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THE FRAME ARCHITECTURE

AN INTRODUCTION



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WHAT IS IT CALLED?

It's Official Name


- “European ITS Framework Architecture”

It's Colloquial Name

- “The FRAME Architecture”

FRamework
 Architecture
 Made for
 Europe

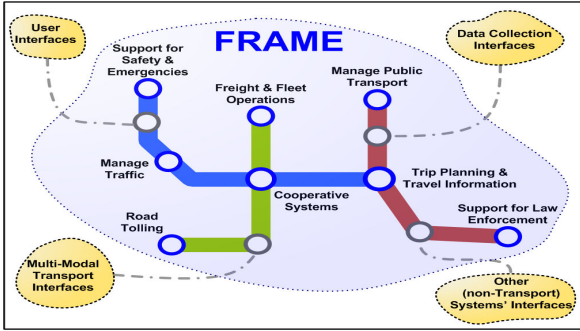
Why was it created?



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DESIRE FOR INTEGRATED AND INTER-OPERABLE ITS

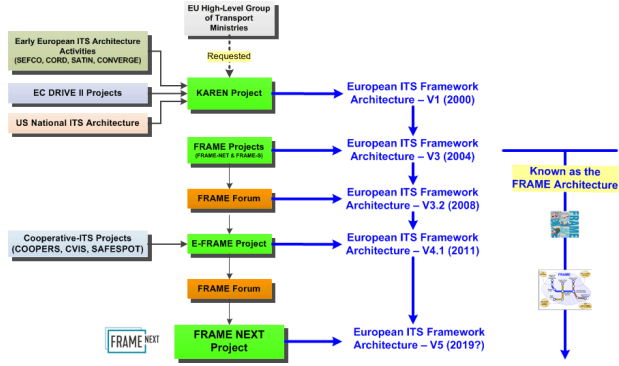


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BRIEF HISTORY




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WHAT IS A SYSTEM ARCHITECTURE?

- A top-level framework showing how the implementation will appear
- Provides the strategic plan for the further design work
- It is **non-deterministic** providing technology independence by showing:
 - “What is needed”
 - NOT
 - “How is it to be implemented”
- **Only includes top-level assumptions**
 - Minimum necessary
 - NOT
 - Maximum Possible

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THE COMPLETE ITS ARCHITECTURE CREATION PROCESS

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FRAME – PRINCIPAL COMPONENTS

1. **User Needs** (formal statements of what the stakeholders want)
e.g. 7.1.4.4 The system shall be able to provide advice to drivers as they approach car parks
2. **Functions** (how the system is to do it)
e.g. 3.1.4.9 Output Car Park Information to Drivers
3. **Data Flows** (the information required)
mt_carpark_occupancy_for_output (x)
td_carpark_occupancy (y)
td_carpark_status (z)
4. **Terminators** (entities outside the system)
Driver (d)


