	United Kingdom	Italy	Finland	France GeoRoute	France BD-UNI	Estonia	Sweden	Norway	Bavaria - INTREST	Austria	Conclusions
General											
Q1.1 Public or private	Public	Public	Public	Public	Public	Public	Public	Public		Public	All Public
Q1.2 Owner	Ordnance survey	Ministry of infrastructures	Finish Road Administation	IGN	IGN	Estonian Land Board	SNRA/LMV	NPRA		BEV	
Q1.3 Concept for updating	Withing 6 months of change	Decentralized	Four times a year by public authorities	Every year in "Ile-de-France", less often elsewhere	Continous	To be developed	Continous and decentralized	Continous and decentralized	Data from NavTech, four times (a year?)	Continous	Daily - yearly Centralized - Decentralized
Q1.4 What area is covered	All GB - England, Scotland and Wales	All Italy At present 70%	All Finland	All France	All France	Planned all Estonia	All Sweden	All Norway	Bavaria	All Austra	
Q1.5 Road types stored	All roads	All roads	All roads	Urban areas - all roads Other areas - main roads	All Roads	All roads	All roads	All roads where length > 50 m	All roads	All Roads	Mostly all Roads
Q1.6 - Q1.7 Attribute types								About 600 attributes			Widely spread
Name				x	x	x	x		x	x (+ short name)	
Road number				x	x		x		x		
Title						x					
Pavement type						x	x				
Width					x	x	x				
Owner						x	x				
Cadastral restrictions (servitutes)						x					
External identifier						x					
Road type	x	x					x				
Nature of road	x				x						
Calculated length	x						x				
Names and department for Transport numbers	x										
Motorway junction number	x										
One way street	x						x				
Restricted or mandatory turn	x						x				
Access prohibitions	x			x			x		x		
Height restrictions	x			x	x (only on motorways)		x				
Length restriction				x							
Goods restriction				x							
Weight restriction				x	x (only on motorways)						
Season restriction				x	x						
Tolls	x										
Contextual info like gates, barriers, level, crossings, bridges etc.	x										
Dimension		x									
Bridge/tunnel		x		x (as points)					x		
Lanes		x		x	x				x		
Status(project, construction...)		x									
Traffic		(x)									
Accidents		(x)									
Pollution info		(x)									
Projects and work in progress		(x)									
Address info			x	x	x						
Data type				x							
Physical road class				x							
Functional road class				x	x (importance for traffic)		x		x		
Administrative boundary				x (Left/Right)_Commune_INSEE_Code	x (Left/Right)_Commune_INSEE_Code						
Bring into service date				x	x						
Position/ground				x	x						
Level at bridge tunnel				x							
Traffic direction				x	x						
Bus lane				x							
Forbidden for dangerous material				x			x				

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Delivery hours				x							
Hours when traffix forbidden				x			x				
Green itinerary?				x	x						
Itinerary name				x							
From signpost/To signpost				x							
Fictitious					x						
Access					x						
Urban					x				x		
Speed limit							x				
Speed category									x		
Form of way									x		
Network level									x		
Display type									x		
Scenic route									x		
Link level									x		
Ramp									x		
Slope									x		
Class of hazard goods									x		
Sign text									x		
Border node									x		
Node type									x		
Node access									x		
Other			Approximately 50 attributes							Date and method of acquisition, date of update	
Q1.9 How is quality described	Using ISO 19113 terminology		Accuracy of location, correctness, coverage and up-to-dateness	Document for dataset		Accuracy, date of surveying etc per feature	Surveying method, responsible party, date per feature	TBD		By product information e.g. : Geometric accuracy (+/- 3 m) Time : up to date	Widely spread
