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the European Union

ConnectTA

## Technical Assistance to Connectivity in the Western Balkans

### Preparation of Road Safety Inspection and Audit Plans for the Core/Comprehensive Road Network in Western Balkans and Pilot them



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### Preparation of Road Safety Inspection and Audit Plans for the Core/Comprehensive Road Network in Western Balkans and Pilot them

- Connecta
- Objective of study
- Road safety inspection
  - status
  - planned activities
- Road safety audit
  - status
  - planned activities



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**Connecta:** a TA to contribute in filling in the gaps of project preparation and transport reform measures in WB6 in the frame of the Connectivity Agenda.

Its purpose is:

- **Bringing high priority energy and transport infrastructure projects to maturity for investment co-financing; and**
- **Supporting the preparation and implementation of short and medium term regional reform measures in the transport sector**

The Connecta mechanism is an organised interaction between **four groups of stakeholders** to achieve a common vision:

- EU (DG NEAR, DG MOVE)
- IFIs (EIB, EBRD, World Bank, KfW, CEB)
- Regional Organisations of Transport and Energy (SEETO and EnCS)
- WB6 Beneficiaries



### Road Safety Sub-project

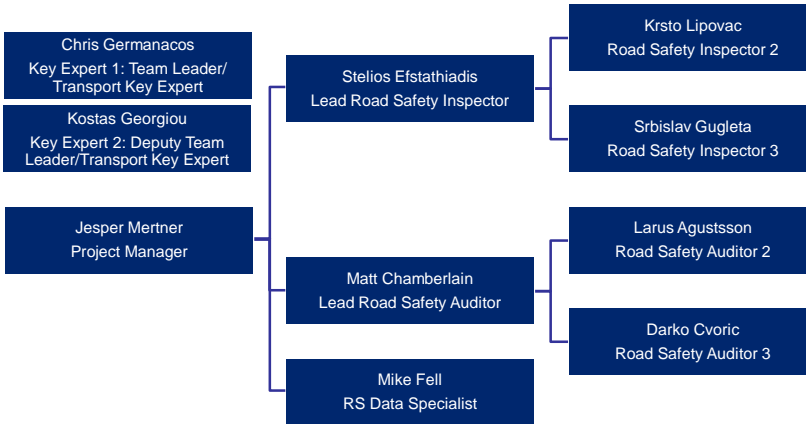


### Preparation of Road Safety Inspection and Audit Plans for the Core/Comprehensive Road Network in Western Balkans and Pilot them

- Component 1 - Prepare a three-year RSI plan for the core and comprehensive network and pilot RSIs on high accident sections
- Component 2 - Help to ensure that road safety audits are carried out according to the Directive 2008/96/EC on all projects on the core and comprehensive network and undertake sample audits (6)
- Component 3 - Support the regional participants in establishment of a national system for continuous road crash data collection (by 2018).



## Road Safety Sub-project team



## Local experts

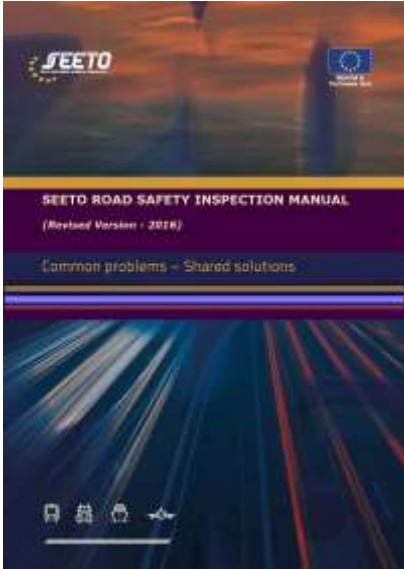
- Amna Redzepagic, covering BiH
- Jovan Hristoski, covering MKD
- Emiljano Zhuleku, covering ALB and KOS
- Dusan Savkovic, covering SRB and MNE



# ROAD SAFETY INSPECTION



## RSI activities



- Map existing core and comprehensive road network in Western Balkans.
- Compile a list of all Road Safety Inspections that have been implemented during the last 3 years (2014-2016),
  - also including those according to EuroRAP/iRAP inspection methodology
  - including the recommendations of the inspections.
- Prepare a three-year Plan (2018- 2020) for road safety inspection for the core and comprehensive road network
  - (SEETO RSI Guidelines, EuroRAP).
- Undertake road safety inspections using SEETO's Road Safety Inspection Guidelines on approx. 10% of the core/comprehensive network
  - (about 550 km covering all WB6).