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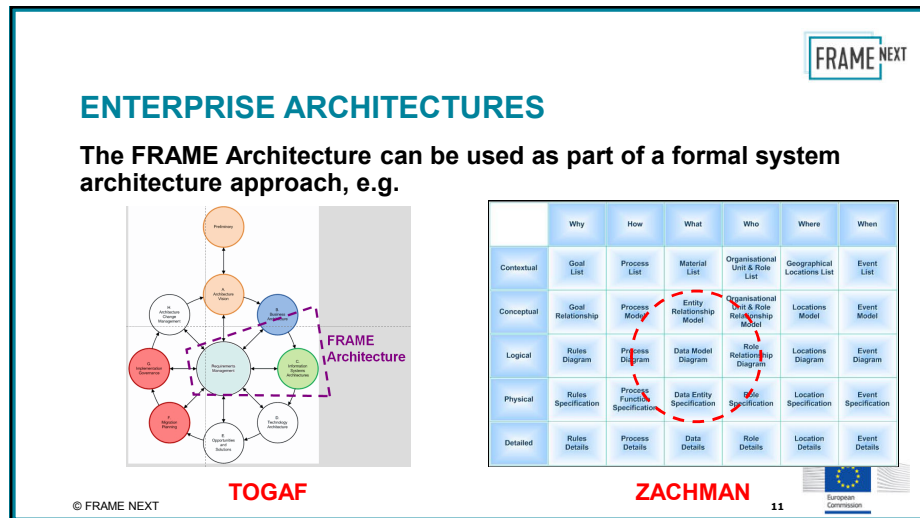
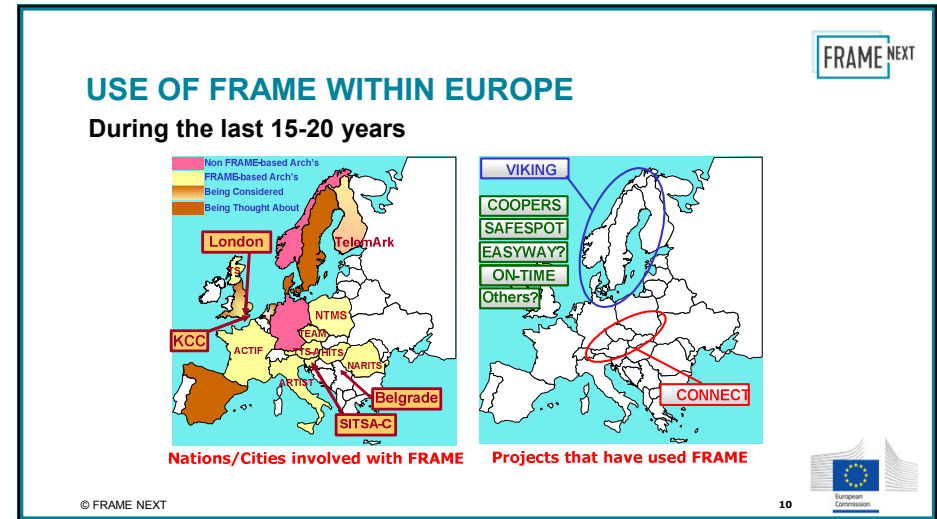
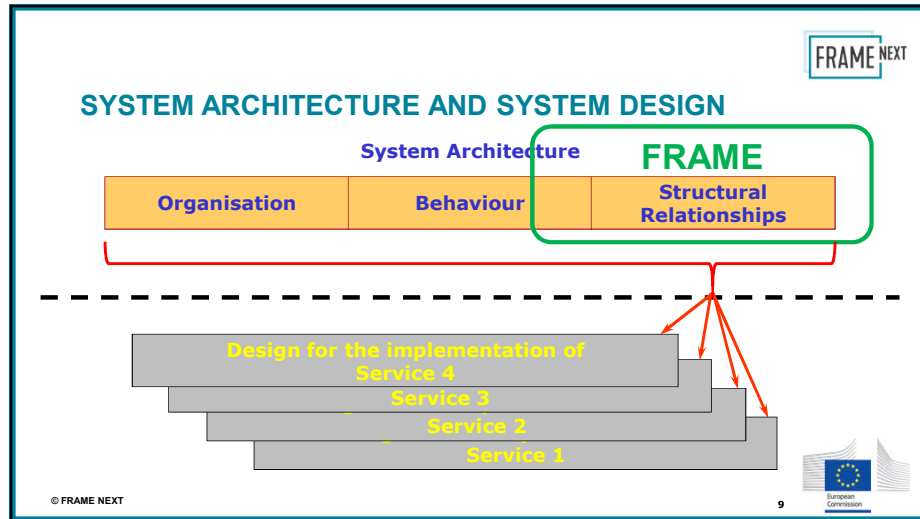
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TYPICAL ITS EXAMPLES