Targeted applications											
Q2.1 Targeted applications											
Asset management	x	?		x (very important)	x		x	x		x	
Road charging	x	?		x (not very important)				x		x	
Navigation and routing	x	?	x	x (important)		x	x	x	x	x	
Fleet management	x	?	x	x (important)			x	x		x	
Safety	x	x	x	x (very important)			x	x		x	
Mobility and society planning	x	?	x	x (not very important)		x	x	x			
Traffic management	x	x	x	x (important)		x	x	x		x	
Pollution		x									
Mapping				x	x	x	x		x	x	
Location referencing									x		
Dynamic data									x		
Public transport									x		
Management of addresses/geocoding				x	x	x			x		
Road Network Model											
Topology											
Q4.1 Brief description	Links and nodes	Arc and nodes	Links and intersections	Road segments, road nodes and complex crossings (surface)	Road segments, road nodes and complex crossings (surface)	Links	Edges and nodes	Edges and nodes 3 different levels of detail	Links and nodes	Geometrical? Edges	
Q4.2 Standards used	GML 2.1.2	GDF 2	GDF	-	-	OGC Simple features	SS 63700x/ISO 19100	ISO 19100		-	Widely spread
Q4.3 Explicit or derived topology	Explicit (derived is also possible)	Explicit	Derived	Derived	Derived	Derived, planned for explicit	Explicit	Explicit	Explicit	Derived	50/50
Q4.4 Model for explicit topology	?	GDF 2	N/A	N/A	N/A	N/A	Port concept	Port concept?		N/A	
Q4.5 Methods for deriving topology from geometry											
Q4.5.1 Geometric constraints	No			Planar	Not planar		No	No			

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Geometry											
Q5.1 Brief description						Oracle SDO_GEOMETRY				Edges with attributes intersect at vertices (not handled as objects). Bridges and tunnels imply a different linestyle	
Q5.2 Standards used	GML?				OGC (PostGIS)	OGC Simple features	ISO 19107	ISO 19107		-	Widely spread
Q5.3 Dimensions	2d	2d	3d	2d	2d/3d	2d	2d/3d	2d/3d		2d	50/50
Q5.4 Types of geometry and interpolation	Points and lines	Points and lines	Points and lines	Points, lines, surfaces	Points, lines, surfaces	Points and lines	Points and lines	Points, lines and surfaces	Points and lines	Points and lines	Points and lines
Q5.5 Coordinate reference systems used	OSGB36/OSTN02	WGS84	EUREF-FIN	NTF	RGF, WGS84, RGFG95, RGR92	Lambert-EST	RT90 2.5 Gon W 0:-15	Euref 89 UTM		MGI	
Temporal dimension											
Q6.1 Temporal dimension	No	No but possibly in the future	Yes, but no historical data stored	No	No	No, but possible in the future	Yes	Yes	No	No	Mostly not
Q6.2 How is temporal dimension represented	N/A	birth date/death date		N/A	Planned "date of creation"	Date of creation/last modification	birth date/death date	birth date/death date also for inter-level associations	N/A	N/A	
Q6.3 Standards used	N/A			N/A	-	-	-	-	N/A	N/A	
Metadata											
Q7.1 Brief description of representation and connection to road network	Not explicitly linked, stated and inferred. Dependent on base topographic data. Temporal info at feature level.	ArcGIS		General documentation (content description, delivery description)	TBD	Data source Positional accuracy Date and time of creation and last modification Responsible person	Surveying method, responsible party, date per feature	TBD		Data definition, product definition	Widely spread
Q7.2 Standards used					ISO 19115 recommended			ISO 19110 planned		-	None
Q7.3 Levels of granularity for metadata											
Entire dataset	Partially			x?	x					x	
Geographic areas				x?							
