Toolkit on Digital Transformation for People-Oriented Cities and Communities

9

Module 9:
Emergency Response and Management

Jointly developed by: ITU, UN-Habitat, UNDP

Module 9 – Emergency Response and Management

- This Module of the Toolkit on Digital Transformation for People-Oriented Cities and Communities focuses on emergency response and management in cities and communities, including the topic of disasters.

- Cities and communities that are starting on their digital transformation journey will find the resources highlighted within this Module useful toward deploying IoT and smart systems in their city to coordinate response to emergency and disaster scenarios.

- This Module is also useful for cities and communities that have already made some headway into their digital transformation processes but would like to validate the effectiveness of IoT and other smart applications in their city for this purpose.

Module 9 – Emergency Response and Management

This Module will cover the following topics:

1. Emergency Response and Management Challenges
2. Emergency Response and Management Solutions
3. Key tools for Emergency Response and Management
    1. Tool #1: Use of cell broadcast and the common alerting protocol
    2. Tool #2: Internet of things devices and applications
    3. Tool #3: Transportation safety management
    4. Tool #4: Automotive emergency response systems
    5. Tool #5: Other preventative services

1. Emergency Response and Management Challenges

What Characterizes an Emergency or Disaster?

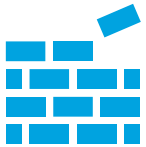
Uncertainty

Sudden or unexpected events

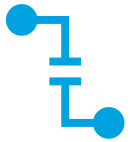
Casualty risk

Urgency

Resource shortages



Significant damage



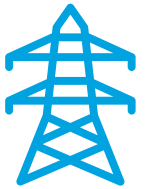
Infrastructure support disruption

Types of Emergencies and Disasters in Cities and Communities

Severe weather

Flooding

Health emergencies



Power and
utility disruptions

Fuel or gas disruptions

Transportation and
traffic accidents

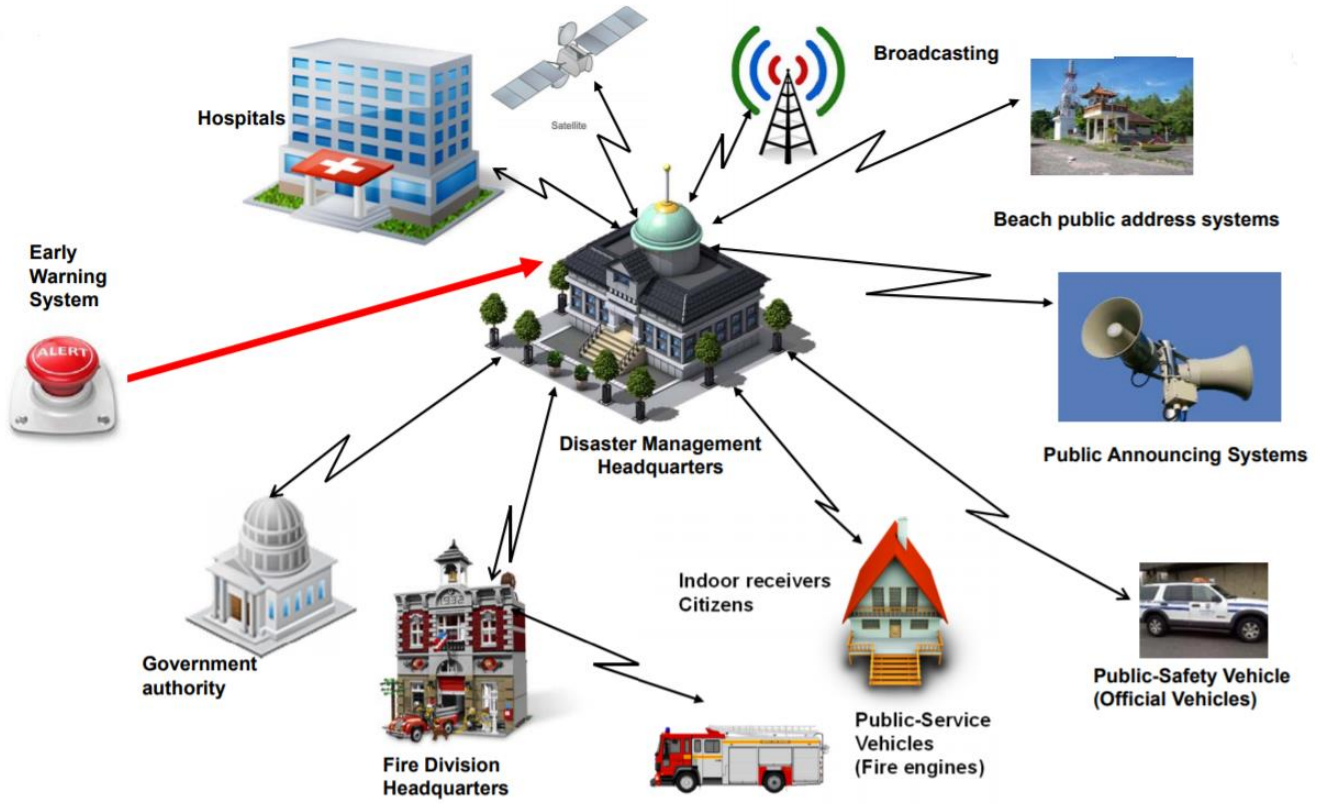
Nuclear disasters

Fires and explosions

2. Emergency Response and Management Solutions

Coordinated Response and Management

Central coordination model of emergency and disaster response & management in cities and communities



(image source)

Up-to-date Response and Management Frameworks

(image source)

Tampere Convention

Victims of disasters can benefit from faster and more effective rescue operations, thanks to the Tampere Convention on the Provision of Telecommunication Resources for Disaster Mitigation and Relief Operations.

Source: ITU-D

National Emergency Telecommunication Plan

A National Emergency Telecommunication Plan promotes coordination across all levels of government, engaging stakeholders to think through the life cycle of a potential disaster.

(image source)

