FRAME-ONLINE website content

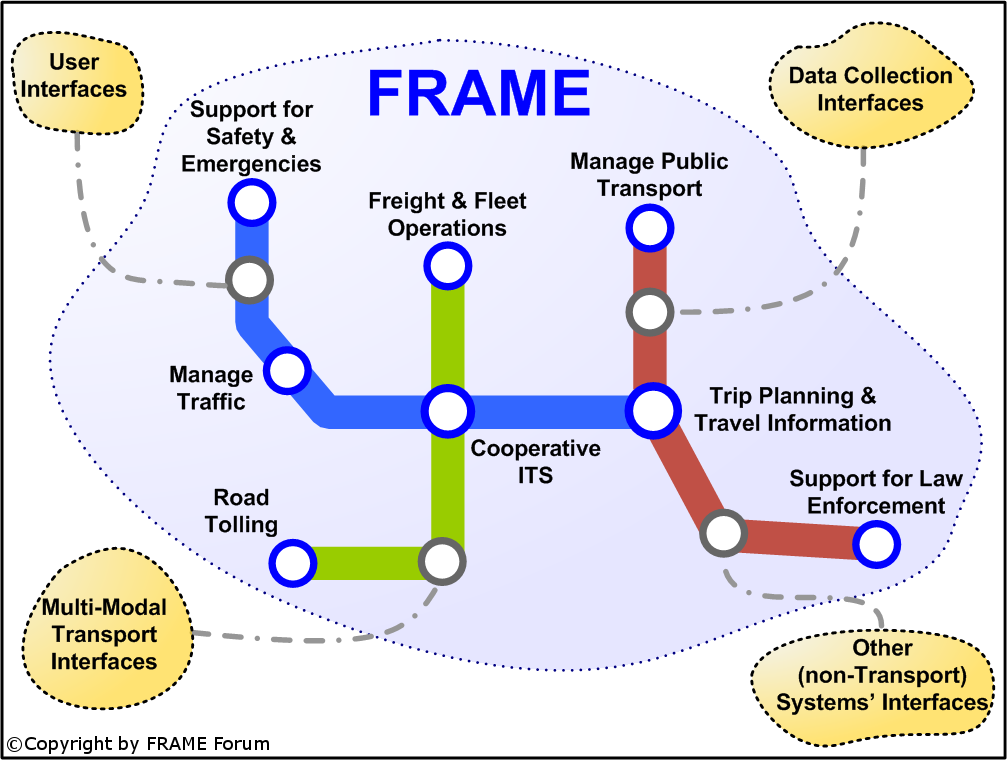
# HOME

Home

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Welcome to the Home Page of the European Intelligent Transport Systems (ITS) Framework Architecture, often now known as [**The FRAME Architecture**](https://webcf.waybackmachine.org/web/20180808191402/http:/frame-online.eu/frame-architecture). It was created to provide a minimum stable framework necessary for the deployment of integrated and inter-operable ITS within the European Union. See [Background](https://webcf.waybackmachine.org/web/20180808191402/http:/frame-online.eu/frame/background) for more information on its history.

The FRAME Architecture comprises the top level requirements and functionality, or the Use Cases, for almost all the ITS applications and services that have been considered for implementation somewhere in the European Union. It is at a “level” such that it can be used as a reference by all ITS architects, and is intended to be the foundation for building the other types of architecture that will be necessary. It will enable them to guarantee compliance at the interfaces of other systems so that seamless services can be provided to cross-border travellers, and an open European market of compatible components can be established.

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**FRAME**– the **FR**amework **A**rchitecture **M**ade for **E**urope

The FRAME Architecture is not intended to be used in its entirety, instead users select the applications and services that they want for their Nation, Region, City, etc. and create a sub-set that conforms to their requirements. Using the FRAME Architecture to do this has two big advantages:

* Most of the work has already been done, and there are FREE Tools available from this website to help you do the rest.
* If adjacent authorities both have ITS Architectures based on FRAME then it is easy to identify commonalities so that common services can be integrated to provide inter-operability.

Note: The FRAME Architecture does ***NOT*** provide detailed designs for equipment. It only describes ***what*** is required and ***not how*** to make it. It has already been used by a number of [Nations, Regions, Cities and Projects](https://webcf.waybackmachine.org/web/20180808191402/http:/frame-online.eu/frame/detailed-information/who-is-using-the-frame-architecture).

**What kind of information do you want to find out about the FRAME Architecture?**

* **Non-technical** – Please see [What is an ITS Architecture](https://webcf.waybackmachine.org/web/20180808191402/http:/frame-online.eu/frame/what-is-an-its-architecture) or [Why do you need an ITS Architecture](https://webcf.waybackmachine.org/web/20180808191402/http:/frame-online.eu/frame/why-you-need-an-its-architecture)
* [**The FRAME Architecture and the ITS Action Plan**](https://webcf.waybackmachine.org/web/20180808191402/http:/frame-online.eu/frame/detailed-information/relationship-with-the-its-action-plan-and-its-directive)
* **The Business and Technical Cases for, and examples of, the use of the FRAME Architecture**can be found [here](https://webcf.waybackmachine.org/web/20180808191402/http:/frame-online.eu/wp-content/uploads/2014/10/business-and-technical-cases.zip)
* **Technical** – What kind of technical information are you looking for?
  + **The FRAME Architecture itself**
    - This is contained within two complementary tools, [The Browsing Tool](https://webcf.waybackmachine.org/web/20180808191402/http:/frame-online.eu/frame/the-browsing-tool) and [The Selection Tool](https://webcf.waybackmachine.org/web/20180808191402/http:/frame-online.eu/frame/the-selection-tool)
    - An overview of the scope of the Architecture can be found [here](https://webcf.waybackmachine.org/web/20180808191402/http:/frame-online.eu/wp-content/uploads/2014/10/FRAME-User-Needs-Structure.pdf) (350kB pdf file)
    - Details of the scope of the FRAME Architecture can be found [here](https://webcf.waybackmachine.org/web/20180808191402/http:/frame-online.eu/wp-content/uploads/2014/10/FRAME-User-Needs-V4.1-01.pdf) (700kB pdf file)
  + **Articles on topics related to the FRAME Architecture**– Please see [Detailed information](https://webcf.waybackmachine.org/web/20180808191402/http:/frame-online.eu/frame/detailed-information)
  + **An answer to a specific question**– Please see [FAQs](https://webcf.waybackmachine.org/web/20180808191402/http:/frame-online.eu/frame/faqs)
  + **In depth information about the FRAME Architecture**– Please look in the [Library](https://webcf.waybackmachine.org/web/20180808191402/http:/frame-online.eu/library)
* [**Seminars and/or Training**](https://webcf.waybackmachine.org/web/20180808191402/http:/frame-online.eu/frame-forum/seminars-workshops)

# FIRST VIEW

[Home](https://webcf.waybackmachine.org/web/20180804120618/http:/frame-online.eu/)  FIRST VIEW

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The topics in this section of the website are oriented towards those who have a high-level and non-technical interest in the use of ITS Architectures, e.g. senior managers and politicians.

* [What is an ITS Architecture](https://webcf.waybackmachine.org/web/20180804120618/http:/frame-online.eu/introduction/what-is-an-its-architecture)
* [Why do you need an ITS Architecture](https://webcf.waybackmachine.org/web/20180804120618/http:/frame-online.eu/introduction/why-you-need-an-its-architecture)
* [What else you should know](https://webcf.waybackmachine.org/web/20180804120618/http:/frame-online.eu/introduction/what-else-you-should-know)
* [FRAME Architecture – Background](https://webcf.waybackmachine.org/web/20180804120618/http:/frame-online.eu/introduction/background)

## What is an ITS Architecture

[Home](https://webcf.waybackmachine.org/web/20180829133900/http:/frame-online.eu/)  [FIRST VIEW](https://webcf.waybackmachine.org/web/20180829133900/http:/frame-online.eu/first-view)  What is an ITS Architecture

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**Informal Definition**

An Intelligent Transport System (ITS) Architecture is a set of high level views that enable plans to be made for integrating ITS applications and services. It normally covers technical aspects, plus the related organisational, legal and business issues.

ITS Architectures can be created at national, regional or city level, or relate to specific sectors or services. They help to ensure that the resulting ITS deployment:

* can be planned in a logical manner;
* integrates successfully with other systems;
* meets the desired performance levels;
* has the desired behaviour;
* is easy to manage;
* is easy to maintain;
* is easy to extend;
* satisfies the expectations of the users.

**Formal Definition**

An ITS architecture is the conceptual design that defines the structure and/or behavior of an integrated Intelligent Transport System (ITS).

An architecture description is a formal description of a system, organized in a way that supports reasoning about the structural properties of the system. It defines the system components or building blocks and provides a plan from which products can be procured[,](https://webcf.waybackmachine.org/web/20180829133900/http:/itslabs.pl/) and systems developed[,](https://webcf.waybackmachine.org/web/20180829133900/http:/itslaboratories.com/) that will work together to implement the overall system. This may enable one to manage investment in a way that meets business needs.

**Technical Definition**

Thus an ITS Architecture is:

* a top-level framework;
* a strategic plan for designs;
  + non-deterministic;
    - it states “What is needed” and not “How it is to be implemented”;
    - it is technology independent;
      * the life-time of an ITS Architecture is normally longer than any particular technology;
* a set of top-level assumptions;
  + the minimun necessary ***not*** the maximum possible.

## Why you need an ITS Architecture

[Home](https://webcf.waybackmachine.org/web/20180829195606/http:/frame-online.eu/)  [FIRST VIEW](https://webcf.waybackmachine.org/web/20180829195606/http:/frame-online.eu/first-view)  Why you need an ITS Architecture

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Like other highly complex systems, integrated ITS applications need a strategic framework as a basis for choices concerning their design and deployment, as well as for investment decisions. Such a framework is generally called a System Architecture.

An Intelligent Transport System Architecture will need to cover technical aspects, plus the related organisational, legal and business issues.

ITS Architectures can be created at national, regional or city level, or relate to specific sectors or services. They help to ensure that the resulting ITS deployment:

* can be planned in a logical manner;
* integrates successfully with other systems;
* meets the desired performance levels;
* has the desired behaviour;
* is easy to manage;
* is easy to maintain;
* is easy to extend;
* satisfies the expectations of the users.

The ability to integrate systems greatly increases their potential. By complying with the European ITS Framework Architecture, not only will applications work together, but they can be made inter-operable at a European level, a feature of growing importance.

Inter-operability encompasses the technical[,](https://webcf.waybackmachine.org/web/20180829195606/http:/itslabs.pl/) operational and organisational aspects[,](https://webcf.waybackmachine.org/web/20180829195606/http:/itslaboratories.com/) and implies the harmonious and complementary functioning of the overall system.

**The benefits of integrated ITS – an example:**

There has been a serious accident on the city ring road. It is just after 8am and there is already congestion involving commuters coming into the city. The traffic control centre needs to be able to:

* identify the nature ot the accident;
* ensure that the appropriate emergency services are alerted;
* give emergency vehicles priority at traffic signals;
* keep other traffic away from the accident;
* inform public transport operations about the incident;
* arrange diversions and advise drivers on all roads and motorways;
* inform pre-trip travellers, so they can adjust their plans.

To co-ordinate these tasks efficiently, there must be *a rapid and reliable flow of information* between all the systems involved. This flow can be speeded up significantly if the systems are integrated, i.e. if data is exchanged automatically between motorway and city control centres[,](https://webcf.waybackmachine.org/web/20180829195606/http:/itslabs.pl/architektura-frame/) if the information is available to public transport operators and users as well as to private car drivers[,](https://webcf.waybackmachine.org/web/20180829195606/http:/itslaboratories.com/frame-architecture/) and can be sent to message panels, on-board vehisle systems, mobile phones, web-based transport informations services, etc.

**In this example, system integration can make it possible not only to minimise travel disruption, but also to save lives.**

## What else you should know

[Home](https://webcf.waybackmachine.org/web/20180829092550/http:/frame-online.eu/)  [FIRST VIEW](https://webcf.waybackmachine.org/web/20180829092550/http:/frame-online.eu/first-view)  What else you should know

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**One page summary**

[Why you need an ITS Architecture](https://webcf.waybackmachine.org/web/20180829092550/http:/frame-online.eu/wp-content/uploads/2014/10/WhyyouneedanITSarchitecture.pdf) is a very short summary of the key reasons for creating and using an ITS Architecture.

**A short guide to ITS Architecture**

[Planning a Modern Transport System](https://webcf.waybackmachine.org/web/20180829092550/http:/frame-online.eu/wp-content/uploads/2014/10/PlanningGuide.pdf) provides an explanation of why you need an ITS Architecture and how to create it. It also provides an overview of ITS for those high-level decision makers who are not familiar with the topic.

**Other languages**

A number of people have liked the short guide so much that they have translated it into their own native language. At the moment the following translations are available.

[Danish version](https://webcf.waybackmachine.org/web/20180829092550/http:/frame-online.eu/wp-content/uploads/2014/10/PlanningGuideDK.pdf)

[Finnish version](https://webcf.waybackmachine.org/web/20180829092550/http:/frame-online.eu/wp-content/uploads/2014/10/PlanningGuideFI.pdf)

[German version](https://webcf.waybackmachine.org/web/20180829092550/http:/frame-online.eu/wp-content/uploads/2014/10/PlanningGuideDE.pdf)

[Polish version](https://webcf.waybackmachine.org/web/20180829092550/http:/frame-online.eu/wp-content/uploads/2014/10/Dummies-Guide-Issue-2aPL.pdf)

[Romanian version](https://webcf.waybackmachine.org/web/20180829092550/http:/frame-online.eu/wp-content/uploads/2014/10/PlanningGuideRO.pdf)

[Serbian version](https://webcf.waybackmachine.org/web/20180829092550/http:/frame-online.eu/wp-content/uploads/2014/10/PlanningGuideSR.pdf)

[Spanish version](https://webcf.waybackmachine.org/web/20180829092550/http:/frame-online.eu/wp-content/uploads/2014/10/PLANIFICACI%C3%93N-DEv4.pdf)

[Swedish version](https://webcf.waybackmachine.org/web/20180829092550/http:/frame-online.eu/wp-content/uploads/2014/10/PlanningGuideSE.pdf)

If you want to translate the short guide into your own native language please contact [info(at)frame-online.net](https://webcf.waybackmachine.org/web/20180829092550/mailto:info@frame-online.net)

**FRAME and the ITS Action Plan – Booklet**

[The FRAME Architecture and the ITS Action Plan](https://webcf.waybackmachine.org/web/20180829092550/http:/frame-online.eu/wp-content/uploads/2014/10/FRAME-ITS-Action-Plan.pdf) is a booklet which explains how the FRAME Architecture can be used to support the ITS Directive (2010) and the ITS Action Plan (2008).

