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Contents

Intellectual Property Rights 7
Foreword..7
Introduction 8
1 Scope 10
2 References 10
2.1 Normative references 10
2.2 Informative references..10
3 Abbreviations 10
4 Executive Summary 12
5 Project MESA SoR..18
5.1 Objectives..18
5.2 Scope of requirements 18
5.3 User requirements..19
5.4 Use of existing protocols 19
5.5 Evolving specifications and standards..19
5.6 Use of open architectures 19
5.7 Mobile computer telecommunications system..19
5.8 Local, regional and national interoperability..19
5.9 Interoperability between MESA user devices 20
5.10 In building and portable service 20
5.11 Operational compromises..20
5.12 Compliant with the need of the participating nations..20
5.13 Pre-testing technology proposals..20
5.13a Type approval and interoperability testing 20
5.14 Frequency neutral technology 20
5.15 Improvements in spectrum efficiencies..20
5.16 Life-cycle procurements..20
5.17 Economical and ergonomically friendly design 21
5.18 Environmentally safe..21
5.18a Regional safety standards..21
5.19 Adequate interference protection..21
5.20 Migration..21
5.21 Consistent with existing standards 21
5.22 Related documents, standards, policies or requirements 22
5.23 Regulatory compliance..22
5.24 Compliance with national and international rules, regulations and standards..22
5.25 Compatible for multiple international standards 22
5.26 Publication of standards and specifications..22
5.27 Interface requirements..22
5.28 Interface protocol requirements..22
5.29 Transparent interfaces 22
5.30 Service platform 23
5.31 Two-way communication..23
5.32 Traffic distribution 23
5.33 Dynamic remote partitioning..23
5.34 Dynamic transfer rates and bandwidth allocation 23
5.35 Multiple levels of availability of service 23
5.36 Priority services..23
5.37 Simultaneous network or system access..23
5.38 Network pre-emption 23
5.39 First-In, first-Out 24
5.40 System and/or network transaction audit trail 24
5.41 Ability to provide statistical reports 24

5.42 Agency-by-agency reports....24
5.43 MESA network component identification....24
5.44 Security requirements....24
5.45 Automated information requirements....24
5.46 Blocking unauthorized access....24
5.47 Over-the-air-rekeying (OTAR)....24
5.48 High-speed, error-free service....25
5.49 End-to-end transmit time....25
5.50 Transparent transfer....25
5.51 Degradation and redundancy....25
5.52 Duty cycle requirements....25
5.53 Data to be transported....25
5.54 Network and data base interconnectivity....26
5.55 Network transmission requirements....26
5.56 Location Determination....26
5.57 Delayed transmission and remote stops....26
5.58 Dynamic updating of data fields....27

Annex A (informative): National and international public service and public safety programs, standards, specifications and requirements....28

A.1 Implementation of interoperable technologies....28
A.2 Impact of PSWAC's four general requirements on Project MESA....28
A.3 Project MESA use of PSWAC recommendations....28
A.4 Impact of additional officers in the field....28
A.5 Law enforcement and criminal justice data systems....29
A.6 Prisons and correctional institutions....29
A.7 Use of Project MESA specifications and standards in deployment of Intelligent Transport System (ITS) communications and other public safety related networks and systems....29
A.8 Use of GLS for vehicle and personnel tracking, security, and inventory control....30
A.9 Impact of recent major events on Project MESA SoR....31
A.10 Major incident operational dynamics....31
A.11 Institutional monitoring....31
A.12 Environmental monitoring....31
A.13 Administrative control of transportation and other related public safety telemetry....31
A.14 The use of global location system in Project MESA....33
A.15 Office of the future and general administrative applications....33
A.16 Network or system messaging....33
A.17 Emergency or distress signals....34
A.18 Corrections and probation officers and staff's use of full motion video....34
A.19 Major incident management and control video....34
A.20 Airborne command and control video....34
A.21 Normal incident command and control video....34
A.22 Traffic surveillance video....34
A.23 Surveillance and monitoring....34
A.24 Law enforcement video applications....35
A.25 Disaster relief video applications....35