Individual elements	Partially				x (geometric source)	x	x				
Thematic	Partially			x?						x	
Other											
Other concepts of interest											
Q8.1 Turns	x			x	x		x	x	x		Mostly yes
Q8.2 Detail levels								x		Different cartographic models	Mostly no
Q8.3 Different types of networks	Ferry		Ferry, pedestrian, bicycle	Railways, ferries	Bicycle path, ferries, lanes, paths	(foot)paths,fords and rafts	Ferry	Ferry, bicycle and tranition points		Ferries, low order road network	Ferry
Q8.4 Other								Working on multi-modularity in transport and guidance			

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Attribute model											
Connection to the road network											
Q9.1 How are attributes connected to Road Network	Attributes and Linear referencing	Linear referencing and attributes	Linear referencing	Attributes	Attributes	Attributes	Linear referencing	Linear referencing	Attributes and Link-/Node-references	Attributes and Link-/Node-references	50/50
Q9.2 Does road network elements carry attributes	Yes	Yes	No	Yes	Yes	Yes	No	No	Yes	Yes	Mostly yes
Q9.3 Are attributes loosely coupled to the network	Yew	Yes	Yes	No	No	No	Yes	Yes	Yes	Yes	Mostly yes
Linear extents	x	x	x				x	x		x	
Point extents	x	x					x	x			
Nodes							x	x			
Turns			x				x	x			
Standards used	Internal		modified GDF				Internal				None
Temporal dimension											
Q10.1 Temporal dimension	No	No		No	No	No	Yes	Yes	No	No	Mostly no
Q10.2 How is temporal dimension represented	N/A	N/A		N/A		N/A	birth date/death date	birth date/death date		N/A	
Q10.3 Standards used	N/A	N/A		N/A		N/A	ISO 19108	ISO 19108?		N/A	
Other geographic attributes/features											
Q11.1 Briefly describe if and how other geographic attributes/features are used and described											
Administrative areas	Available from other produtcs	x		x	x	x	x			x	Mostly yes
Other	Available from other produtcs	Railroads, rivers, built up areas		Water	Railways, railway stations, airports, metro stations, tramway lines, canals, rivers, distribution networks, terrestrial hydrography, buildings, vegetation, relief lines	x					Widely spread
Metadata											
Q12.1 Brief description of representation and connection to attribute model	See Q7.1-			Independent metadata			Surveying method, responsible party, date per feature	TBD		Product information and quality handbook	Widely spread
Q12.2 Levels of granularity for metadata											
Entire dataset						Database spec					
Geographic areas											
Individual elements						x	x				
Thematic										x	
Other											
Q12.3 Standards used										ISO 9001	

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Other concepts of interest											
Q13.1 Fixed or easily extendable model	Extendable Both feature attributes and "events"	Extendable event tables	Extendable	Extendable Feature tables	Extendable Feature tables	Extandable Feature tables	Extendable Catalogue driven Generic feature model	Extendable Catalogue driven Generic feature model		Extandable	Extendable but varying methods
Q13.2 Other				Relationships between nodes and POI:s Relationships between road segments and administrative areas Bridges/tunnels as nodes (<threshold) or road segments (> threshold) Attribute consistency matrix.			The catalogue model and ports for network	The catalogue model and ports for network			
Rules of generalization											
Generalizatons used for links and nodes											
Q14.1 Link representation	Centre line of carriageway		Centre line	Centre line	Centre line	Centre line	Centre line	Road level - Centre line Carriageway level - each carriageway In crossings at carriageway level - a link for each lane		Centre line	Centre line
Q14.2 Dual carriageways as two links	Yes		Yes	Yes (conditionally)	Yes (conditionally)	Yes	Yes	Yes		No	Yes
Q14.3 Shortest link length	1 m		-	10 m	2 m	0.4 m	5 m	2 m		3 m	0.4-10m
Q14.4 Documented rules for different situations for links			Yes	Yes	Yes		Yes	Yes		Yes	
Single carriageway											
Dual carriageway											
Slip road											
Roundabout											
Traffic island											
Link at junction											
Traffic island link											
Enclosed traffic area											
Q14.5 Where are nodes placed											
start end of road segment	x			x			x	x		x	
Intersections at same level	x		?	x			x	x		x	
Intersections at different levels	x		?	x						?	