**Other languages**

The following translations are available.

[Czech version](https://webcf.waybackmachine.org/web/20180829092550/http:/frame-online.eu/wp-content/uploads/2014/10/FRAME-and-the-ITS-Action-Plan-in-CZ.pdf)

**Cooperative Systems – Booklet**

[Cooperative Systems: Deployment and Organisational Issues](https://webcf.waybackmachine.org/web/20180829092550/http:/frame-online.eu/wp-content/uploads/2014/10/Coop-Systems-Depl-Org.pdf) (2011) is a booklet which discusses the non-technical issues related to the deployment of integrated cooperative systems, and the role of the FRAME Architecture.

**Other languages**

The following translations are available.

[Czech version](https://webcf.waybackmachine.org/web/20180829092550/http:/frame-online.eu/wp-content/uploads/2014/10/Coop-Systems-Depl-and-Org-in-CZ.pdf)

## FRAME Architecture – Background

[Home](https://webcf.waybackmachine.org/web/20180829082642/http:/frame-online.eu/)  [FIRST VIEW](https://webcf.waybackmachine.org/web/20180829082642/http:/frame-online.eu/first-view)  FRAME Architecture – Background

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**The FRAME Architecture (officially called the European ITS Framework Architecture)** was developed as a result of recommendations from the High Level Group on transport telematics, which were supported by a resolution of the Council of Ministers. It was created by the EC funded project KAREN (1998-2000) and first published in October 2000. The underlying aim of this initiative was to promote the deployment of (mainly road-based) ITS in Europe by producing a framework which would provide a systematic basis for planning ITS implementations, facilitate their integration when multiple systems were to be deployed, and help to ensure inter-operability, including across European borders.

Because the FRAME Architecture is intended for use within the European Union it conforms to the precepts of subsidiarity, and thus does not mandate any physical or organisational structure on a Member State. It comprises a set of User Needs and a Functional View only (the User Needs providing a form of requirements for the functionalities contained within the Functional View). Most users will only use a sub-set of the FRAME Architecture and a methodology, now supported by computer-based tools, was developed to do this effectively by the EC funded FPV project FRAME-S (2001-04).

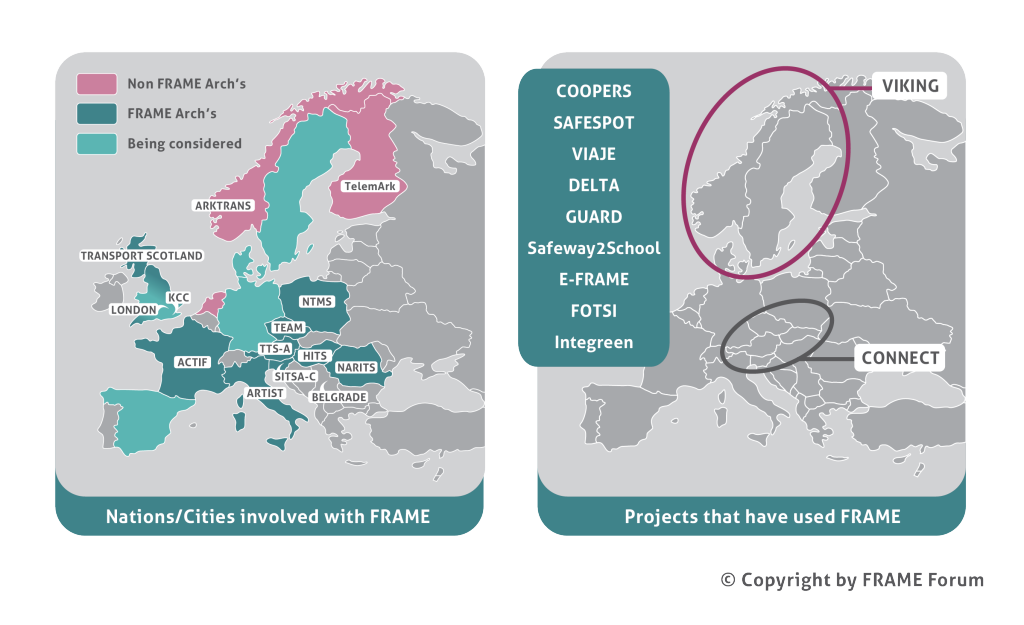
After its creation, and in order to enable others to use the FRAME Architecture, it was recognised that a centre of knowledge would be required to which potential users could put questions, from which they could receive training in its use, and which would keep the Architecture up-to-date with the evolution of ITS. This was provided very successfully from 2001 until 2004 by the EC funded projects (FRAME-NET and FRAME-S). The FRAME-NET project provided User Forums and collected and collated the experiences of FRAME Architecture users. The FRAME-S project maintained the FRAME Architecture[,](https://webcf.waybackmachine.org/web/20180829082642/http:/itslabs.pl/) produced two tools to assist with its use[,](https://webcf.waybackmachine.org/web/20180829082642/http:/itslaboratories.com/) and provided many nations and projects with advice. As a result, they were then able to make[,](https://webcf.waybackmachine.org/web/20180829082642/http:/itslabs.pl/architektura-frame/) or are making, plans to employ the Architecture. Between 2005 and 2008, the start of the E-FRAME project[,](https://webcf.waybackmachine.org/web/20180829082642/http:/itslaboratories.com/frame-architecture/) some limited support for existing and potential users of the FRAME Architecture was provided through the FRAME Forum.

At the time of the KAREN project, the FRAME Architecture had already been adopted as the basis for the French national ITS Architecture (ACTIF), and was subsequently adopted as the basis for the Italian national ITS Architecture (ARTIST). Other nations that have used FRAME since then include Austria (TTS-A), the Czech Republic (TEAM), Hungary (HITS) and Romania (NARITS). In addition a number of specific ITS Architectures have been created in the UK including one for Transport for Scotland and another for the County of Kent. More recently, part of Transport for London has been using the FRAME Architecture to plan its future ITS deployments. In a few cases, e.g. VIKING and the COOPERS IP, it has also been used by R&D projects.

During the FRAME projects, and from experience with other ITS architecture activities in Europe and elsewhere, a number of important lessons have been learned, the most important one being:

* **The need to keep an ITS Architecture up to date:** If it is to remain useful, an ITS Architecture must be kept constantly maintained. The aim of the original KAREN project was to define ITS User Needs until at least 2010, but some parts of ITS have evolved more rapidly and radically than had been foreseen.

Although the User Needs were updated during the early part of the FRAME projects (2002/3), the FRAME Architecture contains only a few references to more recent ITS developments, such as those associated with the Intelligent Vehicle or eSafety initiatives. One particular and highly significant area – in which the European Commission has invested very heavily since 2006 – is called “Cooperative Systems” (as they involve vehicle-vehicle and/or vehicle-to-infrastructure communication), and it was not covered by the original FRAME Architecture. Filling this gap was one of the principal objectives of the E-FRAME project (2008-11).

**Use of FRAME within European Union:**

# FRAME ARCHITECTURE

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**The FRAME Architecture** (officially called the European ITS Framework Architecture) was developed as a result of recommendations from the High Level Group on transport telematics, which were supported by a resolution of the Council of Ministers. It was created and first published by the EC funded project KAREN in October 2000. The underlying aim of this initiative was to promote the deployment of (mainly road-based) ITS in Europe by producing… [read more](https://webcf.waybackmachine.org/web/20180829125536/http:/frame-online.eu/frame/what-is-the-frame-architecture)

**What kind of information do you want to find out about the FRAME Architecture?**

* [**Seminars and/or Training**](https://webcf.waybackmachine.org/web/20180829125536/http:/frame-online.eu/frame-forum/seminars-workshops)
* **Non-technical** – Please see [What is an ITS Architecture](https://webcf.waybackmachine.org/web/20180829125536/http:/frame-online.eu/frame/what-is-an-its-architecture) or [Why do you need an ITS Architecture](https://webcf.waybackmachine.org/web/20180829125536/http:/frame-online.eu/frame/why-you-need-an-its-architecture)
* [**The FRAME Architecture and the ITS Action Plan**](https://webcf.waybackmachine.org/web/20180829125536/http:/frame-online.eu/frame/detailed-information/relationship-with-the-its-action-plan-and-its-directive)
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  + **An answer to a specific question** – Please see [FAQs](https://webcf.waybackmachine.org/web/20180829125536/http:/frame-online.eu/frame/faqs)
  + **In depth Information about the FRAME Architecture** – Please look in the [Library](https://webcf.waybackmachine.org/web/20180829125536/http:/frame-online.eu/library)

## What is the FRAME Architecture

[Home](https://webcf.waybackmachine.org/web/20180829165617/http:/frame-online.eu/)  [FRAME ARCHITECTURE](https://webcf.waybackmachine.org/web/20180829165617/http:/frame-online.eu/frame-architecture)  What is the FRAME Architecture

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**The FRAME Architecture** (originally called the European ITS Framework Architecture) was developed as a result of recommendations from the High Level Group on transport telematics, which were supported by a resolution of the Council of Ministers. It was created and first published by the EC funded project KAREN in October 2000. The underlying aim of this initiative was to promote the deployment of (mainly road-based) ITS in Europe by producing a framework which would provide a systematic basis for planning ITS implementations, facilitate their integration when multiple systems were to be deployed, and help to ensure inter-operability, including across European borders.

A distinctive feature of the FRAME Architecture is that it is designed to have sub-sets created from it, and is thus unlikely to be used in its entirety. Indeed, on occasions, it contains more than one way of performing a service and the user can select the most appropriate set of functionality to deliver it in that environment. Thus the FRAME Architecture is not so much a model of integrated ITS, as a framework from which specific models of integrated ITS can be created in a systematic and common manner.

The FRAME Architecture now covers the following areas of ITS:

* Electronic Fee Collection
* Emergency Notification and Response – Roadside and In-Vehicle Notification
* Traffic Management – Urban, Inter-Urban, Parking, Tunnels and Bridges, Maintenance and Simulation, together with the Management of Incidents, Road Vehicle Based Pollution and the Demand for Road Use
* Public Transport Management – Schedules, Fares, On-Demand Services, Fleet and Driver Management
* In-Vehicle Systems – includes some Cooperative Systems
* Traveller Assistance – Pre-Journey and On-Trip Planning, Travel Information
* Support for Law Enforcement
* Freight and Fleet Management
* Provide Support for Cooperative Systems – specific services not included elsewhere, e.g. bus lane use, freight vehicle parking
* Multi-modal interfaces – links to other modes when required, e.g. travel information, multi-modal crossing management

Because the FRAME Architecture is intended for use within the European Union it conforms to the precepts of subsidiarity, and thus does not mandate any physical or organisational structure on a Member State. It comprises only a set of User Needs which describe what ITS can provide, and a Functional View showing how it can be done. The Methodology, which is supported by computer-based tools, assists the creation of logically consistent sub-sets of the FRAME Architecture Functional View, and the creation of subsequent Physical Views.

## Detailed information

[Home](https://webcf.waybackmachine.org/web/20180829131058/http:/frame-online.eu/)  [FRAME ARCHITECTURE](https://webcf.waybackmachine.org/web/20180829131058/http:/frame-online.eu/frame-architecture)  Detailed information

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**The following sections contain information about the FRAME Architecture. Please click on a section heading for the full text.**

[**Read Me First**](https://webcf.waybackmachine.org/web/20180829131058/http:/frame-online.eu/frame/detailed-information/read-me-first)  
What kind of information do you want to find out about the FRAME Architecture?

[**The FRAME Architecture Version 4.1**](https://webcf.waybackmachine.org/web/20180829131058/http:/frame-online.eu/frame-architecture/detailed-information/the-frame-architecture-version-4-1)  
The FRAME Architecture now contains the Cooperative Systems services and applications developed by the COOPERS, CVIS and SAFESPOT FP6 Integrated Projects. This extension now brings the total number of principal Functional Areas supported by the FRAME Architecture to nine, as shown below. A document containing a brief summary of the contents of each Functional Areva can be found in…

[**What is the FRAME Architecture?**](https://webcf.waybackmachine.org/web/20180829131058/http:/frame-online.eu/frame/detailed-information/what-is-the-frame-architecture)  
The FRAME Architecture (originally called the European ITS Framework Architecture) was developed as a result of recommendations from the High Level Group on transport telematics, which were supported by a resolution of the Council of Ministers. It was created and first published by the EC funded project KAREN in October 2000. The underlying aim of this initiative was to promote the deployment of (mainly road-based) ITS in Europe by producing a…

[**Planning Integrated ITS Deployments**](https://webcf.waybackmachine.org/web/20180829131058/http:/frame-online.eu/frame/detailed-information/planning-integrated-its-deployments)  
The FRAME Architecture is intended to be used to help the planning and deployment of integrated ITS for a region over a period of time (see diagram below). An ITS Architecture is created for that region to show what is required. Often some of the required ITS applications and services exist already, and in this situation the ITS Architecture will show what is needed and how it should be integrated to the existing equipment…

[**Creating an ITS Architecture using FRAME**](https://webcf.waybackmachine.org/web/20180829131058/http:/frame-online.eu/frame/detailed-information/creating-an-its-architecture-using-frame)  
The methodology for creating an ITS Architecture from the FRAME Architecture is illustrated in the figure below. The use of particular technologies or supplier products is not included in the FRAME Architecture. This is important for two reasons. Firstly the ITS Architectures created using the methodology will not become obsolete through advances in technology, or product development, and secondly…

[**Relationship with the ITS Action Plan and ITS Directive**](https://webcf.waybackmachine.org/web/20180829131058/http:/frame-online.eu/frame/detailed-information/relationship-with-the-its-action-plan-and-its-directive)  
The ITS Action Plan makes specific reference to:  
“Support for the wider deployment of an updated multimodal European ITS Framework architecture for intelligent transport systems and definition of an ITS framework architecture for urban transport mobility, including an integrated approach for travel planning, transport demand, traffic management, emergency management, road pricing, and the use of parking and public transport facilities”…

[**Relationship with other Cooperative Systems Activities**](https://webcf.waybackmachine.org/web/20180829131058/http:/frame-online.eu/frame/detailed-information/relationship-with-other-cooperative-systems-activities)  
During FP6 a number of projects, in particular [SAFESPOT](https://webcf.waybackmachine.org/web/20180829131058/http:/www.safespot-eu.org/), CVIS and [COOPERS](https://webcf.waybackmachine.org/web/20180829131058/http:/www.coopers-ip.eu/), and co-funded by the EC, developed a number of “proof of concept” Cooperative Systems. These have been analysed by the E-FRAME project, and a corresponding set of about 230 FRAME User Needs have been written, and for which the corresponding…

