

FRAME User Needs V4.1

Abbreviations and Terms

The following words and abbreviations have the following meaning when used within the FRAME User Needs.

Abbreviation or Term	Meaning
ABS	Anti-lock Braking System
Access Control Centre	The (organisation and) systems that control access to a specific area, e.g. designated residential area, commercial premises.
Black box	A system within a vehicle that records key data and, whenever an incident occurs, e.g. an accident, stores that data for future analysis.
Blue corridor	The result of informing the drivers of other vehicles that an emergency vehicle is approaching in time for those vehicles to move out of the way of the emergency vehicle.
Blue wave	The synchronisation of traffic signals to (try to) ensure that an emergency vehicle never has to stop at a traffic signal.
Consignee	The receiver of goods
Consignor	The sender of goods
Demand responsive public transport	A form of public transport whose precise route can be varied at the request of the passengers, e.g. to pick up or drop off.
eCall	A system that enables the emergency services to be called either automatically, or at the request of a vehicle occupant.
Electronic towbar	A system which enables a platoon of HGVs to be established, i.e. only the first vehicle requires a human driver.
Equipment	When related to HGVs, this term refers to the part that is carrying the goods.
ESP	Electronic Stability Program
ETA	Estimated Time of Arrival
FCD	Floating Car Data – a basic set of data obtained from a vehicle that is part of the current traffic. See also XFCD.
FFM	Freight and Fleet Management
HGV	Heavy Goods Vehicle – a truck/lorry with a weight of over 3500kg and for which special regulations can apply.
Holding zone	A designated area used to park goods carrying vehicles if their final destination for (un)loading is not currently available.

Host vehicle	A vehicle which is carrying the system in question.
HOV	High Occupancy Vehicle – A vehicle with one or more passengers in addition to the driver.
Ghost driver	A vehicle that is being driven the wrong way along a carriageway, e.g. one-way street, motorway.
Green wave	The synchronisation of traffic signals to (try to) ensure that most vehicles do not have to stop at a traffic signal.
Hazardous goods	Goods carried on a vehicle that require the application of special safety precautions during their transport, and that may need to be declared to the road authorities before transit.
ISA	Intelligent Speed Adaptation – a system within a vehicle that keeps that vehicle below a given speed, unless overridden by the driver.
Link	A section of a road network, normally between two (not necessarily consecutive) road intersections (e.g. motorway junctions).
O-D	Origin to Destination – used to indicate the start and finish points of a (partial) journey.
P+R	Park and Ride – A car park with associated public transport, normally to get the vehicle occupants into city centres.
Platooning	A system whereby vehicles are grouped together with electronic coupling so that they follow the behaviour of the lead vehicle automatically.
POI	Point of Interest – a specific point location that someone may find useful or interesting.
PT	Public Transport – busses or trams that share (part of) the road system with road vehicles.
Ramp metering	The use of a basic traffic signal to regulate the flow of traffic entering a motorway according to current traffic conditions
Rest area	A designated area for vehicles, in particular heavy goods vehicles, to be parked in order that their drivers can rest for a length of time.
Service provider	An organisation that supplies an ITS service to users, often for payment. It may or may not own (part) of the equipment used to provide that service, but it does provide the contact point for the users.
System	A set of interacting or interdependent components forming an integrated whole that conform to the FRAME Architecture.
Tachograph	A device that records a vehicle's speed over time.
TCC	Traffic Control Centre – the organisation and systems that control or manage the road traffic on a set of roads, either urban or inter-urban.

TIC	Traffic Information Centre – the organisation and systems that provide traffic and travel information to pre-trip and on-trip travellers, both passengers and drivers.
Tidal Flow	The use of a lane on which traffic may travel in either direction, depending on certain conditions, e.g. at rush hours.
V2I	Vehicle-to-Infrastructure communications – Communications from a vehicle to a stationary unit either at the road side, or at a communications centre.
V2V	Vehicle-to-Vehicle communications
Virtual cone zone	A set of electromagnetic signals that, together, indicate a section of road for which there is no access for normal traffic.
VMS	Variable Message Sign – an electronic traffic sign often used to give travelers information about incidents or special events
VRU	Vulnerable Road Users – e.g. pedestrians and cyclists
Weigh in motion	Devices designed to capture and record axle weights and gross vehicle weights as vehicles drive over a measurement site.
XFCD	Extended Floating Car Data – a full set of data obtained from a vehicle that is part of the current traffic. See also FCD.

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Group	No	Description	Similar
General	1	<i>This group contains the properties that either the Framework Architecture should possess, or that systems built in conformance to the Framework Architecture should possess.</i>	
1.1 Architectural Properties	1.1.1	The Framework Architecture description shall include functional, information, physical and communication perspectives.	
	1.1.2	The Framework Architecture description shall include a number of reference models to describe the relationships between the services needed within the traffic and transport system.	
	1.1.3	The Framework Architecture description shall include a glossary to explain all the main concepts described in the architecture.	
	1.1.4	The Framework Architecture shall be provided in a form which enables it to be up-dated after delivery.	
	1.1.5	The Framework Architecture shall be technology independent.	
	1.1.6	The Framework Architecture shall facilitate the creation of modular and flexible designs, so that manufacturers can produce their own versions of equipment.	
	1.1.7	The Framework Architecture shall allow equipment performing the same service to be provided by various suppliers.	
	1.1.8	The Framework Architecture shall allow the same service to be provided by various service providers.	
	1.1.9	The Framework Architecture shall allow the user to select from one of a number of suppliers of the same service.	
	1.1.10	The Framework Architecture shall support interaction between services provided by private and public bodies.	
	1.1.11	The Framework Architecture shall allow current organisational responsibilities and legal liabilities to be retained.	

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	1.1.12	The Framework Architecture shall, where possible, describe migration path(s) that can be followed to enable architectures defined for existing traffic and transport management, as well as other ITS control and information systems, to become compliant.	
	1.1.13	The Framework Architecture shall allow the use of existing and emerging communication infrastructures, or describe possible migration paths to explain how they can become compliant.	
	1.1.14	The Framework Architecture shall support the integration of Traffic Information Centres and Traffic Control Centres into national and international networks.	
	1.1.15	The Framework Architecture description shall identify clearly the relevant interfaces to other modes of transport.	
1.2 Data Exchange	1.2.1	The Framework Architecture shall provide a high level description of the message sets and data communication protocols to be used in data transfers.	
	1.2.2	The Framework Architecture shall provide a high level description of data stores and data flows, and shall have a single data dictionary.	
	1.2.3	Systems that conform to the Framework Architecture shall exchange information in a manner that permits a given geographic location to be understood by all parties.	
	1.2.4	Systems that conform to the Framework Architecture shall exchange information in a manner that permits road and traffic conditions to be understood by all parties.	
	1.2.5	The Framework Architecture shall provide a high level description of the message sets used to exchange data with external interfaces.	
	1.2.6	The Framework Architecture shall support the use of seamless communications. This shall mean that the use of different communication networks is transparent i.e. switches are made without the intervention of the final user.	
	1.2.7	Systems that conform to the Framework Architecture shall classify incidents, their severity and reference their locations in a standard way.	1.2.4

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Group	No	Description	Similar
	1.2.8	Systems that conform to the Framework Architecture shall provide coherent and consistent advice to all drivers affected by an incident or congestion.	
1.3 Adaptability	1.3.1	Systems that conform to the Framework Architecture shall be able to provide facilities that accommodate the needs of disabled and elderly persons, when relevant.	
	1.3.2	Systems that conform to the Framework Architecture shall be able to provide facilities to enable data about the travel network to be entered and updated.	
	1.3.3	The Framework Architecture shall not constrain its functionality to be implemented in a single topographical domain, be it urban, inter-urban or rural.	
	1.3.4	The Framework Architecture shall not constrain its functionality to be implemented by specific local organisations.	
	1.3.5	The Framework Architecture shall not constrain user interfaces to be of a particular type, or from a particular manufacturer.	
	1.3.6	The Framework Architecture shall not require that each of its user interfaces must operate on a specific item of equipment, unless it is for safety reasons.	
	1.3.7	Systems developed from the Framework Architecture shall be able to use a digital map which contains the necessary additional data, e.g. speed limits, curvature of corners, (bus) lanes, traffic signals.	
1.4 Constraints	1.4.1	The Framework Architecture shall require all systems developed from it to comply with current European and National laws concerning data security, user anonymity and the protection of individual privacy.	
	1.4.2	The Framework Architecture shall require all systems developed from it to comply with the traffic laws and regulations that apply in Europe.	
	1.4.3	The Framework Architecture shall conform to relevant MoU, European directives and guidelines, and European (de facto-) standards.	

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Group	No	Description	Similar
1.5 Continuity	1.5.1	The Framework Architecture shall provide functionality such that the quality of information content is continuous and consistent, both in time and space (i.e. as the traveller moves).	
	1.5.2	The Framework Architecture shall provide functionality that can accommodate environmental stress and infrastructure failures.	
1.6 Cost/Benefit	1.6.1	Whenever possible and practical, the Framework Architecture shall use the same data as input to several parts of its functionality.	
	1.6.2	The Framework Architecture shall avoid the need for unnecessary multiple data sources or redundant data management.	
	1.6.3	The Framework Architecture shall require all systems developed from it to be able to use the most cost-effective means of communication available.	
	1.6.4	The Framework Architecture shall require all systems developed from it to enable operating costs to be reduced whenever possible, when compared with the systems that they replace.	
	1.6.5	The Framework Architecture shall require all systems developed from it that require payment from a user to be able to manage fees/fares.	
	1.6.6	The Framework Architecture shall require all systems developed from it that require payment from a user to be able to receive fees/fares.	
	1.6.7	Systems upgraded to conform to the Framework Architecture, and providing the same services, shall produce financial benefit to their owners.	
	1.7 Expandability	1.7.1	The Framework Architecture shall allow systems developed from it to have an evolutionary development strategy that enables their continuous upgrading.
1.7.2		The Framework Architecture shall provide services that are not constrained to operate in a particular geographic region.	

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1.8 Maintainability	1.8.1	The Framework Architecture shall require all systems developed from it to be capable of being repaired.	
	1.8.2	The Framework Architecture shall require all systems developed from it to be easily maintainable with minimum disturbance.	
1.9 Quality of Data Content	1.9.1	The Framework Architecture shall enable all information systems developed from it to provide data with a stated accuracy, either as additional information or as part of the documentation, at all times.	
	1.9.2	The Framework Architecture shall require all systems developed from it to check all input data for validity, whenever possible, and to report failures.	
	1.9.3	The Framework Architecture shall enable all systems developed from it to check data values by comparing different sources, when available, so as to ensure high-accuracy and completeness.	
	1.9.4	The Framework Architecture shall require all systems developed from it to manage local/regional/national databases in a consistent way.	
1.10 Robustness	1.10.1	The Framework Architecture shall allow all systems developed from it to be able to detect errors in operation, when higher integrity is required, e.g. for financial, security or safety reasons.	
	1.10.2	Systems that conform to the Framework Architecture shall be able to monitor each safety-related component (including software), warn the user in case of problems, and disable it, or reduce it to a safe state.	
	1.10.3	The Framework Architecture shall require all safety-related systems developed from it to be fault-tolerant.	

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	1.10.4	The Framework Architecture shall require all systems developed from it to be reliable with respect to the legal and/or quality requirements necessary for each application.	
	1.10.5	The Framework Architecture shall require all systems developed from it to be able to operate in all potential climatic and traffic conditions.	
	1.10.6	Systems developed from the Framework Architecture shall be able to check input data for reasonableness before it is used by a later part of the system.	
	1.10.7	Systems developed from the Framework Architecture shall be able to obtain vehicle data in a manner that does not affect the correct functioning of the safety functions of the host vehicle.	
	1.10.8	Systems developed from the Framework Architecture shall be able to inform drivers via an in-vehicle device when it is not operating correctly.	
1.11 Safety	1.11.1	The Framework Architecture shall provide functionality that operates in a manner that does not generate a safety hazard for its users.	
	1.11.2	The Framework Architecture shall provide functionality that operates in a manner that does not encourage unsafe behaviour.	
	1.11.3	The Framework Architecture shall provide functionality that operates in a safe manner during degraded modes of operation.	
	1.11.4	The Framework Architecture shall provide functionality that is ultimately under the control of the human operator.	
	1.11.5	Systems developed from the Framework Architecture shall display information in a manner that will avoid driver overload, and distraction from the primary driving task.	
	1.11.6	Systems developed from the Framework Architecture shall display messages to the driver in a priority order that relates to the current traffic and driving situation and the workload of the driver.	1.13.5

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Group	No	Description	Similar
1.12 Security	1.12.1	The Framework Architecture shall require that systems developed from it are capable of surviving accidental and intentional attacks on their integrity.	
	1.12.2	The Framework Architecture shall require systems developed from it to provide protection against unauthorised access.	
	1.12.3	Systems that conform to the Framework Architecture shall encrypt all personal information prior to it being transmitted.	
	1.12.4	System that conform to the Framework Architecture shall be able to maintain its own integrity, e.g. only react to authorised sources, and check that input data is reasonable.	
1.13 User Friendliness	1.13.1	The Framework Architecture shall require all systems developed from it to have user interfaces with similar "look and feel" and similar end user assistance.	
	1.13.2	The Framework Architecture shall require all systems developed from it to be simple and efficient for travellers to use, and easy to understand.	
	1.13.3	The Framework Architecture shall require all interactive systems developed from it to have a user interface syntax that is easy to learn and to remember (especially for users with specific needs).	
	1.13.4	Systems developed from the Framework Architecture shall produce their output within a time that is sufficient to be useful, and within normal expectations,	
	1.13.5	The Framework Architecture shall require all systems developed from it to provide facilities that enable their users to control the speed and frequency of information presentation.	
	1.13.6	The Framework Architecture shall ensure that the safety and security of systems developed from it are not compromised by their ease of use.	
	1.13.7	The Systems developed from the Framework Architecture shall ensure that all the information presented to the driver on one or more channels is unambiguous and consistent.	1.13.1

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Group	No	Description	Similar
	1.13.8	Systems that conform to the Framework Architecture shall display traffic signs according to the Vienna convention.	
1.14 Special Needs	1.14.1	The Framework Architecture shall require systems developed from it to accommodate those users with one or more impairments (e.g. of upper/lower limbs/body, stature, coordination or power, vision, hearing, speech, cognition, epilepsy, etc.) where relevant.	
	1.14.2	The Framework Architecture shall require system developed from it to accommodate those users who travel with baggage and/or extra equipment (e.g. mothers with push-chairs, disabled persons in wheel-chairs, (guide) dogs, etc.) where relevant.	
	1.14.3	The Framework Architecture shall require systems developed from it to be able to take their input from a variety of alternative devices (e.g. keys, voice, buttons, touch-screen, smart card, etc.) to suit travellers with special needs, where relevant.	
	1.14.4	The Framework Architecture shall require systems developed from it to be able to provide output in a variety of alternative modes (e.g. (enlarged) text, symbols, graphics, speech, tactile, HUD, etc.) to suit travellers with special needs, where relevant.	
	1.14.5	The Framework Architecture shall require systems developed from it to be able to repeat information on request, in particular for those with special needs, where relevant.	
	1.14.6	The Framework Architecture shall require systems developed from it to be able to recognise the identity of a traveller using a variety of alternative methods, where relevant.	
	1.14.7	The Framework Architecture shall require systems developed from it to be able to have adaptable user interfaces that may be customised by the traveller, in particular those with special needs, where relevant.	
	1.14.8	The Framework Architecture shall require systems developed from it to be able to be able to read pre-recorded personal details (e.g. impairment and/or medical details), in particular of those with special needs, where relevant.	