Capacity Building and TTX

Challenges to developing TTX

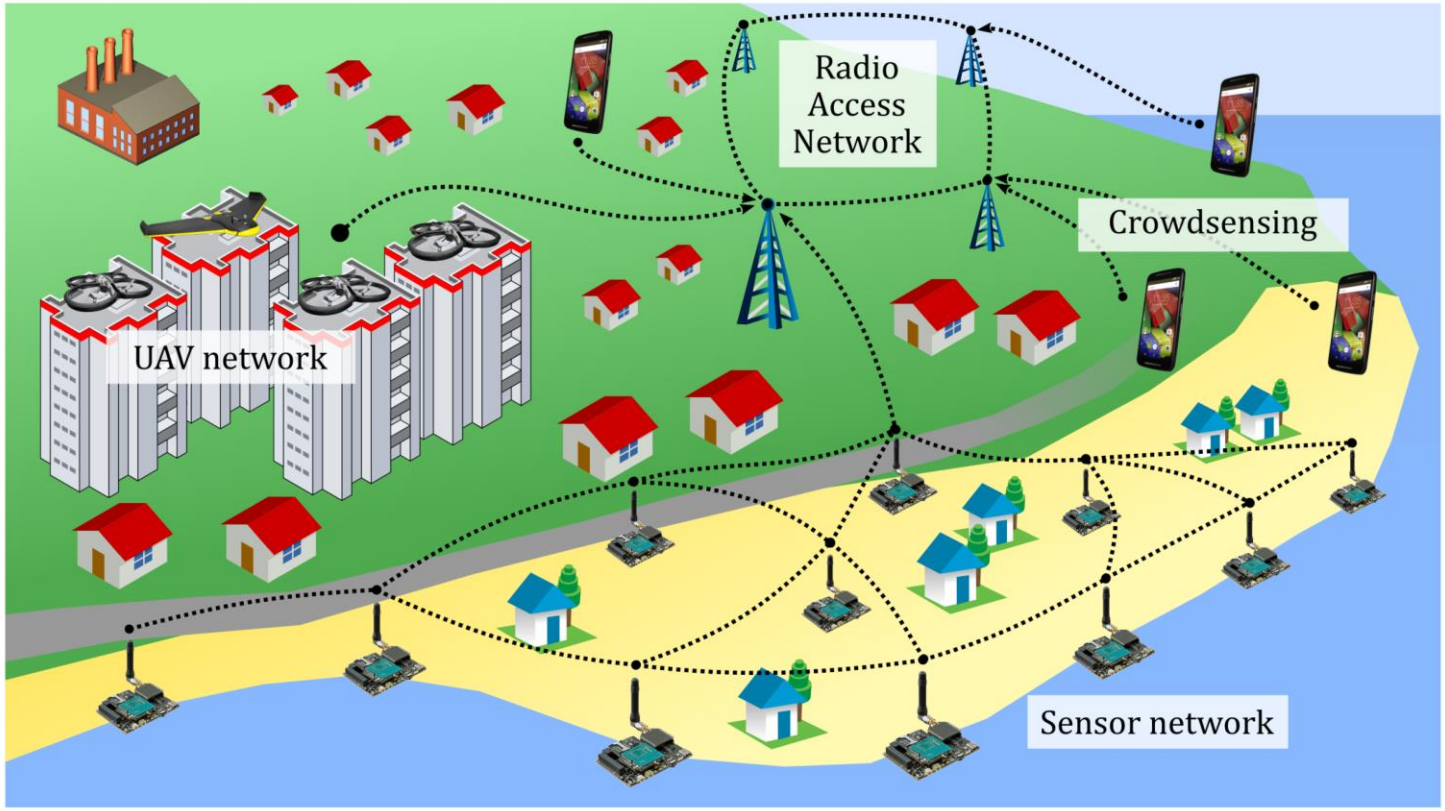
Ensuring participation of the appropriate personnel

Building capacity

Managing sensitive information

Use of Digital Technology and ICTs

Sources of big data in disaster and emergency response and management: an IoT ecosystem made of sensors, smartphones and UAVs



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3. Key Tools for Emergency Response and Management

Introduction to Key Tools for Emergency Response and Management

Tool #1:
Use of cell broadcast and the common alerting protocol

Tool #2:
Internet of things devices and applications

Tool #3:
Transportation safety management

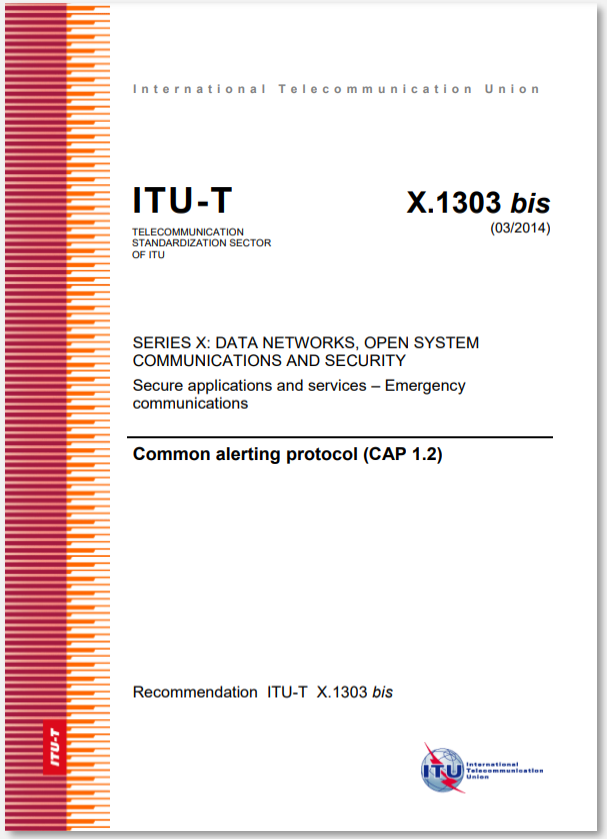
Tool #4:
Automotive emergency response systems

