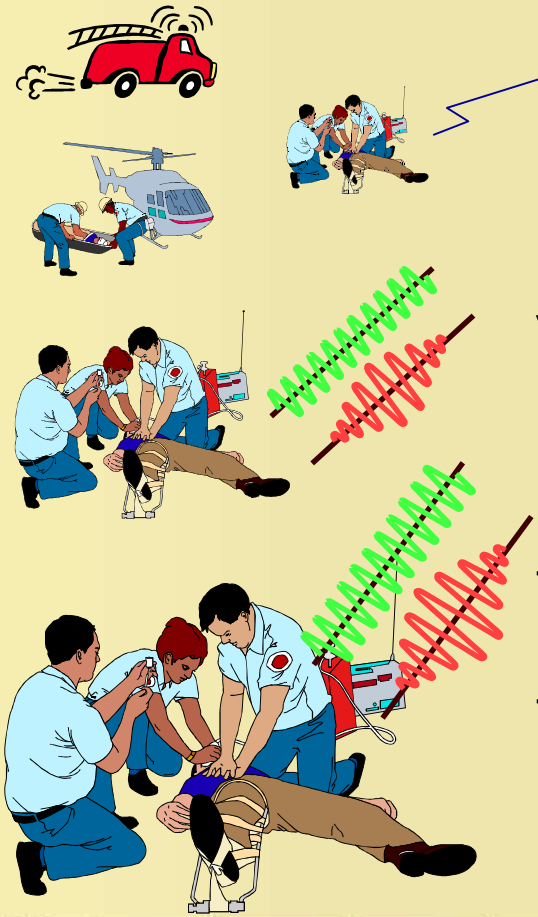


Example of full on-site Command Control and Communication



Emergency and Medical Services (EMS)

Remote Patient Monitoring



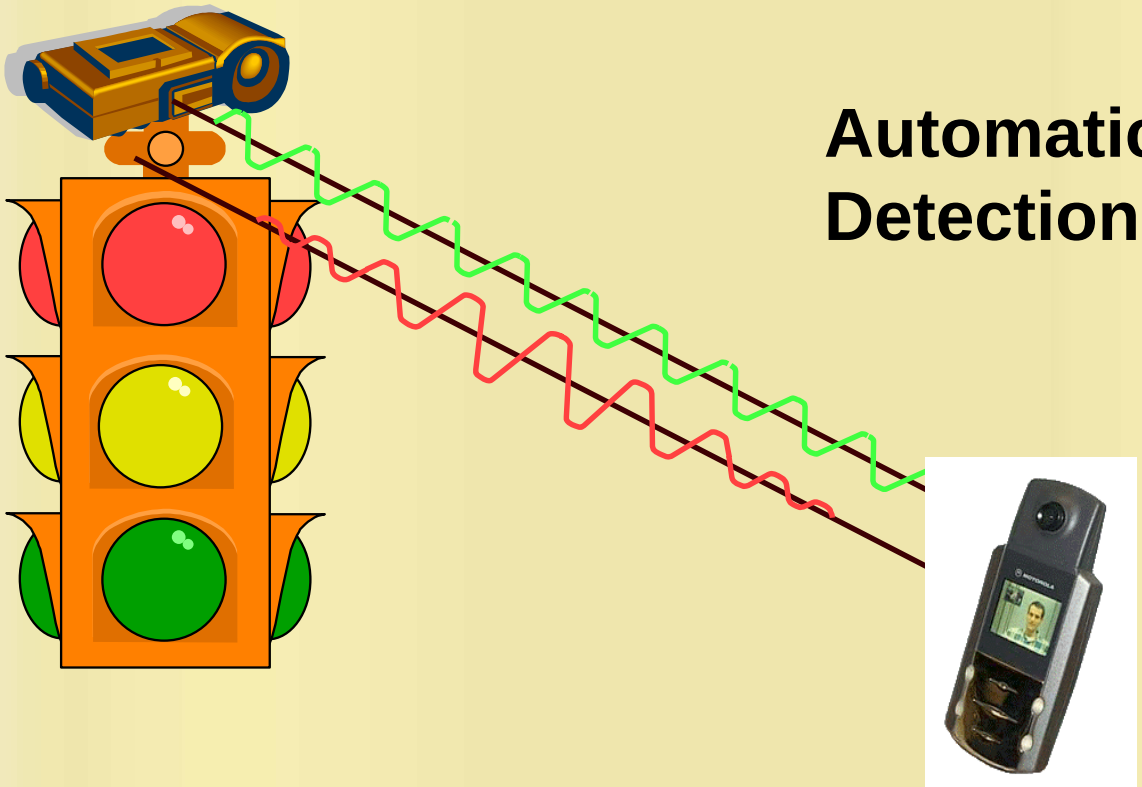
Frontline Medical Assistance by Broadband Wireless Networking:

Video on-line
Electro Encephalographic data (EEG)
Electro Cardiograph (ECG)
Blood Pressure
Temperature, etc.

The bottom line…

Bit-rates can save lives

Camera is Calling



Automatic Recognition & Detection Capabilities:

- Sound
- Image
- Movement
- Material
- Radiation

Mobile Robotics

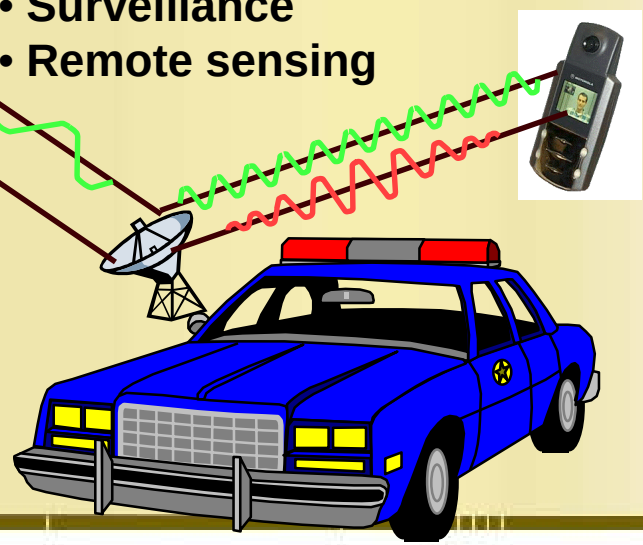
- Automated inspection of non-accessible or hazardous areas
- Rescue of people from hazardous areas
- Anti-terrorist actions
- Incident response both tactical and non-tactical
  - Urban warfare
  - Haz-Mat Handling
  - Airborne control

Broadband out there

"the hot spot scenario"

Rural terrestrial SATCOM support

- **Megabit Up/Down links**
- **Mobile Broadband Repeater**
  - **Remote Disasters**
  - **Evidence gathering**
  - **Real-time ID**
  - **Surveillance**
  - **Remote sensing**



Spectrum Matters

Worldwide and Regional Activities

- **ITU-R WRC-2000 RESOLUTION [GT PLEN-2/5] Global harmonization of spectrum for public protection and disaster relief**
  - **High Data Rates - Video - Multimedia for cross-border operations**
  - **ITU-R WP 8A to study the matter, for action, at WRC-03 (Item 1.3)**

- **FCC and NTIA addressing issues**
- **FCC allocates 764-776/794-806 MHz & 4940-4990 MHz (4.9 GHz) Bands to Public Safety**

- **Coordination of CEPT input to WP 8A**
- **Report on Mobile Broadband**

- **NATO C3 Agency**
- **Sharing Possibilities under evaluation**

Spectrum Matters

Train Crash Scenario

- a draft spectrum assessment example -

Project MESA:
User needs and scenarios drive spectrum requirements

by
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Chairman Project MESA Steering Committee
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See: http://www.projectmesa.org/ftp/Information/Presentations/Project%20MESA%20-%20Spectrum%20Assessment%20Example%20(Train%20Crash%20Scenario).zip