## Existing core and comprehensive road network in Western Balkans

- Approx. 5500 km



## Status on RSI in Regional Participants

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- ALB and RS of BiH have some licensed RSI
- In most countries still unclear which institution will provide certificates



## Road Safety Inspections implemented during the last 3 years (2014-2016)

### Albania

- RSI have been performed in 19 main axes (not all Core and Comprehensive) during 2014

### Recommendations in RSI include:

- All accesses to main road, should be in accordance with road categories and design standards
- Filling, correcting and refreshing with vertical and horizontal signalling
- Repair, replacement and correction in cases of placement outside the technical conditions of guardrails
- Removing commercial signs - advertisements, on the roadside that are in contradiction with the Albanian Road Code
- Improvements all damages asphalts layers
- Demolition and cleaning of objects that are in contravention of the law, along road axes
- Designing projects for the geometric solution of intersections, roundabouts and access to major roads
- More effective Management by Supervision for all construction sites
- Auditing for all road designs
- Before the project implementation begins, the expropriation process must be completed
- Funding should be provided for each object to be implemented.



## Road Safety Inspections implemented during the last 3 years (2014-2016)

### Bosnia and Herzegovina

- No information has been received about RSI performed during the last 3 years in Federation Bosnia and Herzegovina

### Kosovo

- No RSI have been performed in the past 3 years

### Montenegro

- No RSI have been performed in the past 3 years

### The former Yugoslav Republic of Macedonia

- iRAP is currently in progress for the whole Core and Comprehensive road network of Macedonia. The project started in 2017 and is expected to be completed within 2018

### Serbia

- No RSI have been performed in the past 3 years. RSI in ongoing projects



### Overview on data received and missing

Data input	ALB	BiH	KOS	MKD	MNE	SRB
Core and Comprehensive road Network status	✓	x ✓	✓		✓	✓
RSI implemented last 3 years	✓	x ✓	✓		✓	✓
Recommendations	✓					
Traffic data	✓		✓	✓		✓
Accident data	✓		✓		✓	✓



## Three-year Plan (2018-2020) for road safety inspection for the core and comprehensive road network

- Road network that has not been inspected during the last three years:
  - Prepare iRAP maps, according to the star rating methodology.
  - Perform detailed road safety inspections for the road sections that have the worst performance according to the iRAP star rating methodology
  - Take in to account local plans for 20% annually
- Initial cost estimations for consultants doing RSI
  - Based on the input received from each country relevant to the past inspections performed and to the local regulations.
  - Indicative costs to be elaborated more and adapted to local experience and methodology.



## Pilot road safety inspections

### Status

- Field work finalised this week
- Approx. 580 km inspected (550 km planned according to ToR)

### Planned

- Preparation and finalisation of reports for each section



# Pilot road safety inspections

## Typical findings

- problematic guard rails
  - missing, too short
  - damaged
  - beginnings/endings
- Safety zone not ensured
- Junction layout
  - too dynamic (not properly regulated/controlled)
  - 4-leg priority junctions
- Signing and marking missing/worn
- Many, many accesses
- Villages, build-up areas, towns
- Length of exits and entries to fuel station, restaurants, side roads
- Etc.



## Planned activities

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- Collect remaining information and data
- The reports of the RSI for each road section separately are in progress.
  - anticipated that until the end of February 2018, drafts will be ready for the inspected road sections.
- The final version of all RSI reports is anticipated by the end of April 2018 together with the 3-year plan for road safety inspections on the core and comprehensive network.





# ROAD SAFETY AUDIT



## RSA activities

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- Compile a list of all rehabilitation and new construction road projects on the core and comprehensive road network that are currently under preparation. The list should include the following details for every project:
  - Be under concept or preliminary design stage
  - Engineering Scope and estimated cost
  - Current preparation stage of every project (e.g. concept, preliminary design, detailed design or bidding stage)
  - Planned implementation schedule.
  - Financing sources
- Prepare a plan to undertake road safety audits, at various stages as per the Directive 2008/96/EC and SEETO's Road Safety Audit Handbook (COWI, 2014) for the list of projects prepared under Activity 1. Such plan should include:
  - The Audit stages that are required
  - The required Auditors inputs
  - Indicative costs to audit these projects by consulting firms
- Undertake Road Safety Audits for a sample of 6 projects (one in every SEETO member)



## Information to collect

### List of Rehabilitation and Construction Projects

The list should include the following details for every project:

- Engineering scope and estimated cost
- Current preparation stage of every project (e.g. concept, preliminary design, detailed design or bidding stage)
- Planned implementation schedule
- Financing sources.