Tool #5:
Other preventative services

Tool #1

Use of cell broadcast and the Common Alerting Protocol

Use of Cell Broadcast and Common Alerting Protocol



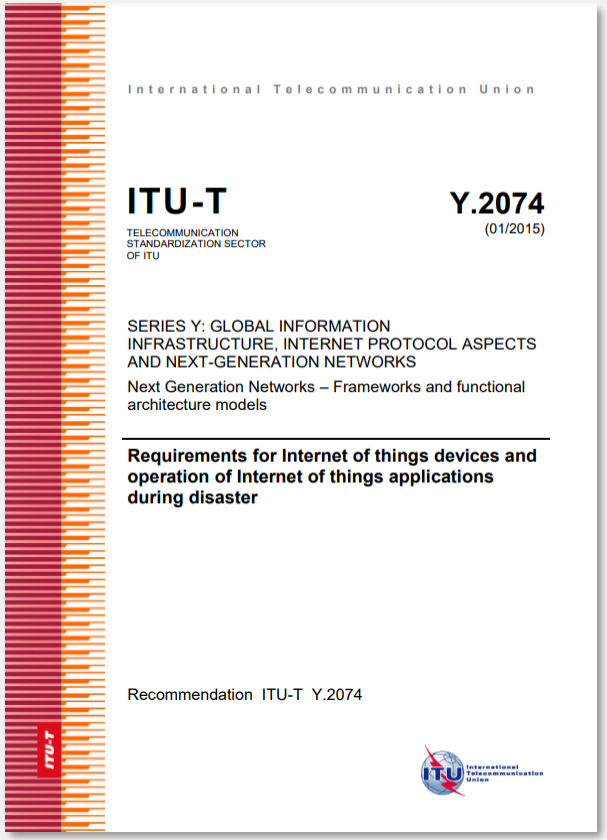
Tool #2

Internet of things devices and applications

Requirements of IoT in Disaster Management

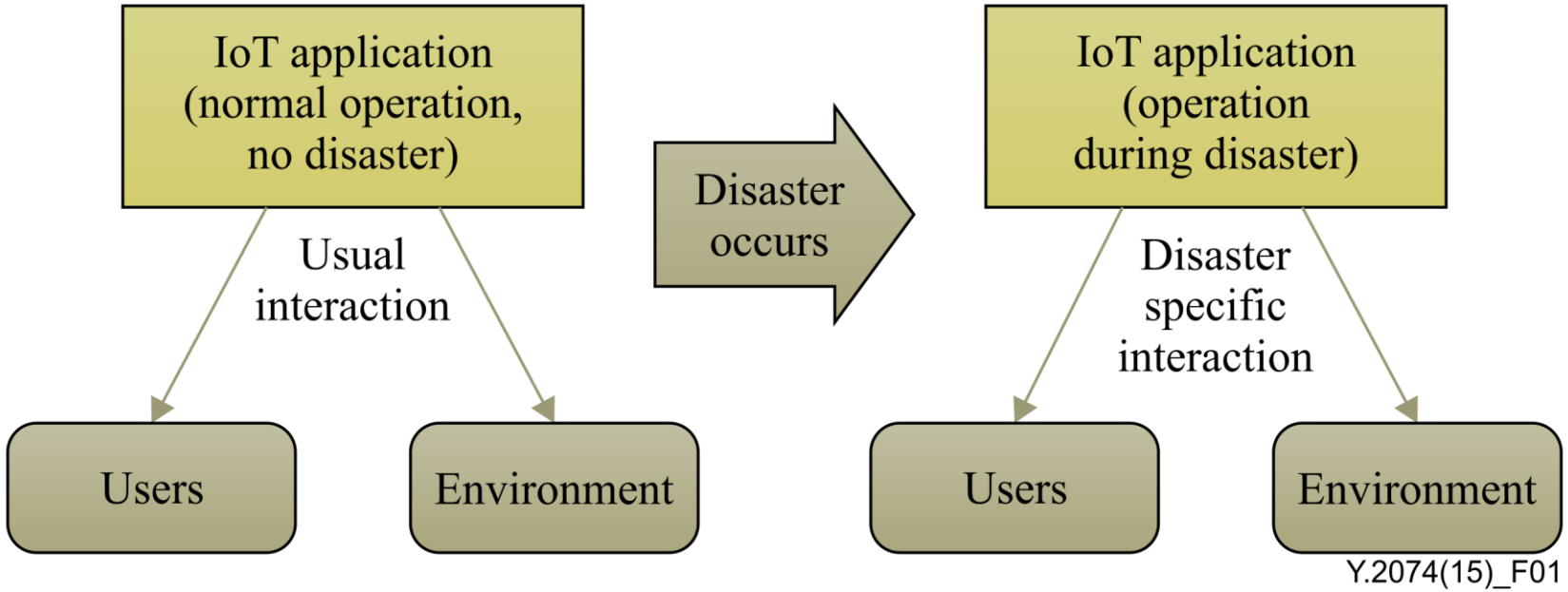
Requirements for IoT devices

Requirements for operation of IoT applications



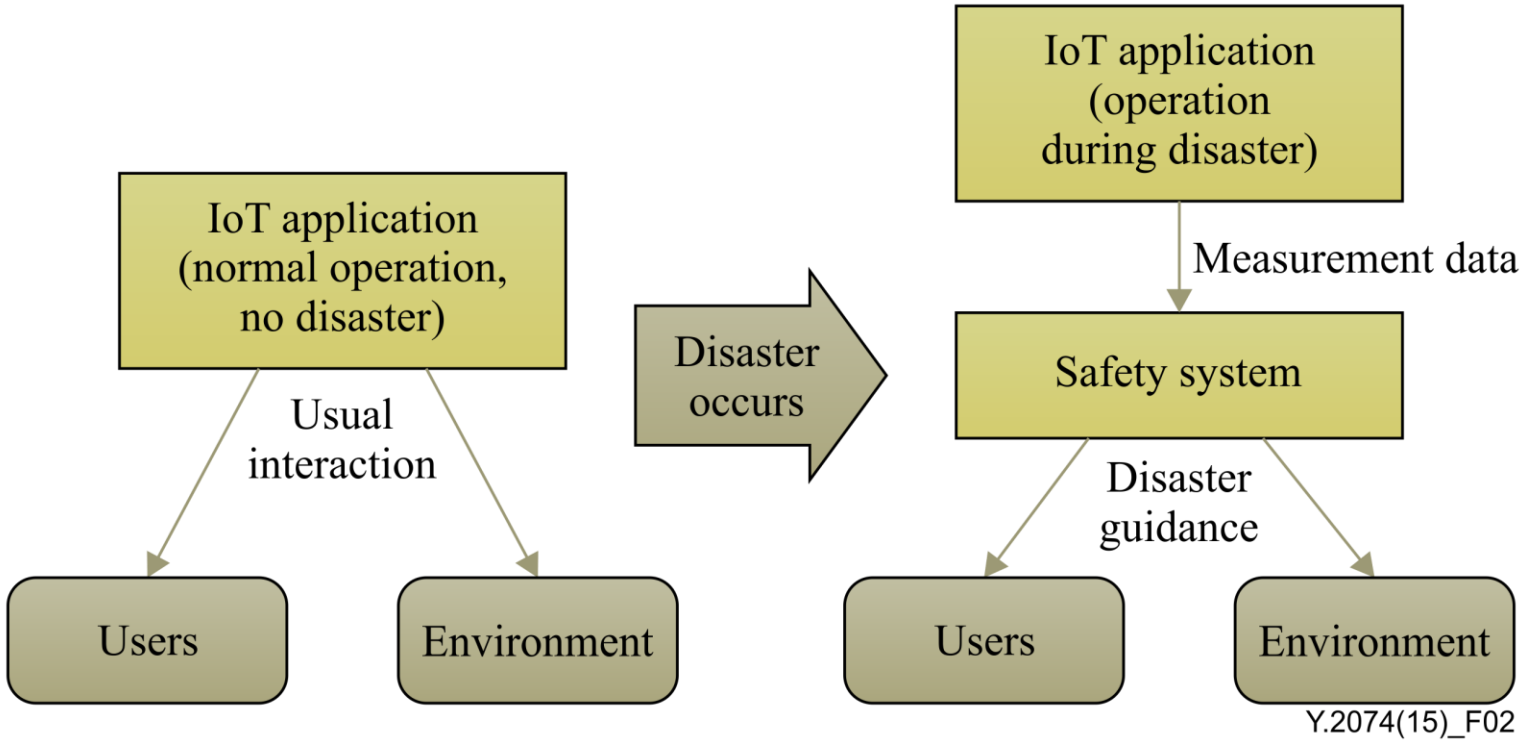
Requirements of IoT in Disaster Management

Operation mode change for IoT applications with dedicated operation mode activated during disaster



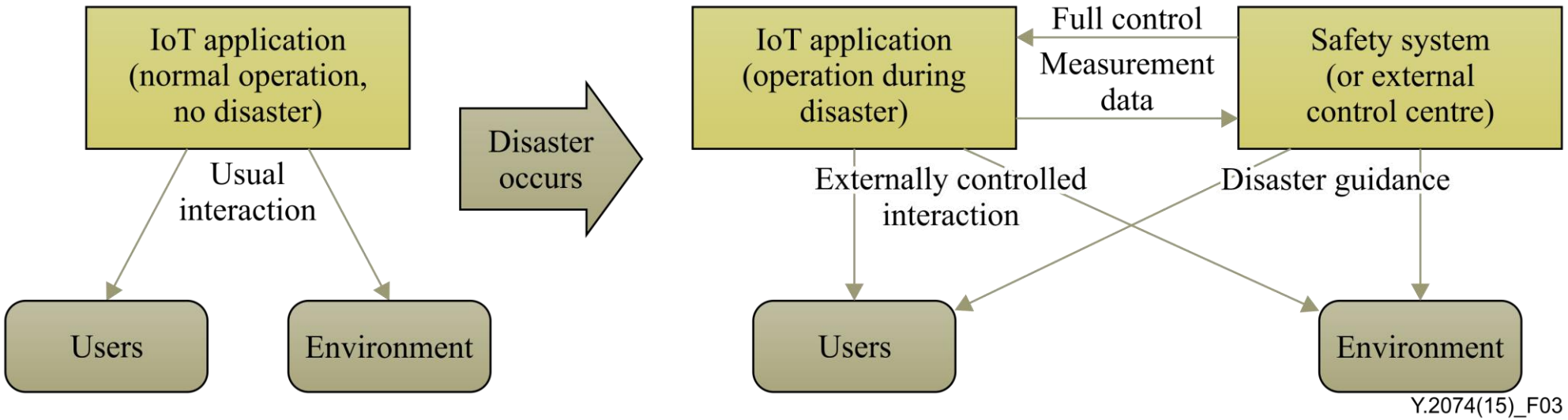
Requirements of IoT in Disaster Management

Operation mode change for IoT applications temporally providing resources to external safety systems during disaster