A.26 Land management and wildfire control applications for full motion video 35

A.27 Emergency medical services video applications 35

A.28 The use of robotics in a hazardous materials environment 35

A.29 Lifeguard and water rescue applications for robotics....36

A.30 Search and rescue applications of robotics....36
A.30.1 Robotics and video/imagery applications in search and rescue....36
A.30.2 Transmission of still photos for public safety applications 36
A.30.3 General encryption requirements 36
A.30.4 Specific and/or unique requirements of the United States Government....36

Annex B (informative): Known North American Federal, state and country requirements 39

Annex C (informative): Law enforcement scenario - Court House Murder....40

Annex D (informative): Law enforcement Scenario - U.S. State and Urban Police Response to Earthquake Damage 42

Annex E (normative): Criminal Justice providers....44

Annex F (normative): Automated criminal history and law enforcement records systems and providers 45

Annex G (normative): Emergency management or disaster recovery agencies 46

Annex H (normative): Special Operations needs....47

Annex I (normative): Health Services....48

I.1 Emergency Medical Services (EMS)....48

I.2 Disaster Medicine....48

Annex J (normative): Fire Services 49

Annex K (normative): Coast Guard Services (and related public safety functions)....52

Annex L (normative): Search and Rescue Activities 53

L.1 Search Activities 53

L.2 Rescue Activities....53

Annex M (normative): Airport Security (and related public safety functions)....54

Annex N (normative): Humanitarian Assistance 55

Annex O (normative): Hazardous Materials (HAZMAT) and related public safety services....56

O.1 Coordination and Management 56

O.2 Analysis and Material Classification....56

O.3 Handling....56

O.4 Cleanup and Rectification 56

Annex P (normative): Correctional institutions....57

P.1 Correctional enforcement and probation officers....57

Annex Q (normative): Planning precepts for responding to large public safety events or emergencies....58

Annex R (normative): General governmental and/or government administration needs....59

Annex S (normative): Land and natural resource management 60

Annex T (normative): Transportation's organizational mandates and missions 61

Annex U (normative): Intelligent Transport Systems (ITS) 62

Annex V (normative): The use of technologies and the compatibility requirement for the various applications 63

V.1 Data to be transported 63
V.2 General 63
V.3 Electronic messaging 63
V.4 Encryption 65
V.5 Office of the future 65
V.6 Transparent network and system access 66
V.7 ITS System Requirements 66
V.8 Transmission of complex files 67
V.9 System integrations and interoperability 68
V.10 Transmission of user and patient monitoring telemeter 68
V.11 Other public safety telemetry applications 68
V.12 Transmission of geographical location data 69
V.13 ITS video requirements 69
V.14 Transmission of full-motion video 70
V.15 Robotics with full-motion video 70
V.16 Transmission of still-photographs and images 71

Annex W (normative): UK Highways Agency - Intelligent Transport Systems (ITS) 72

W.1 Objectives 72
W.2 The English strategic road network 72
W.3 Highways Agency. Transportation's organizational mandates and missions 72
W.4 Intelligent Transport Systems 72
W.5 ITS System Requirements 73
W.6 ITS video requirements 74
W.7 Transmission of full-motion video 74
W.8 Transmission of still-photographs and images 75

Annex X (informative): Bibliography 76

History 77

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Information concerning declarations of IPR relative to MESA which have been received from OPs and which have been communicated to the MESA Secretariat are available and can be found as follows:

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2. As to ETSI: http://webapp.etsi.org/IPR/;
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Foreword

This Technical Specification (TS) has been produced by Public Safety Partnership Project (MESA).