Information contained in each column:

- Type of Road: Whether main or motorway
- Design Stage: Concept, Preliminary, Detailed, Bidding
- Works Type: Rehabilitation, upgrade or new construction
- Start/End: Construction timeline
- Total Cost: Total Construction Costs
- Budget: Cost of works met by state
- WB: Cost met by the World Bank or other IFIs
- Funding Source: Funded by state or IFIs

Route	Section Start	Section End	Length (km)	SEETO Network	Type of Road	DESIGN STAGE	WORKS TYPE:	START:	END:	Total cost (M€)	Budget (M€)	WB (M€)	financing source
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### Overview on data received and missing

Data input	ALB	BiH	KOS	MKD	MNE	SRB
Route	✓	✓		(✓)	✓	✓
Name of Project		✓			✓	✓
Section Start	✓	✓			✓	✓
Section End	✓	✓			✓	✓
Length (km)	✓	✓			✓	(✓)
SEETO Network	✓	✓			✓	✓
Type of Road		✓			✓	✓
Design Stage						
Works Type		✓			✓	✓
Start	✓	✓			✓*	(✓)
End:	✓				✓*	
Total cost (M€)	✓					(✓)
Budget cost (state) (M€)	✓					
IFI cost (M€)	✓					
Funding source					(✓)	

( ) Partly  
\* Few missing



## Example of structure for plan

### Road Safety Audit Plan for Projects in Activity One

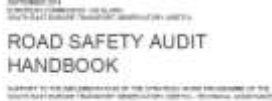
Audit Stage	Estimated Cost (Euros) may vary due to scheme size	Time Estimate (person days) may vary due to scheme size
Stage One – Prelim Design	18,000	17 (7 TL, 10 TM)
Stage Two – Detailed Design	21,000	20 (8 TL, 12 TM)
Stage Three – Pre-Opening	17,000	15 (5 TL, 10 TM)
Stage Four – Early Operation	17,000	15 (5 TL, 10 TM)

Route	Section Start	Section End	Length (km)	START:	END:	Stage One RSA	Stage Two RSA	Stage Three RSA	Stage Four RSA	Total RSA Inputs (Euros)	Total Person Days RSAs
SH 1-N	Hani Hotit	Shkoder	35	2017	2021	2018 18000 Eur	2019 21000 Eur	2020 17000 Eur	2021 17000 Eur	73000 Eur	67 25 TL, 42 TM



### Pilot Road Safety Audits

- Format for Planned Missions to WB6 Countries



COWI

Day and Timing	Purpose of the Meeting	Attendees
Day One AM	<p>Introductions of all Parties.</p> <p>Audit Team Presentation on Project and Audit Process and format for rest of mission</p> <p>Design Team to introduce the Project and hand over design information to Audit Team in hard and soft copy formats</p>	<p>Audit Team</p> <p>Road Authorities</p> <p>Designer</p> <p>Any other Stakeholders</p>
Day One PM		<p>Audit Team to study submitted design information (with nominated attendees from road authority if requested) to identify points of interest for site visit on Day Two</p>
Day Two All day if required	<p>Site Visit to road project (high visibility jackets to worn by all parties)</p> <p>Audit Team to identify, discuss, clarify and any road safety problems with the design</p>	<p>Audit Team</p> <p>Road Authority</p> <p>Design Team (not essential)</p> <p>Any other interested parties</p>
Day Three PM	<p>Audit Team to present findings of the Audit and discuss with all parties</p> <p>Opportunity to agree on Audit findings and recommendations and discuss practical implementation of any proposed design changes</p>	<p>Audit Team</p> <p>Road Authority</p> <p>Design Team</p> <p>Any other interested parties</p>



## Pilot Road Safety Audits

Main issues resulting from first audit:

- Crash barrier design
- Junction layouts
- Gore lengths and entry and exit radii on grade separated junctions
- Bridge parapet design and interface with crash barrier

Participant	Proposed Project	Design Stage	Planned RSA Mission Date
Albania	SH4-O Gjirokastra By-Pass	Detailed	Mission completed 4-6 December 2017
BiH	M5 Jajce - Donji Vakuf TBC (Federation)	Detailed	Mission Planned Early 2018
Kosovo	R6a Lumadh to Mitrovica	Preliminary	Mission Planned Early 2018
Macedonia	A1 Lenishka – Belovodica	Detailed	Mission Completed Oct 2017 (see mission report)
Montenegro	M-2 Kolašin Crkvine - Mojkovac	Detailed	Mission Planned Early 2018
Serbia	NIŠ-Pločnik	Detailed	Mission completed 28-30 Nov 2017



## Planned activities

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- Collect remaining information and data to finalise list of all expected rehabilitation and new construction road projects
- Prepare RSA reports for Albania and Serbia - ongoing
- Carry out RSA in Kosovo, Montenegro and BiH in early 2018 and prepare RSA reports
- We also hope that you will respond to the recommendations
- Prepare plan for RSA at different stages in the Regional Participants.