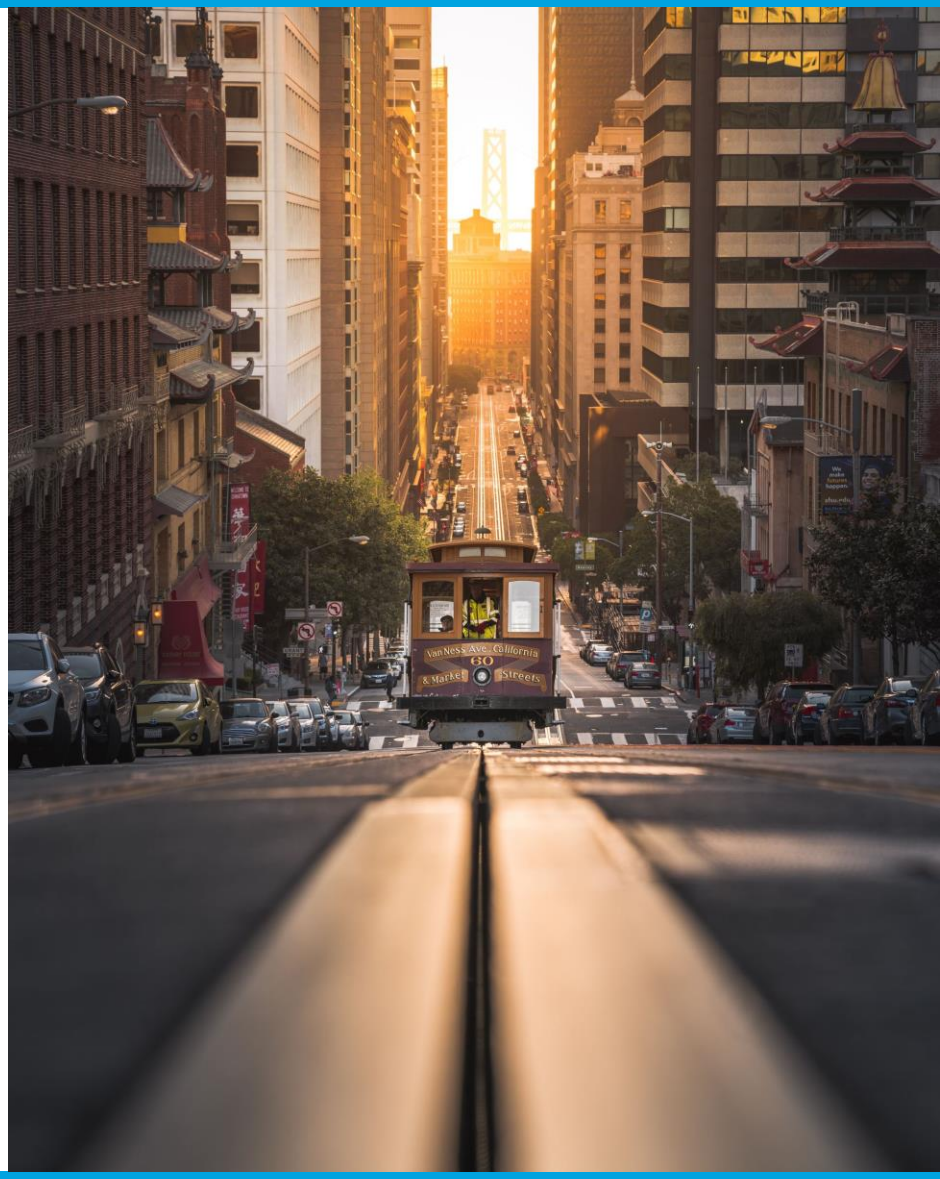
Requirements of IoT in Disaster Management

Operation mode change for IoT applications with external control of operation during disaster



