

A short introduction to ITS

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TBA 4286 Traffic Engineering and ITS
BA6062 Trafikkmodeller og ITS

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ITS - Intelligent Transport Systems (and Services)

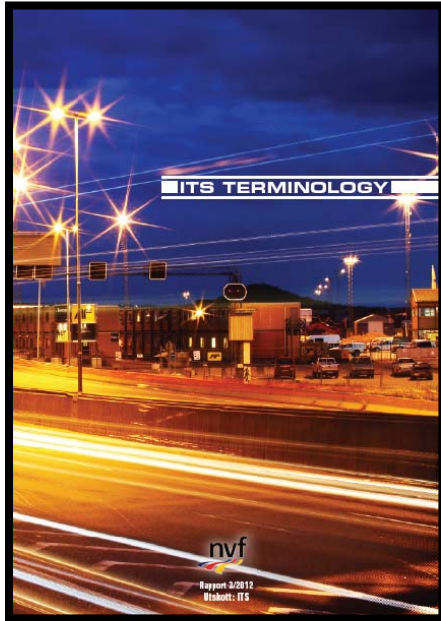
Information and communication technologies and services applied to transport and the related infrastructure

ITS incorporates solutions using ICT in a traffic or transport system.

The intention is to influence user behaviour and improve transport solutions and management in order to improve

- traffic safety and security
- mobility and efficiency
- sustainability including air and noise pollution
- accessibility and user satisfaction

ITS Terminology – see www.its-terminology.com



- Originally published by Nordic Road Association, ITS group (NVF-ITS) and the Nordic road administrations
- Cooperation between road and transport administrations Norway, Sweden, Denmark and Finland
- First edition 1997 (230 terms)
- Second edition 2002 (490 terms)
- Third edition 2012 (870 terms)
- Fourth edition 2018 (1060 terms) **soon available**
- This terminology is internationally accepted and adopted by PIARC, CEN, ERTICO, EU etc
- Authors / experts (ver 4):
 - Kristian Appel, Finland
 - Arvid Aakre, Norway
 - Peter Kronborg, Sweden
- www.its-terminology.com (ver 4)
 - www.nvf-dictionary.org (on-line database, ver 3)
 - www.nvfnorden.org (ITS, Publications, ver 3)

NPRA – ITS Strategy and action plan

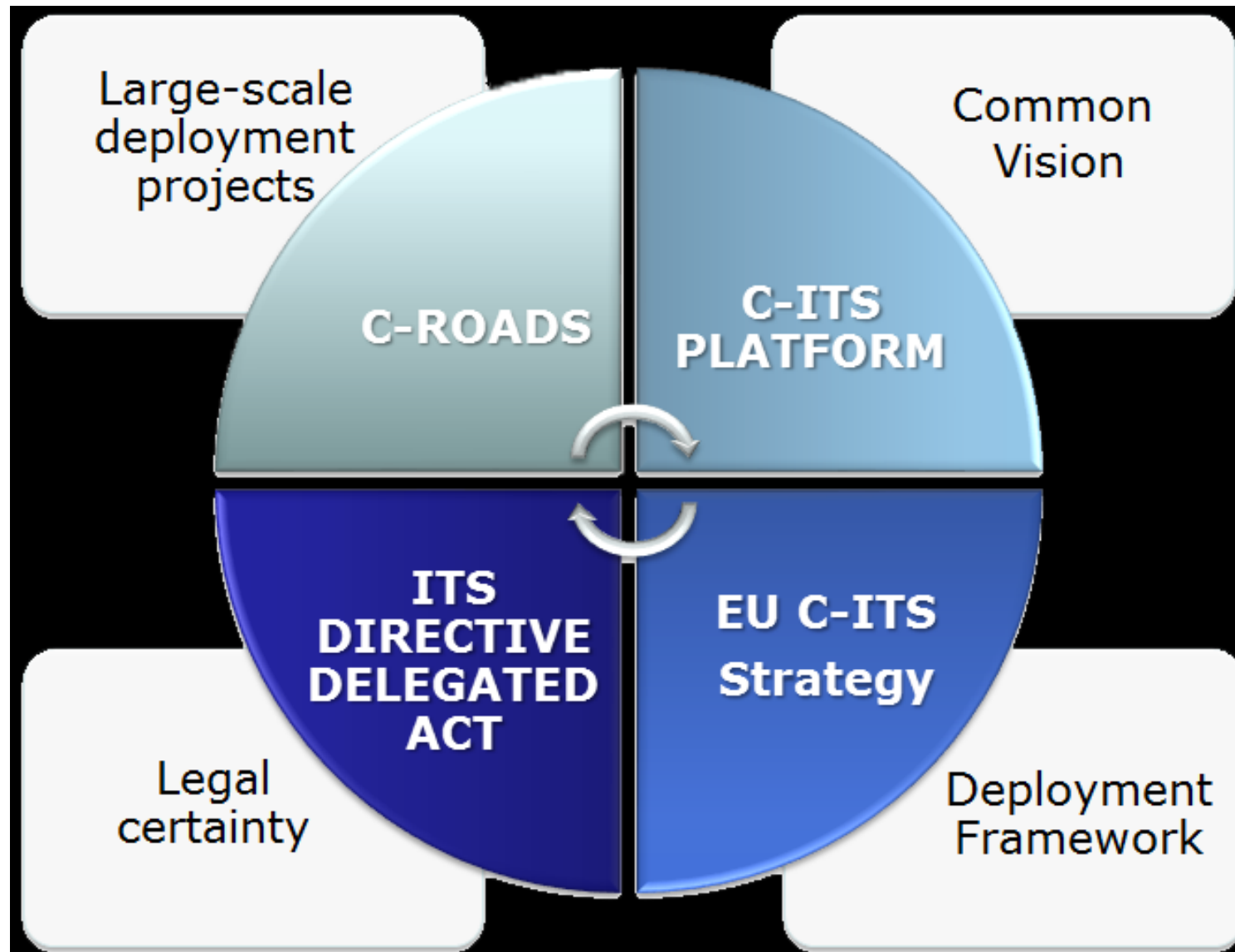


www.vegvesen.no/fag/trafikk/ITS

EU - ITS Action Plan and ITS Directive

| | |
|--|---|
| Optimal Use of Road, Traffic and Travel Data | Continuity of Traffic and Freight Management |
| Road Safety and Security | Integration of Vehicle and Transport Infrastructure |
| Data Protection and Liability | |
| European ITS Coordination | |