[**Why is FRAME a Framework Architecture?**](https://webcf.waybackmachine.org/web/20180829131058/http:/frame-online.eu/frame/detailed-information/why-is-frame-a-framework-architecture)  
A principal objective for the FRAME Architecture is to promote the deployment of ITS in Europe by producing a framework which would provide a systematic basis for planning ITS implementations, facilitate their integration when multiple systems were to be deployed, and help to ensure inter-operability, including across European borders…

[**The FRAME model**](https://webcf.waybackmachine.org/web/20180829131058/http:/frame-online.eu/frame/detailed-information/the-frame-model)  
The FRAME model used for the Functional View is based on hierarchical [Data Flow Diagrams](https://webcf.waybackmachine.org/web/20180829131058/http:/en.wikipedia.org/wiki/Data_flow_diagram). At the highest level is the Context Diagram (see figure below) which shows all the functionality supported by the FRAME Architecture inside a box labelled “System” surrounded by a set of “Terminators”, which are outside the boundary of the system. Each Terminator represents…

[**The FRAME Architecture Views**](https://webcf.waybackmachine.org/web/20180829131058/http:/frame-online.eu/frame/detailed-information/the-frame-architecture-views)  
Integrated ITS services are complex, and it is not possible to describe them completely in a single model or diagram. Instead we use a number of different models, each one concentrating on a different aspect of the integrated ITS services. As an example consider how people might describe a car. Some are interested in their colour and style, others are interested in the interior design…

[**Where are the FRAME Physical and Organisational Views?**](https://webcf.waybackmachine.org/web/20180829131058/http:/frame-online.eu/frame/detailed-information/where-are-the-frame-physical-and-organisational-views)  
An overarching condition on the creators of the FRAME Architecture from the European level is that nothing should be imposed on the Member States because of subsidiarity (“you will not tell me how to design my system!”). This has resulted in an approach in which a European ITS Framework Architecture has been developed, which does not impose choices on its users, but allows them to develop their own framework sub-sets from it, and then to…

[**ITS Architecture as part of Systems Engineering**](https://webcf.waybackmachine.org/web/20180829131058/http:/frame-online.eu/frame/detailed-information/its-architecture-as-part-of-systems-engineering)  
[Systems engineering](https://webcf.waybackmachine.org/web/20180829131058/http:/en.wikipedia.org/wiki/Systems_engineering) is an interdisciplinary field of engineering that focuses on how complex engineering projects should be designed and managed over the life cycle of the project. Whenever complex integrated systems are being designed it is normal for one of the first design products to be the System Architecture. Thus an ITS architecture is a System Architecture for integrated…

[**Who is using the FRAME Architecture?**](https://webcf.waybackmachine.org/web/20180829131058/http:/frame-online.eu/frame/detailed-information/who-is-using-the-frame-architecture)  
The FRAME Architecture was originally created so that it could be used by any Member State, Region, City or Project within the European Union. At present there is no “legislation” that says it must be used, and so it is currently only used by those who wish to use it (see below). The FRAME Architecture is European only insofar as its contents are targeted towards the way things are done within the EU. Any other part of the world…

[**What are the FRAME User Needs?**](https://webcf.waybackmachine.org/web/20180829131058/http:/frame-online.eu/frame/detailed-information/what-are-the-frame-user-needs)  
Example User Needs:  
*The system shall be able to provide alternative routes or mode-switch recommendations when it detects, or is informed, that problems have occurred on a mode.*  
*The system shall ensure that traveller information service providers are aware of the traffic management strategy, so that they can provide information that conforms to it.*

[**Why has UML not been used?**](https://webcf.waybackmachine.org/web/20180829131058/http:/frame-online.eu/frame/detailed-information/why-has-uml-not-been-used)  
UML, or the Universal Modelling Language, describes notations that should be used for many different types of model, including Data Flow Models which are used by FRAME. Thus UML has been used!

[**How can you use the Organisational View?**](https://webcf.waybackmachine.org/web/20180829131058/http:/frame-online.eu/frame/detailed-information/how-can-you-use-the-organisational-view)  
The Organisational View is usually a derivative of the Physical View. It is used to show the organisations that will own, and/or operate, and/or maintain the Sub-systems and Modules in the Physical View. This is very useful for highlighting the relationships between different organisations and any conflicts that may arise. It can also be used to identify any data that will have to be transferred from a sub-system owned by one organisation to…

[**How can you plan the Behaviour of an integrated ITS?**](https://webcf.waybackmachine.org/web/20180829131058/http:/frame-online.eu/frame/detailed-information/how-can-you-plan-the-behaviour-of-an-integrated-its)  
There are occasions when it is necessary to impose a particular form of behaviour, or a particular organisation structure, on integrated ITS. Examples include the need to localise safety functions so that they will continue to work when “higher” (non-safety) functions are absent; provide a command and control structure that conforms to certain legal, or constitutional, requirements…

[**How can you deal with Liabilty Issues?**](https://webcf.waybackmachine.org/web/20180829131058/http:/frame-online.eu/frame/detailed-information/how-can-you-deal-with-liabilty-issues)  
Integrated ITS may be provided by components owned by more than one organisation, and some hazards may be the result of interactions between those components. It will therefore be necessary to identify who is responsible for dealing with the consequences, both legal and technical. An ITS Architecture provides a model of the components, and their interconnections, and thus a basis for analysing these issues…

[**How can you undertake a Risk Analysis?**](https://webcf.waybackmachine.org/web/20180829131058/http:/frame-online.eu/frame-architecture/detailed-information/how-can-you-undertake-a-risk-analysis)  
A risk analysis assesses the hazards that may affect an ITS deployment. Those hazards with the most severe risks should be provided with a mitigation strategy, and each strategy should be assigned to an Owner who is responsible for its implementation…

[**How can you undertake a Cost/Beneift Analysis?**](https://webcf.waybackmachine.org/web/20180829131058/http:/frame-online.eu/frame-architecture/detailed-information/how-can-you-undertake-a-costbenefit-analysis)  
[Cost-benefit analysis](https://webcf.waybackmachine.org/web/20180829131058/http:/en.wikipedia.org/wiki/Cost%E2%80%93benefit_analysis) is a systematic process for calculating and comparing benefits and costs of a project. The costs of an ITS project can be divided between the Capital Costs, e.g. for the acquisition and deployment of equipment, and the Revenue Costs, e.g. for staff. The benefits often cannot be quantified in monetary terms, but may include reduced delays, improved…

## The Browsing Tool

[Home](https://webcf.waybackmachine.org/web/20180829195555/http:/frame-online.eu/)  [FRAME ARCHITECTURE](https://webcf.waybackmachine.org/web/20180829195555/http:/frame-online.eu/frame-architecture)  The Browsing Tool

*feel free to contact us:*  info(at)frame-online.net

If you have not already done so, please [Read Me First](https://webcf.waybackmachine.org/web/20180829195555/http:/frame-online.eu/frame/detailed-information/read-me-first) and [The FRAME Architecture V4.1](https://webcf.waybackmachine.org/web/20180829195555/http:/frame-online.eu/frame-architecture/detailed-information/the-frame-architecture-version-4-1).

The Browsing Tool enables the user to investigate the structure of the FRAME Architecture at every level of detail, and to obtain the description of each and every element within it.

The FRAME Architecture is a large product with many thousands of elements. In addition, the Data Flow Diagrams have had to be organised in an hierarchical manner so that they are understandable. In order to provide a unified front end to the architecture a FRAME Browsing Tool has been creates that permits all the elements of the FRAME Architecture, and their interrelationships, to be viewed interactively using a standard HTML viewer. Thus, for example, it is possible to follow the passage of data from its collection by a particular functionality, through fusion and processing, to its eventual use in providing a service for the end users.

**Installation**

[Download](https://webcf.waybackmachine.org/web/20180829195555/http:/frame-online.eu/wp-content/uploads/2014/10/Browsing-Tool-30082011.zip) 9MB (zip file)

The FRAME Browsing Tool has been designed to use ActiveX and therefore only runs in Internet Explorer (IE). The FRAME Browsing Tool can be launched by the following files:

* IE8: use “HomePage\_V8.html”
* IE9 (or later): use “HomePage\_V9+.html”

Please “allow blocked content” if requested.  Once again, other browsers do not provide full functionality for the FRAME Browsing Tool.

*If you have any problems downloading this file please contact* [info(at)frame-online.net](https://webcf.waybackmachine.org/web/20180829195555/mailto:info@frame-online.net)

**Using the Browsing Tool**

In addition to all the normal browsing features:

* Note that there are two sets of lists available from the top window:  
  – GENERAL : Acronym Definitions and General Definitions;  
  – QUERY : Data Flows, Data Store, DFDs, Functions, Functional Area, Terminator, User Needs
* The Functional View of the FRAME Architecture is hierarchical, and there are two principal ways of navigating the structure:  
  – Using the tree in the left hand window;  
  – When a high-level function in a Data Flow Diagram (DFD) is selected, the DFD for the next level down is displayed.
* All the elements (rectangles, cylinders and lines) in a DFD are active:  
  – If the cursor hovers over them for short time, the corresponding description appears for a few seconds;  
  – If they are selected the corresponding full description page is displayed.
* To print a DFD, right click on the diagram and “print picture”.

## The Selection Tool

[Home](https://webcf.waybackmachine.org/web/20180829131033/http:/frame-online.eu/)  [FRAME ARCHITECTURE](https://webcf.waybackmachine.org/web/20180829131033/http:/frame-online.eu/frame-architecture)  The Selection Tool

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If you have not already done so, please [Read Me First](https://webcf.waybackmachine.org/web/20180829131033/http:/frame-online.eu/frame/detailed-information/read-me-first) and [The FRAME Architecture V4.1](https://webcf.waybackmachine.org/web/20180829131033/http:/frame-online.eu/frame-architecture/detailed-information/the-frame-architecture-version-4-1).

The Selection Tool provides support for a user to select a consistent sub-set of the FRAME Architecture (Functional View), and then to create one or more Physical Views of this sub-set.

**Installation**

The Selection Tool comprises TWO parts

Part 1 – The Tool itself

FRAME\_Selection\_Tool-setup – vPQR.zip – extract the exe file, execute it and follow the normal Windows Installer instructions.

[Download](https://webcf.waybackmachine.org/web/20180829131033/http:/frame-online.eu/wp-content/uploads/2016/11/FRAME-Selection-Tool.zip) 2.9MB (zip file)

Part 2 – The Database

FRAME\_DB\_vXYZ\_ST….mdb where XYZ is the version number of the FRAME Architecture and this should be same as for the Browsing Tool.

[Download](https://webcf.waybackmachine.org/web/20180829131033/http:/frame-online.eu/wp-content/uploads/2016/11/FRAME-Selection-Tool-database.zip) 1.2MB (zip file)

NOTE – any execution of the Selection Tool will make changes to this database and so you are recommended to keep an unused “read only” copy in case you need to start again.

System Requirements

The Selection Tool should run on any PC with **Windows XP, Windows Vista**, **Windows 7, Windows 8 or Windows 10**.

If MS Access is not installed then you will need the “Access Database Engine” from [here](https://webcf.waybackmachine.org/web/20180829131033/http:/www.microsoft.com/en-us/download/details.aspx?id=13255).

**Using the Selection Tool**

User Manual

A new User Manual for this version of the Selection Tool is available, which provides brief explanations on how to use all the features.

[Download](https://webcf.waybackmachine.org/web/20180829131033/http:/frame-online.eu/wp-content/uploads/2014/10/Selection-Tool-User-Manual-02.pdf) 1MB (pdf file)

Reference Manual

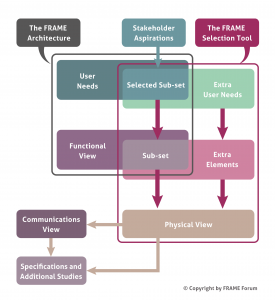
A more detailed Reference Manual on how to use the Selection Tool is also available. Whilst this was written for the previous version, most of its contents are still valid – but it is no longer complete. In particular, it contains a description on how to add extra elements to the FRAME Architecture database that are required for a specific deployment – this is not in the User Manual.

[Download](https://webcf.waybackmachine.org/web/20180829131033/http:/frame-online.eu/wp-content/uploads/2014/10/selection-tool-reference-manual.pdf) 6MB (pdf file)

Overview

The following is an overview of how the Selection Tool is intended to be used.

When creating a bespoke ITS Architecture from the FRAME Architecture the architecture team needs to select a sub-set of the FRAME Architecture and, possibly, add some extra functionality that us not currently present. This process is supported by the FRAME Selection Tool which contains a database with all the elements of the FRAME Architecture, and to which more can be added. This is illustrated in the following figure.

[](https://webcf.waybackmachine.org/web/20180829131033/http:/frame-online.eu/wp-content/uploads/2018/06/FRAME-Architecture-Diagram.png)

*Use of the FRAME Selection Tool*

The Tool does not perform any selections automatically, but it does support the architecture team in its use of the methodology in the following ways.

* The team selects those User Needs that reflect the Stakeholder Aspirations.
* The tool will then guide the architecture team to those parts of the Functional View that help to satisfy those User Needs.
* The FRAME Architecture does not claim to satisfy every possible ITS User Need, and in some circumstances it may be necessary to add extra User Needs and Functional View elements to the Selection Tool data base.
* Since the mapping from User Needs to Functions is not an exact science, the tool will probably report some logical inconsistencies after the first pass (e.g. a data flow with only the function at one end selected). The team can then select further elements, or deselect some of those already selected, until there are no logical consistency errors, and they are satisfied that their selection fully represents the Functional View needed to satisfy the Stakeholder Aspirations.
* Once a Functional View is considered acceptable, it can be used as the basis for one or more Physical Views. The architecture team does this by allocating functions and data stores to individual sub-systems, and to modules within them if required. Modules are used to partition the functionality in sub-systems so that, for example, the functionality for traffic management can be separated from that for parking management.
* Once a Physical View has been completed one of the reports available from the Selection Tool can be used to provide the starting point for an analysis of the Physical Data Flows. This leads to the creation of the Communications View, which shows the characteristics of the links required between each of the sub-systems and modules, plus those with the Terminators.
* An Organisational View can also be created from a Functional View.
* The Tool permits more than one Physical and/or Organisational View to be created from a Functional View so that the advantages and disadvantages of different component configurations, physical locations and deployment scenarios can be explored.

Thus, although the Selection Tool does not have any intelligence to make decisions on behalf of the architecture team, it does perform much of the detailed work of recording all the decisions taken by them. Experience has shown that it is not normally necessary to produce a Data Flow Diagram of the Function View since all the information required to produce a Physical View is held within the data base.