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Group	No	Description	Similar
1.15 Privacy	1.15.1	Systems developed from the Framework Architecture shall be able to provide an un-attributable, but unique, identifier to each vehicle for the duration of a trip in order to provide basic privacy.	
1.16 Communications	1.16.1	Systems developed from the Framework Architecture shall be able to send messages through more than one vehicle and/or road-side device (multi-hop).	
	1.16.2	Systems that conform to the Framework Architecture shall be able to transmit data correctly without a re-transmission (i.e. use error correcting codes).	
	1.16.3	Systems that conform to the Framework Architecture shall manage the communications in a manner which ensures that the communications infrastructure is not overwhelmed by too many messages.	
	1.16.4	Systems developed from the Framework Architecture shall be able to communicate with each vehicle individually, or by class (location, type, speed, lane, area, approaching or leaving a junction).	
Infrastructure Planning and Maintenance	2	<i>This group contains the activities associated with long term planning, modelling and reporting as well as the maintenance of the infrastructure. These User Needs have links with Groups 6-10.</i>	
2.1 Transport Planning Support			
2.1.0 Objectives	2.1.0.1	The system shall be able to exchange traffic and travel information between adjacent TICs to enhance local information and to improve strategic planning.	
	2.1.0.2	The system shall be able to provide facilities to enable co-operation and decision making between all relevant authorities, (e.g. Ministries, local authorities, police forces etc.) to define optimum traffic management strategies.	

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Group	No	Description	Similar
2.1.1 Information Management	2.1.1.1	The system shall be able to produce information for travellers on the traffic and travel conditions of all transport modes relevant to the geographical area covered.	
	2.1.1.2	The system shall be able to provide links to non-transport information systems using "open" communication protocols.	
	2.1.1.3	The system shall be able to collect traffic data for road network use analysis and prediction calculations.	
2.1.2 Planning	2.1.2.1	The system shall be able to model the road network for strategic planning calculations.	
	2.1.2.2	The system shall be able to develop and implement traffic environmental management strategies based on current and predicted traffic conditions.	
	2.1.2.3	The system shall be able to assist in the planning of (inter-modal) routes.	
	2.1.2.4	The system shall be able to simulate a demand management strategy on the road network.	7.3.0.4
	2.1.2.5	The system shall be able to simulate potential capacity reduction, e.g. due to road works.	7.3.0.5
2.1.3 Evaluation	2.1.3.1	The system shall be able to measure the effect of a strategy, and to modify it when necessary.	
2.1.4 Reporting	2.1.4.1	The system shall collect and report data as required by legally appointed authorities.	
	2.1.4.2	The system shall be able to archive (a summary of) historical data on transport demand and transport supply for all transport modes.	

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Group	No	Description	Similar
2.2 Infrastructure Maintenance Management			
2.2.0 Basic Services	2.2.0.1	The system shall provide support for road maintenance and infrastructure management.	
	2.2.0.2	The system shall be able to recommend short term road maintenance activities, including winter maintenance, based on data collected from the road infrastructure possibly combined with the current and/or forecast weather conditions.	
	2.2.0.3	The system shall be able to recommend maintenance work schedules such that they cause the minimum disruption to traffic.	
	2.2.0.4	The system shall be able to support a database of maintenance operations.	
	2.2.0.5	The system shall be able to transmit current and future maintenance schedules to TCCs.	
	2.2.0.6	The system shall be able to maintain statistics on road usage to evaluate the need for possible maintenance.	
2.2.1 Activation	2.2.1.1	The system shall be able to activate fixed de-icing equipment on parts of the road network.	
2.2.2 Monitoring	2.2.2.1	The system shall be able to receive infrastructure equipment status data remotely.	
	2.2.2.2	The system shall be able to monitor the structural integrity of items of infrastructure, e.g. roads, bridges, tunnels, gantries, etc.	
	2.2.2.3	The system shall be able to support a database of the road network, infrastructure and road-side equipment.	
2.2.3 Maintenance Units	2.2.3.1	The system shall be able to transfer information to, and between, road maintenance units.	

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Group	No	Description	Similar
2.2.4 Contracts	2.2.4.1	The system shall be able to support the management and control of maintenance contracts.	
3 Law Enforcement		<i>This group contains the activities associated with the enforcement of traffic laws and regulations, and the collection of evidence. These User Needs have links with Groups 6-10.</i>	
3.1 Policing/Enforcing Traffic Regulations			
3.1.0 Objectives	3.1.0.1	The system shall enforce the traffic laws and regulations of the region automatically (where possible).	
	3.1.0.2	The system shall be able to collect the evidence of a violation of the traffic laws and regulations in a manner suitable to justify the application of a legal punishment	
	3.1.0.3	The system shall be able to provide support for the enforcement of safe driver behaviour and the provision of vehicle priorities.	
	3.1.0.4	The system shall not obstruct or slow down traffic in any way, except when it is part of access control.	
	3.1.0.5	The system shall be able to communicate with Police Command and Control Systems.	
3.1.1 Evidence Collection	3.1.1.1	The system shall be able to collect evidence on vehicles that commit traffic signal violations.	7.1.7.1
	3.1.1.2	The system shall be able to collect evidence on vehicles that exceed a local (variable) speed limit.	7.1.7.2
	3.1.1.3	The system shall be able to measure the characteristics (e.g. length, weight etc.) of a vehicle automatically, whilst the vehicle is in motion ("Weigh in Motion").	9.3.0.2

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Group	No	Description	Similar
	3.1.1.4	The system shall be able to identify the cargo being carried by a heavy goods vehicle automatically.	
4 Financial Transactions		<i>This group contains the activities associated with the payment for traffic or travel services, and includes the manner of the transaction, its enforcement, and the sharing of revenues. These User Needs have links with Groups 6-10.</i>	
4.1 Electronic Financial Transactions			
4.1.0 Objectives	4.1.0.1	The system shall be able to use a variety of relevant payment methods either electronic or not, including central account and post payment, central account and prepayment, on-board account etc.	
	4.1.0.2	The system shall manage customer data, e.g. identification, account, rights of residents, etc.	
	4.1.0.3	The system shall give exact details of any financial transaction to the traveller.	
	4.1.0.4	The system shall be able to manage tariff policies (define fares/fees according to selected criteria).	
	4.1.0.5	The system shall be able to use a variety of payment or receipt means, including contactless "smart cards".	
4.1.1 Traffic Management	4.1.1.1	The system shall have a minimum impact on the traffic flow, e.g. a short transaction duration.	
	4.1.1.2	The system shall have a minimum impact on the driving task.	
	4.1.1.3	The system shall not do anything to reduce the safety of either the travellers in the vehicle, or the staff close to the equipment, e.g. in toll booths.	

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4.1.2 Revenue Sharing	4.1.2.1	The system shall be able to share revenues between road network operators.	
	4.1.2.2	The system shall enable a single payment to be paid for services offered by different related transport systems (e.g. metro, bus, train, road and parking).	
4.1.3 Transaction	4.1.3.1	The system shall be able to exchange information between a toll collection unit and a vehicle.	9.5.3.15
	4.1.3.2	The system shall make "atomic" electronic financial transactions, i.e. that are never partially complete whatever the circumstances, even in degraded system modes.	
	4.1.3.3	The system shall have the maximum security necessary for electronic financial transactions.	
	4.1.3.4	The system shall have a low number of incorrect transactions (e.g., non-effective transactions < 1 in 10E-6; erroneous transactions < 1 in 10E-8);	
4.1.4 Enforcement	4.1.4.1	The system shall be able to collect evidence on the non-payment of tolls, and other illegal financial transactions.	
5 Emergency Services		<i>This group contains 'eCall' and stolen vehicle management (for any vehicle), the prioritising of emergency vehicles, hazardous goods (i.e. goods that need to be tracked) and incident management. These User Needs have links with Groups 6-10.</i>	
5.1 Emergency Notification and Personal Security			
5.1.0 Basic Services	5.1.0.1	The system shall be able to make an 'eCall'.	8.5.1.1 5.1.0.7
	5.1.0.2	The system shall be able to detect that the vehicle has been involved in an accident, identify its location, and initiate 'eCall' automatically.	5.3.1.1 8.5.1.2

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Group	No	Description	Similar
	5.1.0.3	The system shall enable the driver, or any other vehicle occupant, to make an 'eCall', and to receive confirmation that the call has been acknowledged, from outside the vehicle, i.e. at the roadside.	5.3.1.2 8.5.1.3
	5.1.0.4	The system shall be able to give the driver an immediate acknowledgement to his/her emergency call, i.e. to indicate that assistance is on the way.	
	5.1.0.5	The system shall be able to identify the driver / vehicle making an emergency call.	
	5.1.0.6	The system shall be able to provide two-way data and/or voice communications between the vehicle and the emergency control centre.	
	5.1.0.7	The system shall be able to send an 'eCall' automatically if a critical vehicle component goes into an unsafe condition, or some other emergency is detected, e.g. driver ill (see 8.5.0.2).	5.1.0.1 8.5.1.1 8.5.1.4
	5.1.0.8	The system shall be able to minimise the response time for rescuing drivers who have requested assistance from the emergency services, e.g. breakdown, medical emergency, accident etc.	7.2.0.6
5.1.1 Stolen Vehicles			
	5.1.1.1	The system shall be able to detect when a vehicle is (about to) be driven by an unauthorised person (i.e. stolen)	
	5.1.1.2	The system shall be able to detect a vehicle when it has been stolen.	
	5.1.1.3	The system shall be able to stop a vehicle when it has been stolen.	
	5.1.1.4	The system shall be able to provide the location of a vehicle when it has been stolen and/or to indicate when it passes a certain point.	
5.2 Emergency Vehicle Management			
5.2.0 Basic Services	5.2.0.1	The system shall support a green wave for emergency vehicles.	7.1.9.1

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	5.2.0.2	The system shall inform traffic management about the route that is intended for each green wave before it is used.	
	5.2.0.3	The system shall provide the identity of each traffic signal at which priority is needed to the traffic management, and the 'timing window' in which priority is to be given.	
	5.2.0.4	The system shall receive an indication from the emergency vehicle of its need to be given priority at each set of traffic signals before its arrival in the immediate vicinity.	
	5.2.0.5	The system shall enable emergency vehicles to pass through the road network without any priority at signalised junctions, e.g. during a return from an incident.	
5.3 Hazardous Materials and Incident Notification			
5.3.0 Basic Services			
	5.3.0.1	The system shall monitor the movements of hazardous goods, and provide appropriate support in the case of an incident.	
	5.3.0.2	The system shall be able to provide the location of hazardous goods.	
	5.3.0.3	The system shall be able to receive data on the status, character and quantity of hazardous cargo on vehicles within a pre-defined area of interest, and inform the relevant authorities of any non-compliance.	9.5.1.5
5.3.1 Incident Management			
	5.3.1.1	The system shall be able to detect that the vehicle has been involved in an accident, identify its location and cargo, and generate an emergency alert automatically.	5.1.0.2 7.2
	5.3.1.2	The system shall be able to identify its location and cargo, and generate an emergency alert on the command of the vehicle driver.	5.1.0.3
	5.3.1.3	The system shall be able to advise the emergency services on any hazardous goods that have been involved in an incident.	7.2.6.1

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Group	No	Description	Similar
	5.3.1.4	The system shall be able to provide relevant information to the emergency services on the type of hazardous good(s) involved in an incident.	
	5.3.1.5	Systems shall exchange information on hazardous goods in a manner that is understood by all parties.	
5.3.2 Planning	5.3.2.1	The system shall be able to support the planning (e.g. routes) and execution (e.g. authorisation) of the movement of hazardous goods.	7.1.4.9 9.5.2.9
	5.3.2.2	The system shall be able to support the creation of emergency plans.	
6 Travel Information and Guidance		<i>This group contains all the activities concerned with the handling of pre-trip and on-trip information, including mode choice and change, and route guidance</i>	
6.1 Pre-trip Information			
6.1.0 Objectives	6.1.0.1	The system shall provide emergency, or urgent, information to all road users free of charge.	
	6.1.0.2	The system shall be able to require payment for non-emergency, or non-urgent, information.	
	6.1.0.3	The system shall be able to provide accurate, credible, timely, and easy to comprehend traffic and travel information where it may be of benefit to the user.	
	6.1.0.4	The system shall be able to provide information on alternative routes, e.g. where they are quicker, cheaper, shorter, scenic, etc.	
	6.1.0.5	The system shall enable travellers to plan their trip using their own travel criteria, e.g. modes of transport, time of departure/arrival, road selection criteria, etc.	
	6.1.0.6	The system shall enable travellers to plan their trip according to the needs of their disabilities	

FRAME User Needs V4.1

Group	No	Description	Similar
	6.1.0.7	The system shall be able to provide information so that travellers may share a vehicle with others for all or part of a (multi-modal) journey.	10.3.0.2
6.1.1 Modal Choice	6.1.1.1	The system shall be able to influence modal shifts according to a specified transport policy.	
	6.1.1.2	The system shall be able to provide trip information on other modes of transport, e.g. for demand-spreading when major events occur, or when weather conditions, strikes, cultural or sports events etc. cause problems for one mode.	
	6.1.1.3	The system shall be able to provide current and forecast traffic and travel information for all modes at local, regional, national and international levels.	
	6.1.1.4	The system shall be able to provide extensive multi-modal trip information, e.g. prices, fares, routes, forecast & current traffic situations, traffic control, demand mgt measures, local warnings, special events, weather conditions, hotels etc.	10.1.4.2
6.1.2 Information Handling	6.1.2.1	The system shall inform the User when changes occur to the criteria upon which the pre trip information had been given.	6.2.0.6
	6.1.2.2	The system shall be able to provide information on the cancellation of departures from an inter-modal interchange (e.g. railway station, an airport, a port or a coach station) due to the weather; strikes or other reasons.	
	6.1.2.3	The system shall be able to provide route information to all drivers, e.g. restrictions, travel times, etc.	
	6.1.2.4	The system shall be able to support a database of events with links between events that occur concurrently and at the same or adjacent locations.	6.2.2.7
	6.1.2.5	The system shall be able to analyse, process and retrieve data from different combinations of sources (including floating car).	6.2.2.10

FRAME User Needs V4.1			
Group	No	Description	Similar
	6.1.2.6	The system shall be able to provide road and traffic information adapted to different classes of users, e.g. travellers, radio broadcasters, service operators.	6.2.2.9
	6.1.2.7	The system shall provide information using graphical representation or text. Graphical form shall include the use of maps as well as text.	6.2.3.1
	6.1.2.8	The system shall provide information in the native language at the output location, and/or from a user selected choice of other appropriate foreign languages.	6.2.3.3 10.4.2.2
	6.1.2.9	The system shall provide Information Management tools for the operator.	6.2.2.12
	6.1.2.10	The system shall be able to provide access information for those travellers with special needs (e.g. physical access, lifts, escalators, parking & toilets, nappy changing rooms, access for (guide) dogs, etc.) at relevant areas, e.g. transit areas.	
	6.1.2.11	The system shall be able to provide information about "Points of Interest", e.g. location, opening times, price of service, nearest transport service points.	
	6.1.2.12	The system shall be able to receive information about a point of interest from the providers/owners/managers of that "Point of Interest".	
	6.1.2.13	The system shall be able to provide information to travellers so as to influence their choice of destination and/or mode of travel, e.g. to protect the environment of a "Point of Interest", or geographic area.	
	6.1.2.14	The system shall be able to provide information to travellers about the personal support services, e.g. doctor, in a specific locality.	
	6.1.2.15	The system shall be able to receive information about a personal support service, e.g. doctor, from the providers/owners/managers of that service.	
6.1.3 Traveller Interaction	6.1.3.1	The system shall be able to provide facilities for the necessary user identification when a traveller requests information that may result in the purchase or booking of services.	
	6.1.3.2	The system shall be able to require payment for one-off usage of the service.	