Attribution changes	x			x							
Bridge/tunnel				x							
Tollgate				x	x						
Mountain pass				x	x						
Named intersection					x						
Relationship POI -> network				x							
Q14.6 Documented rules for different situations for nodes	No			Only one node for one X,Y -> Some nodes have to be moved. (Tollgates at a crossroad, crossroad at bridge/tunnel)		No	Yes	Yes		Yes	

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Generalizations used for attributes											
Q15.1 Road connection types for attributes	N/A	Stretch, point	Stretch, point and turn	Attributes for entire feature	Attributes for entire feature	Attributes for entire feature	Stretch, point, node turn	Stretch, point, node, turn		Stretch	Widely spread
Q15.2 Many different types of road connections for one attribute type	N/A		no	N/A	N/A	N/A	yes	Yes		No	Mostly no
Q15.3 Can an instance of an attribute have several road connections of different types	N/A		no	N/A	N/A	N/A	no	Yes		No	No
Q15.4 Does each attribute have description on how it shall be generalized	N/A		yes	N/A	N/A	N/A	yes	Yes		Yes	?
Other					Node if radius < 30 m Complex Crossroads (surfaces) if radius > 30 m						
Data export											
Formats used											
Q16.1 Formats and structure used for data export	GML 2.1.2	Shape	Digiroad XML Shape MapInfo	MIF/MID Shape GCM, GCR, GXT for GeoConcept EDIGeO	MIF/MID Shape GeoConcept EDIGeO DXF	Geomedia Warehouse ISFF/DGN DXF DWG MapInfo MIF/MID/TAB Shape ArcInfo Export	Shape XML according to ISO 19118	Sosi, sdv - possibly GML	IDF, Database dumps, MapInfo, Shape, other ASCII-formats	DGN, ASCII, DXF, Shape, ArcINFO/e00	Widely spread
Q16.2 Are any of these formats standardized	OGC		Digiroad national	EDIGeO is French std	EDIGeO is French std	GML in the future	Yes	Sosi is national standard			Widely spread
Possible export of subsets of data											
Q17.1 Briefly describe how subsets can be exported											
Geographic areas	x		x	x	x	x	x	x	x	Tiles	yes
Thematic	x		x	x	x	x	x	x	?	x	yes
Other						GeoMedia capabilities				Historic snapshots	
Possible export of incremental updates											
Q18.1 Describe briefly if and how it is possible to export incremental updates											
Individual elements/attributes	x		x	x	Planned		x	x		x	Mostly yes
How are individual elements identified	version/reason for change		element id codes		id + version WD5 based on feature class, geometry and attributes		object id and version id for individual elements	Link id		Date of update	Similar
Geographic areas/tiles								x		x	
Other											
Rationale											

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Q19.1 Motivation and justification	Single product to underpin asset management and routing applications		Promotion of transport telematics	Simple structure Continous updating Database coverage Address ranges Multiple data sources	Nodes at extremities are redundant and costly. Only one feature class for roads, lanes and paths increase data volume but make it easier to query the whole database. If a lane becomes a road it's easy to change attr	Flexibility, seamless		Very flexible, developed close to ongoing international standardisation, effective links between network and map - reference and coordinates		Need for data which covers the whole nation. International and economic state of the art. Cooperation	
Experiences											
Q20.1 List the three most important elements that helped you develop/launch your roads dataset	1. Relate to other Ordnance Survey Products. 2. Provide the basis for multi-modal solution. 3. Simplicity			Geometry harmonization In-car navigation needs high quality data (skipped by IGNF) EDIGeO vs commersial formats	Matching tools Work on real datasets. Data history comes from people who have worked with data (not from metadata) Separate : Empty, unknown, groundless (without object)	Percieved need in society Oracle knowledge Existing data		Good and close cooperation between Mapping Authority, Road Administration and municipalities. Multi purpose dataset stimulates interest. Motivating for decision takers that the road dataset is used in applications on the internet - gains public interest.		Photogrammetry, GPS, other road related information like street names. Looking at international initiatives and standards. Growing need for digital data.	