The contents of the present document are subject to continuing work within the Specification Group (SG) and may change following formal SG approval. Should the SG modify the contents of the present document, it will be re-released by the SG with an identifying change of release date and an increase in version number as follows:

Version x.y.z where:

x the first digit:

- 1 presented to SG for information;
- 2 presented to SG for approval;
- 3 or greater indicates SG approved document under change control.

y the second digit is incremented for all changes of substance, i.e. technical enhancements, corrections, updates, etc.

z the third digit is incremented when editorial only changes have been incorporated in the document.

The present document includes a general outline of the public safety community's technological needs for the transport and distribution of rate-intensive data, digital video, infrared video and digital voice for both service-specific and general applications. The present document was 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 generation of wireless equipment that will be needed to achieve the objectives of the public safety community. This effort is intended to, among other things, support the efforts of the member countries of the Public Safety Partnership Project (PSPP), Project **MESA** (Mobility Emergency Safety Applications) in meeting their own public safety and public service requirements. (See also clause A.1, Implementation of Interoperable Technologies.)

NOTE: For the purpose of the SoR the terms "Public Safety" and "Public Protection and Disaster Relief" (PPDR) are synonymous. PPDR is defined by the ITU-R. Telecommunication for Disaster Relief (TDR) is utilized by the ITU-T. Emergency Telecommunication Service (ETS) is also defined by the ITU-T and involves "National" Public Protection interests (ITU-T work would involve inter-national communications issues only).

The convergence of voice and data services is revolutionizing the commercial transport of information, both wired and wireless. To date, this convergence has had minimal impact on the dedicated two-way radio systems employed by most public safety agencies. The Project **MESA** SoR anticipates that convergence will be a natural progression within the public safety community as new rate-intensive technologies are implemented. (See also clause A.2, Impact of PSWAC's Four General Requirements on Project **MESA**.)

The initial gross data rates identified in the present document involve capabilities that can support the next generation of public safety wireless technologies. However, all of these requirements identified herein are also intended to clearly chart the migration path from today's analogue systems to the next two generations of wireless, high-speed, digital transport system specifications and standards.

Consistent with the public safety users' missions, it is also expected that the Project **MESA** SoR will emphasize transparent and seamless applications, including multiple levels of security and encryptions. These applications should be available on an individual or system-wide basis.

The Project **MESA** SoR is intended to describe a functional and technical specification and standards platform that can be installed as either a private, leased or otherwise arranged system owned by the government or a governmental/commercial partnership that provides needed service and/or infrastructure to public safety agencies and possibly secondary service to other government or commercial clients.

For the purpose of the present document, public safety includes all criminal justice services, emergency management, Emergency Medical Services (EMS), fire, land management, natural resource management (see also clause A.16, Network or System Messaging), military, transportation, wildlife management, and other similar governmental functions that have a need for aeronautical and terrestrial, high-speed, broadband, digital, mobile wireless communications. (See also clause A.3, Project **MESA** Use of PSWAC Recommendations.)

Finally, it is important to note that the basic service and operational premises embodied in the Project **MESA** SoR are jointly predicated on full compliance with the European Human Rights legislation and/or other citizen's rights as may be defined in that document and/or by the United States Constitution and all other laws, rules and regulations that may be subordinate to either of those documents.

Introduction

The users of professional wireless telecommunications equipment within the Sector of Public Protection and Disaster Relief (PPDR) have developed the **MESA** SoR (SoR) document. It describes the services and applications, which a future advanced wireless telecommunications system should be able to support in order to realize the most effective operational environment for the Sector.

Emphasis has been placed on those applications, which current applied technology cannot carry out to the full, but which have been identified by the users and their agencies to be key requirements and capabilities.

The present document is unique in the sense that it represents the first trans-Atlantic consolidated view expressed directly by the professional users of advanced wireless telecommunication equipment.

Within Partnership Project **MESA** the present document will be updated at regular intervals. This represents the focal source of information for Project **MESA**'s Industry members in their technical work, including Research and Development, pointing forward towards the realization of globally applicable specifications for public safety-oriented next generation communications and subsequent standards that will be transposed (including regional developments) by the Organizations Partners. MESA will also take into account standards and technology that exists or is in development by other technical entities (i.e. ITU, IEEE, etc.) and strive for related coordination and referencing between such entities.