FRAME User Needs V4.1			
Group	No	Description	Similar
	6.1.3.3	The system shall enable the traveller to use cash or electronic means to pay for the one-off usage of the service, where appropriate.	
	6.1.3.4	The system shall be able to provide access to reservations and pre-payment services.	
	6.1.3.5	The system shall be able to provide (multi-modal) booking & pre-payment services from all places that provide (multi-modal) route planning information, e.g. railway stations, airports, ports etc.	
	6.1.3.6	The system shall enable a traveller to book a parking space at Park and Ride sites as part of a (multi-modal) trip.	
	6.1.3.7	The system shall provide information via (public) terminals located at strategic locations: e.g. home, office, inter-modal interchanges (e.g. bus, railway and metro stations), vehicle, restaurant, etc.	
	6.1.3.8	The system shall be able to provide customised pre-trip information to hand-held and in-vehicle devices.	6.2.3.5
	6.1.3.9	The system shall communicate with other information systems using "open" standard protocols.	
	6.1.3.10	The system shall provide information for fixed and mobile terminals using "open" standard communication protocols.	6.2.3.4
6.2 On-trip Information			
6.2.0 Objectives			
	6.2.0.1	The system shall provide emergency, or urgent, information to all users free of charge.	9.5.3.5 9.5.3.6
	6.2.0.2	The system shall be able to require payment for non-emergency, or non-urgent, information.	
	6.2.0.3	The system shall be able to be activated automatically by another system, e.g. traffic management.	

FRAME User Needs V4.1

Group	No	Description	Similar
	6.2.0.4	The system shall provide traffic information (e.g. travel conditions on roads and other modes, accidents, special events, car park status, etc.) to the traveller during his/her trip in a timely manner. .	
	6.2.0.5	The system shall be able to provide urban and inter-urban traffic and travel information to drivers about the domain they are not currently in.	
	6.2.0.6	The system shall inform the User when changes occur to the criteria upon which the trip information had been given.	6.1.2.1
	6.2.0.7	The system shall be able to know where it is in the transport network, and hence provide the position of vehicle or person carrying it.	
6.2.1 Mode Change	6.2.1.1	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.	
	6.2.1.2	The system shall be able to display alternative routes or modes at inter-modal interchanges, or at places where tourism information is available.	
	6.2.1.3	The system shall be able to provide information about other transport modes: e.g. location of P+R areas, PT timetable, etc.	
6.2.2 Information Handling	6.2.2.1	The system shall be able to inform travellers on the current average travel time between fixed points.	
	6.2.2.2	The system shall be able to provide real-time P+R and PT information to vehicle drivers.	
	6.2.2.3	The system shall be able to provide cyclists and pedestrians with information about suitable routes.	
	6.2.2.4	The system shall provide road and traffic safety advice based on current weather and traffic conditions.	

FRAME User Needs V4.1			
Group	No	Description	Similar
	6.2.2.5	The system shall be able to provide all drivers with information on current road travel conditions, e.g. route restrictions, travel times, etc.	
	6.2.2.6	The system shall be able to provide routing information for Commercial traffic to/from a (cargo) modal interchange.	
	6.2.2.7	The system shall be able to support a database of events with links between events that occur concurrently and at the same or adjacent locations.	6.1.2.4
	6.2.2.8	The system shall be able to provide road information according to different geographic scales, e.g. local, regional, national, international.	
	6.2.2.9	The system shall be able to adapt the information to different classes of users, e.g. travellers, radio broadcasters, service operators.	6.1.2.6
	6.2.2.10	The system shall be able to collect data from a variety of different sources, e.g. road/traffic management, police, weather services, floating car etc.	6.1.2.5
	6.2.2.11	The system shall be able to provide operators with an overall view of all active events in an area.	
	6.2.2.12	The system shall provide Information Management tools for the operator.	6.1.2.9
	6.2.2.13	The system shall be able to provide information to vehicle drivers in case of medical emergency, e.g. location of rest areas, medical assistance, etc.	
	6.2.2.14	The system shall be able to modify a travel plan if the traveller does not follow the original travel plan.	
6.2.3 Traveller Interaction	6.2.3.1	The system within the vehicle, or in the centre, shall support various types of presentation to the user, e.g. text, graphics, symbols, speech, etc.	6.1.2.7
	6.2.3.2	The system shall normally provide messages from a finite set of well defined message texts.	7.2.5.2

FRAME User Needs V4.1			
Group	No	Description	Similar
	6.2.3.3	The system shall provide information in the native language at the output location, and/or from a user selected choice of other appropriate foreign languages, when applicable.	6.1.2.8 10.4.2.2
	6.2.3.4	The system shall provide information using "open" standard communication protocols.	6.1.3.10
	6.2.3.5	The system shall be able to provide customised on-trip information to hand-held and in-vehicle devices.	6.1.3.8
	6.2.3.6	The system shall enable drivers to customise the style and content of the information that they receive from hand-held and in-vehicle devices.	
	6.2.3.7	The system shall be able to retain the customisation details in a manner that is independent of any physical output device.	
	6.2.3.8	The system shall be able to provide road and traffic information using road-side equipment, e.g. VMS.	
	6.2.3.9	The system shall be able to provide in-vehicle road, traffic, route guidance and parking information via locally sited equipment, e.g. beacon.	
Personal Information Services	6.3	<i>This is a special case of Groups 6.1, 6.2, 6.4 and 10.4 (ISO Services 1, 2, 3 and 5)</i>	
6.4 Route Guidance and Navigation			
6.4.0 Objectives	6.4.0.1	The system shall provide travellers with recommended routes to specified destinations.	9.5.2.8 9.5.3.22
	6.4.0.2	The system shall not base its decisions on a restricted sub-set of the road network, e.g. motorways only.	
	6.4.0.3	The system shall know where it is within the road network.	9.5.2.13 10.1.2.1

FRAME User Needs V4.1			
Group	No	Description	Similar
	6.4.0.4	The system shall be able to modify its navigation instructions if an incorrect turn is made.	
	6.4.0.5	The system shall be able to provide a driver with a suitable alternative route, when the original planned route becomes unavailable.	
6.4.1 Information Handling			
	6.4.1.1	The system shall be able to provide guidance to Car Parks (with parking spaces).	
	6.4.1.2	The system shall be able to use real-time information to compute the recommended route.	
	6.4.1.3	The system shall be able to compute the total predicted journey time over the route selected.	7.1.6.1 9.5.2.10 10.2.1.3
	6.4.1.4	The system shall be able provide customised navigation information to the destination using a variety of selection criteria, including use by a traveller with special needs.	10.2.3.1
	6.4.1.5	The system shall be able to provide guidance to "Points of Interest".	
	6.4.1.6	The system shall provide information which is consistent with any other information being presented about the road.	
	6.4.1.7	The system shall be able to provide reports on the effectiveness of the navigation instructions that have been provided.	
6.4.2 Traveller Interaction			
	6.4.2.1	The system shall provide route guidance using visual and voice instructions.	
	6.4.2.2	The system shall contain menus which are structured in a logical manner and oriented towards the requirements of the driver (e.g. the most frequently used function shall be the easiest to select).	
	6.4.2.3	The system shall enable bi-directional voice and data communication with the vehicle.	
	6.4.2.4	The system shall enable the use of portable equipment to provide route guidance.	

FRAME User Needs V4.1			
Group	No	Description	Similar
7 Traffic, Incidents and Demand Management		<i>The activities associated with traffic control, incident management and demand management, including monitoring, planning, flow control, exceptions management, speed management, lane and parking management, HOV, road pricing and zoning, and VRUs</i>	
7.1 Traffic Control			
7.1.0 Objectives	7.1.0.1	The system shall support the existing and new traffic management needs of authorities by providing a flexible yet comprehensive approach to determine traffic management strategies (including bridge and tunnel control).	
	7.1.0.2	The system shall be able to implement identified control strategies that conform with specified policy.	
	7.1.0.3	The system shall not do anything to reduce road safety.	7.2.0.2
	7.1.0.4	The system shall manage road traffic in such a way that levels of environmental (i.e. atmospheric and noise) pollution may be reduced.	9.5.4.1
	7.1.0.5	The system shall manage road traffic in such a way that congestion (travel time) may be reduced.	
	7.1.0.6	The system shall be able to help co-ordinate the activities of TICs and TCCs.	
	7.1.0.7	The system shall be able to exchange information between TICs and TCCs, including across national boundaries.	
	7.1.0.8	The system shall enable the data that it stores to be extracted by an operator onto a variety of media and used for other purposes, or by other organisations.	
	7.1.0.9	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.	
	7.1.0.10	The system shall be able to control urban roads and traffic.	
	7.1.0.11	The system shall be able to control inter-urban roads and traffic.	

FRAME User Needs V4.1			
Group	No	Description	Similar
	7.1.0.12	The system shall be able to use different traffic management techniques to control separate areas of the road network.	
	7.1.0.13	The system shall be able to manage the urban/inter-urban interface.	
7.1.1 Monitoring	7.1.1.1	The system shall be able to monitor sections of the road network to provide the current traffic conditions (e.g. flows, occupancies, speed and travel times etc.) as real time data.	
	7.1.1.2	The system shall monitor urban roads and traffic.	
	7.1.1.3	The system shall monitor inter-urban roads and traffic.	
	7.1.1.4	The system shall be able to monitor traffic flow at, and the operation of, the road intersections of the network over which it has the control.	
	7.1.1.5	The system shall be able to monitor the entire road network (network state surveillance tool).	
	7.1.1.6	The system shall be able to monitor and record weather conditions, e.g. wind, fog, rain level, ice, etc.	
	7.1.1.7	The system shall be able to monitor and record environmental (atmospheric and noise) pollution conditions, and provide an alarm when a certain threshold is exceeded.	
	7.1.1.8	The system shall be able to measure the range of visibility and detect reductions caused by adverse weather and pollution conditions (but not darkness).	
7.1.2 Planning	7.1.2.1	The system shall be able to use consistent historical data to complement real-time data, when necessary.	
	7.1.2.2	The system shall be able to predict short, medium, and long-term traffic conditions, e.g. for minutes, hours and days ahead.	
	7.1.2.3	The system shall be able to use historical data to complement predicted data, when necessary.	

FRAME User Needs V4.1			
Group	No	Description	Similar
	7.1.2.4	The system shall be able to analyse road and traffic data to predict possible critical situations.	
	7.1.2.5	The system shall be able to predict weather conditions, in particular the formation of fog and/or ice.	
	7.1.2.6	The system shall be able to predict short, medium and long-term (e.g. for minutes, hours and days ahead) road travel produced environmental (atmospheric and noise) pollution conditions based on traffic and weather conditions.	
	7.1.2.7	The system shall be able to provide historical and predicted data.	
7.1.3 Traffic Control Centres	7.1.3.1	The system shall enable a TCC operator to control, possibly remotely, infrastructure elements (e.g. traffic lights, VMS).	
	7.1.3.2	The system shall enable a TCC operator to log all significant events and to record free text messages prior to their output to travellers.	
	7.1.3.3	The system shall be able to provide a graphical representation of the road network which includes relevant features (e.g. equipment, events, traffic condition etc.) to TCC operators.	
	7.1.3.4	The system shall be able to activate control devices (e.g. traffic lights, VMS), either individually or in groups.	
	7.1.3.5	The system shall enable TCC operators to make temporary changes to the normal control strategy in real-time.	
	7.1.3.6	The system shall be able to implement planned control strategies for planned events, e.g. sport, cultural, etc.	
	7.1.3.7	The system shall be able to support a database of all known (future) events.	
7.1.4 Traffic Flow Control	7.1.4.1	The system shall be able to control the entries and exits to motorways.	

FRAME User Needs V4.1

Group	No	Description	Similar
	7.1.4.2	The system shall be able to provide ramp metering (e.g. using traffic signals or barriers) at selected locations (e.g. slip road entrances to high speed roads).	
	7.1.4.3	The system shall provide Tidal Flow Control (reservation of lanes for exclusive use in one direction for a period, then the other direction for another period, on parts of the road network).	
	7.1.4.4	The system shall be able to provide advice to drivers as they approach car parks (on-street and off-street, as well as motorway service area parking).	
	7.1.4.5	The system shall be able to provide priority to selected travellers (e.g. cyclists, pedestrians) and/or vehicles (e.g. PT, emergency) through the road network, including on motorways (when applicable).	7.1.9.3
	7.1.4.6	The system shall be able to provide control measures for bridges so that warnings of weather conditions, vehicle restrictions and closure can be provided.	
	7.1.4.7	The system shall be able to provide control measures for "tunnel" environments i.e. vehicle restrictions, fire detection, atmospheric pollution and closure.	
	7.1.4.8	The system shall be able to provide co-ordinated traffic management operations during periods of mass movement across (many) regions.	
	7.1.4.9	The system shall be able to provide specific traffic management for exceptional vehicles (e.g. very dangerous cargo, wide loads, etc.) when requested.	5.3.2.1 9.5.2.9
7.1.5 Exceptions Management	7.1.5.1	The system shall be able to provide control measures to protect road maintenance work and workers.	
7.1.5 Exceptions Management	7.1.5.2	The system shall be able to command drivers to change lanes on multi-lane roads.	
7.1.5 Exceptions Management	7.1.5.3	The system shall be able to change the direction of traffic flow on a carriageway in an orderly manner so that it does not create a safety hazard to any road user.	
7.1.5 Exceptions Management	7.1.5.4	The system shall be able to reverse the direction of traffic flow on parts of the urban network.	

FRAME User Needs V4.1

Group	No	Description	Similar
	7.1.5.5	The system shall be able to close roads and advise drivers of a suitable diversionary route for a period of time.	
	7.1.5.6	The system shall be able to command certain classes of vehicle (e.g. heavy vehicles or tourist traffic) to take an alternative route for a period of time.	9.5.2.12 9.5.3.11
	7.1.5.7	The system shall be able to recommend re-routing strategies to reduce congestion or atmospheric pollution.	
	7.1.5.8	The system shall request confirmation of all exceptional measures before they are executed.	
7.1.6 O/D Computations	7.1.6.1	The system shall be able to provide Origin/Destination computations, and route assignment estimations, for the road network.	6.4.1.3 9.5.2.10 10.2.1.3
7.1.7 Speed Management	7.1.7.1	The system shall be able to show the maximum authorised speed of vehicles on selected carriageways to be shown to drivers, and to detect violators.	3.1.1.1
	7.1.7.2	The system shall be able to set variable speed limits on parts of the road network.	3.1.1.2
	7.1.7.3	The system shall be able to calculate recommended speed limits for given traffic and weather conditions, and road network characteristics.	
	7.1.7.4	The system shall be able to transmit recommended speed limits to equipped vehicles.	7.1.7.6 8.2.5.2
	7.1.7.5	The system shall be able to support a database of all speed limits on the road network.	
	7.1.7.6	The system shall be able to provide vehicles with information about the road network, e.g. speed limits, road hazards, junctions etc.	7.1.7.4

FRAME User Needs V4.1			
Group	No	Description	Similar
7.1.8 Roadside-Vehicle Communications	7.1.8.1	The system shall be able to transmit information to a vehicle to update its on-board database.	
7.1.9 Adaptive Traffic Control	7.1.9.1	The system shall be able to provide green wave management for all vehicles.	5.2.0.1
	7.1.9.2	The system shall be able to minimise delays of all vehicles using adaptive signal control	
	7.1.9.3	The system shall be able to override the current method of traffic control to grant priority to selected vehicles, e.g. PT, emergency vehicles.	7.1.4.5 10.1.6.1
	7.1.9.4	The system shall be able to give priority to PT vehicles in a manner that minimises the impact on other road users.	
7.1.10 Lane Management	7.1.10.1	The system shall be able to reserve certain traffic lanes exclusively to specific classes of vehicles (e.g. high occupancy vehicles, or buses) and to detect violators.	
7.1.11 Parking Management	7.1.11.1	The system shall be able to monitor the current usage of the parking facilities.	
	7.1.11.2	The system shall be able to forecast the need for parking slots.	
	7.1.11.3	The system shall be able to identify those vehicles, or their drivers, which violate the parking regulations, e.g. fail to pay, stay too long, etc.	
7.1.12 Vulnerable Road Users	7.1.12.1	The system shall be able to control pedestrian and cycle crossings.	
	7.1.12.2	The system shall be able to monitor and control pedestrian and cycle crossings in order to optimise their use.	

