European ITS Framework Architecture and its application for Co-operative Systems

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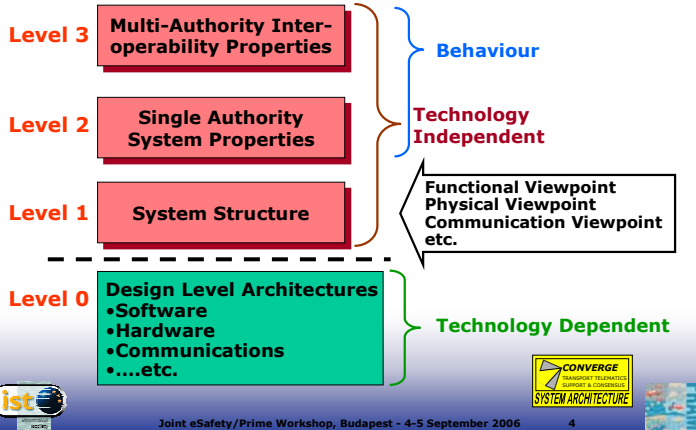
Consequences of Integration for Co-operative Systems

- Integrated system (and large)
  - Whole > sum of the parts
- Many stakeholders that need to co-operate
  - Vehicle Owners/Drivers
  - Road Operators
  - Operators of Other Transport Modes
  - Regulatory/Enforcement Authorities etc.
- Varying commercial interests
  - Public services, commercial services
- Multi-disciplinary activities
  - e.g. Software, Hardware, Traffic Engineering
- Multiple manufacturers / technologies
  - To build integrated systems

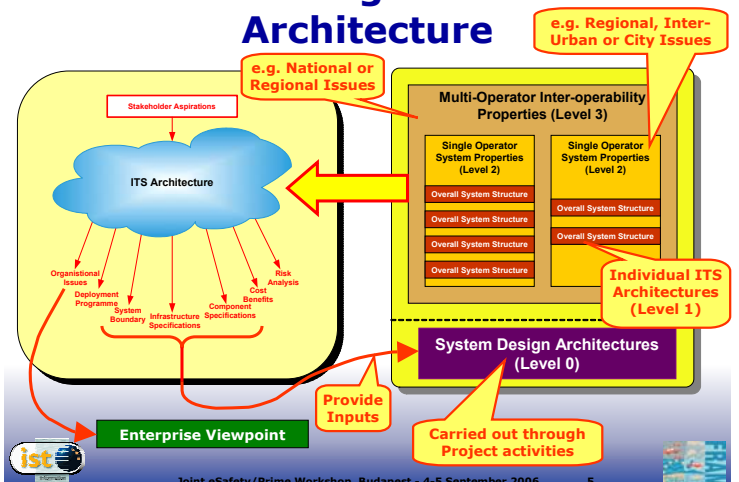
Communication between Parties

- Need a way of describing integrated ITS
  - To identify business opportunities
  - For planning deployments
  - To identify technical solutions
  - To highlight critical parts
  - Simple : that everyone can understand