# ROAD MAP FOR ESTABLISHING A NATIONAL SYSTEM FOR CONTINUOUS ROAD CRASH DATA COLLECTION

WILL BE PRESENTED BY MIKE FELL IN NEXT SESSION



CONNECTA Project team

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Mr. Jesper Mertner, Project Manager – road safety component ([jesper.mertner@connecta-ta.eu](mailto:jesper.mertner@connecta-ta.eu))

## Road Safety Inspections implemented during the last 3 years (2014-2016)

	All sections	SEETO Network	Corridors/Routes	past RSI	past/current iRAP	ConnectA RSI	Missing RSI	approx. length (km)
ALB	Muriqan (MNE border) - Koplik	Core	Route 1	✓				32
	Koplik - Skhoder	Core	Route 1			✓		13
	Skhoder - F. Kruje	Core	Route 1	✓				72
	F. Kruje - Lezhe	Core	Route 1			✓		36
	Hani i Hotit (MNE border) - Fush Kruje	Comprehensive	Route 2b				✓	107
	Fush Kruje - Vore	Comprehensive	Route 2b	✓				14
	Rrogozhine - Fier	Core	Route 2c	✓				45
	Fier - Tepelene	Core	Route 2c				✓	82
	Tepelene - Kakavia (GR border)	Core	Route 2c	✓				58
	Morine Vermice (KOS border) - Lezhe	Core	Route 7					111
	Qaf Thane (MKD border) - Elbasan	Core	Corridor VIII	✓				81
	Elbasan - Tirane	Core	Corridor VIII	✓				25
	Tirane - Durres	Core	Corridor VIII			✓		30
	Durres - Vlore	Core	Corridor VIII				✓	119
Fier - Vlore	Core	Corridor VIII			✓		34	
BIH	Neum west - Neum South	Core	Route 1				✓	5
	Gradiska (CRO border) - Banja Luka - Jajce Jug	Core	Route 2a				✓	127
	Jajce Jug - Donji Vakuf	Core	Route 2a			✓		33
	Donji Vakuf - Lasva	Core	Route 2a				✓	68
	Sarajevo - Hum (MNE border)	Comprehensive	Route 2b				✓	97
	Sarajevo - Vardiste (SRB border)	Comprehensive	Route 3				✓	131
	Banja Luka - Doboj - Karakaj (SRB border)	Comprehensive	Route 9a				✓	198
	Bosanski Samac (CRO border) - Matuzici	Core	Corridor Vc				✓	80
	Matuzici - Ozimica	Core	Corridor Vc				✓	30
	Ozimica - Topcic Polje	Core	Corridor Vc			✓		24
	Topcic Polje - Sarajevo - Jablanica	Core	Corridor Vc				✓	168
	Jablanica - Potoci	Core	Corridor Vc			✓		36
	Potoci - Doljani (CRO border)	Core	Corridor Vc				✓	62