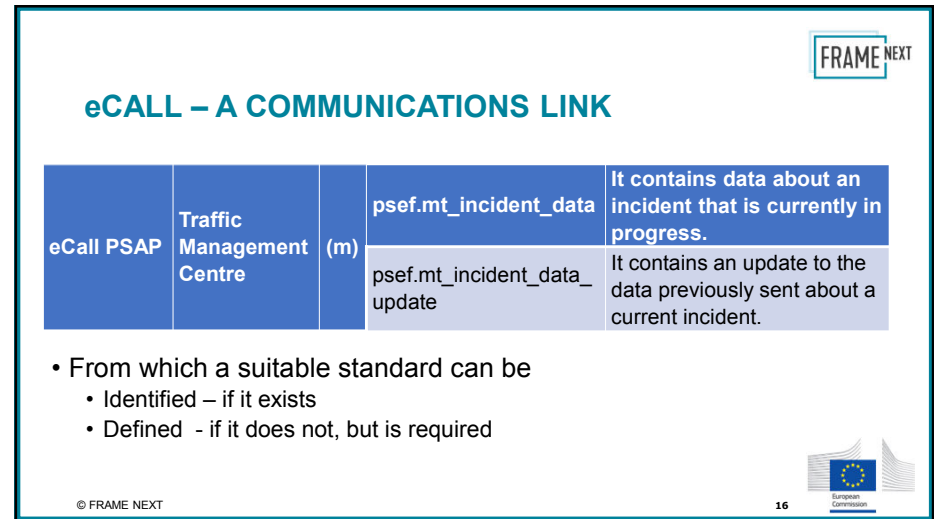
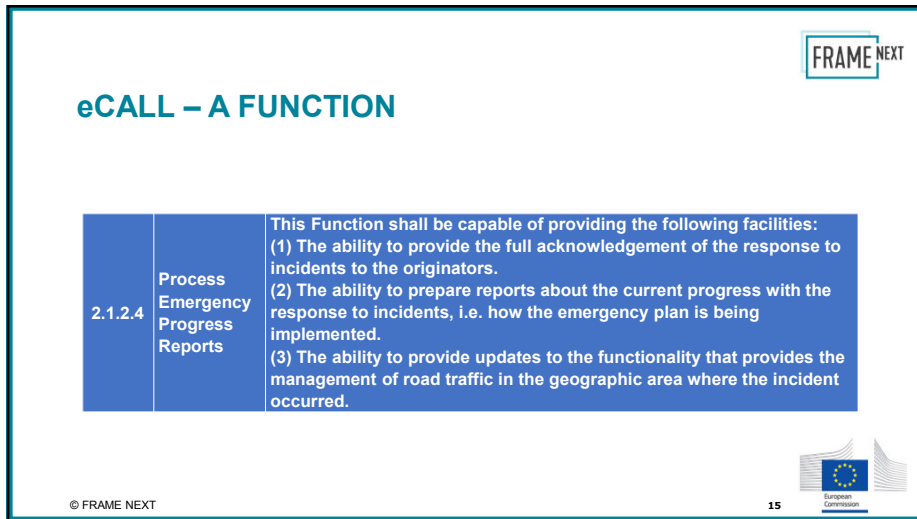
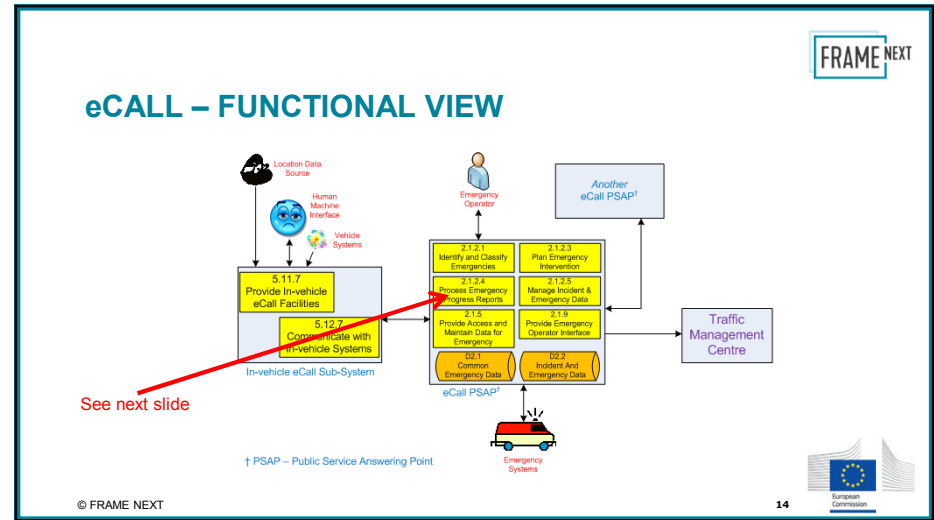
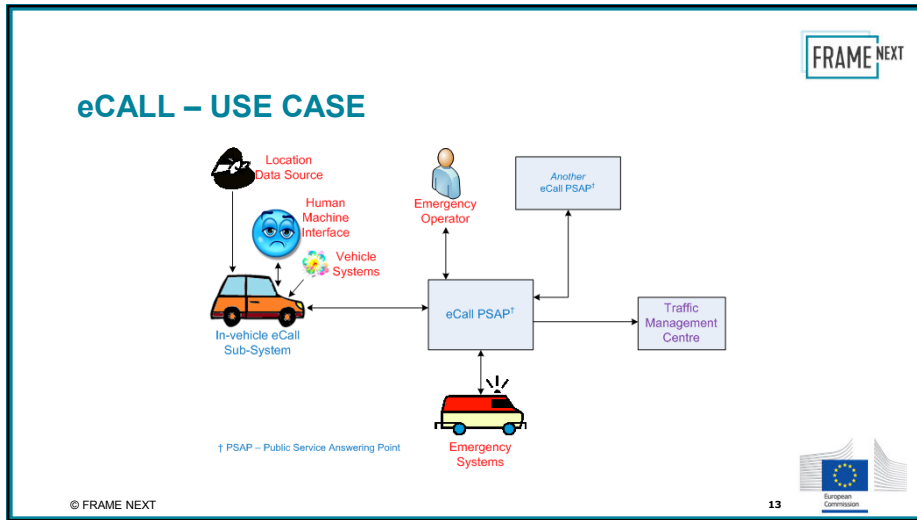
Architectures show structure at different levels