FRAME User Needs V4.1

Group	No	Description	Similar
7.2 Incident Management			
7.2.0 Objectives	7.2.0.1	The system shall detect and respond to various incidents on the road network.	5.3.1 10.1.3.2
	7.2.0.2	The system shall not do anything to reduce road safety.	7.1.0.3
	7.2.0.3	The system shall not do anything that might aggravate, or cause, an incident.	
	7.2.0.4	The system shall assist the emergency services to provide an effective response to road traffic incidents.	
	7.2.0.5	The system shall collect and filter emergency calls from travellers in the road network using a variety of types of communication, e.g. road-side telephones, mobile phones, (automatic) on-board 'MayDay' etc.	
	7.2.0.6	The system shall minimise the time between the occurrence of an incident and its detection.	5.1.0.8
	7.2.0.7	The system shall be able to validate that an incident has occurred in order to avoid false alarms.	
	7.2.0.8	The system shall be able to suggest one or more responses for dealing with an incident.	
	7.2.0.9	The system shall be able to run (pre-)defined incident mitigation strategies automatically.	
7.2.1 Emergency Services	7.2.1.1	The system shall be able to locate and identify emergency vehicles on the road network.	
	7.2.1.2	The system shall be able to co-ordinate the emergency and rescue services once an incident has been detected, and until the situation has returned to normal.	
	7.2.1.3	The system shall provide communications between the emergency services, hospitals and TCCs for the provision of incident information.	

FRAME User Needs V4.1			
Group	No	Description	Similar
7.2.2 Information Management	7.2.2.1	The system shall be able to collect and store data on each incident, e.g. location, type, severity, number & type of vehicles involved, the emergency/rescue vehicles needed etc.	
	7.2.2.2	The system shall be able to identify and classify all incidents on the road network.	
	7.2.2.3	The system shall be able to provide information on each incident to TICs for onward transmission to travellers.	
7.2.3 Reporting	7.2.3.1	The system shall be able to produce incident data statistics, e.g. frequencies of occurrence, by time, type and location; identification of "high risk" locations on the road network; performance of the incident detection system.	
7.2.4 Post-Incident Management	7.2.4.1	The system shall be able to minimise the consequences of an incident on the road network for those travellers who are not involved.	
	7.2.4.2	The system shall be able to monitor the aftermath of an incident.	
7.2.5 Pre-Incident Management	7.2.5.1	The system shall be able to detect "non-vehicle" incidents before they can escalate into traffic accidents, e.g. bad weather conditions, objects on the road, ghost drivers, etc.	
	7.2.5.2	The system shall be able to provide local warnings on dangerous sections of the road network.	6.2.3.2
7.2.6 Hazardous Goods	7.2.6.1	The system shall be able to advise the emergency services on any hazardous goods that have been involved in an incident.	5.3.1.3
7.3 Demand Management			
7.3.0 Objectives	7.3.0.1	The system shall provide information that will influence travellers' decisions regarding aspects of their journey, e.g. destinations, time, mode of travel, route etc.	

FRAME User Needs V4.1			
Group	No	Description	Similar
	7.3.0.2	The system shall receive up-to-date information on those factors that will influence the demand management strategy, e.g. traffic levels, car park usage, other modes usage, fares, tolls, etc.	
	7.3.0.3	The system shall be able to recommend a strategy to reduce demand.	
	7.3.0.4	The system shall be able to simulate a demand management strategy on the road network.	2.1.2.4
	7.3.0.5	The system shall be able to simulate potential capacity reduction, e.g. due to road works.	2.1.2.5
7.3.1 Zoning			
	7.3.1.1	The system shall be able to create a "traffic collar" and limit the entry of all vehicles into a defined area according to (a set of) criteria.	
	7.3.1.2	The system shall be able to recommend alternative routes (e.g. that take into account the needs of heavy vehicles (and hazardous goods)) when required.	
	7.3.1.3	The system shall be able to control the access of vehicles into a zone using a form of identification, e.g. electronic tags, number plate readers, etc.	
	7.3.1.4	The system shall be able to use physical barriers to control the access of vehicles into a zone.	
7.3.2 Pricing Management			
	7.3.2.1	The system shall be able charge for the use of a section of road, or facility (e.g. bridge, tunnel etc.), based on given policy decisions, e.g. duration, distance, congestion etc.	
	7.3.2.2	The system shall be able to adjust toll fees according to a given pricing strategy.	
	7.3.2.3	The system shall be able to adjust parking fees according to a given pricing strategy.	
	7.3.2.4	The system shall be able to adjust public transport fares according to a given pricing strategy.	

FRAME User Needs V4.1			
Group	No	Description	Similar
7.3.3 Parking Management	7.3.3.1	The system shall be able to implement parking strategies in specific areas, including P+R strategies.	
7.3.4 Vulnerable Road Users	7.3.4.1	The system shall be able to provide information to promote the use of cycles and walking.	
7.3.5 Car Sharing	7.3.5.1	Deleted and moved to 6.1.0.7	
Cooperative Systems – Traffic Safety	7.4	<i>These are applications and services that enhance the safety of traffic by providing Road Hazard Warnings, Ghost Driver Management, advice on Lane Utilisation, Speed Management, Headway Management, Collision Warnings, VRU Warnings, and Warnings about Emergency Vehicles. These User Needs are associated with functions that are expected to use V2V and V2I technologies (Cooperative Systems).</i>	
Road Hazard Warning	7.4.1	<i>The activities associated with the collection of data, e.g. FCD and weather conditions, about the current situation, identification as to whether a hazardous condition exists, and then the provision of warnings to drivers that are appropriate to that hazard (motorcycle, traffic conditions, traffic queues, hazardous locations). In this set, each User Needs starts with a title that indicates its rôle in this scenario.</i>	
	7.4.1.1	(X)FCD – The system shall be able to maintain a database of the road network.	
	7.4.1.2	(X)FCD – The system shall be able to determine the intended route of the host vehicle.	6.4.0.1 7.5.1.2
	7.4.1.3	(X)FCD – The system shall be able to determine the relative position of the host vehicle on a road (e.g. lane, distance from a datum point) at all times (urban, inter-urban, tunnels etc.).	8.4.2.1

FRAME User Needs V4.1

Group	No	Description	Similar
	7.4.1.4	<i>(X)FCD</i> – The system shall be able to obtain information (values and status) from the host vehicle’s systems (e.g. ABS, ESP, Longitudinal and Lateral Acceleration, Speed, Wipers) without affecting the safe functioning of those systems.	8.5.3.4
	7.4.1.5	<i>(X)FCD</i> – The system shall be able to determine the environmental conditions in the vicinity of the host vehicle.	
	7.4.1.6	<i>(X)FCD</i> – The system shall be able to determine the visibility in the vicinity of the host vehicle, and classify the cause of the reduction, e.g. fog, rain, darkness.	
	7.4.1.7	<i>(X)FCD</i> – The system shall be able to infer XFCD, i.e. the road conditions (e.g. reduced friction, aquaplaning) and traffic conditions (e.g. vehicle breakdown, traffic incident), from the state of the host vehicle systems’ data (e.g. speed, acceleration, brakes, lights).	
	7.4.1.8	<i>(X)FCD</i> – The system shall be able to maintain a database of dynamic fused XFCD from the host vehicle’s systems and sensors.	
	7.4.1.9	<i>(X)FCD</i> – The system shall be able to send XFCD from the host vehicle to a road-side device.	8.2.4.1
	7.4.1.10	<i>(X)FCD</i> – The system shall enable data received from vehicles by a road-side device to be integrated, analysed and fused.	8.2.4.1
	7.4.1.11	<i>(X)FCD</i> – The system shall enable a road-side device to send fused traffic data to the TCC.	
	7.4.1.12	<i>(X)FCD</i> – The system shall enable a road-side device to send weather and environmental conditions to the TCC road-side device.	
	7.4.1.13	<i>(X)FCD</i> – The system shall be able to fuse the XFCD data from a number of vehicles with the host vehicle data to create a more accurate view of the road and traffic conditions in that area.	
	7.4.1.14	<i>(X)FCD</i> – The system shall be able to send fused FCD to the TCC from an road-side device.	
	7.4.1.15	<i>(X)FCD</i> – The system shall be able to send XFCD to the TCC from the host vehicle.	

FRAME User Needs V4.1

Group	No	Description	Similar
	7.4.1.16	<i>(X)FCD</i> – The system shall be able to add traffic data from the infrastructure (e.g. induction loops, radar) to the fused XFCD data of the road-side device.	
	7.4.1.17	<i>(X)FCD</i> – The system shall be able to communicate with another vehicle either directly, or via an road-side device. (Communications).	8.2.4.1
	7.4.1.18	<i>(X)FCD</i> – The system shall be able to match a visual image of a vehicle with the (un-attributable – for privacy protection) identity of a vehicle that is providing FCD and/or XFCD.	
	7.4.1.19	<i>Hazard Detection</i> – The system shall be able to determine the existence of a sharp curve from the road network database.	
	7.4.1.20	<i>Hazard Detection</i> – The system shall be able to determine that the host vehicle is partially occupying an adjacent lane for a short time, e.g. due to manoeuvre round a sharp bend, or lane width reductions.	
	7.4.1.21	<i>Hazard Detection</i> – The system shall be able to detect the presence of fire or smoke on the host vehicle.	
	7.4.1.22	<i>Hazard Detection</i> – The system shall enable the host vehicle to send information about its own safety behaviour (i.e. whether or not the vehicle was being driven in an unsafe manner, e.g. excessive speeding, swapping of lanes, overtaking, driver inattention) to a road-side device.	
	7.4.1.23	<i>Hazard Detection</i> – The system shall be able to detect presence of other vehicles and traffic participants in the vicinity of the host vehicle, and determine its type, e.g. car, lorry, emergency, maintenance, cycle, pedestrian.	
	7.4.1.24	<i>Hazard Detection</i> – The system shall be able to determine the status of the traffic in the vicinity of the host vehicle, e.g. congestion, stationary vehicle(s).	

FRAME User Needs V4.1

Group	No	Description	Similar
	7.4.1.25	<i>Hazard Detection</i> – The system shall be able to detect the presence of stationary objects (seen or deduced) in the carriageway ahead of the host vehicle, and to warn the driver via an in-vehicle device.	
	7.4.1.26	<i>Hazard Detection</i> – The system shall be able to detect the presence of stationary objects (seen or deduced) in the opposite carriageway to that of the host vehicle, and to send a warning to other vehicles.	
	7.4.1.27	<i>Hazard Detection</i> – The system shall enable the TCC to determine whether an incident has occurred.	
	7.4.1.28	<i>Hazard Detection</i> – The system shall enable an road-side device to determine whether an incident has occurred.	
	7.4.1.29	<i>Motorcycle Warning</i> – The system shall be able to detect that the host motorcycle has fallen onto the road pavement, and send this information to other vehicles.	
	7.4.1.30	<i>Motorcycle Warning</i> – The system shall be able to detect that the host motorcycle has fallen onto the road pavement, and send this information to a road-side device.	
	7.4.1.31	<i>Traffic Condition Warning</i> – The system shall be able to warn drivers in a timely manner of moving incidents (e.g. road/winter maintenance vehicles, long/wide loads) via an in-vehicle display.	7.2.5.1
	7.4.1.32	<i>Traffic Condition Warning</i> –The system shall be able to send to vehicles following the host vehicle information about the traffic conditions, or the traffic signs, near the host vehicle, that it may be useful to receive in advance.	7.4.1.49 7.4.2.6 7.4.3.10 7.4.4.18 8.5.5.2

FRAME User Needs V4.1

Group	No	Description	Similar
	7.4.1.33	<i>Traffic Queue Detection</i> – The system shall be able to locate the tail end of a traffic queue and estimate its speed of propagation.	
	7.4.1.34	<i>Traffic Queue Detection</i> – The system shall be able to inform drivers, via in-vehicle and road-side devices, of slow moving obstacles (e.g. person, animal, slow vehicle) and advise on the appropriate action (e.g. speed and lane).	
	7.4.1.35	<i>Hazardous Location Notification</i> – The system shall be able to warn drivers in a timely manner of incidents ahead (e.g. road works, accident, traffic queue) via an in-vehicle display. Where available and relevant this information shall include lane(s)/road section(s) affected and expected delay.	7.2.2.3 7.2.4.1
	7.4.1.36	<i>Hazardous Location Notification</i> – The system shall be able to warn the driver in a timely manner, via an in-vehicle display, of adverse road surfaces and weather conditions along the planned route.	7.2.5.1
	7.4.1.37	<i>Hazardous Location Notification</i> – The system shall be able to warn driver, via an in-vehicle device, of adverse driving conditions ahead (e.g. slippery road, low visibility, queuing traffic) and advise on the appropriate action (e.g. speed).	6.2.2.4 7.1.1.6 7.1.2.6 7.2.5.1
	7.4.1.38	<i>Hazardous Location Notification</i> – The system shall be able to warn drivers, via a road-side device, of adverse driving conditions ahead (e.g. slippery road, low visibility, queuing traffic) and advise on the appropriate action (e.g. speed).	6.2.2.4 7.1.1.6 7.1.2.6 7.2.5.1
	7.4.1.39	<i>Hazardous Location Notification</i> – The system shall be able to warn the driver, via an in-vehicle device, that the host vehicle is about to enter a curve that has been classified as a black spot for that category of vehicle, and recommend a suitable speed and trajectory.	

FRAME User Needs V4.1

Group	No	Description	Similar
	7.4.1.40	<i>Hazardous Location Notification</i> – The system shall be able to warn the driver, via an in-vehicle device, that the host vehicle is about to enter a section of road whose surface has less grip than normal (low μ).	
	7.4.1.41	<i>Hazardous Location Notification</i> – The system shall be able to inform drivers, via an in-vehicle device, of obstacles in the carriageway and advise on the appropriate action (e.g. speed and lane).	7.4.6.14
	7.4.1.42	<i>Hazardous Location Notification</i> – The system shall be able to inform drivers, via road-side devices, of obstacles in the carriageway and advise on the appropriate action (e.g. speed and lane).	7.4.6.14
	7.4.1.43	<i>Hazardous Location Notification</i> – The system shall enable a road-side device to select and activate a traffic management strategy in the event of an incident (including poor driving conditions).	
	7.4.1.44	<i>Hazardous Location Notification</i> – The system shall be able to send information about incidents ahead in the next section from a road-side device to drivers via an in-vehicle device.	
	7.4.1.45	<i>Hazardous Location Notification</i> – The system shall be able to estimate the condition of the road surface in the vicinity of the host vehicle and send warnings to other vehicles.	8.2.4.1
	7.4.1.46	<i>Hazardous Location Notification</i> – The system shall be able to estimate the condition of the road surface in the vicinity of the host vehicle and send warnings to a road-side device.	8.2.4.1
	7.4.1.47	<i>Hazardous Location Notification</i> – The system shall be able to send information about incidents on the road network ahead from the TCC to drivers via an in-vehicle device.	
	7.4.1.48	<i>Hazardous Location Notification</i> – The system shall provide "copies" of the traffic signs that are relevant to the current section of the road (e.g. speed limit, road hazards, junctions) to the driver at all times via an in-vehicle display.	7.4.2.5 7.4.3.9 7.4.4.17 8.5.5.1

FRAME User Needs V4.1			
Group	No	Description	Similar
	7.4.1.49	<i>Hazardous Location Notification</i> – The system shall be able to send to following vehicles "copies" of the traffic signs, or information about the local traffic (e.g. sudden congestion), that it may be useful to receive in advance.	7.4.1.32 7.4.2.6 7.4.3.10 7.4.4.18 8.5.5.2
Ghost Driver Management	7.4.2	<i>The activities associated with the management of the situation when a vehicle is being driven the wrong way along a road or carriageway.</i>	
	7.4.2.1	The system shall be able to detect that a (non-self-reporting) vehicle is travelling in the wrong direction along a “one-way” road (i.e. a ghost driver), and warn other vehicles “ahead” of that vehicle.	
	7.4.2.2	The system shall be able to warn drivers in a timely manner of self-reporting ghost drivers via an in-vehicle display.	7.2.5.1
	7.4.2.3	The system shall be able to detect that the host vehicle is travelling in the wrong direction along a “one-way” road (i.e. a ghost driver), and warn/advise that driver to correct the situation.	
	7.4.2.4	The system shall be able to detect that a vehicle is overtaking (i.e. in the wrong lane) on a two-lane road and that there is another vehicle approaching in that lane, and provide a warning to the drivers of both vehicles via their in-vehicle devices.	
	7.4.2.5	The system shall provide "copies" of the traffic signs that are relevant to the current section of the road (e.g. speed limit, road hazards, junctions) to the driver at all times via an in-vehicle display.	7.4.1.48 7.4.3.9 7.4.4.17 8.5.5.1

FRAME User Needs V4.1

Group	No	Description	Similar
	7.4.2.6	The system shall be able to send to following vehicles "copies" of the traffic signs, or information about the local traffic (e.g. sudden congestion), that it may be useful to receive in advance.	7.4.1.32 7.4.1.49 7.4.3.10 7.4.4.18 8.5.5.2
Lane Utilization	7.4.3	<i>The activities associated with the management of the use of lanes on a multi-lane road, including providing restrictions, the management of obstacles and of hard shoulder running.</i>	
	7.4.3.1	The system shall be able to provide lane usage information to the driver via an in-vehicle display.	
	7.4.3.2	The system shall be able to provide lane restriction information (e.g. HGV, HOV) from outside the vehicle, and to confirm that it is consistent with the information that has been sent directly to that vehicle.	7.1.10.1
	7.4.3.3	The system shall be able to provide instructions not to change lanes to the driver via an in-vehicle device in order to stabilise the total traffic flow. These instructions may either apply to all types of vehicle, or to sub-sets.	
	7.4.3.4	The system shall provide information to the driver via an in-vehicle display when auxiliary lanes are now available for use by that type of vehicle (e.g. hard shoulder running).	
	7.4.3.5	The system shall ensure that the auxiliary lane is free from obstacles before it is released for use.	
	7.4.3.6	The system shall be able to provide lane usage information to the driver via an in-vehicle display when there are temporary restrictions to lane usage (e.g. at road works).	7.1.5.2
	7.4.3.7	The system shall be able to advise a driver, via an in-vehicle device, which lane to use when passing an incident/accident.	

