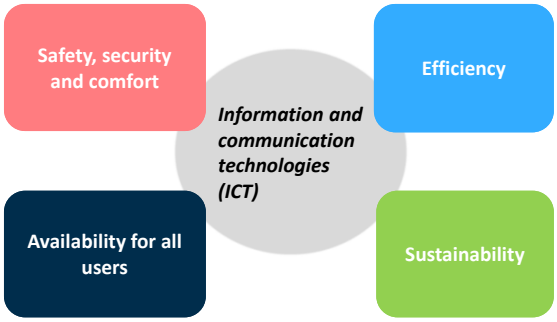
Content

- What is ITS and ITS services
- Examples on ITS services that will support tunnel safety

Intelligent transport systems (ITS) are transport systems where information and communication technologies (ICT) has been implemented making the transport systems more safe and secure, more comfortable, more efficient, more available for all types of users and more sustainable.



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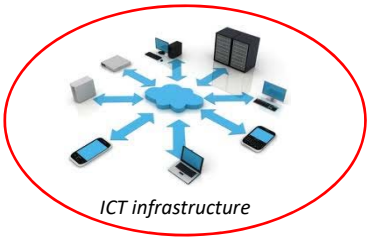
ITS objects

Road infrastructure

Vehicles with persons and/or goods

Infrastructure equipment



ICT infrastructure

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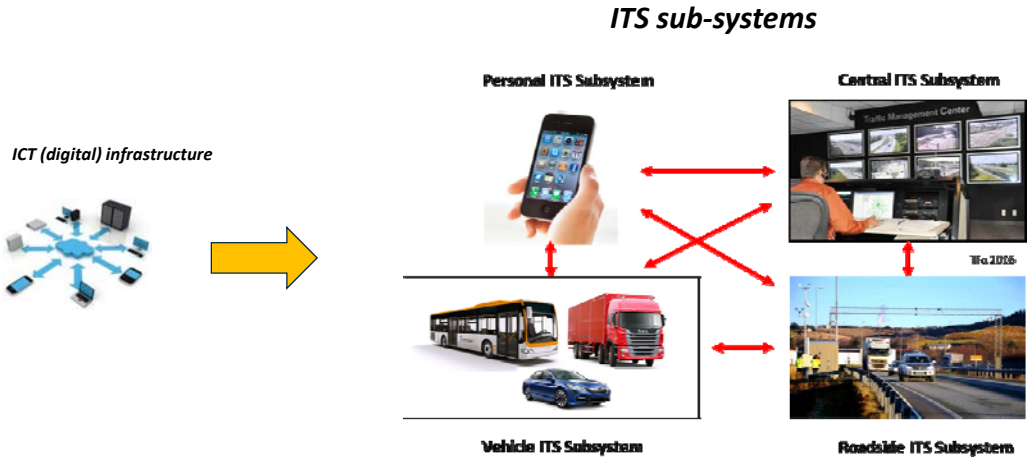
Main objects in the ICT (digital) infrastructure



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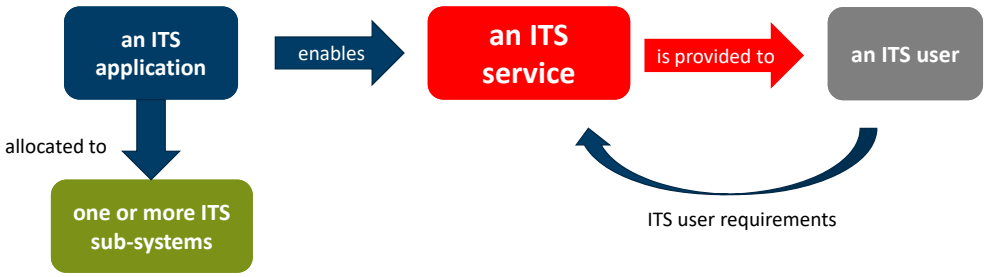
ITS service

Definition: *A functionality provided by the ITS to an ITS user fulfilling the user requirements to safety, security, efficiency, sustainability and availability*



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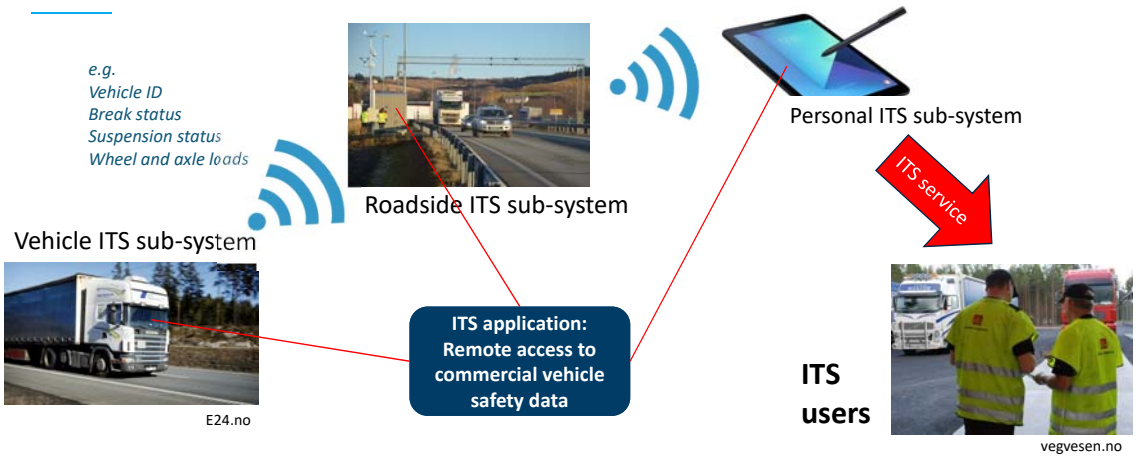
Example: ITS Service::Remote access to commercial vehicle safety data[1]