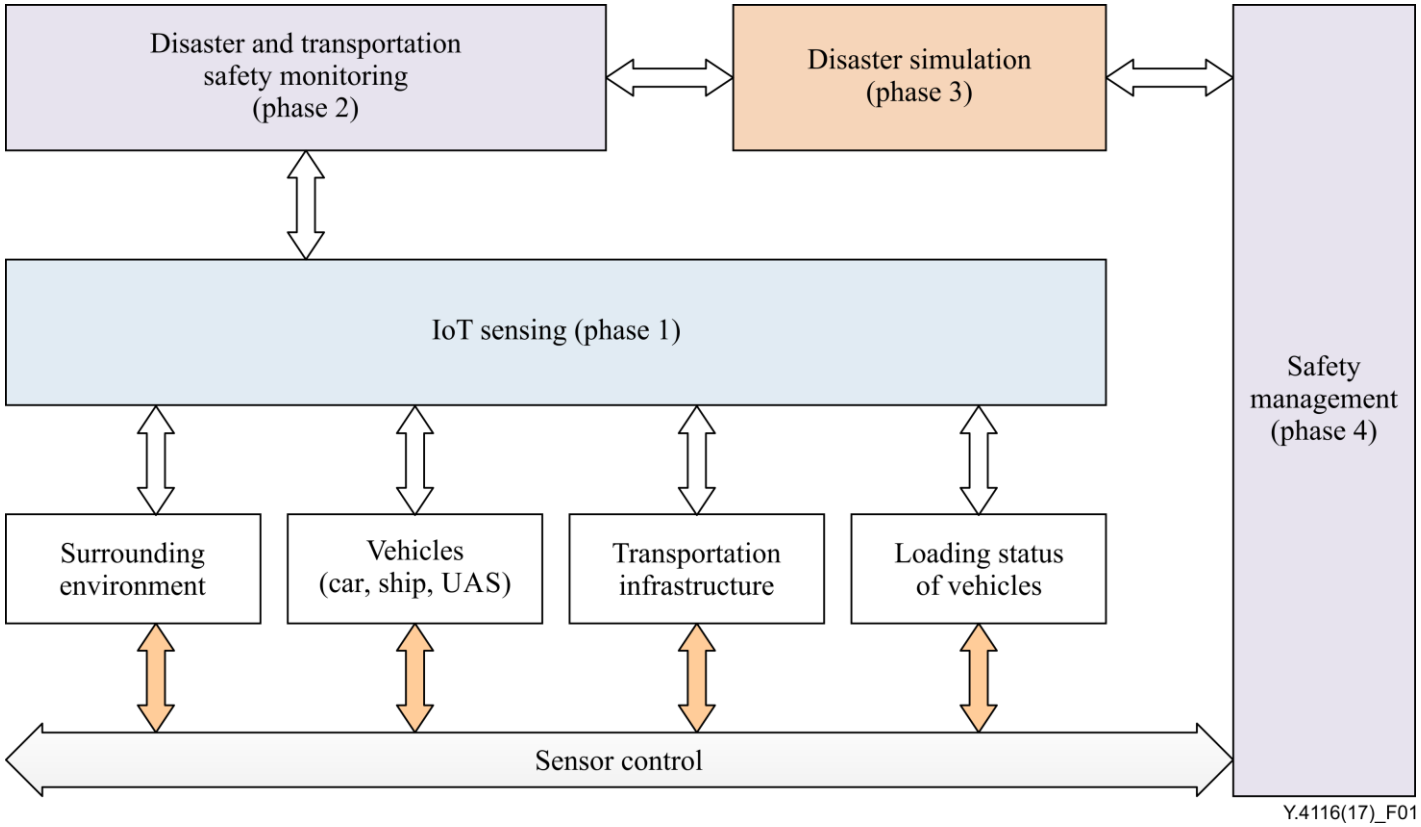
Tool #3

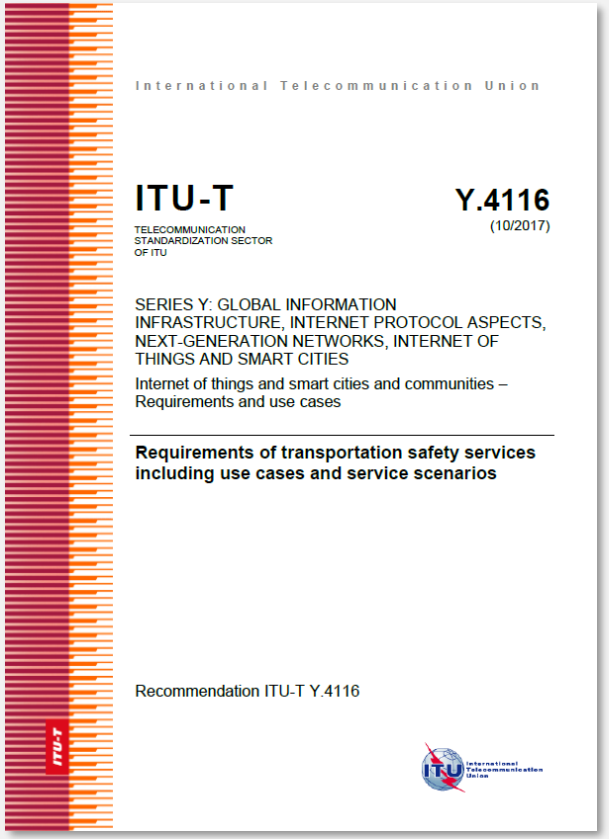
Transportation safety management



Transportation Safety Services

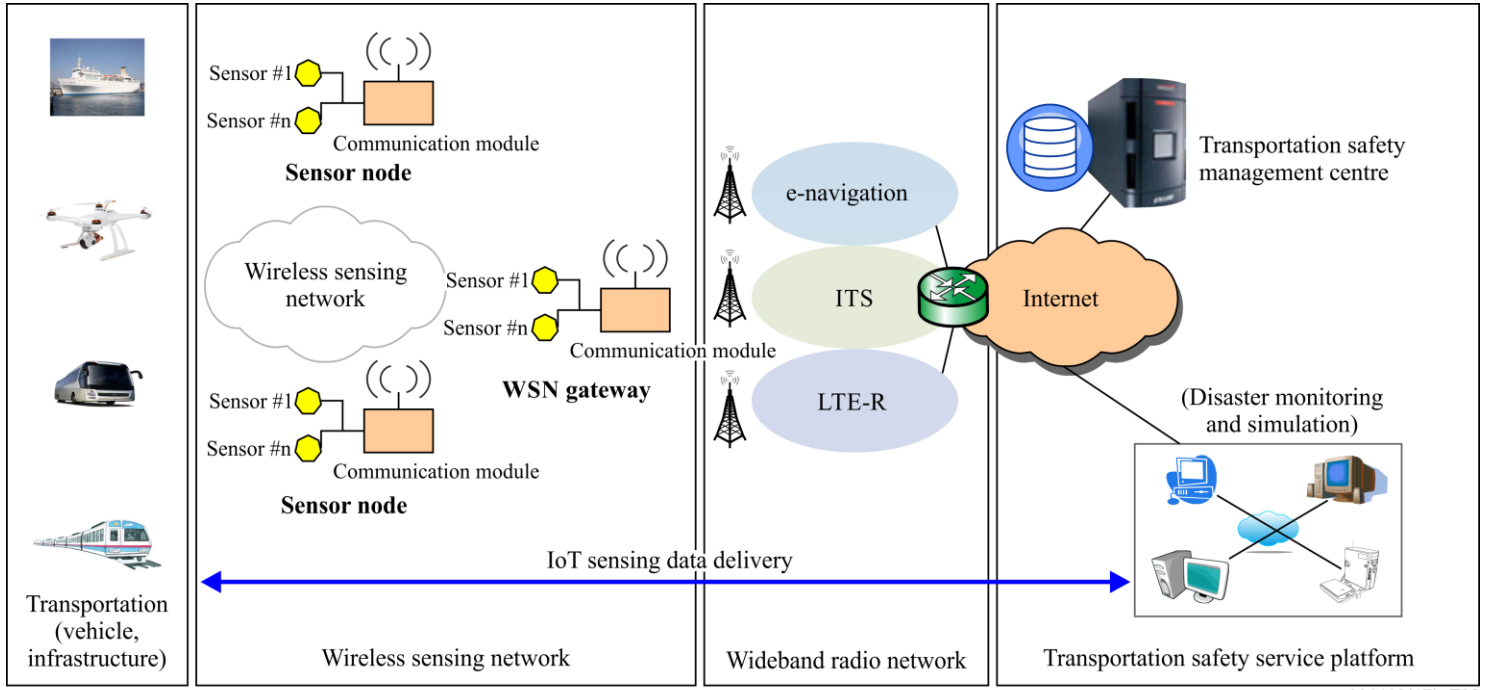
The concept of transportation safety management