FRAME User Needs V4.1			
Group	No	Description	Similar
	7.4.3.8	The system shall be able to advise a driver, via an in-vehicle device, where to stop safely (e.g. an appropriate exit lane, hard shoulder)	
	7.4.3.9	The system shall provide "copies" of the traffic signs that are relevant to the current section of the road (e.g. speed limit, road hazards, junctions) to the driver at all times via an in-vehicle display.	7.4.1.48 7.4.2.5 7.4.4.17 8.5.5.1
	7.4.3.10	The system shall be able to send to following vehicles "copies" of the traffic signs, or information about the local traffic (e.g. sudden congestion), that it may be useful to receive in advance.	7.4.1.32 7.4.1.49 7.4.2.6 7.4.4.18 8.5.5.2
Speed Management	7.4.4	<i>The activities associated with providing warning to drivers on the current legal speed limit and/or the current recommended speed limit.</i>	7.1.7.n
	7.4.4.1	The system shall be able to recommend a safe speed limit according to the prevailing traffic, weather and road conditions based on the current legal speed limit.	8.2.5.1 8.2.5.4
	7.4.4.2	The system shall be able to warn drivers, via an in-vehicle display, of different legal speed limits as a result of particular weather conditions.	7.1.7.3
	7.4.4.3	The system shall provide legal speed limits continuously to the driver, via an in-vehicle display, according to the type of the host vehicle and the lane in which it is travelling (Intelligent Speed Adaptation – ISA). A suitable message should be provided if the service provision cannot be guaranteed.	8.2.5.1 8.2.5.4
	7.4.4.4	The system shall be able to provide recommended speed limits continuously to the driver, via an in-vehicle display, according to the type of the host vehicle and the lane in which it is travelling (Intelligent Speed Adaptation – ISA). A suitable message should be provided if the service provision cannot be guaranteed.	8.2.5.1 8.2.5.4

FRAME User Needs V4.1

Group	No	Description	Similar
	7.4.4.5	The system shall enable the driver of the host vehicle, via an in-vehicle device, to receive safety-related information (e.g. legal speed limit, recommended speed limit) from other vehicles in the vicinity.	8.2.5.1 8.2.5.4
	7.4.4.6	The system shall enable the driver of the host vehicle, via an in-vehicle device, to receive safety-related information (e.g. legal speed limit, recommended speed limit) from a road-side device.	8.2.5.1 8.2.5.4
	7.4.4.7	The system shall enable the driver of the host vehicle, via an in-vehicle device, to receive safety-related information (e.g. legal speed limit, recommended speed limit) from the TCC.	8.2.5.1 8.2.5.4
	7.4.4.8	The system shall be able provide recommended speed limits from outside the vehicle, and to confirm that they are consistent with the limits that have been sent directly to that vehicle.	8.2.5.2
	7.4.4.9	The system shall enable a road-side device to display safety-related information (e.g. legal speed limit, recommended speed limit) to drivers via a road-side device.	8.2.5.2
	7.4.4.10	The system shall enable the TCC to display safety-related information (e.g. legal speed limit, recommended speed limit) to drivers via a road-side device.	8.2.5.2
	7.4.4.11	The system shall be able to compare the reported speed of a vehicle with the current legal speed limit and send a warning to that vehicle for display to the driver, via an in-vehicle device, if its current speed is greater than the legal speed limit.	
	7.4.4.12	The system shall be able to compare the reported speed of a vehicle with the current legal speed limit and display a warning to the driver, via a road-side device, if its current speed is greater than the legal speed limit.	
	7.4.4.13	The system shall be able to compare the reported speed of a vehicle with the current recommended speed limit and send a warning to that vehicle for display to the driver, via an in-vehicle device, if its current speed is greater than the recommended speed limit.	

FRAME User Needs V4.1

Group	No	Description	Similar
	7.4.4.14	The system shall be able to compare the reported speed of a vehicle with the current recommended speed limit and display a warning to the driver, via a road-side device, if its current speed is greater than the recommended speed limit.	
	7.4.4.15	The system shall be able to warn the driver, via an in-vehicle device, that the host vehicle is exceeding the maximum speed limit.	
	7.4.4.16	The system shall inform the driver, via an in-vehicle display, that there is a modification to the speed limit ahead, and the reason for it.	
	7.4.4.17	The system shall provide "copies" of the traffic signs that are relevant to the current section of the road (e.g. speed limit, road hazards, junctions) to the driver at all times via an in-vehicle display.	7.4.1.48 7.4.2.5 7.4.3.9 8.5.5.1
	7.4.4.18	The system shall be able to send to following vehicles "copies" of the traffic signs, or information about the local traffic (e.g. sudden congestion), that it may be useful to receive in advance.	7.4.1.32 7.4.1.49 7.4.2.6 7.4.3.10 8.5.5.2
Headway Management	7.4.5	<i>The activities associated with providing a driver with a safe recommended headway from the vehicle in front.</i>	
	7.4.5.1	The system shall enable the TCC to calculate recommended headways for the current traffic and environment conditions.	
	7.4.5.2	The system shall provide the current minimum headway for the current speed limit to the driver via an in-vehicle device.	
	7.4.5.3	The system shall be able to recommend a safe minimum headway according to the current speed limit, traffic, weather and road conditions to the driver via an in-vehicle device.	

FRAME User Needs V4.1			
Group	No	Description	Similar
	7.4.5.4	The system shall inform the driver, via an in-vehicle display, that there is a modification to the recommended headway ahead, and the reason for it.	
	7.4.5.5	The system shall be able to warn the driver, via an in-vehicle device, that the host vehicle is violating the minimum headway.	
Collision Warning	7.4.6	<i>The activities associated with identifying the possibility of collision with another vehicle in various circumstances and sending a consequential warning to the driver.</i>	
	7.4.6.1	The system shall be able to determine the type and current position of other vehicle(s) in the vicinity of the host vehicle, and to predict their future path(s).	
	7.4.6.2	The system shall be able to determine that there is a high probability of a collision between the host vehicle and another vehicle.	
	7.4.6.3	The system shall be able to warn the driver approaching a junction, via an in-vehicle device, of other equipped vehicles approaching that junction.	
	7.4.6.4	The system shall be able to warn the driver approaching a junction, via an in-vehicle device, of an equipped emergency vehicle that is approaching that junction.	
	7.4.6.5	The system shall be able to determine that the host vehicle is (about to) change lanes and warns the driver, via and in-vehicle device, if there are other equipped vehicles on potential collision path (e.g. motor-cycle in a blind spot).	
	7.4.6.6	The system shall be able to determine that the host vehicle is (about to) overtake, or turn across the road, and warns the driver, via and in-vehicle device, if there are other equipped vehicles on potential collision path (e.g. motor-cycle in a blind spot).	
	7.4.6.7	The system shall be able to compare the current trajectory of a vehicle with the road geometry and send a warning to that vehicle for display to the driver, via an in-vehicle device, that it is about to depart its lane.	

FRAME User Needs V4.1

Group	No	Description	Similar
	7.4.6.8	The system shall be able to compare the current trajectory of a vehicle with the road geometry and send a warning to the driver, via a road-side device, that it is about to depart its lane.	
	7.4.6.9	The system shall be able to compare the current trajectory of a vehicle with the road geometry and send a warning to the drivers of other vehicles that might be affected, via an in-vehicle device, that an oncoming vehicle lane departure into their lane is imminent.	
	7.4.6.10	The system shall be able to compare the current trajectory of a vehicle with the road geometry and send a warning to the drivers of other vehicles that might be affected, via a road-side device, that an oncoming vehicle lane departure into their lane is imminent.	
	7.4.6.11	The system shall be able to warn the driver, via an in-vehicle device, that another equipped vehicle is approaching the host vehicle from the front and in the same (partial) lane.	
	7.4.6.12	The system shall be able to warn the driver, via an in-vehicle device, that another equipped vehicle is approaching the host vehicle from the rear in the same (partial) lane and, when possible, provide advice, e.g. change to a safe adjacent lane, accelerate.	
	7.4.6.13	The system shall be able to warn the driver, via an in-vehicle device, that a slower equipped vehicle is ahead of the host vehicle and in the same (partial) lane and, when possible, provide advice, e.g. change to a safe adjacent lane, decelerate, brake.	
	7.4.6.14	The system shall be able to warn the driver, via an in-vehicle device, that there is a stationary object ahead of the host vehicle and in the same (partial) lane and, when possible, provide advice, e.g. change to a safe adjacent lane, brake.	7.4.1.41 7.4.1.42
	7.4.6.15	The system shall be able to advise the driver, via an in-vehicle device, of a recommended speed and distance from the vehicle ahead, based on the speed and characteristics (e.g. mass, load being carried) of the host vehicle and of the vehicle ahead.	

FRAME User Needs V4.1

Group	No	Description	Similar
	7.4.6.16	The system shall be able to calculate the current and future trajectories of each vehicle and VRU approaching the host vehicle at an urban intersection and assess the potential for collisions with the host vehicle.	
	7.4.6.17	The system shall be able to warn the driver of the host vehicle, via an in-vehicle device, of any collisions that could occur with other vehicles and/or VRU that are approaching an urban intersection.	
	7.4.6.18	The system shall be able to use a road-side device to warn drivers of any collisions that could occur with other vehicles and/or VRU that are approaching an urban intersection.	
	7.4.6.19	The system shall be able to calculate the trajectory of each vehicles and VRU approaching a T-junction, predict their future trajectories, assess potential conflicts and advise the driver on the minor road when to exit and join the main road.	
	7.4.6.20	The system shall be able to receive the status of traffic signals/signs that the host vehicle is approaching.	
	7.4.6.21	The system shall be able to provide advice to the driver approaching a junction, via an in-vehicle device, recommendations in terms of lane, speed, when traffic signal will change.	
	7.4.6.22	The system shall be able to advise a driver, via an in-vehicle device, how to approach a complex urban junction, e.g. speed required to go through green phase, imminent red phase warning, reduce speed to avoid queuing traffic, another vehicle or VRU, recommended lane choice.	
	7.4.6.23	The system shall be able to provide a warning to the driver, via an in-vehicle display, that other drivers ahead are performing an emergency brake manoeuvre.	
	7.4.6.24	The system shall be able to inform vehicles behind the host vehicle that it is performing an emergency brake manoeuvre.	

FRAME User Needs V4.1			
Group	No	Description	Similar
	7.4.6.25	The system shall be able to provide a warning to the driver, via an in-vehicle display, that other vehicles behind are behaving in a dangerous manner (e.g. over speed limit, below minimum headway).	
<i>Vulnerable Road User Warning</i>	7.4.7	<i>The activities associated with warning a driver that a VRU is in a dangerous location.</i>	
	7.4.7.1	The system shall be able to warn the driver, via an in-vehicle device, that a VRU has been detected in a dangerous location by a system at the road side.	
	7.4.7.2	The system shall be able to warn the driver, via an in-vehicle device, that a VRU has been detected in a dangerous location by a system on the host vehicle.	
<i>Emergency Vehicle Warning</i>	7.4.8	<i>The activities associated with facilitating a smooth journey (blue wave) for emergency vehicles.</i>	
	7.4.8.1	The system shall enable drivers to be warned, via an in-vehicle device, that there are one, or more, stationary assistance/emergency vehicles ahead of them.	
	7.4.8.2	The system shall enable drivers to be warned, via a road-side device, that there are one, or more, stationary assistance/emergency vehicles ahead of them.	
	7.4.8.3	The system shall enable an emergency vehicle to request a “blue wave” from those other vehicles that are in its path.	
	7.4.8.4	The system shall enable an emergency vehicle to request a green signal for when that vehicle passes a controlled intersection.	
	7.4.8.5	The system shall enable the trajectory of an emergency vehicle to be predicted and compared with the trajectories of other vehicles in the vicinity, and to warn the drivers of those other vehicles with a potential conflict, via an in-vehicle device.	