Glossary & Acronyms

[Home](https://webcf.waybackmachine.org/web/20180829195628/http:/frame-online.eu/)  [FRAME ARCHITECTURE](https://webcf.waybackmachine.org/web/20180829195628/http:/frame-online.eu/frame-architecture)  Glossary & Acronyms

*feel free to contact us:*  info(at)frame-online.net

* **ABS** – Anti-lock Braking System
* **ACC** – Autonomous Cruise Control
* **API** – Application Programming Interface
* **ASN.1** – Abstract Syntax Notation
* **CAN** – Controller Area Network
* **CONVERGE** – Transport Telematics Support and Consensus – (EC funded project 1996-98)
* **COOPERS** – Cooperative Systems for intelligent road safety (EC co-funded project 2006-2010)
* **CVIS** – Cooperative Vehicle-Infrastructure Systems (EC co-funded project 2006-2010)
* **DFD** – Data-Flow Diagram
* **DSRC** – Dedicated Short Range Communications
* **EC** – European Commission
* **E-FRAME** – Extend FRAMEwork Architecture for cooperative systems (EC funded project 2008-11)
* **EITSFA** – European ITS Framework Architecture
* **ESC** – Electronic Stability Control
* **ESP** – Electronic Stability Progam
* **ETA** – Estimated Time of Arrival
* **ETSI** – European Telecommunications Standards Institute
* **FAQ** – Frequently Asked Question
* **FCD** – Floating Car Data
* **FDF** – Functional Data Flow
* **FRAME** – Framework Architecture Made for Europe  
  The core name that has been given to the recent EC funded projects that have maintained and supported the FRAME Architecture, as well as to the European ITS Framework Architecture itself.
* **FRAME-NET** – FRAME Network (EC funded project 2001-04)
* **FRAME-S** – FRAME Support (EC funded project 2001-04)
* **GIDS** – Generic Intelligent Driver Support (EC co-funded project 1989-91)
* **GPS** – Global Positioning System
* **HGV** – Heavy Goods Vehicle
* **HMI** – Human Machine Interface
* **HOV** – High Occupancy Vehicle
* **HTML** – Hypertext Markup Language
* **IE8** – Internet Explorer 8
* **IEEE** – Institute of Electrical & Electronics Engineers
* **ISA** – Intelligent Speed Adaptation
* **ITS** – Intelligent Transport System(s)  
  The use of computers and communications in (road) transport. Previously it has gone by the name of IVHS (Intelligent Vehcile Highway Systems), RTT (Road Transport Telematics) and RTI (Road Transport Informatics).
* **KAREN** – Keystone Architecture Required for European Networks (EC funded project 1998-2000)  
  The EC funded project that created the first version of the European ITS Framework Architecture.
* **OBU** – On Board Unit
* **O-D** – Origin to Destination
* **OSI** – Open Systems Interconnection
* **PC** – Personal Computer
* **PT** – Public Transport
* **PDF** – Physical Data Flow
* **RAID** – Risk analysis for ITS architecture development
* **RSU** – Road Side Unit
* **SAE** – Society of Automotive Engineers (US)
* **SAFESPOT** – Cooperative systems for road safety “Smart Vehicles on Smart Roads” (EC co-funded project 2006-2010)
* **TCC** – Traffic Control Centre
* **TIC** – Travel Information Centre
* **UML** – Unified Modelling Language
* **V2I** – Vehicle to Infrastructure
* **V2V** – Vehice to Vehicle
* **VANET** – Vehicle Ad Hoc Network
* **VMS** – Variable Message Sign
* **VRU** – Vulnerable Road User
* **WLAN** – Wireless Local Area Network
* **WP** – Work package
* **XFCD** – Extended Floating Car Data

# SEMINARS & WORKSHOPS

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**[](https://webcf.waybackmachine.org/web/20180829131020/http:/frame-online.eu/wp-content/uploads/2014/09/favicon.bmp)  SEMINAR**

**TOPIC:** Planning integrated ITS using the FRAME Architecture.  
**Duration:** 1 day  
**Language:** English

**Description:**  
The Seminar is a short high level introduction to ITS Architecture in general, and the FRAME Architecture in particular.  
The Seminar can be presented on its own, or as an introduction to the Workshop.

**Recommended Audience:**

* Those who want to know what the FRAME Architecture is, and if it is what they need.
* Those who make the decisions about ITS planning and implementation.
* Those who provide high-level advice about ITS planning and implementation.
* Those who support the decision making process with technical data.
* Those who participate in the creation and release of Calls for Tender.

**Further details on the Seminar can be found in**[**Download**](https://webcf.waybackmachine.org/web/20180829131020/http:/frame-online.eu/wp-content/uploads/2015/02/FRAME-Seminar-01.pdf)**170kB (pdf file).**

**For further information please contact the FRAME Team at**[**info(at)frame-online.net**](https://webcf.waybackmachine.org/web/20180829131020/mailto:info@frame-online.net)

**[](https://webcf.waybackmachine.org/web/20180829131020/http:/frame-online.eu/wp-content/uploads/2014/09/favicon.bmp)  WORKSHOP**

**TOPIC:** Creating an ITS Architecture from the FRAME Architecture, and how to use it.  
**Duration:** 1-2 days  
**Language:** English

**Description:**  
The Workshop will provide instruction on how to use the European ITS Framework (FRAME) Architecture. The two-day Workshop includes a practical example of using the FRAME Architecture Tools.  
The Workshop can be presented on its own, or together with the Seminar.

**Recommended Audience:**

* Those who support the decision making process with technical data.
* Those who participate in the creation and release of Calls for Tender.

**Further details on the Workshop can be found in**[**Download**](https://webcf.waybackmachine.org/web/20180829131020/http:/frame-online.eu/wp-content/uploads/2015/02/FRAME-Workshop-01.pdf)**170kB (pdf file).**

**For further information please contact the FRAME Team at**[**info(at)frame-online.net**](https://webcf.waybackmachine.org/web/20180829131020/mailto:info@frame-online.net)

**[](https://webcf.waybackmachine.org/web/20180829131020/http:/frame-online.eu/wp-content/uploads/2014/09/favicon.bmp)  ANALYSIS & CONSULTANCY**

ITS architectures can be used to identify and resolve management and business issues; undertake Cost/Benefit and Risk Analysis; as well as to produce Deployment and Migration Plans. Moreover, they can be used to specify the components of ITS services and their high-level communications requirements.

**For further information please contact the FRAME Team at**[**info(at)frame-online.net**](https://webcf.waybackmachine.org/web/20180829131020/mailto:info@frame-online.net)

# FRAME FORUM

[Home](https://webcf.waybackmachine.org/web/20180829133841/http:/frame-online.eu/)  FRAME FORUM

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The FRAME Forum consists of a group of organisations who have taken the responsibility for promoting the use of the European ITS Framework Architecture, and for guiding its future development.

Forum membership is open to any public or private organisation, or individuals interested in ITS Architecture development.

The FRAME Forum Board is supported by the FRAME Team which undertakes all the technical work.

For information contact [info(at)frame-online.net](https://webcf.waybackmachine.org/web/20180829133841/mailto:info@frame-online.net)

# LIBRARY

[Home](https://webcf.waybackmachine.org/web/20180829125509/http:/frame-online.eu/)  LIBRARY

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There are a number of different types of document and report available from this page. Although some of them were created by earlier projects, much of their contents are still valid, especially those that relate to descriptions, techniques and processes. Since different readers will have different requirements, no attempt has been made to judge their current relevance, though their publication dates are provided for information. The different types of document and report are as follows:

* [FRAME Architecture](https://webcf.waybackmachine.org/web/20180829125509/http:/frame-online.eu/library/frame-architecture)
* [Other ITS Architecture Reports](https://webcf.waybackmachine.org/web/20180829125509/http:/frame-online.eu/library/other-its-architecture-reports)
* [Articles and Papers](https://webcf.waybackmachine.org/web/20180829125509/http:/frame-online.eu/library/articles-papers)
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## FRAME Architecture

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feel free to contact us:   info(at)frame-online.net

The first version of the European ITS Framework Architecture, now often known as the FRAME Architecture, was created by the project KAREN and published in 2000. Many of the following documents date from this period, but a few were updated by the project FRAME-S in 2004. The E-FRAME project (2008-2011) further extended the Architecture to include Cooperative Systems.

Note on terminology – During the KAREN project the term “architecture” was applied to both the components (Functional, Physical and Communications) as well as to the total Framework. The FRAME-S project reviewed this terminology in the light of IEEE Std 1471-2000 and the Framework Architecture is now said to comprise Functional, Physical and Communications Viewpoints.

#### **The FRAME Architecture Version 4.1 (September 2011)**

“[The FRAME Architecture Version 4.1](https://webcf.waybackmachine.org/web/20180829195617/http:/frame-online.eu/frame-architecture/detailed-information/the-frame-architecture-version-4-1)” contains the Cooperative Systems services and applications developed by the COOPERS, CVIS and SAFESPOT FP6 Integrated Projects.

The following documents provide additional information on this version of the FRAME Architecture:

FRAME Architecture – Part 1 – Overview  
[Download](https://webcf.waybackmachine.org/web/20180829195617/http:/frame-online.eu/wp-content/uploads/2015/09/D15-FRAME-Architecture-Part-1-1.0.pdf) (0.8MB pdf file)

FRAME Architecture – Part 4 – Changes for the current version (4.1)  
[Download](https://webcf.waybackmachine.org/web/20180829195617/http:/frame-online.eu/wp-content/uploads/2015/09/D15-FRAME-Architecture-Part-4-1.0.pdf) (0.9MB pdf file)

FRAME Architecture – Part 5 – FRAME Architecture Methodology  
[Download](https://webcf.waybackmachine.org/web/20180829195617/http:/frame-online.eu/wp-content/uploads/2015/09/D15-FRAME-Architecture-Part-5-1.0.pdf) (0.4MB pdf file)

FRAME Architecture – Part 6 – Function, Data Flow, Data Store and Terminator Descriptions  
[Download](https://webcf.waybackmachine.org/web/20180829195617/http:/frame-online.eu/wp-content/uploads/2015/09/D15-FRAME-Architecture-Part-6-1.0.pdf) (4.6MB pdf file)

#### **Consolidated User Needs for Cooperative Systems (September 2011)**

This document has two principal aims. As a deliverable of the E-FRAME project its primary aim is to describe the extensions to the User Needs that were necessary to include Cooperative Systems within the European ITS Framework (FRAME) Architecture. The secondary aim is to provide a document that describes the FRAME User Needs in general, and that can replace the corresponding document produced by the FPIV project KAREN, some of whose contents are no longer relevant.

[Download](https://webcf.waybackmachine.org/web/20180829195617/http:/frame-online.eu/wp-content/uploads/2014/10/D13-Consolidated-UNs-for-Coop-Systems-Issue.pdf) (1.4 MB pdf file)

The current set of User Needs (only) can be found in [download](https://webcf.waybackmachine.org/web/20180829195617/http:/frame-online.eu/wp-content/uploads/2014/10/FRAME-User-Needs-V4.1-01.pdf) (700kB pdf file) or [download](https://webcf.waybackmachine.org/web/20180829195617/http:/frame-online.eu/wp-content/uploads/2014/10/FRAME-User-Needs-V4.1-01.doc) (1.4MB doc file). A pictorial version of the structure of the User Needs can be found in [download](https://webcf.waybackmachine.org/web/20180829195617/http:/frame-online.eu/wp-content/uploads/2014/10/FRAME-User-Needs-Structure.pdf) (350kB pdf file)

#### **Physical and Communication Viewpoints for ITS Architectures of Cooperative Systems (September 2011)**

This document provides an introduction to creating ITS System Architectures for Cooperative Systems applications with the FRAME Architecture tools, and demonstrates this process using two examples from Cooperative-ITS. It describes the design of two ITS applications using the FRAME Architecture, the first of which represents the first level priority services for the European TEN-T Network of the Cooperative Systems Task Force of the EasyWay project, and the second represents an example called “Traffic Adaptive Crossing” which can be installed on any road intersection.  These examples show on the one side the wide applicability of the FRAME methodology at a European Level, and on the other side that the additional complexity of cooperative ITS in terms of functions, modules and data can be handled with the updated versions of the available tools.  
[Download](https://webcf.waybackmachine.org/web/20180829195617/http:/frame-online.eu/wp-content/uploads/2015/09/D7-and-D8_Physical-and-Communications-Viewpoint-Issue.pdf) (1.6MB pdf file)

#### **Deployment and Organisational Issues for Cooperative Systems (September 2011)**

One of the constraints to deployment is undoubtedly the fact that Cooperative Systems, by definition, involve players from many different sectors: the automotive industry, road operators and telecommunications operators, as well as road-based service and equipment providers. Real world deployment will require the definition of new relationships between these players as well as the solution of technical, organisational and business issues. The FRAME Architecture provides a tool and a methodological approach which can be used to help plan the deployment of integrated ITS for a nation, region, city or project. By creating various viewpoints – functional, physical, communications – a foundation can be produced to analyse and help solve the issues.  
[Download](https://webcf.waybackmachine.org/web/20180829195617/http:/frame-online.eu/wp-content/uploads/2015/09/D10-Deployment-and-Organisational-Issues-v1.0a.pdf) (1.8MB pdf file)

#### **Current cooperative systems standardisation and its relation to ITS Architecture (September 2011)**

The objective of this document is to describe the links between the current (July 2011) standardization activities, with an emphasis on cooperative systems, and ITS architecture. It also provides guidelines for the use of standards in this area by giving information on Standards Development Organizations, the main standards currently available, ongoing activities (including the work being done in response to Mandate M/453) and makes recommendations for the usage of standards together with the cooperative systems architecture. Finally, this document proposes measures or tools for a more efficient and better utilization of standards.  
[Download](https://webcf.waybackmachine.org/web/20180829195617/http:/frame-online.eu/wp-content/uploads/2015/09/D16-Current-Cooperative-Systems-Standardisation_v1.2a.pdf) (1MB pdf file)

Older Documents  
The following documents were written to describe aspects of earlier versions of the FRAME Architecture.  Whilst some specific issues/topics may have changed, many have not and these documents are sometimes the only place where certain topics have been described.  They should therefore be read with these warnings and knowledge in mind.

#### **Overview (August 2000)**

This Document acts as the “base document” for the other European ITS Framework Architecture Deliverable Documents that were produced by the KAREN Project. It includes an overview of each document in the form of its Executive Summary, plus background material on the development of system architecture within Europe and the reasons for the establishment of the KAREN Project. The document also describes the general system architecture development process used by the KAREN and a comparison with other architectures. Thus its contents provide some background information about the rationale behind what the KAREN project produced, from which the current FRAME Architecture has been developed.