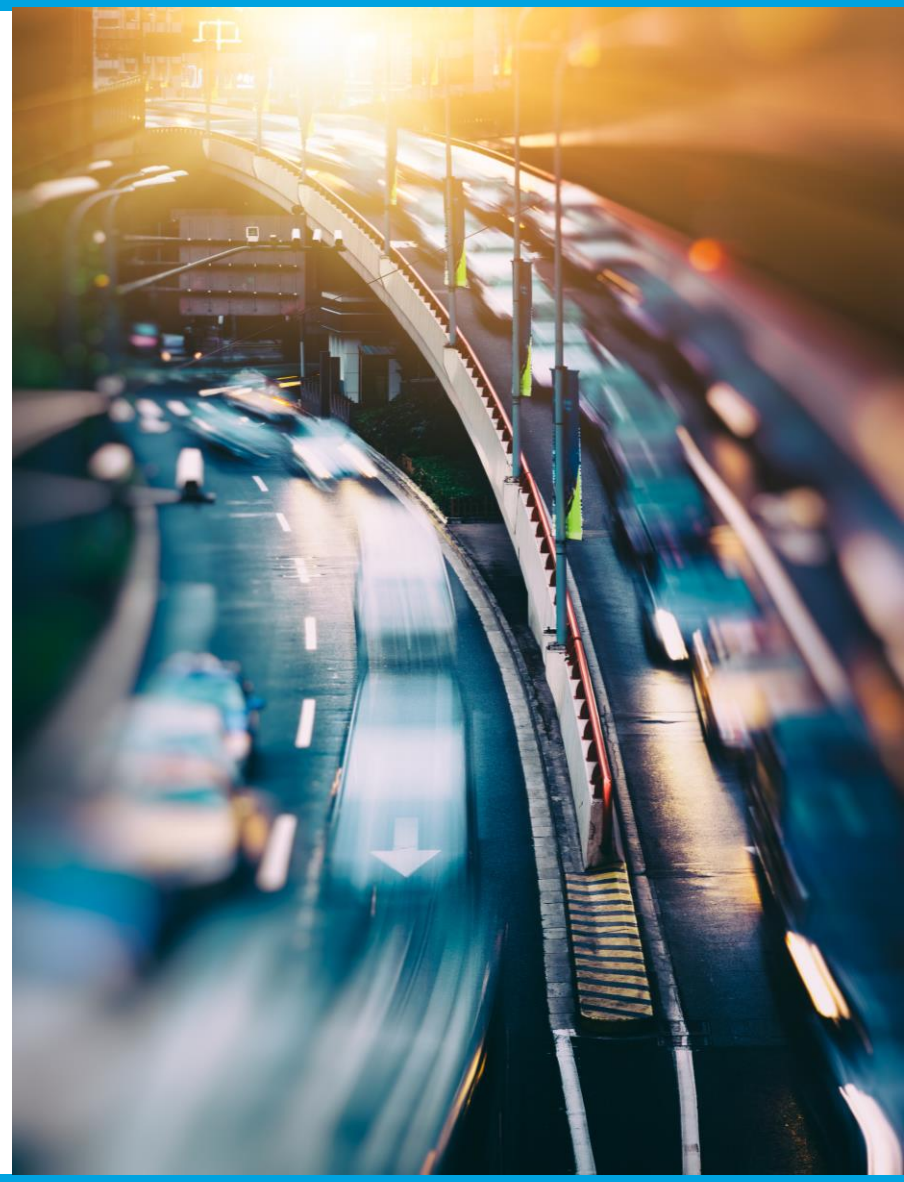
Transportation Safety Services

System structure for transportation safety management



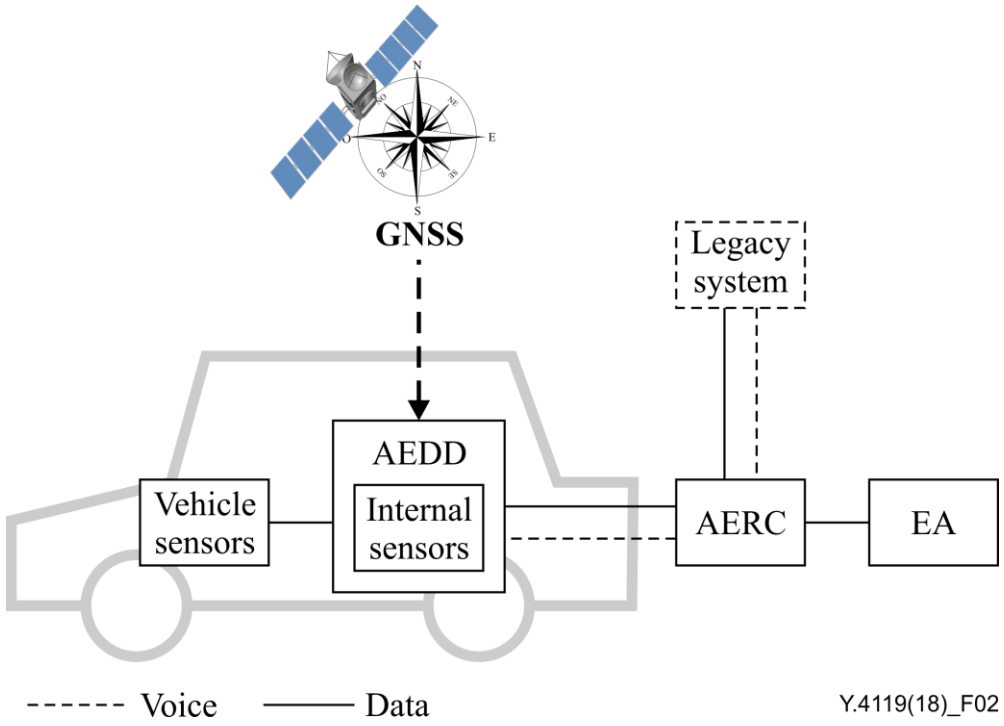
Tool #4

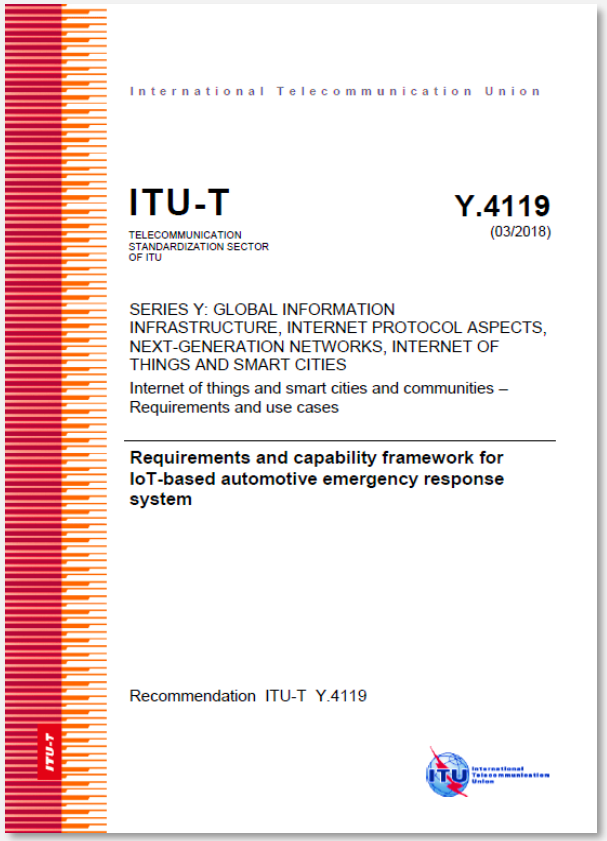
Automotive emergency response systems



Automotive Emergency Response Systems

Overview of the AERS

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SERIES Y: GLOBAL INFORMATION INFRASTRUCTURE, INTERNET PROTOCOL ASPECTS, NEXT-GENERATION NETWORKS, INTERNET OF THINGS AND SMART CITIES

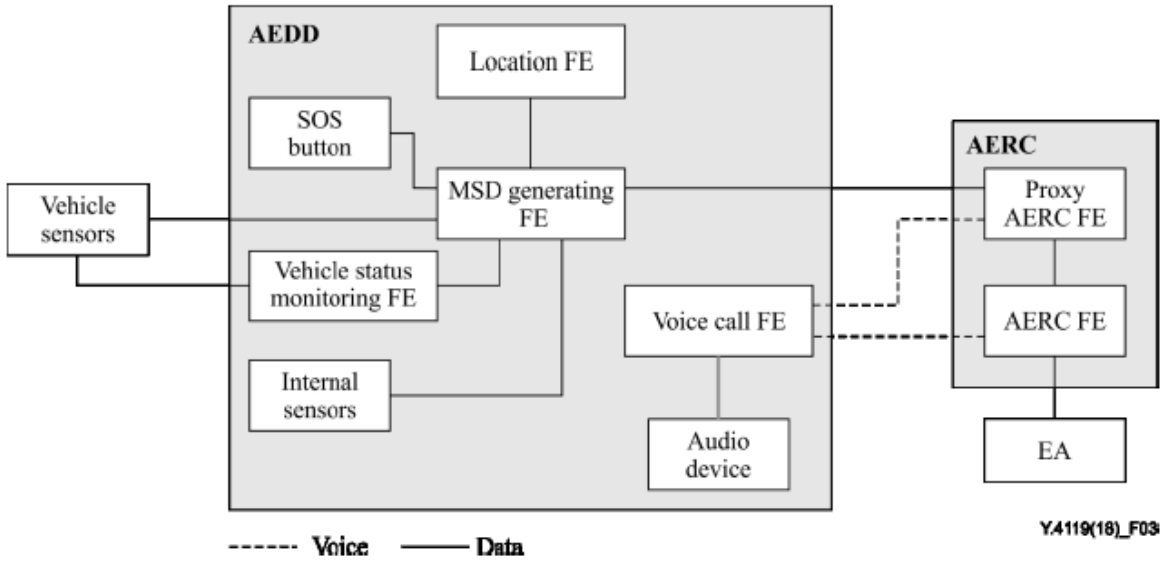
Internet of things and smart cities and communities – Requirements and use cases