FRAME User Needs V4.1			
Group	No	Description	Similar
	7.4.8.6	The system shall be able to inform the driver of the host vehicle, via an in-vehicle device, that an emergency vehicle is approaching, and in sufficient time to enable a “blue corridor” to be created by all equipped vehicles.	
	7.4.8.7	The system shall be able to advise the driver, via an in-vehicle device, of an appropriate lane to use to create a “blue corridor”.	
	7.4.8.8	The system shall enable the host emergency vehicle to “place” virtual cones around the site of an accident.	
	7.4.8.9	The system shall enable the driver of the host vehicle to be advised, via an in-vehicle device, not to enter a zone defined by virtual cones.	
Cooperative Systems – Traffic Efficiency Traffic Flow Optimisation	7.5	<i>These are applications and services that enhance the efficiency of traffic by providing Traffic Flow Optimisation, Advanced Adaptive Traffic Signals and Flexible Lane Allocation. These User Needs are associated with functions that are expected to use V2V and V2I technologies (Cooperative Systems).</i>	
	7.5.1	<i>The activities associated with optimising the traffic flow by providing routes suitable for the vehicle, and alternatives when there is congestion.</i>	
	7.5.1.1	The system shall enable a traveller to request and receive journey plans in advance, assess different plans according to certain criteria (e.g. vehicle type, travel time, cost, expected traffic density, planned events, facilities en route, parking), and to save one for future use.	6.1.0.4 6.1.0.5 6.1.0.6 7.6.2.3
	7.5.1.2	(X)FCD – The system shall be able to send the intended route of the host vehicle (e.g. from a navigation system) to a road-side device.	7.4.1.2 8.2.4.1
	7.5.1.3	The system shall be able to monitor the current inter-urban traffic and weather/environmental conditions, identify incidents, assess their impact, make short term predictions, and select and initiate an appropriate mitigation strategy.	7.1.1.3 7.1.3.5

FRAME User Needs V4.1

Group	No	Description	Similar
	7.5.1.4	The system shall be able to monitor the current inter-urban traffic and weather/environmental conditions for the road network and recommend and/or set an appropriate traffic management strategy.	7.1.1.3 7.1.3.5
	7.5.1.5	The system shall be able to manage the traffic in an area using a number of local semi-autonomous traffic management units, whose rules can be modified when required.	
	7.5.1.6	The system shall enable the TCC to receive information about emergencies, e.g. eCall, ghost drivers.	
	7.5.1.7	The system shall enable the TCC to obtain travel times from cellular telephone service providers.	
	7.5.1.8	The system shall enable the TCC to inform drivers, via an in-vehicle device, about (foreseen and unexpected) incidents on the driver's planned route.	7.1.7.6
	7.5.1.9	The system shall be able to warn the driver, via an in-vehicle device, of incidents in the urban road network as they are detected.	
	7.5.1.10	The system shall enable the service provided to the traveller to be passed from one TCC to another as the traveller moves from one area of coverage to another.	
	7.5.1.11	The system shall be able to provide the driver, via an in-vehicle device, and on request, details of the (predicted) traffic situation in a defined area of interest, and for a time horizon, that has been selected by the driver. This information shall be updated at (selected) intervals.	
	7.5.1.12	The system shall enable the driver to store data relating to the characteristics of the host vehicle for that trip (e.g. loaded weight, hazardous goods, (trailer) dimensions).	9.5.7.1
	7.5.1.13	The system shall be able to determine the characteristics of the host vehicle (e.g. Type, (Total) weight, Width, Length (including trailer)).	9.5.7.2
	7.5.1.14	The system shall enable the host vehicle to receive information from other vehicles about the goods being carried by those vehicles.	9.5.7.3

FRAME User Needs V4.1

Group	No	Description	Similar
	7.5.1.15	The system shall be able to provide the driver via an in-vehicle device with a route to a selected destination that takes account of the vehicle type, the state of the traffic on the road network and any incidents/congestion (route options may be offered and one selected by the driver).	7.2.2.3
	7.5.1.16	The system shall be able to calculate an optimal speed for each type of vehicle through designated sections of the road network and provide that information to drivers via an in-vehicle device.	
	7.5.1.17	The system shall be able to compute an alternative local route for vehicles approaching a location to be avoided (e.g. one where there is a traffic incident or congestion above a given severity), and does not create congestion downstream. The alternative route computed may depend upon the vehicle type, and may need to be changed as the incident or congestion to be avoided evolves over time.	7.1.0.5 7.1.5.7 7.2.0.1
	7.5.1.18	The system shall be able to inform the driver, via an in-vehicle device, that an incident has been detected ahead on the selected route and provide a revised route.	6.2.1.1
	7.5.1.19	The system shall be able to present an alternative route that avoids an incident or congestion to the driver via an in-vehicle device, and to update that route if necessary.	
	7.5.1.20	The system shall enable the TCC to instruct drivers, via an in-vehicle device, of an alternative route that should be followed (to avoid an incident).	
	7.5.1.21	The system shall be able to “follow” those vehicles that have been provide with individual routes and to prove the effectiveness of those suggested routes, making changes to the algorithms that will be used in the future if necessary.	7.1.1.1
	7.5.1.22	The system shall be able to inform the driver via an in-vehicle device that part(s) of the selected route include one or more Flexible Lane Allocation sections.	
	7.5.1.23	The system shall inform the driver via an in-vehicle device that the vehicle has departed from the selected route and a revised route has been requested.	6.4.0.4

FRAME User Needs V4.1			
Group	No	Description	Similar
	7.5.1.24	The system shall be able to calculate a predicted time for a total journey made up from separate links. The predicted time shall be updated regularly as the time for each link changes.	6.4.1.3 7.1.6.1
	7.5.1.25	The system shall enable the TCC to recommend the use of alternative routes for different types of vehicle.	6.4.0.4 7.1.5.6 7.3.1.2 9.5.2.12
	7.5.1.26	The system shall enable the TCC to command the use of alternative routes for different types of vehicle.	6.4.0.4 7.1.5.6 7.3.1.2 9.5.2.12
	7.5.1.27	The system shall be able to provide current and predicted journey times to another navigation device via an open interface (to enable dynamic navigation on the other device).	
	7.5.1.28	The system shall enable the TCC to inform traveller information service providers of the current traffic management strategy.	7.1.0.9
	7.5.1.29	The system shall be able to analyse traffic data using an off-line simulation tool.	
	7.5.1.30	The system shall be able to use a simulation model for predicting the effects of implementing a given cooperative traffic management scenario.	7.3.0.4 7.3.0.5
Advanced Adaptive Traffic Signals	7.5.2	<i>The activities associated with improving the flow of traffic through a signalised junction.</i>	
	7.5.2.1	The system shall enable a road-side device to receive information on the status of traffic signals.	
	7.5.2.2	The system shall enable the driver of a host vehicle to request a series of green phases from traffic signals (i.e. a green wave) for the route that is about to be taken.	

FRAME User Needs V4.1

Group	No	Description	Similar
	7.5.2.3	The system shall enable a traffic signal controller to receive a request for a green phase from an approaching vehicle; in the event that more than one conflicting request is received at the same time they shall be prioritised (e.g. emergency vehicles before private vehicles), possibly by the TCC operator.	7.1.9.1
	7.5.2.4	The system shall be able to determine the queue length in front of traffic signals in urban areas.	
	7.5.2.5	The system shall enable the traffic signal controller to determine the expected arrival time of a vehicle at the junction using data received from that vehicle (e.g. current location and speed profile, estimated time of arrival).	
	7.5.2.6	The system shall enable the traffic signal controller to inform the driver, via an in-vehicle display, that a green phase will be available when the host vehicle arrives at that junction at a recommended speed; this includes the ability to warn that a green phase is not possible.	
	7.5.2.7	The system shall be able to calculate an optimal speed for each vehicle through a section of road.	
	7.5.2.8	The system shall enable a traffic signal controller that has received a green phase request to inform downstream controllers that a green wave vehicle is approaching.	
	7.5.2.9	The system shall be able to keep track of the speed profiles of green wave vehicles between signalised junctions.	
	7.5.2.10	The system shall be able to warn other vehicles that a green wave is in operation.	
	7.5.2.11	The system shall be able to determine that the host vehicle is about to go through a red traffic signal, and to broadcast a warning to vehicles in the vicinity.	
	7.5.2.12	The system shall enable the host vehicle to receive a message that another vehicle is about to go through a red traffic signal, and to provide a warning to the driver, via an in-vehicle device.	

FRAME User Needs V4.1

Group	No	Description	Similar
<i>Flexible Lane Allocation</i>	7.5.3	<i>The activities associated with the temporary use of PT lanes by other authorised vehicles.</i>	
	7.5.3.1	The system shall permit approved vehicles to use a section of a bus lane when it is not being used by PT or other specific vehicles (e.g. taxis and emergency services).	
	7.5.3.2	The system shall be able to predict the usage of a particular section of a bus lane for a short time into the future (e.g.15 minutes).	
	7.5.3.3	The system shall enable an approved vehicle that wishes to use a section of bus lane to provide its characteristics, destination and speed for lane use management.	
	7.5.3.4	The system shall enable the driver to set the destination of the host vehicle that wishes to use a bus lane, if this cannot be provided by the navigation system for lane use management.	
	7.5.3.5	The system shall be able to determine whether there is congestion on the normal road and, if so, whether a temporary licence should be given to the approved vehicle that is making a request to use a corresponding section of a bus lane without causing delays to scheduled PT vehicles.	
	7.5.3.6	The system shall inform the driver whether a licence has been granted to become an approved vehicle and, if so, for how long it will remain valid.	
	7.5.3.7	The system shall monitor the approved vehicles on the bus lanes and, if its licence has expired, that vehicle will be ordered to leave the bus lane at the end of that section.	
	7.5.3.8	The system shall monitor the usage of the bus lanes, and if a green wave cannot be sustained for a PT vehicle, then approved vehicles shall be ordered to leave the bus lane at the end of that section, and no further licences will be granted until suitable conditions are resumed.	
	7.5.3.9	The system shall monitor the congestion in each section of a bus lane and if a “critical/emergency” situation arises then approved vehicles shall be ordered to leave that section and the up-stream section(s) of bus lanes.	

FRAME User Needs V4.1			
Group	No	Description	Similar
	7.5.3.10	The system shall monitor the usage of the bus lanes and record the identification, time and location of any vehicle that does not have permission to use it, for further processing by an enforcement agency.	
	7.5.3.11	The system shall collect traffic information (e.g. number of vehicles, speeds, queue lengths, violation details) on the roads covered by flexible bus lane allocation for statistical purposes, and to improve the algorithms used to decide when non-PT vehicles can use the bus lane.	
Cooperative Systems – Value-Added and Other Services	7.6	<i>These are applications and services that provide eCall, Enhanced Route Guidance and Navigation, Access Control and Service Continuity. These User Needs are associated with functions that are expected to use V2V and V2I technologies (Cooperative Systems).</i>	
eCall	7.6.1	<i>These activities are associated with providing emergency support after a traffic/vehicle/driver incident.</i>	5.1.0.n 7.2.0.n 7.2.1.n
	7.6.1.1	The system shall be able to detect that the host vehicle has been involved in an incident/accident and to call the emergency services either automatically or on command of the driver/passenger (eCall).	
	7.6.1.2	The system shall be able to send a request for assistance (eCall) message to the emergency services from a road-side device.	8.5.1.1
Enhanced Route Guidance and Navigation	7.6.2	<i>The activities are associated with providing personalised and up-to-date route guidance.</i>	6.4.n.n
	7.6.2.1	The system shall be able to provide data to add to, or to replace, that used to form a digital map.	
	7.6.2.2	The system shall enable the driver of the host vehicle to provide the destination and personal settings for the journey (e.g. desired route, way points, special needs).	6.4.1.4

FRAME User Needs V4.1

Group	No	Description	Similar
	7.6.2.3	The system shall enable a traveller to request and receive personalised journey plans in advance, assess different plans according to certain criteria (e.g. vehicle type, travel time, cost, expected traffic density, planned events, facilities en route, parking), and to save one for future use.	6.1.0.4 6.1.0.5 6.1.0.6 7.5.1.1
	7.6.2.4	The system shall enable the traveller information service provider to receive current inter-urban traffic management, and weather, conditions and planned events.	
	7.6.2.5	The system shall enable the traveller information service provider to be provided with current an predicted inter-urban traffic conditions.	
	7.6.2.6	The system shall enable the traveller to request and receive (anticipated) weather/environmental conditions on, or before, a planned trip.	
	7.6.2.7	The system shall be able to calculate the expected time of arrival at a destination or way point based on the driver's profile and the anticipated traffic conditions.	6.4.1.3
	7.6.2.8	The system shall be able to provide the driver, via an in-vehicle device, with a personalised route.	
	7.6.2.9	The system shall be able to provide the driver, via an in-vehicle device, with an estimated time of arrival which is updated at regular intervals.	
	7.6.2.10	The system shall enable the driver to (request and) receive, via an in-vehicle device, personalised on-trip information about incidents that may affect the planned journey.	
	7.6.2.11	The system shall enable a traveller to request and receive, via an in-vehicle device, personalised on-trip alternative journey plans (to avoid an incident) and to accept/reject the proposal(s).	
	7.6.2.12	The system shall be able to provide the pre-trip driver, via an in-vehicle device, with suggested alternative routes.	
	7.6.2.13	The system shall enable a traveller to request and receive, via an in-vehicle device, on-trip information about facilities on, or near, the planned route (e.g. fuel stations, refreshment areas).	

FRAME User Needs V4.1			
Group	No	Description	Similar
	7.6.2.14	The system shall be able to send O-D data, from the navigation system, and current location data from the host vehicle to the TCC to enable geo-referenced travel times to be produced.	
	7.6.2.15	The system shall enable the service provided to the traveller to be passed from one Service Provider to another as the traveller changes areas of coverage.	
Access Control	7.6.3	<i>These activities are associated with controlling access to a specific area into which only designated vehicles can go.</i>	7.3.1
	7.6.3.1	The system shall enable the host vehicle to receive the information from a road-side device that it is about to enter a “sensitive are”, and then to contact the relevant Access Control Centre.	
	7.6.3.2	The system shall enable the host vehicle to detect (e.g. using map matching) that it is about to enter a “sensitive area” and to contact the relevant Access Control Centre.	
	7.6.3.3	The system shall enable the Access Control Centre to give, or deny, permission for an equipped vehicle to enter a “sensitive area”.	
	7.6.3.4	The system shall enable the Access Control Centre to monitor all equipped vehicles, and the traffic, within a “sensitive area” and to send instructions to the drivers of the equipped vehicles.	
	7.6.3.5	The system shall enable the Access Control Centre to store information about each equipped vehicle.	
	7.6.3.6	The system shall enable the host vehicle to close the contact with the Access Control Centre when it leaves the “sensitive area” and to create a report for the freight vehicle driver.	
Service Continuity	7.6.4	<i>These activities are associated with ensuring that applications and services are provided throughout a journey.</i>	

FRAME User Needs V4.1			
Group	No	Description	Similar
	7.6.4.1	The system shall be able to exchange relevant information between adjacent TCCs and TICs to ensure the continuity of services for travellers.	2.1.0.1
8 Intelligent Vehicle Systems		<i>This group contains the functions found within a vehicle, including vision enhancement, longitudinal and lateral collision avoidance, lane keeping, platooning, speed control, driver alertness, 'eCall' initiation, etc.</i>	
8.1 Vision Enhancement		<i>This service does not require communications with any other vehicle or infrastructure and is therefore outside the scope of the European ITS Framework Architecture.</i>	
8.1.0 Basic Services	8.1.0.1	Deleted - outside new system boundary	
	8.1.0.2	Deleted - outside new system boundary	
	8.1.0.3	Deleted - outside new system boundary	
	8.1.0.4	Deleted - outside new system boundary	
8.2 Automated Vehicle Operation			
8.2.0 Objectives	8.2.0.1	The system shall provide support for direct or indirect assistance for the driving task.	
8.2.1 Collision Avoidance	8.2.1.1	The system shall be able to inform another vehicle when the host vehicle has detected that a collision is imminent.	
	8.2.1.2	Deleted - outside new system boundary	
	8.2.1.3	Deleted - outside new system boundary	
8.2.2 Lane Keeping	8.2.2.1	The system shall be able to provide support to control the lateral dynamic behaviour of the vehicle automatically, and keep the vehicle within its current lane of the carriageway.	8.4.2.1

FRAME User Needs V4.1

Group	No	Description	Similar
	8.2.2.2	The system shall be able to provide support to provide the driver with information, or active steering support, to assist him/her to keep within the current lane of the carriageway.	8.4.2.2
8.2.3 Platooning	8.2.3.1	The system shall provide support to create a platoon of vehicles, in particular trucks ("Electronic Towbar" or "Road Train").	
	8.2.3.2	Deleted - outside new system boundary	
	8.2.3.3	Deleted - outside new system boundary	
	8.2.3.4	Deleted - outside new system boundary	
	8.2.3.5	Deleted - outside new system boundary	
	8.2.3.6	Deleted - outside new system boundary	
	8.2.3.7	Deleted - outside new system boundary	
8.2.4 Short Range Communications	8.2.4.1	The system shall be able to communicate with other equipped vehicles, and/or the infrastructure, to exchange data for automatic vehicle control.	
8.2.5 Speed Control	8.2.5.1	The system shall be able to provide support to limit the speed of a vehicle automatically to the a given, but variable, maximum (intelligent speed adaptation)	
	8.2.5.2	The system shall be able to receive (variable) mandatory speed limits from outside the vehicle.	7.1.7.4
	8.2.5.3	Moved to 8.5.5.1	
	8.2.5.4	The system shall be able to display continuously to the driver the current mandatory speed limit.	
	8.2.5.5	Deleted - outside new system boundary	