Levels of Thinking

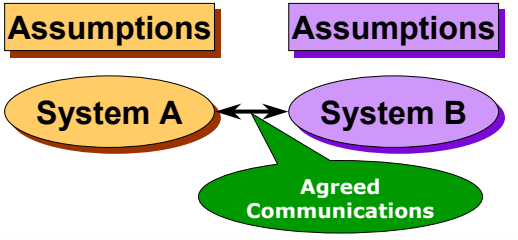


Uses of a High-Level ITS Architecture



Partial System Integration

- Many people think that you only need good communications to integrate systems

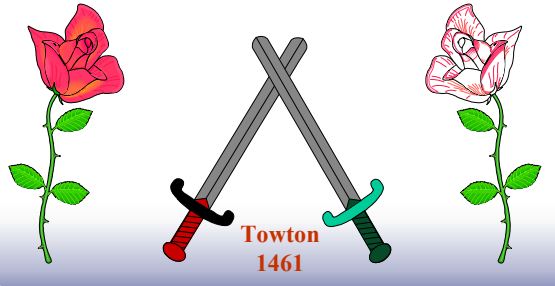


- Different assumptions prevent inter-operability

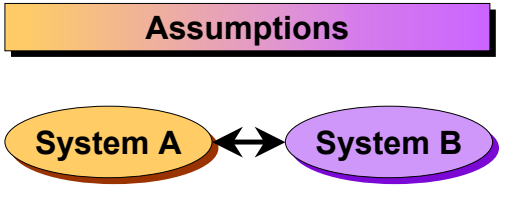
Agreed Communications BUT Different Assumptions/Beliefs

"Long live King Henry!"

"Long live King Edward!"



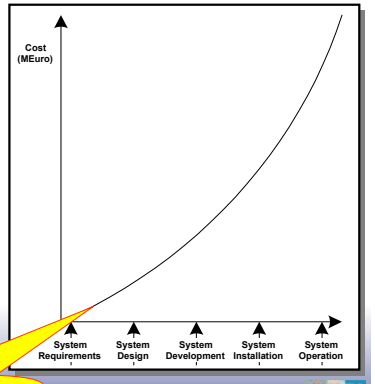
Consistent System Integration



- Agreed communications **AND** common assumptions produce inter-operability
- Achieved with a System Architecture

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
  - "70% of faults found after unit testing are requirements errors"

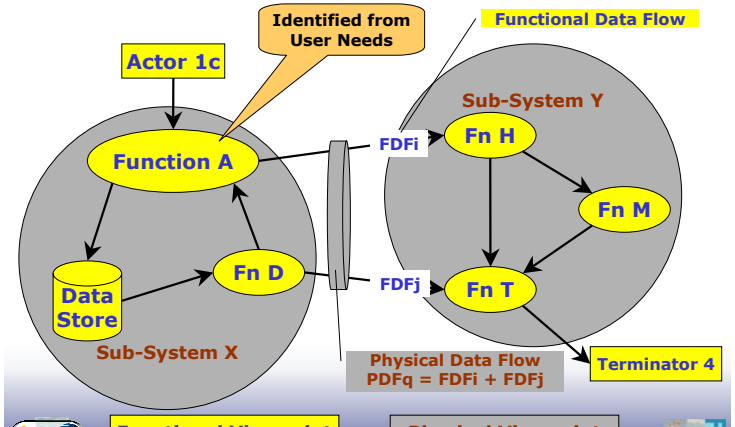


System Architectures used here

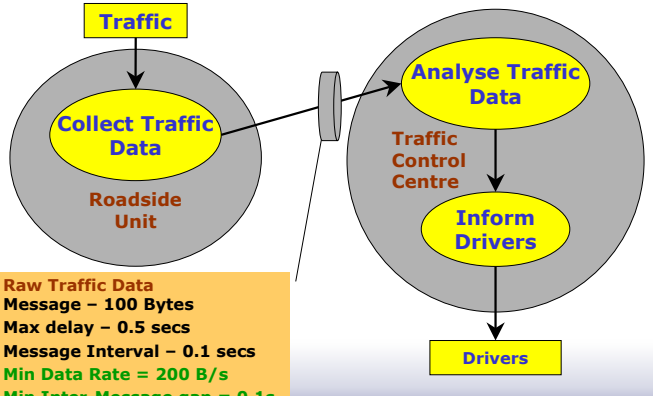
What is a High-Level ITS Architecture?