[Download](https://webcf.waybackmachine.org/web/20180829195617/http:/frame-online.eu/wp-content/uploads/2014/10/eitsfa-overview.zip) (2.9MB zip file – Main document and Annex 1)

#### **Models of ITS (August 2000)**

This document provides an introduction to ITS Architectures and Models, and describes the relationship of the European ITS Framework Architecture to National, Local, Service and System Architectures. A variety of Models have been developed, including Reference, Enterprise and Primary Process Models which present ITS services from a variety of viewpoints.

[Download](https://webcf.waybackmachine.org/web/20180829195617/http:/frame-online.eu/wp-content/uploads/2014/10/eitsfa-models-of-its.zip) (1.5MB zip file – Main document)

#### **Physical Viewpoint (August 2000)**

It was not considered to be in the best interests of European ITS deployment to develop a single “definitive system” as the European ITS Physical Architecture, because there is no one way in which this can or should be done. This document therefore provides 13 examples of key physical systems that can be developed using components from the Functional Architecture.

[Download](https://webcf.waybackmachine.org/web/20180829195617/http:/frame-online.eu/wp-content/uploads/2014/10/eitsfa-physical-viewpoint.zip) (4.7MB zip file – Main document and Annexes 1 & 2)

#### **Deployment Approach and Scenarios (August 2000)**

This document provides a description of a methodology, which is recommended for the development of specific architectures, based upon the European ITS Framework Architecture. It describes issues and possible solutions to take into account when developing such architectures and deploying ITS. The report also describes national initiatives developing national architectures and proposes recommendations based on their experience.

[Download](https://webcf.waybackmachine.org/web/20180829195617/http:/frame-online.eu/wp-content/uploads/2014/10/eitsfa-deployment-approach.zip) (1.5MB zip file – Main Document)

#### **Cost-Benefit Analysis (August 2000)**

In order to design and implement any type of architecture effectively, it is essential that the costs and benefits involved are clearly understood. In this way, the architecture can be focused on areas where the best value for money can be obtained. This document aims to address this need by presenting a Cost Benefit Study into the development and adoption of a framework architecture for ITS. The objective of this task is to look at the benefits likely to be obtained from the deployment of the Framework Architecture. In particular, it considers the results obtained from European Telematics projects where the integration of different applications in a common infrastructure has demonstrated benefits.

[Download](https://webcf.waybackmachine.org/web/20180829195617/http:/frame-online.eu/wp-content/uploads/2014/10/eitsfa-cost-benefit-analysis.zip) (1.4MB zip file – Main document)

#### **RAID – Risk Analysis for ITS Deployment (May 1999)**

The RAID study on System Architecture focused on the identification of the threats which can slow down the deployment of a Transport Telematics European Framework Architecture and which are related to the deployment of ITS in general. Threats are clustered and analysed by using a scenario-based approach that facilitates analysis of relationships between the contents of the RAID database and the actual implementation environment. For those threats that were found to be most critical, mitigation strategies are recommended by RAID. RAID’s activities were complementary to those of the KAREN project.

[Download](https://webcf.waybackmachine.org/web/20180829195617/http:/frame-online.eu/wp-content/uploads/2014/10/raid-risk-analysis.zip) (460kB zip file – Main document and Annexes 1, 2 & 3)

#### **FRAME-S – Guide to Configuration Management and ITS Architecture Documentation (April 2003)**

This document provides a guide to the Configuration Management practices for the European ITS Architectures that are based on the European ITS Framework Architecture. As a foundation to the definition of the Configuration Management practices, the document includes a definition of what “compatibility” means for the Framework Architecture.

[Download](https://webcf.waybackmachine.org/web/20180829195617/http:/frame-online.eu/wp-content/uploads/2014/10/eitsfa-configuration-management.zip) (260kB zip file – Main document)

#### **List of User Needs (August 2000)**

The document describes the process of collecting, categorising and endorsing the original List of European ITS User Needs which formed the basis of the first version of the European ITS Architecture Framework. This document has been superseded by one produced by the project E-FRAME in 2011 (see above) and is included here solely for those who are interested in the history of the FRAME Architecture.

[Download](https://webcf.waybackmachine.org/web/20180829195617/http:/frame-online.eu/wp-content/uploads/2014/10/KAREN-D2.2-List-of-User-Needs.zip) (1.3MB zip file – Main document ONLY)

## Articles & Papers

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**These are various articles and papers that have been published and/or presented at various conferences. They are contain a useful summary of various topics on aspects of ITS Architecture in general, and the FRAME Architecture in particular.**

#### **PAPERS:**

#### **Using the FRAME Architecture for Planning Integrated Intelligent Transport Systems (EATIS 2009)**

The potential complexity and size of Intelligent Transport Systems (ITS) requires that they be implemented through a systems engineering approach based on the use of ITS Architectures. These enable a high level set of “views” of the proposed ITS to be obtained early in its lifecycle so that many of the details and implications can be checked and, if necessary, changed at significantly less cost than if the need for a change is only found when some/all of the development work has been completed. The FRAME Architecture has been created for use as the starting point for any deployment of ITS, and a methodology for its use has been developed. This methodology is now supported by two FRAME Architecture Tools. The FRAME Architecture is currently being extended to include cooperative systems.

[Download](https://webcf.waybackmachine.org/web/20180829160852/http:/frame-online.eu/wp-content/uploads/2014/10/eatis-2009.pdf) (230kB pdf file)

#### **Using the FRAME Architecture for Planning Integrated Intelligent Transport Systems (ITS Spain 2009)**

The potential complexity and size of Intelligent Transport Systems (ITS) requires that they be implemented through a system engineering approach based on the use of ITS Architectures. These enable a high level set of “views” of the proposed ITS implementation to be obtained early in its lifecycle so that many of the details and implications can be checked and, if necessary, changed at significantly less cost than if the need for a change is only found when some/all of the development work has been completed. The FRAME Architecture has been created for use as the starting point for any deployment of ITS, and a methodology for its use has been developed. This methodology is now supported by two FRAME Architecture Tools. The FRAME Architecture is currently being extended to include  
cooperative systems.

[Download](https://webcf.waybackmachine.org/web/20180829160852/http:/frame-online.eu/wp-content/uploads/2014/10/its-spain-2009.pdf) (130kB pdf file)

#### **Using the European ITS Framework Architecture (ITS World Congress 2006)**

This paper describes a use that has been made of the European ITS Framework Architecture, and the FRAME Browsing and Selection Tools, in a project to create a regional ITS Architecture. It describes the processes that were used, from the definition of the Stakeholder Aspirations to the creation of the descriptions of the physical entities and the links that are needed to fulfil them. Examples of the results are presented, together with an evaluation of them. The evaluation confirmed both the usefulness of the resulting regional ITS Architecture, and the effectiveness of the FRAME methodology to create it.

[Download](https://webcf.waybackmachine.org/web/20180829160852/http:/frame-online.eu/wp-content/uploads/2014/10/its-wc-2006.pdf) (75kB pdf file)

#### **Different Types of ITS Architectures and their Uses (ITS World Congress 2005)**

This paper looks at how one should choose the best type of Architecture to create for an ITS deployment. There are three main Architecture types, comprising Framework, Defined and Specific. They all contain the User Needs and the functionality supporting them, but they differ in what else they comprise. A Framework ITS Architecture contains guidance for the creation of the other outputs and is most suitable for (inter-)national ITS Architectures. Both the Defined and the Specific ITS Architectures contain the actual created outputs. A Defined Architecture is most suitable for regional ITS Architectures. A Specific ITS Architecture only supports one or two Services and is best used by  
manufacturers as the basis for their product ranges. The choice of which ITS Architecture to create depends on the starting point, plus how and where it will be used.

[Download](https://webcf.waybackmachine.org/web/20180829160852/http:/frame-online.eu/wp-content/uploads/2014/10/its-wc-2005.pdf) (170kB pdf file)

#### **How Can an ITS Architecture be Created – A European View (ITS World Congress 2004)**

This paper provides an overview of the ITS architecture creation process and how the results can be used in ITS development and deployment. It starts by looking at the Stakeholders and their rôle in the ITS architecture creation process. The results of the process are then described and their use in ITS deployment explained. The use of the two basic types of ITS Architecture is then explained, and the paper finishes with a discussion on how Multi-modal ITS Architectures can be created.

[Download](https://webcf.waybackmachine.org/web/20180829160852/http:/frame-online.eu/wp-content/uploads/2014/10/its-wc-2004-bossom.pdf) (195kB pdf file)

#### **Why Do You Need an ITS Architecture – European and National Perspectives (ITS World Congress 2004)**

ITS is becoming more complex and difficult to produce and deploy successfully. One way of alleviating this situation is to create an ITS Architecture. This provides a top-level framework that contains the minimum top-level assumptions necessary. Once created, an ITS Architecture can be used to produce a variety of management products to guide the future ITS deployment. An architectural approach provides benefits for the ITS Stakeholders, with End Users, Authorities and Operators as well as Manufacturers and Suppliers all gaining from a long term planned approach. An ITS deployment without an Architecture is likely to be a “technology island” with no links, and little in common, with the other “islands”. A growing number of European nations are now creating their own ITS Architectures, based on the KAREN/FRAME Architecture, which will assist them to provide ITS services.

[Download](https://webcf.waybackmachine.org/web/20180829160852/http:/frame-online.eu/wp-content/uploads/2014/10/its-wc-2004-jesty.pdf) (55kB pdf file)

#### **Configuration Management in the European ITS Framework Architecture Environment (ITS World Congress 2003)**

This paper provides the background and description of the Configuration Management practices being implemented by the FRAME Project for the European ITS Framework Architecture. The challenges that this presents arise from the flexibility of use that is built into the Framework Architecture and the freedom that its Users have to modify it when creating their own ITS Architectures. Therefore Configuration Management practices have been developed for both the Framework Architecture maintainers and its Users.

[Download](https://webcf.waybackmachine.org/web/20180829160852/http:/frame-online.eu/wp-content/uploads/2014/10/its-wc-2003-bossom.pdf) (75kB pdf file)

#### **Involving Stakeholders in ITS Architecture Creation (ITS World Congress 2003)**

Part of the planning process for the deployment of integrated ITS services should be the creation of an ITS Architecture. This architecture will contain the solutions to the problems and aspirations of the various stakeholders. This paper describes a process, based on experience, for use by ITS architects to capture the Stakeholders Aspirations and then create the corresponding User Needs. It highlights the distinction between a problem and its solutions, and also provides advice for how to write, structure and use the User Needs.

[Download](https://webcf.waybackmachine.org/web/20180829160852/http:/frame-online.eu/wp-content/uploads/2014/10/its-wc-2003-jesty.pdf) (140kB pdf file)

#### **ARTICLES:**

“[Many Languages, One Voice](https://webcf.waybackmachine.org/web/20180829160852/http:/frame-online.eu/wp-content/uploads/2014/10/Many-Languages-One-Voice-TH-Mar-Apr-2011.pdf)” from Thinking Highways Vol 6 No 1, Mar/Apr 2011  
“[A Particularly Common Goal](https://webcf.waybackmachine.org/web/20180829160852/http:/frame-online.eu/wp-content/uploads/2014/10/A-Particularly-Common-Goal-TH-Nov-Dec-2010.pdf)” from Thinking Highways Vol 5 No 4, Nov/Dec 2010  
“[Things to Make and Do](https://webcf.waybackmachine.org/web/20180829160852/http:/frame-online.eu/wp-content/uploads/2014/10/Things-to-Make-and-Do-TH-Nov-Dec-2010.pdf)” from Thinking Highways Vol 5 No 4, Nov/Dec 2010  
“[Drawing Inspiration](https://webcf.waybackmachine.org/web/20180829160852/http:/frame-online.eu/wp-content/uploads/2014/10/Drawing-Inspiration-TH-US-Nov-Dec-2010.pdf)” from Thinking Highways (North America), Nov/Dec 2010

## Brochures

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**One page summary**

[Why you need an ITS Architecture](https://webcf.waybackmachine.org/web/20180829125459/http:/frame-online.eu/wp-content/uploads/2014/10/WhyyouneedanITSarchitecture.pdf) is a very short summary of the key reasons for having an ITS Architecture.

**A short guide to ITS Architecture**

[Planning a Modern Transport System](https://webcf.waybackmachine.org/web/20180829125459/http:/frame-online.eu/wp-content/uploads/2014/10/PlanningGuide.pdf) provides an explanation of why you need an ITS Architecture and how to create it. It also provides an overview of ITS for those high-level decision makers who are not familiar with the topic.

**Other languages**

A number of people have liked the short guide so much that they have translated it into their own native language. At the moment the following translations are available.

[Danish version](https://webcf.waybackmachine.org/web/20180829125459/http:/frame-online.eu/wp-content/uploads/2014/10/PlanningGuideDK.pdf)

[Finnish version](https://webcf.waybackmachine.org/web/20180829125459/http:/frame-online.eu/wp-content/uploads/2014/10/PlanningGuideFI.pdf)

[German version](https://webcf.waybackmachine.org/web/20180829125459/http:/frame-online.eu/wp-content/uploads/2014/10/PlanningGuideDE.pdf)

[Polish version](https://webcf.waybackmachine.org/web/20180829125459/http:/frame-online.eu/wp-content/uploads/2014/10/Dummies-Guide-Issue-2aPL.pdf)

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[Spanish version](https://webcf.waybackmachine.org/web/20180829125459/http:/frame-online.eu/wp-content/uploads/2014/10/PLANIFICACI%C3%93N-DEv4.pdf)

[Swedish version](https://webcf.waybackmachine.org/web/20180829125459/http:/frame-online.eu/wp-content/uploads/2014/10/PlanningGuideSE.pdf)

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**FRAME and the ITS Action Plan – Booklet**

[The FRAME Architecture and the ITS Action Plan](https://webcf.waybackmachine.org/web/20180829125459/http:/frame-online.eu/wp-content/uploads/2014/10/FRAME-ITS-Action-Plan.pdf) is a booklet which explains how the FRAME Architecture can be used to support the ITS Directive and the ITS Action Plan.

**Other languages**

The following translations are available.

[Czech version](https://webcf.waybackmachine.org/web/20180829125459/http:/frame-online.eu/wp-content/uploads/2014/10/FRAME-and-the-ITS-Action-Plan-in-CZ.pdf)

**Cooperative Systems – Booklet**

[Cooperative Systems: Deployment and Organisational Issues](https://webcf.waybackmachine.org/web/20180829125459/http:/frame-online.eu/wp-content/uploads/2014/10/Coop-Systems-Depl-Org.pdf) is a booklet which discusses the non-technical issues related to the deployment of integrated cooperative systems, and the role of the FRAME Architecture.