FRAME User Needs V4.1			
Group	No	Description	Similar
	8.2.5.6	Deleted - identical to 8.2.5.2	
8.2.6 Supporting Tasks	8.2.6.1	Deleted - outside new system boundary	
	8.2.6.2	Deleted - outside new system boundary	
	8.2.6.3	Deleted - outside new system boundary	
	8.2.6.4	Deleted - outside new system boundary	
	8.2.6.5	Deleted - outside new system boundary	
	8.2.6.6	Deleted - outside new system boundary	
	8.2.6.7	Deleted - outside new system boundary	
8.3 Longitudinal Collision Avoidance			
8.3.0 Objectives	8.3.0.1	The system shall be able to provide the driver with assistance in longitudinal separation from other vehicles in, or entering, the host vehicle's lane.	
	8.3.0.2	Deleted - outside new system boundary	
	8.3.0.3	Deleted - outside new system boundary	
8.3.1 Collision Avoidance	8.3.1.1	Deleted - outside new system boundary	
	8.3.1.2	The system shall be able to provide support to warn the driver when the vehicle in front is too close.	
	8.3.1.3	The system shall be able to provide support to determine a safe vehicle trajectory relative to the lane/road boundaries.	8.4.1.3
	8.3.1.4	Deleted - outside new system boundary	

FRAME User Needs V4.1			
Group	No	Description	Similar
	8.3.1.5	Deleted - outside new system boundary	
	8.3.1.6	Deleted - outside new system boundary	
	8.3.1.7	Deleted - outside new system boundary	
8.3.2 Supporting Tasks			
	8.3.2.1	Deleted - outside new system boundary	
	8.3.2.2	Deleted - outside new system boundary	
	8.3.2.3	Deleted - outside new system boundary	
	8.3.2.4	Deleted - outside new system boundary	
	8.3.2.5	Deleted - outside new system boundary	
8.4 Lateral Collision Avoidance			
8.4.0 Objectives			
	8.4.0.1	The system shall provide support to monitor for hazards involved in lane keeping, lane changing, entering and leaving high speed roads, and overtaking.	
	8.4.0.2	Deleted - outside new system boundary	
8.4.1 Collision Avoidance			
	8.4.1.1	The system shall be able to provide support to warn the driver if the host vehicle moves towards a volume of road space that is about to be occupied, or already occupied, by another road user.	
	8.4.1.2	Deleted - outside new system boundary	
	8.4.1.3	The system shall be able to provide support to determine a safe vehicle trajectory relative to the lane/road boundaries.	8.3.1.3
	8.4.1.4	Deleted - outside new system boundary	

FRAME User Needs V4.1			
Group	No	Description	Similar
8.4.2 Lane Keeping	8.4.2.1	The system shall be able to provide support to detect the position of the vehicle relative to lane boundaries and/or roadway shoulders.	8.2.2.1
	8.4.2.2	The system shall be able to provide support to to warn the driver when the vehicle approaches or exceeds the lane boundaries.	8.2.2.2
8.4.3 Supporting Tasks	8.4.3.1	Deleted - outside new system boundary	
	8.4.3.2	Deleted - outside new system boundary	
	8.4.3.3	Deleted - outside new system boundary	
	8.4.3.4	Deleted - outside new system boundary	
	8.4.3.5	Deleted - outside new system boundary	
8.5 Safety Readiness			
8.5.0 Basic Services	8.5.0.1	The system shall minimise the risk of an accident due to the impaired alertness of the driver.	
	8.5.0.2	The system shall be able to detect impairment of the driver, e.g. alcohol/drug abuse, drowsiness, sudden health problems, prolonged inattention, etc.	
	8.5.0.3	The system shall be able to warn the driver when a lack of alertness is detected.	
	8.5.0.4	The system shall be able to warn surrounding drivers that this driver has a problem.	
8.5.1 eCall	8.5.1.1	The system shall be able to make an 'eCall'.	5.1.0.7 5.1.0.1
	8.5.1.2	The system shall be able to detect that the vehicle has been involved in an accident, identify its location, and initiate an 'eCall' automatically.	5.1.0.2 9.4.0.3

FRAME User Needs V4.1			
Group	No	Description	Similar
	8.5.1.3	The system shall be able to identify the vehicle's location, and make an 'eCall' on the command of a vehicle occupant.	5.1.0.3 9.4.0.4
	8.5.1.4	The system shall be able to detect that the driver is impaired, identify its position, and initiate an 'eCall' automatically.	5.1.0.7 9.4.0.4
8.5.2 Automatic Parking	8.5.2.1	The system shall be able to manoeuvre the vehicle to the roadside automatically, when the driver does not respond.	
	8.5.2.2	Deleted - outside new system boundary	
8.5.3 Environmental Monitoring	8.5.3.1	Deleted - outside new system boundary	
	8.5.3.2	Deleted - outside new system boundary	
	8.5.3.3	Deleted - outside new system boundary	
	8.5.3.4	The system shall be able to collect information about the vehicle and its environment for other organisations to use, i.e. probe or floating car data.	
8.5.4 Accident Data Recording	8.5.4.1	The system shall be able to record data about an accident and the journey immediately before (black box).	
	8.5.4.2	The system shall be able to provide data about an accident or a journey to an authorised person, e.g. the police.	
8.5.5 Traffic Information & Signs	8.5.5.1	The system shall provide "copies" of the traffic signs that are relevant to the current section of the road (e.g. speed limit, road hazards, junctions) to the driver at all times.	

FRAME User Needs V4.1			
Group	No	Description	Similar
	8.5.5.2	The system shall be able to send to following vehicles "copies" of the traffic signs, or information about the local traffic (e.g. sudden congestion), that it may be usefull to receive in advance	
8.5.6 Vehicle Information	8.5.6.1	The system shall be able to provide a unique ID to an authorised authority on request (i.e. electronic vehicle identification EVI)).	
8.5.7 Improper Use	8.5.7.1	The system shall be able to provide support for detecting that the vehicle is not being used properly, e.g. being stolen.	
8.6 Pre-crash Restraint Deployment		<i>This service does not require communications with any other vehicle or infrastructure and is therefore outside the scope of the European ITS Framework Architecture.</i>	
8.6.0 Basic Services	8.6.0.1	Deleted - outside new system boundary	
	8.6.0.2	Deleted - outside new system boundary	
9 Freight and Fleet Management		<i>This group contains all the activities associated with FFM, including statutory data collection and reporting; orders and document mgt; planning, scheduling, monitoring, reporting & operations mgt; vehicle and cargo safety; mgt of inter-modal interfaces.</i>	
9.1 Commercial Vehicle Pre-Clearance			
9.1.0 Basic Services	9.1.0.1	The system shall enable the device storing the information recorded by the tachograph to be physically removed from the vehicle.	
	9.1.0.2	The system shall enable all electronically recorded information stored on-board the vehicle to be interrogated whenever required.	

FRAME User Needs V4.1

Group	No	Description	Similar
	9.1.0.3	The system shall be able to communicate with road-side equipment whilst the vehicle is travelling.	
	9.1.0.4	The system shall protect the tachograph against fraud, and from being accessed by unauthorised persons.	
9.2 Commercial Vehicle Administrative Processes			
9.2.0 Basic Services			
	9.2.0.1	The system shall be able to store all necessary statutory (i.e. required by law) information on-board the vehicle.	9.5.3.2
	9.2.0.2	The system shall be able to provide communications between fleet operators and the relevant authorities for the transfer of registration data (e.g. vehicle identity, load, etc.) plus payments.	
9.3 Automated Roadside Safety Inspection			
9.3.0 Basic Services			
	9.3.0.1	The system shall be able to transfer safety-related information (e.g. brakes status, driving time etc.) from the vehicle to the road-side whilst the vehicle is travelling.	
	9.3.0.2	The system shall enable the weight of a commercial vehicle to be measured whilst the vehicle is travelling (weigh-in-motion).	3.1.1.3
	9.3.0.3	The system shall be able to collect evidence automatically about a vehicle that has violated the regulations.	4.1.4.1

FRAME User Needs V4.1			
Group	No	Description	Similar
9.4 Commercial Vehicle On-Board Safety Monitoring			
9.4.0 Basic Services	9.4.0.1	The system shall be able to monitor the vehicle and cargo safety status, and the behaviour of the driver (e.g. duration of driving time, excess speed).	9.5.3.10
	9.4.0.2	The system shall issue a warning to the driver whenever a threshold for a vehicle or cargo safety status, or driver behaviour, has been exceeded, and the relevant data shall be recorded.	
	9.4.0.3	The system shall be able to identify the vehicle's location, and make an 'eCall' to the emergency services on the command of a vehicle occupant.	8.5.1.3
	9.4.0.4	The system shall be able to detect that the vehicle has been involved in an incident, identify its location, and initiate an 'eCall' to the emergency services automatically.	8.5.1.2 8.5.1.4
	9.4.0.5	The system shall be able to report to the home base when incorrect driver behaviour persists (e.g. driver is ill, or an unskilled driver is in control).	
9.5 Commercial Fleet Management			
9.5.0 Objectives	9.5.0.1	The system shall support fleet and freight operations for all sizes of operator, including single vehicle companies.	
	9.5.0.2	The system shall be able to incorporate additional regulations as and when required, and provide an indication of compliance.	
9.5.1 Road Freight Management	9.5.1.1	The system shall enable the exchange of information, e.g. market enquiries, offer and supplier evaluation data, contracts, invoices, payments etc. between parties, e.g. consignors, consignees etc.	

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Group	No	Description	Similar
	9.5.1.2	The system shall be able to provide information about a cargo, (e.g. loading status, contents, delays, delivery status, disputes etc.) to the fleet management centre in real time.	
	9.5.1.3	The system shall be able to prepare and update official documents, e.g. transport orders, customs declarations, hazardous goods declarations, notices of dispatch etc. in a controlled manner, and assist the process of checking them.	9.5.3.8
	9.5.1.4	The system shall be able to exchange official documents (e.g. transport orders, customs declarations, hazardous goods declarations, notices of dispatch etc.) between vehicles, the fleet management centre and the relevant authorities in a controlled manner	9.5.3.4
	9.5.1.5	The system shall be able to transfer any information about a journey (e.g. route, (hazardous or oversize) cargo, etc.) to the relevant authorities (e.g. TCCs, TICs etc.) when required.	5.3.0.3
	9.5.1.6	The system shall be able to track the physical (e.g. temperature) and administrative status (e.g. shipment status, delivery status, etc.) of a cargo throughout its journey.	9.5.3.16
	9.5.1.7	The system shall enable the consignee to receive information, (e.g. delivery note, invoice etc.) directly from the vehicle.	
	9.5.1.8	The system shall enable the shipper to receive information (e.g. destination, contractual data etc.) directly from the vehicle.	
	9.5.1.9	The system shall be able to confirm electronic documents with electronic signatures.	
	9.5.1.10	The system shall be able to reconstitute the route taken by any item, and the contracts that have been fulfilled (tracing function).	9.5.3.12
	9.5.1.11	The system shall be able to analyse the costs and performance of the FFM operations.	9.5.2.16 9.5.3.21
	9.5.1.12	The system shall be able to transfer any data that has been recorded on a vehicle to the home base and/or any other authorised third party.	

FRAME User Needs V4.1			
Group	No	Description	Similar
9.5.2 Road Freight Fleet Management	9.5.2.1	The system shall be able to support some aspects of the planning, monitoring, controlling and evaluation of vehicle fleet operations (see below).	
	9.5.2.2	The system shall be able to assign tasks to vehicles and drivers, e.g. pick-up and delivery instructions.	
	9.5.2.3	The system shall be to optimise the scheduling of vehicles.	
	9.5.2.4	The system shall be to optimise the scheduling of drivers.	
	9.5.2.5	The system shall be able to optimise the assignment of loads.	
	9.5.2.6	The system shall be able to weigh the vehicle, compare it with the expected weight and report on any discrepancies or overweight.	
	9.5.2.7	The system shall be able to transfer all information relating to a cargo (e.g. task assignment, load planning etc.) to the vehicle.	9.5.3.3
	9.5.2.8	The system shall be able to provide an optimal route for each 'normal' vehicle.	6.4 9.5.3.22
	9.5.2.9	The system shall be able to provide suitable routes for 'abnormal' vehicles (e.g. oversized, overweight, hazardous cargo etc.) when requested.	5.3.2.1 7.1.4.9
	9.5.2.10	The system shall be able to predict a time of arrival.	6.4.1.3 7.1.6.1 10.2.1.3
	9.5.2.11	The system shall be able to communicate with other systems, e.g. workshop, customs, road operator, police, etc.	
	9.5.2.12	The system shall be able to provide a driver with a suitable alternative route, when the original planned route becomes unavailable.	7.1.5.6 9.5.3.11
	9.5.2.13	The system shall be able to locate, identify and monitor the status of a vehicle, equipment or cargo at any time.	6.4.0.3 10.1.2.1

FRAME User Needs V4.1			
Group	No	Description	Similar
	9.5.2.14	The system shall be able to inform the driver about a change of task, e.g. change of pick-up, delivery, route etc.	9.5.3.11
	9.5.2.15	The system shall be able to schedule the maintenance of vehicles, equipment and cargo units.	
	9.5.2.16	The system shall be able to monitor and analyse the vehicle fleet and drivers' staff costs and performance.	9.5.1.11
9.5.3 Road Vehicle, Driver, Equipment and Cargo Management	9.5.3.1	The system shall support the activities associated with the management of individual vehicles, i.e. not related to the vehicle fleet as a whole.	
	9.5.3.2	The system shall be able to store all necessary commercial and statutory vehicle, driver, trip and freight information on-board the vehicle.	9.2.0.1
	9.5.3.3	The system shall be able to receive all necessary commercial and statutory vehicle, driver, trip and freight information from the fleet management centre at any time.	9.5.2.7
	9.5.3.4	The system shall be able to transfer official documents (e.g. transport orders, customs declarations, hazardous goods declarations, notices of dispatch etc.) between vehicles and relevant parties in a controlled manner.	9.5.1.4
	9.5.3.5	The system shall enable the driver to receive traffic information.	
	9.5.3.6	The system shall enable the driver to receive weather information.	
	9.5.3.7	The system shall enable voice communication between the vehicle and the fleet management centre.	
	9.5.3.8	The system shall be able to assist the process of checking the vehicle, equipment and cargo documents.	9.5.1.3
	9.5.3.9	The system shall be able to record data (e.g. from vehicle, equipment, cargo unit sensors, and driver input etc.) for later processing.	

FRAME User Needs V4.1

Group	No	Description	Similar
	9.5.3.10	The system shall be able to record driver's hours, and report on available hours, deviations and disturbances.	9.4.0.1
	9.5.3.11	The system shall enable the driver to receive a change (e.g. to the route, task, etc.) at any time.	7.1.5.6 9.5.2.12 9.5.2.14
	9.5.3.12	The system shall be able to record the actual route taken.	9.5.1.10
	9.5.3.13	The system shall be able to report when a substantial deviation from the intended route has been used (e.g. to detect a possible theft of the vehicle).	
	9.5.3.14	The system shall be able to determine a delay in the planned time of arrival, and communicate this to the fleet management centre.	
	9.5.3.15	The system shall enable automatic payment, e.g. of tolls etc.	4.1.3.1
	9.5.3.16	The system shall be able to detect when the status of the cargo (e.g. changes in temperature or humidity) exceeds a given limit during the transport cycle, and trigger an alarm.	9.5.1.6
	9.5.3.17	The system shall be able to adjust the temperature and humidity of a freight unit remotely, during the transport cycle.	
	9.5.3.18	The system shall be able to monitor the vehicle and cargo unit for erroneous procedures (e.g. doors being opened incorrectly) and trigger an anti-theft alarm message to the home base and/or any relevant body.	
	9.5.3.19	The system shall be able to provide communications between the vehicle and local breakdown support, e.g. for repair of punctured tyres.	
	9.5.3.20	The system shall enable automatic remote vehicle diagnostics.	
	9.5.3.21	The system shall be able to monitor and analyse the vehicle and driver's staff costs and performance.	9.5.1.11

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Group	No	Description	Similar
	9.5.3.22	The system shall be able to provide the driver with a route to a destination	6.4 9.5.2.8
	9.5.3.23	The system shall be able to record the payment of tolls.	
	9.5.3.24	The system shall be able to monitor the weight of the cargo, check conformance with the documentation and report any variations.	
	9.5.3.25	The system shall be able to record the details of any relevant legal offence committed by the driver, vehicle or cargo, that has been registered with the authorities, and provide them to authorised personnel.	
	9.5.3.26	The system shall be able to record supplementary information about events recorded by the tachograph, e.g. reason for waiting time.	
	9.5.3.27	The system shall be able to provide the driver with relevant information about client sites (consignors & consignees), e.g. location, pick-up/delivery times, average waiting time.	
	9.5.3.28	The system shall be able to collect and record information about collection/delivery operations, e.g. arrival & waiting times, additional work, incidents.	
	9.5.3.29	The system shall be able to time-stamp data recorded during a trip, e.g. current location.	
	9.5.3.30	The system shall be able to produce a message about a new collection of cargo that has been made.	
	9.5.3.31	The system shall be able to provide a list of all the servicing and repair actions that have been done, and any special accessories that have been installed, for confirmation by the driver prior to departure.	
	9.5.3.32	The system shall be able to identify cargo, e.g. during loading and unloading, compare it for compliance with a manifest, and issue a warning in case of non-compliance.	
	9.5.3.33	The system shall be able to identify the vehicle and/or equipment, e.g. to gain access to a controlled site.	
	9.5.3.34	The system shall be able to locate an item of cargo within the vehicle and/or equipment.	