- Top-level framework
- Strategic plan for designs
  - "What is needed"
    - NOT
  - "How is it to be implemented"
    - Technology independent
- Top-level assumptions
  - Minimum necessary
    - NOT
  - Maximum Possible

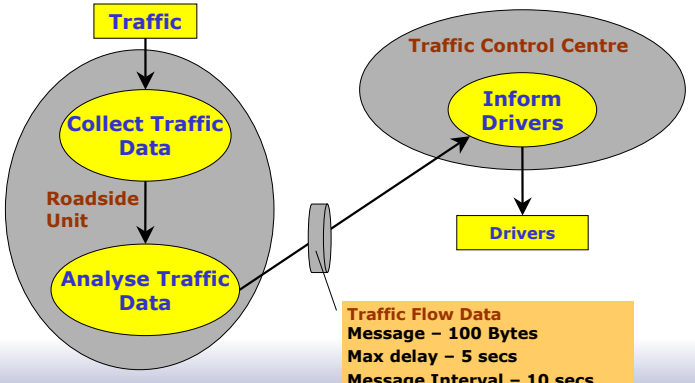
Simple Overview



Example Application 1a



Example Application 1b



Example Application 2

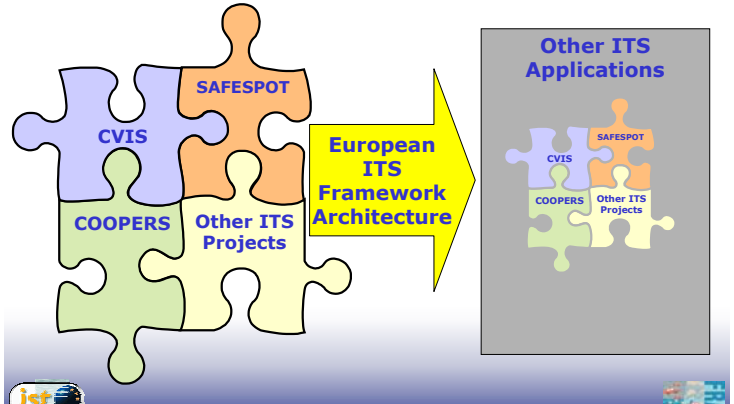
- **Intersection Safety:**
  - Projects will produce demonstrations
  - Provide "proof of concept"
- **The next step will be:**
  - Deployment throughout European Union
    - In time
    - In space
    - By many providers

Use of a High-Level Architecture

A High-Level Architecture provides

- **In time**
  - Technology will change
  - → Technology independence
- **In space**
  - Intersections have many configurations
  - → High-Level functional and physical structure
- **Multiple providers**
  - Many designs
  - → High-Level Specifications

Additional Benefit to Co-operative System IPs and STREPS



Why use the European ITS Framework Architecture?

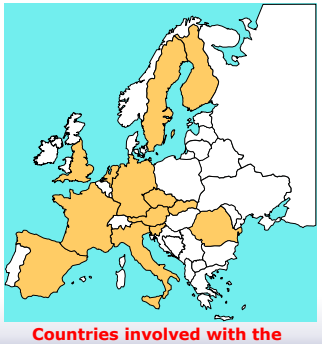
- Cost
  - Many similarities between nation states
    - Especially for cross-border services
  - Estimate that Framework Architecture has 80%
    - Work does not have to be repeated
- Compatibility and Communication
  - A common approach
  - A common planning "language"
- Knowledge Pool
  - Increasing body of experience available
    - e.g. from the FRAME Forum Team

FRAME –Activities being funded by the FRAME Forum

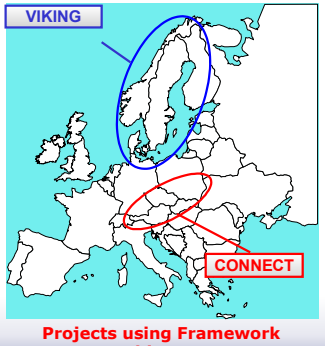
- Maintenance of
  - the European ITS Framework Architecture
    - Version 3 → Version 3.1
  - Maintenance of the Selection Tool
    - Version 1.1.5 → Version 1.1.6
- Review of current ITS Architectures
  - Europe and rest of the world
- Update FRAME Web Site
- Direct support for members
- Open User Forum 15? November 2006

www.frame-online.net

European ITS Framework Architecture in Europe



Countries involved with the Framework Architecture



Projects using Framework Architecture

Thank you for listening