## Road Safety Inspections implemented during the last 3 years (2014-2016)

	All sections	SEETO Network	Corridors/Routes	past RSI	past/current iRAP	ConnectA RSI	Missing RSI	approx. length (km)
KOS	Brnjak (SRB border) - Veternik	Comprehensive	Route 6a				✓	72
	Veternik - Lipljan	Core	Route 6a			✓		8
	Lipljan - Hani i Elezit ( MKD border)	Core	Route 6a				✓	56
	Kuqishte (MNE border) - Kijeve/Kijevo	Comprehensive	Route 6b				✓	67
	Kijeve/Kijevo - Gjurgjice/Djurdjice	Comprehensive	Route 6b			✓		11
	Gjurgjice/Djurdjice - Fushe Kosove/Kosovo Polje	Comprehensive	Route 6b			✓		28
	Vermice/Vrbnica (ALB border) - Mardare (SRB border)	Core	Route 7				✓	125
MKD	Djeneral Jankovic (KOS border) - Skopje	Core	Route 6a		✓		✓	16
	Podmolje - Bitola	Comprehensive	Route 8		✓		✓	78
	Mladinovci - Stip - Novo Selo (BG border)	Comprehensive	Route 10		✓		✓	142
	Kafasan (ALB border) - Skopje	Core	Corridor VIII		✓		✓	190
	Skopje - Stracin	Core	Corridor VIII		✓		✓	62
	Stracin - Kriva Palanka	Core	Corridor VIII		✓	✓	✓	27
	Kriva Palanka - Deve Bair (BG border)	Core	Corridor VIII		✓		✓	16
	Tabanovce (SRB border) - Skopje - Bogorodica (GR border)	Core	Corridor X		✓		✓	181
	Veles - Prilep	Comprehensive	Corridor Xd		✓		✓	61
	Prilep - Bitola	Comprehensive	Corridor Xd		✓	✓	✓	42
	Bitola - Medzilija (GR border)	Comprehensive	Corridor Xd		✓		✓	14
MNE	Debeli Brijeg (CRO border) - Sukobin (ALB border)	Core	Route 1				✓	122
	Scepan Polje (BIH border) - Bozaj (ALB border)	Comprehensive	Route 2b				✓	154
	Dobrakovo (SRB border) - Moska	Core	Route 4				✓	81
	Moska - Podgorica	Core	Route 4			✓		54
	Podgorica - Bar	Core	Route 4				✓	50
	Ribarevine - Dracenovac (SRB border)	Comprehensive	Route 6a				✓	79
Kolasin - Kula (KOS border)	Comprehensive	Route 6b				✓	99	

## Road Safety Inspections implemented during the last 3 years (2014-2016)

	All sections	SEETO Network	Corridors/Routes	past RSI	past/current iRAP	ConnectA RSI	Missing RSI	approx. length (km)
SRB	Uzice - Kotroman (BIH)	Comprehensive	Route 3				✓	54
	Vatin (RO border) - Belgrade - Orlovaca	Core	Route 4				✓	117
	Orlovaca-Stepojevac	Core	Route 4			✓		22
	Stepojevac-Celije	Core	Route 4			✓		22
	Celije - Knezevici	Core	Route 4				✓	146
	Knezevici - Kokin Brod	Core	Route 4	✓				39
	Kokin Brod - Gostun (MNE border)	Core	Route 4				✓	70
	Cacak/Preljina - Mrcajevci	Comprehensive	Route 5			✓		12
	Mrcajevci - Vrnjci	Comprehensive	Route 5				✓	44
	Vrnjci - Kamidzora	Comprehensive	Route 5			✓		21
	Kamidzora - Paracin - Vrska Cuka (BG border)	Comprehensive	Route 5				✓	136
	Spiljani (MNE border) - Brnjak (KOS border)	Comprehensive	Route 6a				✓	28
	Nis - Merosina	Core	Route 7	✓				7
	Merosina - Merdare (KOS border)	Core	Route 7				✓	71
	Novi Sad/Petrovaradin - Sremska Kamenica	Comprehensive	Route 9a			✓		8
	Sremska Kamenica - Irig	Comprehensive	Route 9a	✓				14
	Irig - Ruma	Comprehensive	Route 9a				✓	9
	Ruma - Klenak	Comprehensive	Route 9a	✓				35
	Klenak - Loznica - Mali Zvornik (BIH border)	Comprehensive	Route 9a				✓	80
	Batrovci (CRO border) - Kuzmin	Core	Corridor X				✓	34
	Kuzmin - Sremska Mitrovica	Core	Corridor X	✓				21
	Sremska Mitrovica - Beograd/Dobanovci	Core	Corridor X				✓	48
	Beograd/Dobanovci - Bubanj Potok	Core	Corridor X			✓		30
	Bubanj Potok - Mali Pozarevac	Core	Corridor X			✓		21
	Mali Pozarevac - Presevo (MKD border)	Core	Corridor X				✓	350
	Horgos (HU border) - Feketic	Core	Corridor Xb				✓	72
	Feketic-Sirig	Core	Corridor Xb			✓		22
	Sirig - Beograd/Dobanovci	Core	Corridor Xb				✓	91
	Nis - Gostun (BIH border)	Core	Corridor Xc				✓	110