- **ARKTRANS**
 - Mainly multi-modal Freight and Fleet Management
- **US National ITS Architecture**
- **Many project architectures**
- **Communications architectures**
 - E.g. COMeSafety, UTM
- **Also Data Models**
 - E.g. DATEX II

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- ### EXAMPLE - eCALL
1. A “112” call is made from a vehicle, either automatically by the vehicle e.g. when the airbags are deployed, or manually by an occupant.
 2. The call is received by an eCall Public Service Answering Point (PSAP) which determines the cause and dispatches the necessary assistance.
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ORGANISATIONAL ISSUES

Figure 3a: Scenario A

† PSAP – Public Service Answering Point

Figure 3b: Scenario B

† PSAP – Public Service Answering Point

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BENEFITS OF AN ARCHITECTURAL APPROACH

1. **For the Citizen**
 - Better integration of transport service
 - Compatible equipment that works everywhere, in the same way
2. **For Authorities and Operators**
 - Technology independence
 - For long term planning
 - Open market with common standards
 - Multiple sources – suppliers in competition
3. **For Suppliers and Manufacturers**
 - Open market with common standards
 - Larger market place – economies of scale
 - Encourages diversity of supplier – including SMEs

Systems in harmony

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IMPACT ON DEVELOPMENT COSTS (10 : 100: 1000 RULE)

- Cost of fixing problems in System development increases exponentially with time
- System Architectures can expose these problems early in the development cycle
- Early fixing costs less

System Architectures used here

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An ITS Architecture provides a
WIN WIN situation

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