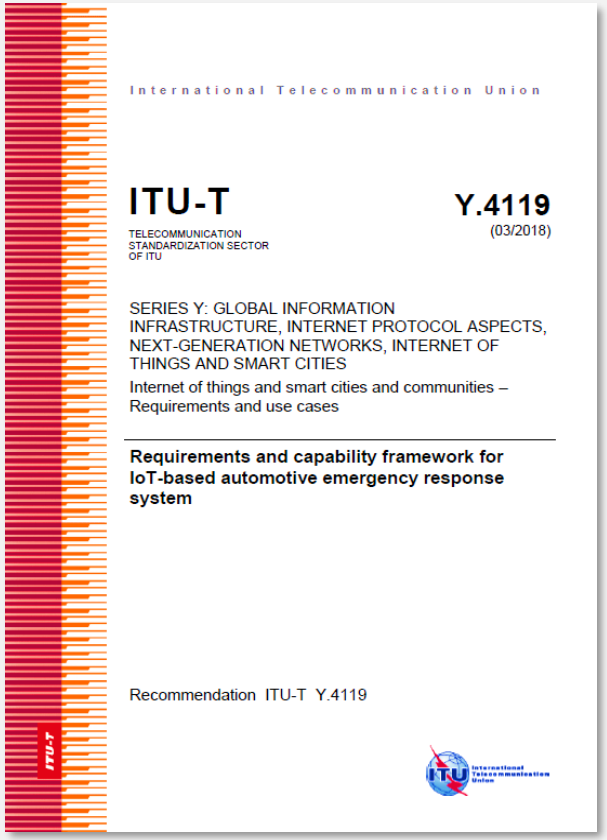
Requirements and capability framework for IoT-based automotive emergency response system

Recommendation ITU-T Y.4119

Automotive Emergency Response Systems

Capability framework of AERS

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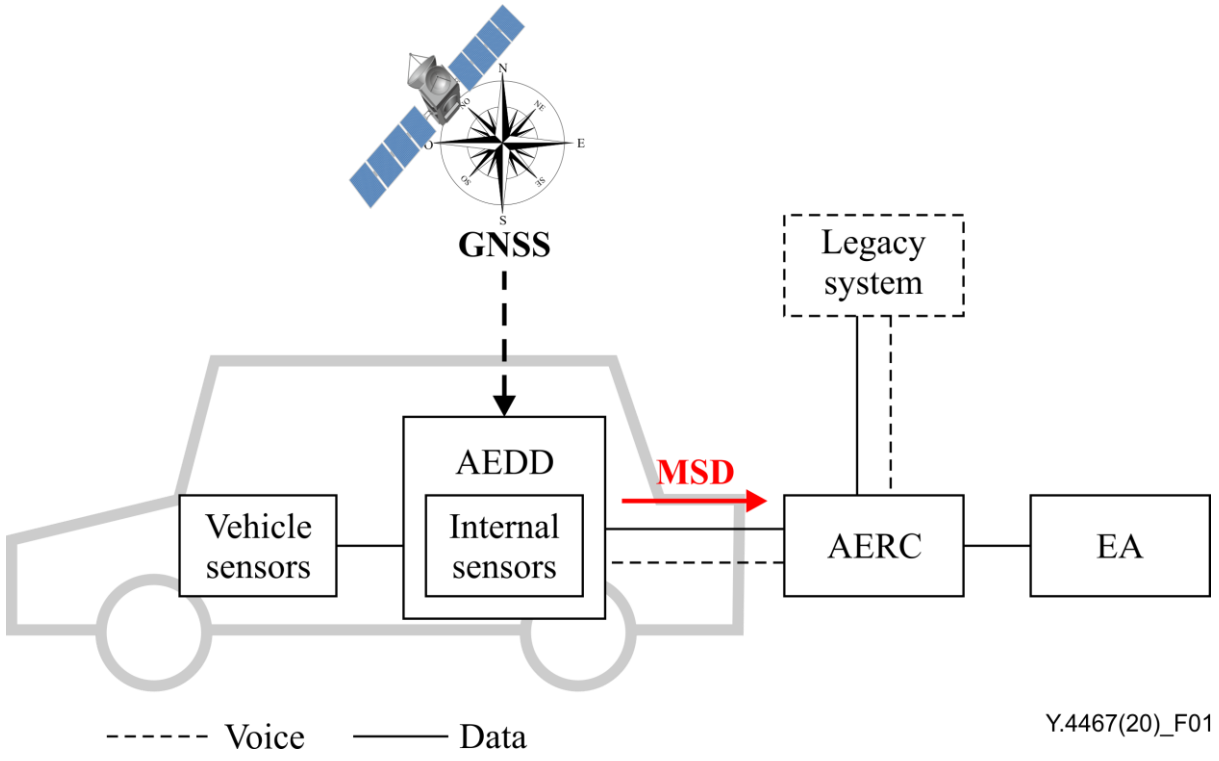
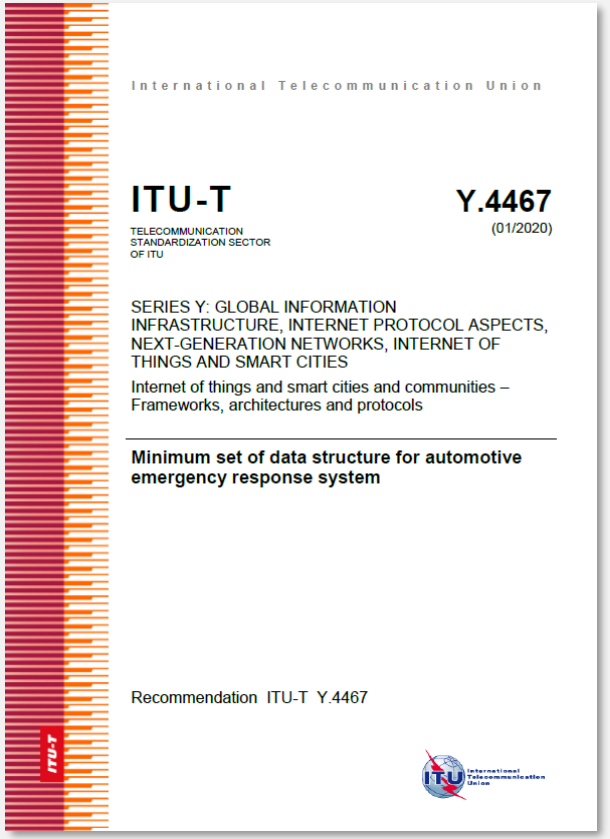
Automotive Emergency Response Systems