## Pilot road safety inspections Albania

Country	Corridor/Route/Node	Name of the Project (sections)	Section_Start Node	Section_End Node	Type of road	SEETO Network/ Core/Comprehensive	Section length (km)	RSI Proposed Length
ALB	E762 dhe SH1	Shkoder - Koplik	Road Start Tuzit	Start of By Pass Koplik	Secondary Intercity (Kat C, according the Albanian Code)	Comprehensive	13	13,0
ALB	E 762	F. Kruje - Lezhe	Overpassing F. Kruje	Roundabout in Lezha exit	Main Intercity (partially for Thumane - Milot) and secondary (the remaining part)	Core	35,9	35,9
ALB	SH 2	Tirane - Durres	Overpassing Kamez	Interchange of By Pass Shkozet	Main intercity	Core	30	30,0
ALB	E 853	Fier - Vlore	Intersection to Aulona Road	Intersection to road Sinan Ferhati	Main intercity (Levan - Vlore) and secondary for ( Fier- Levan)	Comprehensive	33,6	33,6
ALB:							Sub-total:	112,5

## Pilot road safety inspections BiH

Country	Corridor/ Route/Node	Name of the Project (sections)	Section_Start Node	Section_End Node	Type of road	SEETO Network/ Core/Comprehensive	Section length (km)	RSI Proposed Length
BiH	Route 2a	E-661 (M 5 : Jajce Jug - Donji Vakuf)	0+000	33+000	Motorway	Core	32	33
BiH	Corridor Vc	E-73 (M 17: Karuše - Ozimica)	0+000	29+485	The Main Road	Core	29,5	29,5
BiH	Corridor Vc	E-73 (M 17: Ozimica - Topčić Polje)	0+000	23+993	The Main Road	Core	24	24,0
BiH	Corridor Vc	E-73 (M 17: Jablanica - Potoci)	0+000	36+312	The Main Road	Core	36,3	36,3
BiH:							Sub-total:	122,8



## Pilot road safety inspections Montenegro

Country	Corridor/ Route/Node	Name of the Project (sections)	Section_Start Node	Section_End Node	Type of road	SEETO Network/ Core/Comprehensive	Section length (km)	RSI Proposed Length
MNE	Route 4	Podgorica- Mioska	PG	Mioska	National	Belgrade 8 SRB)- Podgorica(MNE)	54	54,0
MNE:							Sub-total:	54,0





## Pilot road safety inspections Macedonia

Country	Corridor/ Route/Node	Name of the Project (sections)	Section_Start Node	Section_End Node	Type of road	SEETO Network/ Core/Comprehen sive	Section length (km)	RSI Proposed Length
MKD	A3		Bitola	Prilep	2way		42	42,0
MKD	A2		Stracin	Kriva Palanka	2way		27	27,0
MKD	R-106	Prilep - Drenovo	Prilep	Drenovo	2way (3-lanes)		8.5	8.5
MKD	R-106	Drenovo - Rosoman – connection A1	Drenovo	Rosoman	2way (3-lanes)		9-9	9,9
MKD:							Sub-total:	87,4



## Pilot road safety inspections Serbia

Country	Corridor/ Route/Node	Name of the Project (sections)	Section_Start Node	Section_End Node	Type of road	SEETO Network/ Core/Comprehen sive	Section length (km)	RSI Proposed Length
SRB	Route 4	IB22	9	61	2way	Comprehensive	21,2	21,8
SRB	Route 9	IB21	97	98	motoput	Comprehensive	7,8	7,8
SRB	Corridor X	A1	11	12	Autoput	Core	21,5	21,5
SRB	Corridor X	A1	9	11	Autoput	Core	22,1	22,1
SRB	Route 4	IB22	61	62	2way	Comprehensive	33,1	33,1
SRB	Corridor Xb	A1	37	38	Autoput	Core	22,1	22,1
SRB	Route 5	IB23	77	78	2way	Comprehensive	19,8	19,8
SRB	Route 5	IB22	75	76	2way	Comprehensive	12,2	12,2
SRB:							Sub-total:	156,9



## Pilot road safety inspections Kosovo

Country	Corridor/ Route/No de	Name of the Project (sections)	Section_Start Node	Section_End Node	Type of road	SEETO Network/ Core/Comprehe nsive	Section length (km)	RSI Proposed Length
KOS	R6b		Fushe Kosove	Gjurgjice/ R7- R6b Interchange	National/ the main road	Core	28	28,0
KOS	R6b		Gjurgjice/ R7- R6b Interchange	Kijeve	National/ the main road	Comprehensive	11	11,0
KOS	R6a		Veternik/ N-2 a nd N-25.2 interchange	Lipjan/N-2 and N-25 roundabout	National/ the main road	Core	7,6	7,6
KOS:							Sub-total:	46,6