1) ISO 14813-1:2014 ITS – Reference model architecture for the ITS sector – Part 1: ITS service domains, service groups and services

ITS services in ISO 14813-1

Relevant ITS service domains (3 of 13 domains)

- Traffic management and operations
- Freight transport
- Emergency services

Some examples from the domain called *Traffic management and operations*

Traffic monitoring (traffic data collection)

Available traffic data

- Traffic flow rate
- Vehicle speeds
- Headway between vehicles
- Physical parameters (length, width, height, axles and wheel)
- Licence plate number
- Level of service
- AutoPASS tag in Heavy Goods Vehicles (mandatory)

Vehicle data

- Vehicle break temperature

pixapay.com

Incident monitoring and confirmation

flir.com

thesun.co.uk

aaanything.net

flir.com

brisbanetimes.com.au

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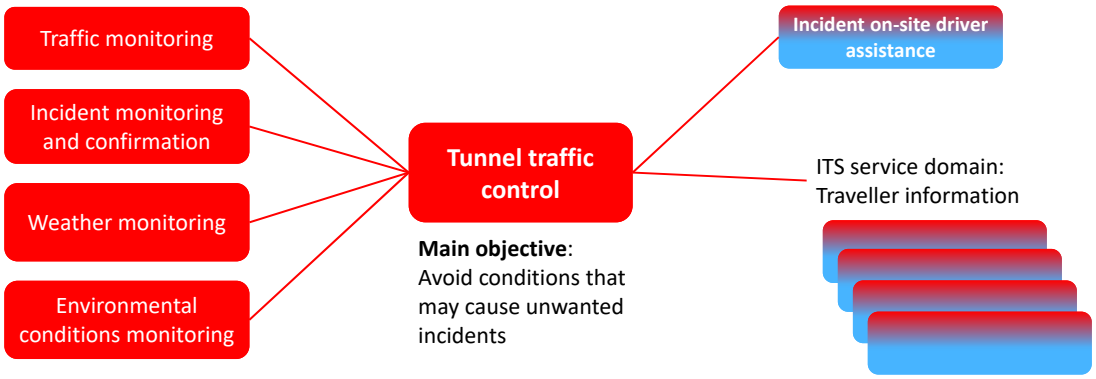
Tunnel (freeway) traffic control



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Some examples from the domain called *Freight transport*

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Remote access to commercial vehicle data

Creditnews.no

- Vehicle ID
- Transport operator ID
- Wheel and axle loads
- Maintenance and repairs
- Break status, e.g. temperature
- Suspension condition
- Engine status, e.g. temperature
- Tyre wear and pressure
- Fuel state

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Commercial vehicle cargo state monitoring

Real time monitoring of:

- Physical characteristics like temperature, pressure, moisture or weight
- Status of any ongoing chemical or physical processes
- Position of the cargo on the vehicle and any changes

Warning to the driver and/or to remote facilities, e.g. fleet management and traffic control centres

flom.no

glomdalen.no

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Dangerous goods movement data collection and sharing

Forskningsradet.no

What?
How much?
What type of vehicle?
Planned route?
Where? (real time position of the transport)

Database

Police

blalys.net

Emergency services

blalys.net

tv2.no

Road authorities

Statens vegvesen

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Dangerous goods movement police/safety coordination

- Planning, registration and approval process for the route
- Identification and implementation of safety measures
- Real-time monitoring of the vehicle
- Provision and implementation of escorting vehicles

Co-ordination

Road authorities

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Some examples from the domain called *Emergency services*

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User-initiated emergency call

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Emergency message (voice or digital)

Emergency message response (voice or digital)

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Automated emergency call and mayday (eCall)

Emergency message (eCall message) triggered by vehicle sensors

Emergency message response (voice or digital)

nrk.no

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Conclusions

- There are many different ITS services that will improve tunnel safety and support tunnel traffic monitoring and management.
- Most services have already today a high Technological Readiness Level (TRL)
- Some services require Vehicle ITS sub-systems that do not have the needed TRL today
- The safety impact of the different ITS services is difficult to quantify due to lack of empirical data, different contexts from one tunnel to another and fast technological developments.

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Thank you for your attention!

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