**Other languages**

The following translations are available.

[Czech version](https://webcf.waybackmachine.org/web/20180829125459/http:/frame-online.eu/wp-content/uploads/2014/10/Coop-Systems-Depl-and-Org-in-CZ.pdf)

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**These reports contain information that relate to ITS Architectures in general.**

**CONVERGE – Guidelines for the Development and Assessment of ITS Architectures (February 1998)**

These guidelines provide advice for Transport Telematics projects on the development and assessment of their system architectures, and suggestions are made as to the possible contents of their System Architecture Deliverables.

[Download](https://webcf.waybackmachine.org/web/20180829133850/http:/frame-online.eu/wp-content/uploads/2014/10/converge-guidelines.pdf) (500kB pdf file)

**Handledning för Systemarkitekturarbete inom / Handbook for ITS Architecture (2004)**

This handbook, which has been produced for the Swedish National Road Administration in cooperation with ITS Sweden, describes a methodology for producing an ITS Architecture. It provides an introduction to an important tool to promote a strategic architecture for the transport sector. A common system architecture creates the conditions for cooperation between different organisations and systems, which in turn provides the opportunity for an holistic approach to the transport system. With the help of a system architecture there can be clear descriptions of the relationships between services, systems and information which thus facilitate their development and deployment. **(In Swedish)**

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**These reports contain information that relates to ITS engineering in general, but not explcitly ITS Architecture.**

**UTMC22 – Framework for the Development and Assessment of Safety-Related (Inter-)Urban Traffic Management Systems (March 2000)**

This Framework describes a process to analysis the safety hazards associated with an ITS and to assess their risk; to identify safety requirements that will reduce the risk to an acceptable level; and to demonstrate that the safety requirements have been applied correctly. It brings together the topics of Functional System Safety, Traffic Safety and Human Machine Interaction. The Framework draws heavily on the results of earlier EC funded projects undertaken in the FP2 DRIVE I, FP3 DRIVE II and FP4 EC research programmes, in particular CODE, DRIVE Safely, EMCATT, HINT, HOPES and PASSPORT, and the UK SafeIT project [MISRA](https://webcf.waybackmachine.org/web/20180829161208/http:/www.misra.org.uk/).

The project that created this Framework was funded by the UK Department for Transport as part of the UTMC programme.

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FRAME NEXT is a project that extends the European ITS Framework Architecture, now normally known as the FRAME Architecture, with the activities of the different member states in Europe, within the priority areas of the ITS directive (Directive 2010/40/EU) and with the methodologies and tools that make a modern ITS architecture attractive and appealing for its users.

The result of the project will be an ITS environment for Europe which emphasizes conditions for system interoperability and supports transport policy goals of seamless multimodal mobility, enhanced road safety and lower emissions. In order to take into account current developments this environment will be able to change and adapt to the respective needs.

Changing partnerships along the ITS value chain are needed to deliver new services and applications to end-users as well as to public and private organisations. FRAME NEXT will contribute to a facilitated establishment of new cooperations.

FRAME NEXT website is available [HERE](https://webcf.waybackmachine.org/web/20201230134443/https:/www.frame-next.eu/)

FRAME NEXT factsheet is available [HERE](https://webcf.waybackmachine.org/web/20201230134443/https:/frame-online.eu/wp-content/uploads/2018/11/Factsheet_FRAME_NEXT.pdf)

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* **Functional Architecture (**[**main**](https://webcf.waybackmachine.org/web/20011104023515/http:/www.frame-online.net/Karen_doc/d31final.pdf)**,**[**annex 1**](https://webcf.waybackmachine.org/web/20011104023515/http:/www.frame-online.net/Karen_doc/d31a1fin.pdf)**,**[**annex 2**](https://webcf.waybackmachine.org/web/20011104023515/http:/www.frame-online.net/Karen_doc/d31a2fin.pdf)**,**[**annex 3**](https://webcf.waybackmachine.org/web/20011104023515/http:/www.frame-online.net/Karen_doc/d31a3fin.pdf)**)**
* **Physical Architecture (**[**main**](https://webcf.waybackmachine.org/web/20011104023515/http:/www.frame-online.net/Karen_doc/d32final.pdf)**,**[**annex 1**](https://webcf.waybackmachine.org/web/20011104023515/http:/www.frame-online.net/Karen_doc/d32a1fin.pdf)**,**[**annex 2**](https://webcf.waybackmachine.org/web/20011104023515/http:/www.frame-online.net/Karen_doc/d32a2fin.pdf)**)**
* **Communication Architecture (**[**main**](https://webcf.waybackmachine.org/web/20011104023515/http:/www.frame-online.net/Karen_doc/d33final.pdf)**,**[**annex 1**](https://webcf.waybackmachine.org/web/20011104023515/http:/www.frame-online.net/Karen_doc/d33a1fin.pdf)**,**[**annex 2**](https://webcf.waybackmachine.org/web/20011104023515/http:/www.frame-online.net/Karen_doc/d33a2fin.pdf)**)**
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* **Models of ITS (**[**main**](https://webcf.waybackmachine.org/web/20011104023515/http:/www.frame-online.net/Karen_doc/d37final.pdf)**)**
* **Overview (**[**main**](https://webcf.waybackmachine.org/web/20011104023515/http:/www.frame-online.net/Karen_doc/d36final.pdf)**,**[**annex 1**](https://webcf.waybackmachine.org/web/20011104023515/http:/www.frame-online.net/Karen_doc/d36a1fin.pdf)**)**
* **Proposed Framework of Required Standards (**[**main**](https://webcf.waybackmachine.org/web/20011104023515/http:/www.frame-online.net/Karen_doc/d41final.pdf)**)**
* **Deployment Approach and Scenarios (**[**main**](https://webcf.waybackmachine.org/web/20011104023515/http:/www.frame-online.net/Karen_doc/d42final.pdf)**)**
* **RAID (**[**main**](https://webcf.waybackmachine.org/web/20011104023515/http:/www.frame-online.net/Karen_doc/raid/RAIDMAIN.PDF)**,**[**annex 1**](https://webcf.waybackmachine.org/web/20011104023515/http:/www.frame-online.net/Karen_doc/raid/ANNEX_1.PDF)**,**[**annex 1A**](https://webcf.waybackmachine.org/web/20011104023515/http:/www.frame-online.net/Karen_doc/raid/ANNEX_1A.PDF)**,**[**annex 1B**](https://webcf.waybackmachine.org/web/20011104023515/http:/www.frame-online.net/Karen_doc/raid/ANNEX_1B.PDF)**,**[**annex 2**](https://webcf.waybackmachine.org/web/20011104023515/http:/www.frame-online.net/Karen_doc/raid/ANNEX_2.PDF)**,**[**annex 2A**](https://webcf.waybackmachine.org/web/20011104023515/http:/www.frame-online.net/Karen_doc/raid/ANNEX_2A.PDF)**,**[**annex 2B**](https://webcf.waybackmachine.org/web/20011104023515/http:/www.frame-online.net/Karen_doc/raid/ANNEX_2B.PDF)**,**[**annex 2C**](https://webcf.waybackmachine.org/web/20011104023515/http:/www.frame-online.net/Karen_doc/raid/ANNEX_2C.PDF)**,**[**annex 3**](https://webcf.waybackmachine.org/web/20011104023515/http:/www.frame-online.net/Karen_doc/raid/ANNEX_3.PDF)**)**
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**Articles**

* ["Deployment of the European ITS Framework Architecture"](https://webcf.waybackmachine.org/web/20011104023515/http:/www.frame-online.net/Articles/IEEE-ITSC2001.DOC)G.Franco - IEEE - ITSC 2001
* ["Architecture Experiences in the Urban Environment"](https://webcf.waybackmachine.org/web/20011104023515/http:/www.frame-online.net/Articles/EU-ITS2000.DOC) G.Franco - EU ITS 2000

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* ["What is a System Architecture?"](https://webcf.waybackmachine.org/web/20011104023515/http:/www.frame-online.net/Presentations/What%20is%20a%20System%20Architecture2.PDF) PDF document (prepared by P.Jesty)
* ["Creating an Architecture"](https://webcf.waybackmachine.org/web/20011104023515/http:/www.frame-online.net/Presentations/Creating%20an%20Architecture2.PDF)PDF document (prepared by P.Jesty)

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| **OBJECTIVES** |
| The prime objective of the FRAME projects is to co-ordinate and promote the wide-scale implementation of ITS in Europe through the deployment of the European ITS Framework Architecture. FRAME-NET will provide a focal point for confrontation and co-ordination of ITS architecture-related activities in the whole of Europe.  The Framework Architecture was developed by the KAREN project in response to the need for a single reference platform in Europe which would provide a basis for the development of ITS products and services. A number of national authorities have since started to develop their own national ITS framework architectures, and are adapting KAREN to their own needs. In implementing the Framework, individual countries and users will tend to adopt their own priorities and make their own decisions on investment. In this context, FRAME-NET plays an important role in providing technical guidance, and overall co-ordination to ensure coherence at the European level. The network will also help maintain the momentum previously created and encourage wider use of the Framework Architecture.  The intention is that through the activities of FRAME-NET, all those involved in ITS architecture-related activities will interact with each other to exchange knowledge and exploit accumulated experience. This will enable solutions to be found and a common approach adopted. The Thematic Network will help to achieve this objective by co-ordinating on-going activities concerning the Framework, and by providing a forum for dissemination and concertation. The Network will also serve as a democratic means for the member states to protect the stability of the European ITS Framework Architecture.  [Top](https://webcf.waybackmachine.org/web/20011104025351/http:/www.frame-online.net/objectives.htm#inizio) |

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**European Framework Architecture**

First issue (KAREN) - published Sept 2000 (documents available here in PDF form)

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* **List of User Needs**[**Main**](https://webcf.waybackmachine.org/web/20020610155224/http:/www.frame-online.net/Karen_doc/d22final.pdf)**- 1.4MB***Introduction, description of approach adopted, and analysis;*[**Annex 1**](https://webcf.waybackmachine.org/web/20020610155224/http:/www.frame-online.net/Karen_doc/d22appf.pdf)**150KB**  *List of user needs according to KAREN;*[**Annex 2**](https://webcf.waybackmachine.org/web/20020610155224/http:/www.frame-online.net/Karen_doc/d22appg.pdf)**130KB***List of user needs with ISO numbering*
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* **Communication Architecture**[**Main**](https://webcf.waybackmachine.org/web/20020610155224/http:/www.frame-online.net/Karen_doc/d33final.pdf)**1.7MB***Description of communications links required by systems to support the data flows* [**Annex 1**](https://webcf.waybackmachine.org/web/20020610155224/http:/www.frame-online.net/Karen_doc/d33a1fin.pdf)**1.4MB***List of user needs relating to communications*[**Annex 2**](https://webcf.waybackmachine.org/web/20020610155224/http:/www.frame-online.net/Karen_doc/d33a2fin.pdf)**1.5MB***Technologies used for communications*
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* **RAID   Risk analysis for ITS architecture development** [**Main**](https://webcf.waybackmachine.org/web/20020610155224/http:/www.frame-online.net/Karen_doc/raid/RAIDMAIN.PDF)**227MB***Approach to the constraints analysis, mitigation strategies and recommendations*[**Annex 1A**](https://webcf.waybackmachine.org/web/20020610155224/http:/www.frame-online.net/Karen_doc/raid/ANNEX_1A.PDF)**139KB***Red and orange*r*isk database*; [**Annex 1B**](https://webcf.waybackmachine.org/web/20020610155224/http:/www.frame-online.net/Karen_doc/raid/ANNEX_1B.PDF)**64KB**Yellow *green and blue*risk database [**Annex 2A**](https://webcf.waybackmachine.org/web/20020610155224/http:/www.frame-online.net/Karen_doc/raid/ANNEX_2A.PDF)*Database description*[**Annex 2B**](https://webcf.waybackmachine.org/web/20020610155224/http:/www.frame-online.net/Karen_doc/raid/ANNEX_2B.PDF)Background information;  [**Annex 2C**](https://webcf.waybackmachine.org/web/20020610155224/http:/www.frame-online.net/Karen_doc/raid/ANNEX_2C.PDF)*Risk analysis results*
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* ["Architecture Experiences in the Urban Environment"](https://webcf.waybackmachine.org/web/20020610155224/http:/www.frame-online.net/Articles/EU-ITS2000.DOC) *ITS World Congress, Torino 2000*