FRAME User Needs V4.1

Group	No	Description	Similar
	9.5.3.35	The system shall be able to record the location of operational points, e.g. pick up, delivery, home base.	
	9.5.3.36	The system shall be able to transfer site access details to the driver from the home base.	
	9.5.3.37	The system shall be able to record guidance details of regular and/or frequent trips so that they do not have to be re-calculated.	
	9.5.3.38	The system shall be able to report automatically the receipt and/or reading of incoming messages to the sender.	
	9.5.3.39	The system shall be able to add a time stamp and/or vehicle position to any message sent from the vehicle; this data to be added at the time the message was formulated and/or the time it was sent.	
	9.5.3.40	The system shall be able to record details about pallets, and provide this information to the home base when required.	
	9.5.3.41	The system shall be able to assist the process of confirming that the driver is suitable qualified to take a given cargo, e.g. dangerous goods.	
	9.5.3.42	The system shall provide information in the native language of the driver.	
9.5.4 Freight Distribution	9.5.4.1	The system shall manage freight and fleets in such a way that the impact of commercial vehicles on the urban environment is minimised.	7.1.0.4
	9.5.4.2	The system shall be able to manage freight and fleets in such a way that the distribution of goods in an urban area will be made in the most efficient manner.	
	9.5.4.3	The system shall be able to manage the use of (un-)loading zones to aid the distribution of goods in an urban area.	
	9.5.4.4	The system shall be able to book places in an equipment/container storage area.	
	9.5.4.5	The system shall be able to forecast the use of an equipment/container storage area	

FRAME User Needs V4.1			
Group	No	Description	Similar
9.5.5 Inter-Modal Interface	9.5.5.1	The system shall be able to manage the use of the interface between freight transport modes in an effective manner.	
	9.5.5.2	The system shall be able to support a combined transport interface management function.	
	9.5.5.3	The system shall be able to support a freight transport order processing function that is common to all modes of transport.	
	9.5.5.4	The system shall ensure that the information associated with a vehicle, equipment or container is available when that vehicle, equipment or container arrives at a modal interchange.	
	9.5.5.5	The system shall enable the matching of demand for, and supply of, (multi-modal) freight transport resources.	
Hazardous Goods Vehicle Management	9.5.6	<i>The activities associated with managing the transit of hazard goods through an area.</i>	
	9.5.6.1	The system shall enable the relevant authority to plan and manage routes that are suitable for use by vehicles carrying hazards goods.	
	9.5.6.2	The system shall enable a driver of a vehicle carrying hazardous goods to request from the relevant authority, via an on-board device, an approved route from the current position of the host vehicle to a stated destination.	5.3.2.1 7.3.1.2 9.5.2.9
	9.5.6.3	The system shall enable the driver of a vehicle carrying hazardous goods to be guided, via an in-vehicle device, along an approved route by the relevant authority.	
	9.5.6.4	The system shall enable a vehicle carrying hazardous goods to be monitored, via an in-vehicle device, by the relevant authority.	5.3.0.n 9.5.1.5
	9.5.6.5	The system shall enable the relevant authority to detect incidents within its area and to re-route any vehicle carrying hazardous goods that will be affected by the consequences of that incident	

FRAME User Needs V4.1

Group	No	Description	Similar
Driver Rest Areas	9.5.6.6	The system shall enable the relevant authority to monitor all vehicles carrying hazardous goods within its area of responsibility, to confirm that they are proceeding as planned, and to contact the driver of any vehicle that is not behaving correctly.	
	9.5.6.7	The system shall enable vehicles carrying hazardous goods to be transferred from one authority to another as they pass from one area of responsibility to another.	
	9.5.6.8	The system shall enable a vehicle carrying hazardous goods to request appropriate assistance in the case of an incident or accident (eCall).	5.1.0.n 5.3.1.3 5.3.1.4 7.2.6.1
	9.5.7	<i>The activities associated with booking and managing freight driver rest areas.</i>	
	9.5.7.1	The system shall enable the driver to store data relating to the characteristics of the host vehicle for that trip (e.g. loaded weight, hazardous goods, (trailer) dimensions).	7.5.1.12
	9.5.7.2	The system shall be able to determine the characteristics of the host vehicle (e.g. Type, (Total) weight, Width, Length (including trailer)).	7.5.1.13
	9.5.7.3	The system shall enable the host vehicle to receive information from other vehicles about the goods being carried by those vehicles.	7.5.1.14
	9.5.7.4	The system shall enable the freight vehicle driver, to request a reservation for a rest area parking place. The request will include the planned route, estimated time, required duration, potential flexibility, possible hazardous goods and vehicle type.	
	9.5.7.5	The system shall enable a rest area parking reservation to be made based on the request that has been received, or to state that one is not available and/or propose and alternative booking, and to send the details to the freight vehicle driver and the fleet operator.	
	9.5.7.6	The system shall enable the driver to accept or reject alternative proposals for a rest area parking place.	

FRAME User Needs V4.1

Group	No	Description	Similar
Loading Zone Management	9.5.7.7	The system shall be able to receive an ETA from a vehicle that is approaching a rest area, based on current traffic conditions, and to send confirmation to the driver that the reserved parking place is still available together with information about the other services that are available.	
	9.5.7.8	The system shall enable the driver to determine the ETA to the booked rest area parking place, based on current traffic information, and to confirm/modify/cancel details of the booking.	
	9.5.7.9	The system shall be able to identify the vehicle that arrives at a rest area, and to inform the driver which parking slot to use and how to get there.	
	9.5.7.10	The system shall be able to receive a message that a vehicle is leaving the rest area.	
	9.5.8	<i>The activities associated with booking urban (un)loading places</i>	
	9.5.8.1	The system shall enable the freight vehicle driver, to request a reservation for an urban parking place to enable un/loading. The request will include the desired location, time, duration, potential flexibility, possible hazardous goods and vehicle type.	
	9.5.8.2	The system shall enable an un/loading zone parking allocation to be made based on the request that has been received, or to state that one is not available and/or propose an alternative booking, and to send the details to the freight vehicle driver and the fleet operator.	
	9.5.8.3	The system shall enable the driver to accept or reject alternative proposals for an urban parking place.	
	9.5.8.4	The system shall be able to receive an ETA from a vehicle that is approaching an urban parking place, and to receive confirmation that the urban parking place (or holding zone) is still/now available and/or receive updates to the booking.	

FRAME User Needs V4.1			
Group	No	Description	Similar
	9.5.8.5	The system shall be able to inform the driver, via an in-vehicle device, of a holding zone that may be used in the event that a suitable urban parking place is not available, or the booked urban parking place is no long available, at the desired time.	
	9.5.8.6	The system shall enable the urban parking zone to be monitored for any vehicle that is parked with or without permission, including overstaying.	
	9.5.8.7	The system shall be able to provide up-to-date micro-routing information to a booked parking place (or holding zone).	
	9.5.8.8	The system shall be able to receive a message that a vehicle is leaving the urban parking place.	
10 Public Transport Management		<i>This group contains the activities associated with public transport (PT), demand responsive PT, Shared PT, on-trip PT Information and Traveller Security. It includes management, scheduling, monitoring, information handling, communications and PT priority.</i>	
10.1 Public Transport Management			
10.1.0 Objectives	10.1.0.1	The system shall provide effective and attractive PT.	
	10.1.0.2	The system shall be able to manage one or more modes of PT.	
	10.1.0.3	The system shall be able to assist PT operators in planning for the optimum use of existing resources to meet the demand.	
	10.1.0.4	The system shall be able to analyse records of usage and operational data, and passenger surveys, to assist in the planning process.	
10.1.1 Scheduling	10.1.1.1	The system shall be able to produce optimum vehicle schedules that consider many issues, e.g. links, points, day types, vehicle types, demand types, time bands, limits based on demand etc.	

FRAME User Needs V4.1			
Group	No	Description	Similar
	10.1.1.2	The system shall be able to produce optimum driver schedules.	
10.1.2 Monitoring	10.1.2.1	The system shall be able to receive information about the identity, location, status and occupancy all vehicles in the fleet in real time.	6.4.0.3 9.5.1.13
	10.1.2.2	The system shall be able to monitor the number of travellers waiting at a pick-up point, e.g. Park and Ride site.	
10.1.3 Incident Management	10.1.3.1	The system shall be able to identify an incident and to revise its services so that passengers may complete their journeys.	
	10.1.3.2	The system shall be able to schedule PT operations dynamically so that incidents or unexpected events can be handled with the minimum disruption.	7.2
10.1.4 Information Handling	10.1.4.1	The system shall be able to inform travellers about PT operations for a mode of transport, e.g. travel times, delays, fares etc.	10.4.0.1
	10.1.4.2	The system shall be able to provide information about a PT service to the travellers before and during the journey.	6.1.1.4 10.4.0.1
	10.1.4.3	The system shall be able to provide an update of arrival/departure information in real-time and present it to travellers of that mode before and during the journey.	10.4.1.1 10.4.1.2
	10.1.4.4	The system shall be able to provide information that is relevant to travellers with special needs, e.g. obstacles, manually operated doors, manual payment systems, restrictions for guide dogs, etc.	
10.1.5 Communications	10.1.5.1	The system shall be able to provide two-way data and voice communication between PT vehicles and a central location.	10.5.0.2

FRAME User Needs V4.1			
Group	No	Description	Similar
10.1.6 Priority	10.1.6.1	The system shall be able to select those vehicles that need to be given priority and communicate the requests to the TCC.	7.1.9.3
10.2 Demand Responsive Public Transport			
10.2.0 Objectives	10.2.0.1	The system shall be able to provide both planned and spontaneous trips.	
	10.2.0.2	The system shall be able to satisfy a variety of booking types, e.g. last minute, return trip (including weeks/months ahead), being able to take advantage of late opening hours, special facilities etc.	
	10.2.0.3	The system shall be able to provide access to a wide variety of destinations over a large geographic area.	
	10.2.0.4	The system shall be able to obtain service information so that other journeys may include other modes of transport.	
	10.2.0.5	The system shall provide the traveller with an easy to use user interface that minimises the amount of data to be provided by the traveller.	
10.2.1 Information Handling	10.2.1.1	The system shall provide all the information necessary to prepare a journey.	
	10.2.1.2	The system shall enable the user to book a trip from a variety of access points, e.g. internet, "on-street" terminals, etc.	
	10.2.1.3	The system shall be able to predict the time that will be taken to make a particular trip.	6.4.1.3 7.1.6.1 9.5.2.10
	10.2.1.4	The system shall be able to provide a service in which travellers wait a minimum period of time for a Demand Responsive PT vehicle to arrive.	

FRAME User Needs V4.1			
Group	No	Description	Similar
	10.2.1.5	Deleted and moved to 10.2.4.2 with changes	
	10.2.1.6	The system shall be able to locate and identify the Demand Responsive PT vehicles.	
	10.2.1.7	The system shall be able to schedule the Demand Responsive PT vehicles in real-time.	
	10.2.1.8	The system shall be able to plan the Demand Responsive PT vehicle trips in the most efficient manner.	
	10.2.1.9	The system shall enable the traveller to specify any special needs that he or she may have, e.g. disability, young children, etc.	
10.2.2 Communications	10.2.2.1	The system shall be able to provide two-way data communications between the Demand Responsive PT vehicles and a control centre.	
	10.2.2.2	The system shall be able to provide two-way voice communications between the Demand Responsive PT vehicles and a control centre for non-routine use.	10.5.0.2
10.2.3 Route Guidance	10.2.3.1	The system shall be able to inform the driver about the optimum route, according to specified criteria, that he or she should take for one or more trips.	6.4.1.4
10.2.4 Reporting	10.2.4.1	The system shall be able to provide statistics of usage for reporting to managers, and use in day-to-day operations.	
	10.2.4.2	The system shall be able to provide statistics on how well it actually satisfies its customers, e.g. response times, for reporting to its users.	
10.3 Shared Transport Management			
10.3.0 Basic Services	10.3.0.1	The system shall support car pooling, i.e. the sharing of a small number of cars between a larger set of people; normally the cars are the property of the system owner.	

FRAME User Needs V4.1			
Group	No	Description	Similar
	10.3.0.2	The system shall support car sharing, i.e. the allocation of a single car to a number of people for a single journey; normally one of them owns the car.	6.1.0.7
	10.3.0.3	The system shall be able to register people either as a driver and/or a (paying) passenger.	
	10.3.0.4	The system shall enable drivers and passengers to input pooling or sharing requests from a variety of access points, using the minimum amount of data	
	10.3.0.5	The system shall support an interactive database of car sharers that will permit them to find suitable partners.	
	10.3.0.6	The system shall be able to record each trip made, both for statistical purposes and to levy a possible charge.	
	10.3.0.7	The system shall provide the cost of the journey to the traveller before he or she accepts the service that is being offered, unless the service is free.	
	10.3.0.8	The system shall support a database containing the prices being charged by drivers for carrying passengers; this shall be available to drivers and passengers before they accept the service being offered.	
	10.3.0.9	The system must provide a positive indication to the drivers if the service being offered is free, and what additional charges (if any) they can levy on the passengers.	
10.4 On-Trip Public Transport Information			
10.4.0 Objectives			
	10.4.0.1	The system shall be able to inform travellers about all PT operations, e.g. bus, rail, metro, air, taxi, car pooling etc.	10.1.4.1 10.1.4.2
10.4.1 Information Handling			
	10.4.1.1	The system shall be able to provide in-vehicle general (dynamic) PT information, as well as the arrival time at, and name of, the next stop for this vehicle.	10.1.4.3

FRAME User Needs V4.1

Group	No	Description	Similar
	10.4.1.2	The system shall be able to provide general (dynamic) PT information, personal safety information, as well as the arrival times of next vehicles, delays, etc. at mode interchanges, e.g. bus stops, in metro, railway or bus stations, etc.	10.1.4.3
	10.4.1.3	The system shall be able to provide information that is relevant to travellers with special needs, e.g. obstacles, manually operated doors, restrictions for guide dogs and/or push chairs, etc.	
10.4.2 Traveller Interaction			
	10.4.2.1	The system shall provide service information which is legible, understandable and capable of being assimilated very quickly by all travellers, including those with special needs.	
	10.4.2.2	The system shall provide information in the native language at the output location, and/or from a user selected choice of other appropriate foreign languages, when applicable.	6.1.2.8 6.2.3.3
10.5 Public Travel Security			
10.5.0 Basic Services			
	10.5.0.1	The system shall monitor for, and collect evidence on, illegal activities in various locations, e.g. car parks, PT facilities, PT vehicles, etc.	
	10.5.0.2	The system shall be able to provide two-way data and voice communication between PT vehicles and a central location.	10.1.5.1 10.2.2.2
	10.5.0.3	The system shall summon assistance when requested by drivers, or other travellers, e.g. after disorderly behaviour amongst certain passengers.	