Cooperative, connected and automated mobility (C-ITS)



- CAPITAL is a support action funded by the European Union which aims to design and deliver a collaborative and free capacity-building programme within ITS

9 new courses start on 15th of April 2018:

- TMC and roadside technologies for ITS
- Introduction to ITS and C-ITS
- ITS and C-ITS user services
- Standards, architectures and communication technologies for ITS and C-ITS
- Information security, data protection and privacy
- Financial incentives and business and procurement models for C-ITS deployment
- Cost-benefit analyses of ITS services
- Impact assessment of ITS and C-ITS systems
- Guidance in deploying ITS and C-ITS



Information security, data protection and

Developing applied tools for privacy and data protection in C-ITS.

Starts: Apr 15, 2018



Financial incentives and business and

Learn about stakeholder perspectives, governance schemes and data exchange.

Starts: Apr 15, 2018



Guidance in deploying ITS and C-ITS

Introducing policy frameworks, implementation strategies and roadmaps for ITS and C-ITS.

Starts: Apr 15, 2018



Cost-benefit analyses of ITS services

Learn the main concepts for carrying out a cost-benefit analysis for the deployment of

Starts: Apr 15, 2018



Introduction to ITS and C-ITS

Introductory course for anyone who wants to understand the fundamentals of ITS and C-ITS.

Starts: Apr 15, 2018



Standards, architectures and communication

Learn about interoperability, testing and certification of ITS and C-ITS services.

Starts: Apr 15, 2018



Impact assessment of ITS and C-ITS systems

Learn about methods for evaluating ITS and C-ITS.

Starts: Apr 15, 2018



TMC and roadside technologies for ITS

Explore a C-ITS approach in the context of traffic control and management.

Starts: Apr 15, 2018



ITS and C-ITS user services

An overview of the benefits and challenges of existing and new C-ITS services for professional

Starts: Apr 15, 2018

Cooperative systems (C-ITS)



SAE levels of vehicle automation

| SAE level | Name | Narrative Definition | Execution of Steering and Acceleration/Deceleration | Monitoring of Driving Environment | Fallback Performance of <i>Dynamic Driving Task</i> | System Capability (<i>Driving Modes</i>) |
|---|-------------------------------|--|---|-----------------------------------|---|--|
| Human driver monitors the driving environment | | | | | | |
| 0 | No Automation | the full-time performance by the <i>human driver</i> of all aspects of the <i>dynamic driving task</i> , even when enhanced by warning or intervention systems | Human driver | Human driver | Human driver | n/a |
| 1 | Driver Assistance | the <i>driving mode</i> -specific execution by a driver assistance system of either steering or acceleration/deceleration using information about the driving environment and with the expectation that the <i>human driver</i> perform all remaining aspects of the <i>dynamic driving task</i> | Human driver and system | Human driver | Human driver | Some driving modes |
| 2 | Partial Automation | the <i>driving mode</i> -specific execution by one or more driver assistance systems of both steering and acceleration/deceleration using information about the driving environment and with the expectation that the <i>human driver</i> perform all remaining aspects of the <i>dynamic driving task</i> | System | Human driver | Human driver | Some driving modes |
| Automated driving system ("system") monitors the driving environment | | | | | | |
| 3 | Conditional Automation | the <i>driving mode</i> -specific performance by an <i>automated driving system</i> of all aspects of the dynamic driving task with the expectation that the <i>human driver</i> will respond appropriately to a <i>request to intervene</i> | System | System | Human driver | Some driving modes |
| 4 | High Automation | the <i>driving mode</i> -specific performance by an automated driving system of all aspects of the <i>dynamic driving task</i> , even if a <i>human driver</i> does not respond appropriately to a <i>request to intervene</i> | System | System | System | Some driving modes |
| 5 | Full Automation | the full-time performance by an <i>automated driving system</i> of all aspects of the <i>dynamic driving task</i> under all roadway and environmental conditions that can be managed by a <i>human driver</i> | System | System | System | All driving modes |

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Some aspects of automation

- **Comfort**

This is quite «simple», we have lots of these systems today

- **Environment**

It is possible to optimize the driving process to reduce emissions and other environmental impacts

- **Safety**

Safety is very important and a critical factor to get acceptance of automation (responsibility, functionality, create / avoid accidents)

- **Efficiency**

It is a large potential for increased efficiency, but this is quite difficult and it will probably require many years of experience and development to get real benefits

Automation – man vs machine

- Will automated systems be better than manual systems?
- The answer is probably both YES and NO
- Automated systems
 - Might reduce errors ?
 - Might be more consistent ?
 - Might react and communicate fast
 - Might optimize for the community
 - Might see without visibility, will never be tired etc
- Manual systems
 - Might evaluate and give priority to the most important details ?
 - Might use own experience and preferences to adjust driving ?
 - Might be more flexible ?
 - Might work better during bad weather conditions ?
- Acceptance, security, hacking, liability, terror, privacy etc ?