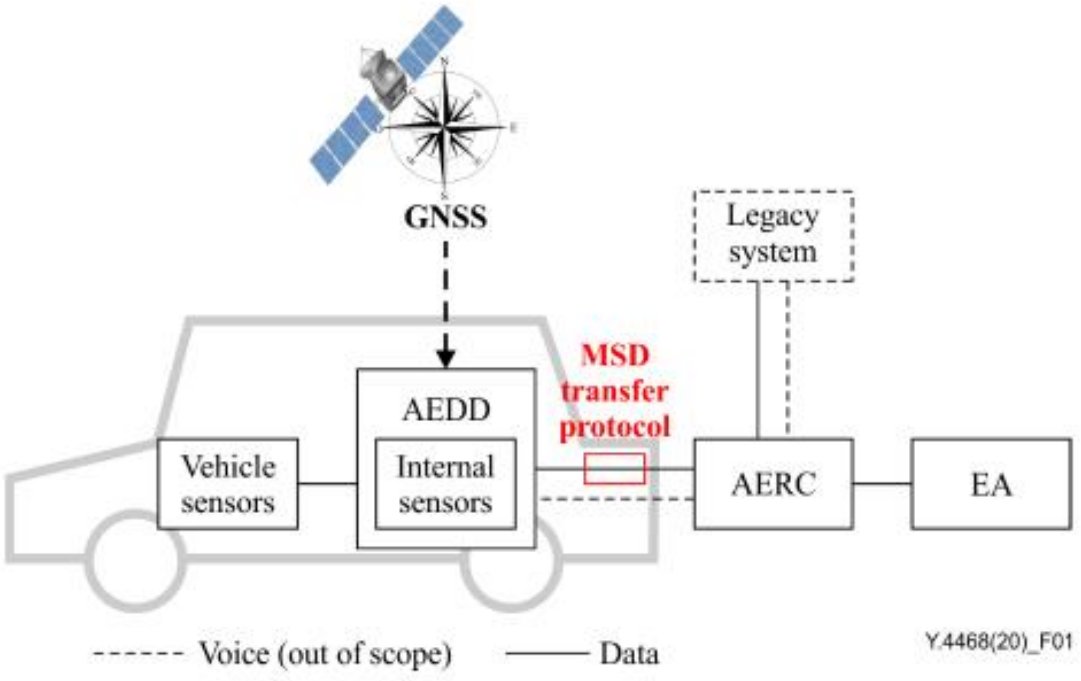
MSD transmission

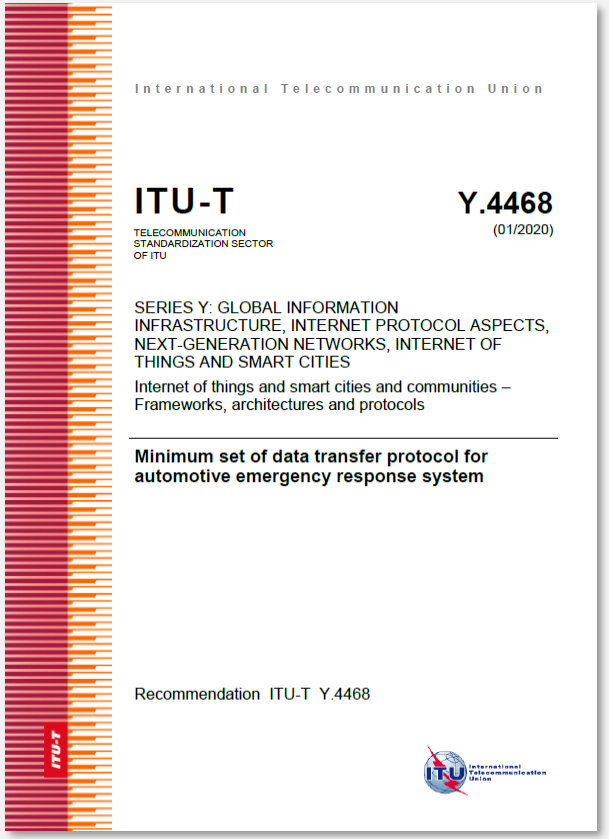




Automotive Emergency Response Systems

Scope of MSD transfer protocol

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SERIES Y: GLOBAL INFORMATION INFRASTRUCTURE, INTERNET PROTOCOL ASPECTS, NEXT-GENERATION NETWORKS, INTERNET OF THINGS AND SMART CITIES

Internet of things and smart cities and communities – Frameworks, architectures and protocols

Minimum set of data transfer protocol for automotive emergency response system

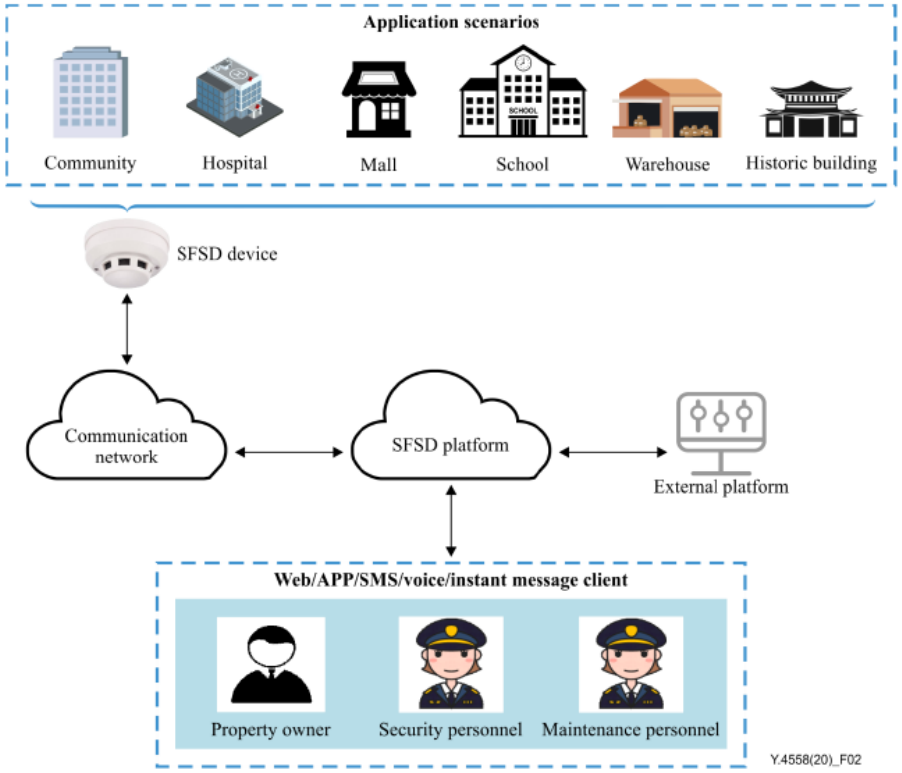
Recommendation ITU-T Y.4468

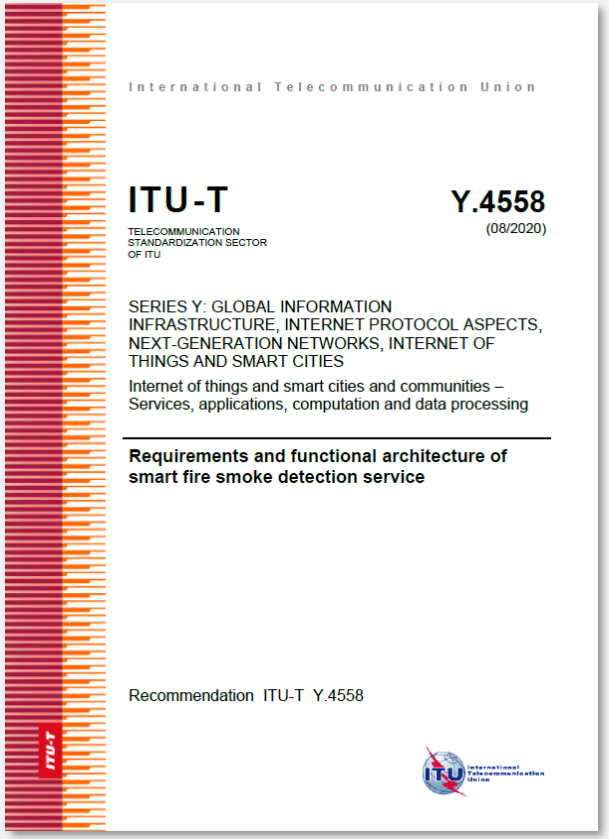
Tool #5

Other preventative services

Smoke Detection Services

Implementation and deployment model of smart fire smoke detection service

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(08/2020)

SERIES Y: GLOBAL INFORMATION INFRASTRUCTURE, INTERNET PROTOCOL ASPECTS, NEXT-GENERATION NETWORKS, INTERNET OF THINGS AND SMART CITIES

Internet of things and smart cities and communities – Services, applications, computation and data processing

Requirements and functional architecture of smart fire smoke detection service

Recommendation ITU-T Y.4558

Module 9 –
Emergency Response and Management

Thank you for completing this Module of the ITU Toolkit on Digital Transformation for People-Oriented Cities and Communities.

We hope that you found the information in this Module useful toward planning and initiating your city or community's digital transformation process.

Please review the resources highlighted within for further details, including valuable real-world use cases, on how to get started on – and optimize from the onset – your city or community's digital transformation journey.

Toolkit on Digital Transformation for People-Oriented Cities and Communities

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