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| **OBJECTIVES** |
| The aim of the European Framework Architecture is to provide a single reference platform for the development of ITS products and services in Europe. The prime objective of the FRAME projects is to promote the implementation and enhancement of the Framework Architecture.  There are currently two closely related projects:   * **FRAME-NET**is a Thematic Network whose aim is to provide the opportunity for all those involved in architecture-related activities in Europe to exchange experience and information. This will be done through: **- a series of workshops (each on specific topics)  - "Cluster Meetings" open to all interested organisations - this Website, as an interactive forum** * **FRAME-S** is responsible for: **-  updates of the European Framework Architecture -  the organisation and running of training courses  -  on-line assistance for those developing their own architectures**   **To understand what an architecture consists of and how to create one:**   * ["What is a System Architecture?"](https://webcf.waybackmachine.org/web/20020610160639/http:/www.frame-online.net/Presentations/What%20is%20a%20System%20Architecture2.PDF) (PDF 380KB) * ["Creating an Architecture"](https://webcf.waybackmachine.org/web/20020610160639/http:/www.frame-online.net/Presentations/Creating%20an%20Architecture2.PDF)(PDF 207KB)   [Top](https://webcf.waybackmachine.org/web/20020610160639/http:/www.frame-online.net/objectives.htm#inizio) |
| ABOUT FRAME |
| [THE FRAME PROJECTS](https://webcf.waybackmachine.org/web/20050310190814/http:/www.frame-online.net/aboutFRAME.htm#FRAME%20projects)  [PROJECT PARTICIPANTS](https://webcf.waybackmachine.org/web/20050310190814/http:/www.frame-online.net/aboutFRAME.htm#Who%20is%20involved)  [WORK GROUPS](https://webcf.waybackmachine.org/web/20050310190814/http:/www.frame-online.net/aboutFRAME.htm#Work%20Groups)  [PROJECT BROCHURES](https://webcf.waybackmachine.org/web/20050310190814/http:/www.frame-online.net/aboutFRAME.htm#Brochures)  [CONTACT INFORMATION](https://webcf.waybackmachine.org/web/20050310190814/http:/www.frame-online.net/aboutFRAME.htm#Contact%20information)  The FRAME projects  The FRAME projects (FRamework Architecture Made for Europe) were funded by the European Commission as part of the 5th Framework Programme of the Information Society Technologies (IST) Directorate. They were a follow-on to the KAREN project (1998-2000) which developed the first version of the European ITS Framework Architecture.  The aim of the two closely linked projects FRAME-NET and FRAME-S (2001-2004) was to promote the use of the Framework Architecture, to give support to users and to make any necessary updates and improvements to the Architecture.  For a full list of those involved in the two projects see the [PARTICIPANTS](https://webcf.waybackmachine.org/web/20050310190814/http:/www.frame-online.net/participants.htm) page.  All reports and other material produced by these projects can be downloaded from the [LIBRARY](https://webcf.waybackmachine.org/web/20050310190814/http:/www.frame-online.net/library.htm) page.   * FRAME-NET (July 2001-Sept 2004) was a 'Thematic Network' whose role was to provide information about the European ITS Architecture and promote opportunities for those involved in architecture-related activities in Europe to exchange their experience. This was achieved through: - publication of brochures, leaflets, etc.  - organisation of international meetings and workshops - management of the FRAME Website.  Contact was also maintained with non European countries. During events such as the World ITS Congresses, workshops were organised in order to promote discussion of architecture-related topics of international interest.   FRAME-NET set up several [Work Groups](https://webcf.waybackmachine.org/web/20050310190814/http:/www.frame-online.net/aboutFRAME.htm#Work%20Groups) which examined various aspects of the Framework Architecture and support activities in order to make recommendations for improvements.   The project was led by Jan Willem Tierolf of RWS-AVV (Netherlands DOT); other main partners are ERTICO (Belgium) and MIZAR Automazione (Italy). They were assisted by a group of project members representing the main national architecture initiatives in Europe (see below). * FRAME-S (Aug 2001-Oct 2004) was an 'Accompanying Measure' responsible for the following activities: -  updates to the European ITS Framework Architecture -  creation and running of training seminars and workshops -  Help Desk for technical assistance for architecture developers  -  development of Navigation Tools for the Framework Architecture   FRAME-S was led by Richard Bossom of Siemens Traffic Controls (UK); Peter Jesty was responsible for training activities. They were supported by seven partners with expertise in ITS architectures (listed below).  Among the major achievements of FRAME-S - issue of a series of Architecture updates (culminating in Version 3.0) - development of the Browsing Tool - development of the Selection Tool - issue of a Configuration Guide for national ITS architecture developers - creation of training seminar and workshop programmes - holding of numerous training sessions throughout Europe   Work Groups  The FRAME-NET Work Groups consisted of FRAME Project partners and representatives of the major national ITS architecture initiatives in Europe. They were led by MIZAR Automazione. Each group prepared a final report (see below).   * MULTIMODALITY (Final report - D3.1 - Oct 2002) examining the need and possibility of extending the Framework Architecture to cover intermodal and multimodal functions. The report concludes that although a full European multimodal architecture is not feasible, key interfaces should be developed and the relevant 'User Needs' included in the Framework Architecture. * NATIONAL ARCHITECTURE VALIDATION  (Final report - D3.2 - Feb 2004) assessment of the 'usability' and 'usefulness' of the Framework Architecture and the support provided by the FRAME projects from the point of view of national architecture initiatives. A inventory was also compiled of the current status of national ITS architectures. * VALIDATION OF NAVIGATION TOOL (Final report - D3.3 - Nov 2004) an examination of the requirements and options for the Browsing and Selection Tools developed by FRAME-S to facilitate use of the Framework Architecture.  The group carried out tests on the prototype tools and gave feedback to the FRAME-S project. * IMPACT ANALYSIS (Final report - D3.4 Dec 2003) an evaluation of the advantages and risks of using the Framework Architecture, with a first attempt to make a quantified analysis of the costs and benefits.  The above reports can be downloaded from the [LIBRARY](https://webcf.waybackmachine.org/web/20050310190814/http:/www.frame-online.net/library.htm) page.   Brochures   |  |  |  |  | | --- | --- | --- | --- | | [PROJECT BROCHURE](https://webcf.waybackmachine.org/web/20050310190814/http:/www.frame-online.net/Brochures/Brochure-1%20Sept2001.pdf) | (PDF)    980KB | **8 page colour brochure:   description of FRAME projects, explanation of benefits of using a system architecture for ITS** | **September 2001** | | [**PROJECT FOLDER**](https://webcf.waybackmachine.org/web/20050310190814/http:/www.frame-online.net/Brochures/frame%20folder%20Nov%2003%20final.pdf) | (PDF)    270KB | **4 page folder:**  **current progress in FRAME projects and use of Framework Architecture** | **November**  **2003** |       Participants    For full list of all those involved as FRAME partners, members and associates see [PARTICIPANTS](https://webcf.waybackmachine.org/web/20050310190814/http:/www.frame-online.net/participants.htm)    The support of the FRAME projects extended to all EU Member States, including the new Accession countries. Technical assistance was offered free of charge to those working on the development of national ITS architectures.    The activities of the network were open to anyone interested in knowing more about ITS architectures, in particular those working for:  - national, regional and city transport authorities - public transport and freight fleet operators - transport information service providers - manufacturers of ITS products and services  FRAME PROJECT CONSORTIUM  The Consortium consists of representatives of the national ministries of the main European countries currently developing national architectures, plus a number of organisations closely involved in ITS architecture work.  • AFT-IFTIM (France) • Department for Transport (UK) • DSCR - Direction de la sécurité et de la circulation routière (France) • ERTICO (Belgium) • Mega International (France) • MIZAR Automazione (Italy) • MIT - Ministero delle Infrastrutture e dei Trasporti (Italy) • National University of Athens (Greece) • NEI - Ecorys (Netherlands) • Politecnico di Torino (Italy) • Rijkswaterstaat - AVV (Netherlands) • Siemens Traffic Controls (UK) • Swedish National Road Authority (Sweden) • TNO (Netherlands) • Traficon Ltd. (Finland) • University of Leeds (UK) • VTT (Finland)  Contact information  European Commission Project Officer Wolfgang Höfs European Commission DG Information Society Tel: +32.2.2956877 Fax: +32.2.2969548  Project Leader for FRAME-NET Jan Willem Tierolf Rijkswaterstaat - AVV Rotterdam, NL Tel: +31 10 2825879 Fax: +31 10 2825842  Project Leader FRAME-S Richard Bossom Siemens Traffic Controls Poole, Dorset, UK Tel: +44 1202 782216 Fax: +44 1202 782797  [Top](https://webcf.waybackmachine.org/web/20050310190814/http:/www.frame-online.net/aboutFRAME.htm#inizio) |

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| **EUROPEAN ITS ARCHITECTURE** |
| * [**Brief history**](https://webcf.waybackmachine.org/web/20050310190810/http:/www.frame-online.net/eitsfa2.htm#History)**of the European ITS Framework Architecture** * [**Areas covered**](https://webcf.waybackmachine.org/web/20050310190810/http:/www.frame-online.net/eitsfa2.htm#Areas%20covered)**by the Architecture** * [**Overview**](https://webcf.waybackmachine.org/web/20050310190810/http:/www.frame-online.net/eitsfa2.htm#Overview)**of the main features  Note that:** * **Printable versions of the documentation can be found in the**[**LIBRARY**](https://webcf.waybackmachine.org/web/20050310190810/http:/www.frame-online.net/library.htm) * **You can navigate the Functional Architecture by means of the**[**BROWSING TOOL**](https://webcf.waybackmachine.org/web/20050310190810/http:/www.frame-online.net/BrowsingTool/welcome_v3.htm) * **You can create your own Architecture using the**[**SELECTION TOOL**](https://webcf.waybackmachine.org/web/20050310190810/http:/www.frame-online.net/selectiontool.htm)   **History of the Architecture**   * **Version 1.0 was created by the KAREN Project (Keystone Architecture Required for European Networks) and issued in October 2000. It was the result of an effort to create a minimum stable framework necessary for the deployment of working and workable ITS within the European Union until at least 2010. The Architecture focusses mainly on road-based applications. It is planned to extend it in the future to include intermodal interfaces.** * **Version 1.1 was issued in March 2002 by the FRAME Projects. It consists of an update of the previous version and corrects a number of inconsistencies found in Version 1.0. For details of the changes made see the Update Notes (D10) in the**[**LIBRARY**](https://webcf.waybackmachine.org/web/20050310190810/http:/www.frame-online.net/library.htm)**.** * **Version 2.0 was issued in August 2004 by the FRAME Projects. It is an upgrade of the previous version which takes into account the use of the Selection Tool. For details of the changes made see the Update Notes (D11) in the**[**LIBRARY**](https://webcf.waybackmachine.org/web/20050310190810/http:/www.frame-online.net/library.htm)**. Note that this document also includes details of all Update Request and Problem Reports submitted by users.** * **Version 3.0 was issued in November 2004 and incorporates further improvements based on the Update Requests and Problem Reports submitted by users of the ITS Framework Architecture. For details of the changes made see Update Notes (D12).**   [**Top**](https://webcf.waybackmachine.org/web/20050310190810/http:/www.frame-online.net/eitsfa2.htm#inizio)  **Areas covered**  **The following are the FUNCTIONAL AREAS covered by the European ITS Framework Architecture**   * **Electronic Payment Facilities** * **Safety and Emergency Facilities** * **Traffic Management** * **Public Transport Operations** * **Advanced Driver Assistance Systems (ADAS)** * **Traveller Journery Assistance** * **Support for Law Enforcement** * **Freight and Fleet Operations**   [**Top**](https://webcf.waybackmachine.org/web/20050310190810/http:/www.frame-online.net/eitsfa2.htm#inizio)  **Overview**  **The European ITS Framework Architecture is a "tool-box" from which other ITS Architectures and/or systems specifications can be developed. It provides a framework for the development of:**   * **National, Regional or Local ITS Architectures** * **Systems for ITS deployments at national, regional or local level**   **What does it consist of?**   * **User Needs: provide the formal definition of what the stakeholders want an ITS deployment to provide in terms of the services they want to see delivered and any constraints they wish to place on the delivery of these services.** * **Functional Viewpoint: defines the functionality needed by the ITS System to fulfil the User Needs and interface with the outside world. It also includes a definition of the data used by the System as input or output. It is divided into Functional Areas, which are further divided into Functions. All the Areas are provided with diagrams (called Data Flow Diagrams) which show how the functions relate to each other, to Data Stores and to the Terminators (the outside world) through the Data Flows.** * **Physical Viewpoint: describes the various ways the Functional Architecture can be used by defining how the functionalities can be grouped into physical locations to form implementable Systems, taking account of any User Needs that have physical (as opposed to functional) requirements. It consists of a series of "Example Systems" and also provides a description of the methodology for deployment and implementation.** * **Communications Viewpoint: developed from the Physical Architecture and describes the kind of communications links needed in a System in order to support its physical data flows. It may include some requirements from the User Needs, where they relate to specific communication requirements. It consists of an analysis of the communications requirements for several of the "Example Systems" in the Physical Architecture. It also describes the best current communication technologies and standards.** * **Deployment Study: shows how the Systems derived from the Architecture can be deployed and describes some of the ways in which existing systems can be migrated to conform with the European Framework Architecture.** * **Cost Benefit Study: provides a prediction of the likely costs and benefits that can be expected to accrue from the deployment of the Architecture.** * **Organisational Viewpoint: looks at how the organisations responsible for owning, managing or operating sysems can work together in order to deliver the ITS services being developed.** * **Risk Analysis: describes the risks to ITS deployment and categorises them according to the seriousness of their impact. Mitigation strategies may are provided for some of the most severe risks.**   **Other background information on the methodology can be found in the Overview Document (D3.6) in the**[**LIBRARY**](https://webcf.waybackmachine.org/web/20050310190810/http:/www.frame-online.net/library.htm)**.** |