The present document is not specifically written to be studied end-to-end, rather it represents a unique source of information in the aim of understanding the often very difficult and dangerous working environments, which the user community is facing, such that Industry can provide the most effective and accurate technical solutions.

Finally, it represents the establishment of a clear understanding that the advanced needs of the PPDR Sector should be based on a high-mobility, broadband wireless network or related capabilities that allow for the provision of dynamic bandwidth, offering of self-healing characteristics and secure network access. The Project **MESA** SoR also reflects the vision of a mobile broadband-shared network that can be simultaneously accessed by multiple users, with multiple applications in a specified geographical area fully independent from availability of public networks and supply of electrical power.

1 Scope

The present document describes the basis for a functional and technical specification and standards platform that can be installed as either a private system owned by government or a governmental/commercial partnership that provides priority service to public safety agencies and possibly secondary service to other commercial clients.

It is envisaged that the Project **MESA** specifications will define robust management and control systems to ensure secure and reliable operational capabilities for the public safety and public security users worldwide.

The present document reflects the requirements of public service and public safety agencies to have priority service and system restoration, extremely reliable service, and ubiquitous coverage within a user's defined service area.

2 References

References are either specific (identified by date of publication and/or edition number or version number) or non-specific.

- For a specific reference, subsequent revisions do not apply.
- Non-specific reference may be made only to a complete document or a part thereof and only in the following cases:
  - if it is accepted that it will be possible to use all future changes of the referenced document for the purposes of the referring document;
  - for informative references.

Referenced documents which are not found to be publicly available in the expected location might be found at http://docbox.etsi.org/Reference.

For online referenced documents, information sufficient to identify and locate the source shall be provided. Preferably, the primary source of the referenced document should be cited, in order to ensure traceability. Furthermore, the reference should, as far as possible, remain valid for the expected life of the document. The reference shall include the method of access to the referenced document and the full network address, with the same punctuation and use of upper case and lower case letters.

NOTE: While any hyperlinks included in this clause were valid at the time of publication ETSI cannot guarantee their long term validity.

2.1 Normative references

Not applicable.

2.2 Informative references

[1] ETSI TR 170 002: "Project MESA; Service Specification Group - Services and Applications; Definitions, symbols and abbreviations".

3 Abbreviations

For the purposes of the present document, the abbreviations given in TR 170.002 [1] and the following apply:

AFIS Automated Fingerprint Information System
ATF U.S. Department of Treasury's Bureau of Alcohol, Tobacco, and Firearms
ATL Attempt To Locate
CDMV Canadian Department of Motor Vehicles

COMPUSEC	COMPUter SECurity
COMSEC	COMmunications SECurity
DMAT	Disaster Medical Assistance Team
DMV	Department of Motor Vehicles (US)
DOD	Department Of Defense (US)
DOT	Department Of Transportation (US)
ECG	ElectroCardioGram
EMS	Emergency Medical Services
ETSI	European Telecommunications Standards Institute
FBI	Federal Bureau of Investigation (US)
FCC	Federal Communications Commission (US)
FD	Fire Department
FIFO	First-In, First-Out
GIS	Geographic Information System
GLS	Global Location System
HAZMAT	HAZardous MATerials
HF	High Frequency
IAFIS	Integrated Automated Fingerprint Identification System
IDWCS	Integrated Digital Wireless Communications System
INFOSEC	INFOrmation systems SECurity
IST	Incident Support Team
ISTEA	Intermodal Surface Transportation Efficiency Act (US)
ITS	Intelligent Transport System (Past term usage includes Intelligent Transportation System)
ITU	International Telecommunications Union
LAN	Local Area Network
MESA	Mobility Emergency Safety Applications
MRI	Magnetic Resonance Imaging
NCIC	National Crime Information Center (US)
NLETS	National Law Enforcement Telecommunications System (US)
NTIA	National Telecommunications and Information Administration (US)
OP	Organizational Partners
OSA	Open System Architecture
OTAR	Over-The-Air-Rekeying
PASS	Personal Alert Safety Systems
PD	Police Department
PP	Public Protection
PPDR	Public Protection and Disaster Relief
PS	Public Safety
PSAP	Public Safety Answering Point
PSPP	Public Safety Partnership Project
PSWAC	Public Safety Wireless Advisory Committee (US)
RF	Radio Frequency
SC	Steering Committee
SCADA	Supervisory Control And Data Acquisition
SENTRY	The Federal Bureau of Prisons' "SENTRY" database (US)
SoR	Statement of Requirements
SSG	Service Specification Group
TETRA	TErrestrial Trunked Radio
TRANSEC	TRANsmission SECurity
UL	Underwriters Laboratories
US&R	Urban Search and Rescue
USAR/TSAR	Urban Search And Rescue/Technical Search And Rescue
WAN	Wide Area Network

4 Executive Summary

The Public Safety Partnership Project (PSPP), Project **MESA** (Mobility for Emergency and Safety Applications), is an international collaborative effort for the coordination and development of next-generation high-mobility wireless broadband data specifications, standards, and capabilities. A **MESA**-capable system and applicable standards are envisioned to cover the transfer of digital voice, data, video (including infrared), and other digital data applications at high data rates between and among **MESA**-capable user devices and external network components. Various applications and services that the Project may benefit, as both an ad hoc or day-to-day operational environment, include all **MESA** users[1] involved in traditional Public Safety/Public Protection (PS/PP) entities such as law enforcement, fire protection and suppression, and emergency medical services (i.e. First Responders to incidents).

For the purposes of the present document, the term "**MESA** user" is construed to also include all compensated and volunteer PS/PP services, agencies, and entities that are involved in the aforementioned traditional activities and natural and manmade emergency and disaster mitigation and response, homeland security, peacekeeping activities, national/international crime and terror investigative services (including mass destruction and bio-terrorism investigation, mitigation, and response), transportation provision and management, and natural resources management. The term **MESA** user also includes those traditionally non-public safety governmental services that acquire a PS/PP role, activity, or tasks in preparation for or in response to an emergency event or a pre-planned large-scale event. This would include all military services that become engaged in support of any of these activities or roles.

The SoR (SoR) development, technical specification, and standards development activities of Project **MESA** are currently supported through two Organizational Partners (OP), representing Europe and North America-the European Telecommunications Standards Institute (ETSI) and the Telecommunications Industry Association (TIA). The final Project **MESA** deliverables will be used by the supporting Standards Development Organizations (i.e. TIA, ETSI, or others who join later) for regional development and publication. Other technical organizations and entities are also encouraged to consider **MESA** activities, specifications, and resulting standards that are published.

The initial Project **MESA** SoR document was approved by the Project **MESA** Steering Committee in 2002 and represents the first trans-Atlantic consolidated view expressed directly by the professional users of advanced wireless data communications equipment and systems. The SoR was developed as part of a global effort to identify and develop uniform capabilities, scenarios, specifications, and eventually a suite of open technical standards that can be used for the elaboration of next-generation wireless broadband data communications equipment and systems. These voluntary standards will be used achieve the objectives of the **MESA** user communities. Project **MESA**'s activities support the efforts of the member organizations from many countries in meeting their own PS/PP and public service wireless data telecommunications requirements.

The Project **MESA** SoR reflects the vision of a mobile broadband network (shared and/or ad hoc) that can be simultaneously accessed by multiple users, using various applications and levels of security, in a specified geographical area, and that may operate potentially independently from the availability of public networks and the supply of commercial electrical power. Specifically, the SoR describes the services and applications (involving peak air interface user data rates at least 1,5 to 2 megabits per second (Mbps) or greater)[2] that a wireless telecommunications system should be capable of supporting, in order to realize the most effective operational environment for the users. Emphasis has been placed on those applications and technological platforms that current technology has not yet satisfactorily addressed, but which have been identified by the users and their agencies as key requirements for applications and services.