## Library 2005

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| **Available from this page:**   * [**EUROPEAN ITS FRAMEWORK ARCHITECTURE**](https://webcf.waybackmachine.org/web/20050211062722/http:/www.frame-online.net/library.htm#European%20ITS%20Framework%20Architecture) * [**ARCHITECTURE UPDATE NOTES**](https://webcf.waybackmachine.org/web/20050211062722/http:/www.frame-online.net/library.htm#Architecture%20Update%20Notes) * [**REPORTS AND STUDIES**](https://webcf.waybackmachine.org/web/20050211062722/http:/www.frame-online.net/library.htm#Reports%20and%20Studies)**- technical reports produced by the FRAME projects** * [**BROCHURES AND LEAFLETS**](https://webcf.waybackmachine.org/web/20050211062722/http:/www.frame-online.net/library.htm#Brochures%20and%20leaflets)**- information about the FRAME projects, the European ITS Framework Architecture, and ITS in general** * [**NEWSLETTERS**](https://webcf.waybackmachine.org/web/20050211062722/http:/www.frame-online.net/library.htm#Newsletters)**- about FRAME activities** * [**ARTICLES and PAPERS**](https://webcf.waybackmachine.org/web/20050211062722/http:/www.frame-online.net/library.htm#Articles)**- about ITS Architectures** * [**PRESENTATIONS**](https://webcf.waybackmachine.org/web/20050211062722/http:/www.frame-online.net/library.htm#Presentations)**- slides about the FRAME projects** * [**REPORT FORMS**](https://webcf.waybackmachine.org/web/20050211062722/http:/www.frame-online.net/reportforms.htm)**- to inform us about architecture problems or request an update**   **(Except where stated, the above are in PDF form)**  **[European ITS Framework Architecture](https://webcf.waybackmachine.org/web/20050211062722/http:/www.frame-online.net/library.htm)   VERSION 3 (published November 2004)   Written documents relating to the Framework Architecture can be downloaded below.  Version 3.0 contains modifications to some parts of the previous versions of the Architecture. The changes regard above all the User Needs and Functional Viewpoint and affect the documents marked (\*).**  **The changes themselves and the reasons for making them are explained in the**[**Update Notes**](https://webcf.waybackmachine.org/web/20050211062722/http:/www.frame-online.net/library.htm#Architecture%20Update%20Notes)**.**  **(Note that it is also possible to examine parts of the Framework Architecture using the**[**Browsing Tool**](https://webcf.waybackmachine.org/web/20050211062722/http:/www.frame-online.net/BrowsingTool/welcome_v3.htm)**.)**   * **OVERVIEW** [**Main**](https://webcf.waybackmachine.org/web/20050211062722/http:/www.frame-online.net/Karen_doc/d36final.pdf)**1.4MB  (Report D3.6) *Guide to the documents listed below and background to the methodology adopted in the European ITS Framework Architecture*** * **LIST OF USER NEEDS** [**Main**](https://webcf.waybackmachine.org/web/20050211062722/http:/www.frame-online.net/Karen_doc/d22final.pdf)**1.4MB  *(*Report D2.2)*Introduction, description of approach adopted, and analysis;*** [**Appendix F**](https://webcf.waybackmachine.org/web/20050211062722/http:/www.frame-online.net/Karen_doc/d22appf.pdf)**150KB  *List of user needs according to KAREN;*** * **FUNCTIONAL VIEWPOINT** [**Main**](https://webcf.waybackmachine.org/web/20050211062722/http:/www.frame-online.net/Karen_doc/KAREN%20D3.1%20Functional%20Viewpoint%20Version%203.pdf)**\* 700KB  (Report D3.1) *General description of functional needs and explanation of methodology;*** * **PHYSICAL VIEWPOINT** [**Main**](https://webcf.waybackmachine.org/web/20050211062722/http:/www.frame-online.net/Karen_doc/d32final.pdf)**1.5MB (Report D3.2) *Description of how functionalities can be grouped to form usable systems*** [**Annex 1**](https://webcf.waybackmachine.org/web/20050211062722/http:/www.frame-online.net/Karen_doc/d32a1fin.pdf)**2MB *Description of 'example systems' ;*** [**Annex 2**](https://webcf.waybackmachine.org/web/20050211062722/http:/www.frame-online.net/Karen_doc/d32a2fin.pdf)**1.4MB  *Description of functions of data stores, plus templates*** * **COMMUNICATION VIEWPOINT** [**Main**](https://webcf.waybackmachine.org/web/20050211062722/http:/www.frame-online.net/Karen_doc/d33final.pdf)**1.7MB (Report D3.3) *Description of communications links required by systems to support the data flows*** [**Annex 1**](https://webcf.waybackmachine.org/web/20050211062722/http:/www.frame-online.net/Karen_doc/d33a1fin.pdf)**1.4MB  *List of user needs relating to communications*** [**Annex 2**](https://webcf.waybackmachine.org/web/20050211062722/http:/www.frame-online.net/Karen_doc/KAREN%20D3.3%20A2%20Version%202.pdf)**\* 1.5MB  *Technologies used for communications*** * **COST-BENEFIT ANALYSIS** [**Main**](https://webcf.waybackmachine.org/web/20050211062722/http:/www.frame-online.net/Karen_doc/d34final.pdf)**1.5MB  (Report D3.4) *Cost and benefits of development and implementation of framework architectures*** * **MODELS OF ITS** [**Main**](https://webcf.waybackmachine.org/web/20050211062722/http:/www.frame-online.net/Karen_doc/d37final.pdf)**1.5MB  (Report D3.7) *Description of the four models of ITS and their relevance for architecture users*** * **Proposed Framework of Required Standards** [**Main**](https://webcf.waybackmachine.org/web/20050211062722/http:/www.frame-online.net/Karen_doc/d41final.pdf)**1.6MB (Report D4.1) *Identifies existing standards and protocols relevant to the Framework Architecture, recommends future needs*** * **Deployment Approach and Scenarios** [**Main**](https://webcf.waybackmachine.org/web/20050211062722/http:/www.frame-online.net/Karen_doc/d42final.pdf)**1.6MB  *Presents recommendations regarding deployment opf th ITS Architecture*** * **RAID   Risk analysis for ITS architecture development** [**Main**](https://webcf.waybackmachine.org/web/20050211062722/http:/www.frame-online.net/Karen_doc/raid/RAIDMAIN.PDF)**227MB *Approach to the constraints analysis, mitigation strategies and recommendations***[**Annex 1A**](https://webcf.waybackmachine.org/web/20050211062722/http:/www.frame-online.net/Karen_doc/raid/ANNEX_1A.PDF)**139KB  *Red and orange*r*isk database*;**[**Annex 1B**](https://webcf.waybackmachine.org/web/20050211062722/http:/www.frame-online.net/Karen_doc/raid/ANNEX_1B.PDF)**64KB  Yellow *green and blue*risk database** [**Annex 2A**](https://webcf.waybackmachine.org/web/20050211062722/http:/www.frame-online.net/Karen_doc/raid/ANNEX_2A.PDF)***Database description***[**Annex 2B**](https://webcf.waybackmachine.org/web/20050211062722/http:/www.frame-online.net/Karen_doc/raid/ANNEX_2B.PDF)**Background information;**[**Annex 2C**](https://webcf.waybackmachine.org/web/20050211062722/http:/www.frame-online.net/Karen_doc/raid/ANNEX_2C.PDF)***Risk analysis results*** * **CONVERGE   Best Practice** [**Main**](https://webcf.waybackmachine.org/web/20050211062722/http:/www.frame-online.net/Karen_doc/Converge/ArchGuidelines.PDF)**509KB  *Description of best practice in relation to ITS architecture***   [**Top**](https://webcf.waybackmachine.org/web/20050211062722/http:/www.frame-online.net/library.htm#inizio)  **Architecture Update Notes  The following documents provide details of the changes made in all versions of the European ITS Framework Architecture developed by the FRAME projects. Annex 2 of D11 (relating to version 2.0) also applies to D12 (relating to version 3.0).**   * **D10 - Update Notes for Version 1.1 (  MB)** * **D11 -**[**Main doc**](https://webcf.waybackmachine.org/web/20050211062722/http:/www.frame-online.net/Reports&OtherDocs/FRAME%20D11.pdf)**(259 KB) Update Notes for Version 2.0**[**Annex 1**](https://webcf.waybackmachine.org/web/20050211062722/http:/www.frame-online.net/Reports&OtherDocs/FRAME%20D11%20-%20Annex%201.pdf)**(350 KB) Analysis of Update Requests and Problem Reports**[**Annex 2**](https://webcf.waybackmachine.org/web/20050211062722/http:/www.frame-online.net/Reports&OtherDocs/FRAME%20D11%20-%20Annex%202.pdf)**(725 KB) Update Request Details** * **D12 -**[**Main doc**](https://webcf.waybackmachine.org/web/20050211062722/http:/www.frame-online.net/Reports&OtherDocs/FRAME%20D12.pdf)**(303 KB) Update Notes for Version 3.0**   **Reports and Studies  FRAME-S Reports**   * **D14**[**GUIDE TO CONFIGURATION MANAGEMENT**](https://webcf.waybackmachine.org/web/20050211062722/http:/www.frame-online.net/Reports&OtherDocs/D14%20Guide%20to%20ConfigurationManagement.ZIP)**(PDF zip 175KB) Detailed indications for architecture developers on how to keep track of the modifications made in new versions (issued April 2003)**   **FRAME-NET Reports  The FRAME-NET Work Groups have published five reports:**   * **INTERMODALITY STUDY (zipped PDF 1.2MB)** [**Report D3.1**](https://webcf.waybackmachine.org/web/20050211062722/http:/www.frame-online.net/Reports&OtherDocs/ReportD3-1%20Intermodality%20FRAME-Oct02.zip)**issued October 2002 A study which assesses whether and how to extend the European ITS Framework Architecture to intermodal and multimodal transport** * **NATIONAL VALIDATION STUDY (zipped PDF 742KB)** [**Report D3.2**](https://webcf.waybackmachine.org/web/20050211062722/http:/www.frame-online.net/Reports&OtherDocs/D3.2%20Validation%20Feb04.zip)**issued February 2004 A review of experience in national ITS architecture initiatives to assess the 'useability' and 'usefulness' of the European ITS Framework Architecture, plus an inventory of national ITS architecture initiatives in Europe.** * **NAVIGATION TOOL VALIDATION (zipped PDF 582KB)** [**Report D3.3**](https://webcf.waybackmachine.org/web/20050211062722/http:/www.frame-online.net/Reports&OtherDocs/D3.3_Nav_Tool_Validation_Nov04.zip)**issued November 2004 Development guidelines and validation of the Browsing and Selection Tools developed by FRAME-S for the examination and use of the Framework Architecture.** * **IMPACT ANALYSIS (zipped PDF 1.48MB)** [**Report D3.4**](https://webcf.waybackmachine.org/web/20050211062722/http:/www.frame-online.net/Reports&OtherDocs/D3.4%20Impact%20Analysis.zip)**issued December 2003 An analysis of the costs and benefits of developing a Framework Architecture** * **CLUSTER REPORT (PDF 221KB)** [**Report D3.5**](https://webcf.waybackmachine.org/web/20050211062722/http:/www.frame-online.net/Reports&OtherDocs/D3.5ClusterReport%20Nov04.pdf)**issued November 2004**   [**Top**](https://webcf.waybackmachine.org/web/20050211062722/http:/www.frame-online.net/library.htm#inizio)  **Brochures and leaflets**   * [**Project Brochure**](https://webcf.waybackmachine.org/web/20050211062722/http:/www.frame-online.net/Brochures/Brochure-1%20Sept2001.pdf)**(Sept 2001) 958KB explains the objectures of the FRAME Projects** * [**Folder Insert**](https://webcf.waybackmachine.org/web/20050211062722/http:/www.frame-online.net/Brochures/frame%20inserts%20Nov%2003%20final.pdf)**(Nov 2003) 334KB descriptions of major FRAME-based national architectures** * [**Planning a Modern Transport System**](https://webcf.waybackmachine.org/web/20050211062722/http:/www.frame-online.net/Brochures/ITS%20Planning%20Guide%20Issue%202%20.pdf)**: A guide to ITS Architecture (Issue 2) (April 2004) 766KB 20-page colour brochure explaining what an ITS architecture is and how to create one** * [**About ITS**](https://webcf.waybackmachine.org/web/20050211062722/http:/www.frame-online.net/Brochures/About%20ITS.PDF)**(Feb 2004) A 3-page leaflet explaining the main benefits of ITS** * [**What is ITS?**](https://webcf.waybackmachine.org/web/20050211062722/http:/www.frame-online.net/Brochures/What-is-ITS.PDF)**(Feb 2004) longer version of above leaflet describing some typical ITS applications**   **Newsletters**   * [**September 2004**](https://webcf.waybackmachine.org/web/20050211062722/http:/www.frame-online.net/Newsflashes/FRAME%20Newsletter5%20Sept%202004.pdf) **News of meeting with EC in June, report on sessions in Budapest and examples of recent ITS architecture deployment in France and Italy.** * [**April 2004**](https://webcf.waybackmachine.org/web/20050211062722/http:/www.frame-online.net/Newsflashes/FRAME%20Newsletter4%20April%202004.pdf) **News of training seminar held in Spain. Programme of 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# E-FRAME

**ublic Deliverables**

**Project Factsheet**

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**Extended FRAME Architecture for Cooperative Systems**

**"**[**FRAME V4.1 - Cooperative ITS Extended**](https://webcf.waybackmachine.org/web/20120528083224/http:/www.frame-online.net/node/122)**" is now available. It contains the Cooperative Systems services and applications developed by the COOPERS, CVIS and SAFESPOT FP6 Integrated Projects.**

**A full description of the FRAME Architecture, and the work done to create this version, can be found in**[**download**](https://webcf.waybackmachine.org/web/20120528083224/http:/frame-online.net/sites/default/files/eframe-project/deliverables/D15%20-%20FRAME%20Architecture%20V4.1.zip)**(6 MB zip file).**

**Consolidated User Needs for Cooperative Systems**

**This document has two principal aims.  As a deliverable of the E-FRAME project its primary aim is to describe the extensions to the User Needs that were necessary to include Cooperative Systems within the European ITS Framework (FRAME) Architecture.  The secondary aim is to provide a document that describes the FRAME User Needs in general, and that can replace the corresponding document produced by the FPIV project KAREN, some of whose contents are no longer relevant.**

[**Download**](https://webcf.waybackmachine.org/web/20120528083224/http:/frame-online.net/sites/default/files/eframe-project/deliverables/D13%20-%20Consolidated%20UNs%20for%20Coop%20Systems%20-%20Issue.pdf)**(1.4 MB)**

**The FRAME Architecture and the ITS Action Plan**

**This booklet explains how the FRAME Architecture can be used to support the ITS Directive and the ITS Action Plan.**

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**Physical and Communications Viewpoints for ITS Architectures of Cooperative Systems**

**This document provides an introduction to creating ITS System Architectures for Cooperative Systems applications with the FRAME Architecture tools, and demonstrates this process using two examples from cooperative ITS. The first of which represents the first level priority services for the European TEN-T Network of the Cooperative Systems Task Force of the EasyWay project, and the second represents an example called “Traffic Adaptive Crossing” which can be installed on any road intersection.**

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**Cooperative Systems: Deployment and Organisational Issues**

**This booklet discusses the non-technical issues related to the deployment of integrated cooperative systems, and the role of the FRAME Architecture. It is a summary of the document "Deployment and Organsiational Issues for Cooperative Systems" (see below)**

[**Download**](https://webcf.waybackmachine.org/web/20120528083224/http:/frame-online.net/sites/default/files/first-view/further-reading/Coop%20Systems%20-%20Depl%20%26%20Org.pdf)**(2.8MB)**

**Deployment and Organisational Issues for Cooperative Systems**

**The deployment of integrated Cooperative Systems, by definition, involves players from many different sectors: the automotive industry, road operators and telecommunications operators, as well as road-based service and equipment providers. Real world deployment will require the definition of new relationships between these players as well as the solution of technical, organisational and business issues. Further unsolved issues cover communication technologies and protocols, safety issues, security and privacy issues, and liability and legal issues. The FRAME Architecture provides a tool and a methodological approach which can be used to help plan the deployment of integrated ITS for a nation, region, city or project. By creating various viewpoints – functional, physical, communications – a foundation can be produced to analyse and help solve the issues.**

[**Download**](https://webcf.waybackmachine.org/web/20120528083224/http:/frame-online.net/sites/default/files/eframe-project/deliverables/D10%20Deployment%20and%20Organisational%20Issues%20v1.0a.pdf)**(1.8 MB) - A short version can be found in the booklet "Cooperative Systems: Deployment and Organisational Issues" (see above)**

**Current cooperative systems standardisation and its relation to ITS Architecture**

**The objective of this document is to describe the links between the current (July 2011) standardization activities, with an emphasis on cooperative systems, and ITS architecture. It also provides guidelines for the use of standards in this area by giving information on Standards Development Organizations, the main standards currently available, ongoing activities (including the work being done in response to Mandate M/453) and makes recommendations for the usage of standards together with the cooperative systems architecture. Finally, this document proposes measures or tools for a more efficient and better utilization of standards.**

[**Download**](https://webcf.waybackmachine.org/web/20120528083224/http:/frame-online.net/sites/default/files/eframe-project/deliverables/D16%20-%20Current%20Cooperative%20Systems%20Standardisation_v1.2a.pdf)**(1 MB)**

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