Consistent with the **MESA** users' missions, it is also expected that the Project **MESA** SoR and the resulting technical specifications will:

- Emphasize transparent and seamless wide-area network applications.
- Include multiple levels of security and data encryption schemes that may be a function of the network or a function of the application or communication device to ensure end-to-end data protection.

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[1] Including federal, national, regional, state, local, tribal and non-governmental organizations, as applicable.

[2] This corresponds to the ITU definitions of ‘broadband' viz. beyond the primary rate which is at least 1,5 Mbps to 2 Mbps (peak). Additionally, ITU-R Report M.2033 Radiocommunication objectives and requirements for public protection and disaster relief Edition, 2003 implies broadband starting as 1 Mbps to 4 Mbps. Ultimately, broadband is somewhat relative as it relates to data rates and capabilities that meet the needs of users and the type of transmission that is needed to facilitate such needs or applications.

- Offer robust operational management and control systems capabilities.
- Reflect the requirements of **MESA** users to have priority operational services and priority system restoration.
- Provide an extremely reliable service model and ubiquitous coverage within a user's defined service area.

Additionally, the **MESA** SoR is intended to describe a functional and open standards-based platform that can be installed as either a private system owned by the government or a governmental-commercial partnership that provides authorized service to **MESA** user agencies and possibly secondary service to other commercial clients. The Project **MESA** specifications are not intended to specifically identify particular frequency spectrum for use, thereby allowing standardized technology to be used in any authorized and available spectrum consistent with the required channel bandwidth.

Within the SoR document, a general outline of the **MESA** user community's technological needs for the transport and distribution of rate-intensive data, digital video, infrared video, and digital voice for both service-specific and general applications is categorized into six distinct sections:

- Technology needs of each type of **MESA** user discipline.
- General technology requirements.
- General, functional, and operational requirements.
- Technology and applications.
- Use of technologies.
- Compatibility requirements for the various applications.

Each clause details requirements used in different national and international PS/PP programs. Additionally, four annexes are incorporated into the SoR document, providing additional informational materials to further the reader's understanding of the requirements and how the resulting technology might be applied in "real-world" applications. The annexes include national and international PS/PP programs; standards, specifications, and requirements; known North American federal, state, and county requirements; and two law enforcement scenarios-a courthouse murder and a state and urban police response to an earthquake event.

The SoR document is not written specifically to be studied end-to-end; rather it represents a unique source of information with the aim of providing an understanding of the unique and often very difficult and dangerous working environments that the **MESA** user community is facing, that industry can use in providing the most innovative, effective, and accurate technical solutions to meet this unique operational environment. It also represents the establishment of the clear understanding that the advanced needs of this user community should be based on a highly mobile, interoperable, broadband wireless network that allows the provision of dynamic bandwidth, self-healing characteristics and secure network access.

Within Project **MESA**, the SoR document will be updated at regular intervals and represents the focal source of information for Project **MESA**'s industry members in their work toward the realization of next-generation, globally applicable communications capabilities, specifications, and the future standards that evolve from them.

The intention is that the corresponding **MESA** Technical Specification Group will utilize the evolving SoR in order to map existing and needed capabilities, standards and gaps, progressing toward the development of corresponding technical specifications. A "System of Systems" approach is being utilized, leveraging current and evolving communications technology and user requirements.

Within Project **MESA**, the SoR document will be updated at regular intervals and represents the focal source of information for Project **MESA**'s industry members in their work toward the realization of next-generation, globally applicable communications capabilities, specifications, and the future standards that evolve from them.

MESA output will be transposed by supporting standards development organizations (i.e. TIA, ETSI, etc.) for regional development and publication. Other technical organizations and entities are encouraged to consider **MESA** activities and approved specifications, as well as resulting standards that are published.