Interreg
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Danube Transnational Programme
RADAR

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O3.3a STUDY VISITS

THEMATIC AREA 1: SAFER ROADS INVESTMENT PLANS

RADAR – Risk Assessment on Danube Area Roads

https://www.interreg-danube.eu/radar

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Abbreviation list

AADT	Annual Average Daily Traffic
ASP	Associated Strategic Partner
BCR	Benefit Cost Ratio
DfT	Department for Transport
DTP	Danube Transnational Programme
FYRR	First Year Rate of Return
HBM	Hydraulically Bound Mixtures
HE	Highways England
HGV	Heavy Goods Vehicle
iRAP	International Road Assessment Programme
ITS	Intelligent Transport Systems
KSI	Killed and Seriously Injured
NRF	National Roads Fund
PP	Project Partner
RADAR	Risk Assessment on Danube Area Roads (DTP project)
RSF	Road Safety Foundation
RSEG	Road Safety Expert Group
SRIP	Safer Roads Investment Plan
SRN	Strategic Road Network
SRS	Star Rating Score
TRL	Transport Research Laboratory
UDIP	User-Defined Investment Plan
UK	United Kingdom
VRUs	Vulnerable Road Users
WP	Work Package
WSCC	West Sussex County Council

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Executive Summary

On 22-23 October 2019, RADAR project team carried out the second study visit of WP3, this time to Chichester, UK. The purpose of the Study visit was to hear about leading UK practice in road injury reduction and the application of Safer Roads Investment Plans and to consider the potential for their application in the Danube region.

The visit was kindly hosted by the West Sussex County Council, whose representatives shared their experience and expertise from implementing road safety upgrading schemes onto regional road network, with the utilization of financial resources provided through a dedicated (ring-fenced) Safer Roads Fund. The presentation included a bus tour along A285 road, which has recently undergone several safety upgrades.

The ring-fenced funding theme was in general introduced by Jeanne Breen OBE, a leading international expert on road safety policy, budgeting and investments, who gave several lessons on Safe System principles and conditions needed for its implementation.

Lastly, a session on the implementation of iRAP´s Safer Road Investment Plans was held, supported by expertise and knowledge sharing from iRAP Centre of Excellence – Transport Research Laboratory.

1. Study visit itinerary

Tuesday, 22/10/2019

Venue: Edes House, West Street, Chichester, PO19 1RW - West Sussex County Council

Time	Topic	Presenter
9:00	Introduction and welcome	**Roger Elkins** (West Sussex County Council) and **Olivera Rozi** (EIRA)
9:15	The purpose of this study visit	**Dr Marko Ševrović** (EIRA)
9:30	Budgets and spending on safety	**Jeanne Breen OBE** (Independent Consultant)
10:00	Discussion – "When is roads investment actually spending on infrastructure safety?"	moderated **by Dr Steve Lawson** (EuroRAP) and **Jeanne Breen OBE**
10:30	The SRIP and UDIP	**Dr Marko Ševrović** (EIRA)
11:00-11:30	Coffee Break	
11:30	The Safer Roads Fund for English local authority roads	**Brian Lawton** (Road Safety Foundation) and **Jon Forster** (West Sussex County Council)
12:00	Making change happen on the ground	**West Sussex County Council contractor**
12:30	Discussion	Moderated by **Dr Marko Ševrović UK hosts**
13:00-14:00	Lunch (and inspection of Sussex Police mobile traffic camera speed enforcement van)	**Sussex Police**
14:00	The Safe System and Safe System measures	**Jeanne Breen OBE**
14:30	**Workshop session on selected themes** *Looking for answers to i.e. How does my country decide where to spend on road infrastructure safety? How much is spent on road infrastructure safety in the Danube region? What are the priorities for road infrastructure spending in my country? What are the advantages of SRIP?, etc.*	Moderated by **Jeanne Breen OBE, Olivera Rozi** (EIRA) and **Marko Ševrović** (EIRA)
15:30	Refreshment break	
16:00	Feedback session	
16:30	Briefing on Wednesday study visits	
16:45	Close and 45-minute walking tour around Chichester	**Shelagh Weekes** (Chichester Tour Guides)

Wednesday, 23/10/2019

Meeting point: Edes House, West Street, Chichester, PO19 1RW - West Sussex County Council

Time	Topic	Presenter
9:25	Meet at Edes House, West Street, West Sussex County Council	
9:30	Site visit by coach to the improvements on the A285 and narrated update on progress (returning by 11:15)	
11:30	Use of safety rating and SRIPs on the strategic road network by Highways England	**John Fletcher** (TRL)
	Discussion on A285 site visit and use of the SRIP in the UK	Moderated by **Olivera Rozi** (EIRA), **Marko Ševrović** (EIRA) and **John Fletcher** (TRL)
13:00	Lunch	
14:00	Conclusions and disperse	

2. Day 1 – Road safety investments

First day of Study visit was dedicated to the introduction of state-of-the-art practices and experience with funding road infrastructure safety upgrades at different governmental levels in UK, as well as the illustration of how iRAP Safer Roads Investment Plans (SRIPs) can be implemented in practice and help infrastructure managers to allocate budgets and prioritize actions across their road networks.

2.1. Policy framework for road infrastructure safety funding

Significant part of the first day programme consisted of contributions of Mrs. Jeanne Breen OBE, who gave several lessons on road safety budgeting and investments, as well as safe system principles. Among others, she in detail described different levels of opportunities for road infrastructure development funding and introduced several other best practice examples from Sweden and the Netherlands.

As an introduction to the session Mrs. Breen shared the basic principles and preconditions, which shall be met in order to develop **a successful road safety funding framework**, which include:

- establishment of transparent safety funding mechanisms providing sufficient and sustainable resources;
- development of a rational framework for allocation of resource;
- principal sources of sustainable funding based on general tax revenues, road funds, user fees and insurance levies.

Each resource category stated above was further explained in more details, indicating the pros and cons of such an instrument. Generally speaking, majority of such instruments require strong political commitment and will, a solid strategic framework with national safety targets, as well as ring-fenced funds in order to allocate budgets effectively.

General tax revenues:

- relatively simple to administer (usually by respective Ministry of Finance);
- lacking transparency without ring-fenced funds, which makes it difficult to:
    - identify total costs;
    - identify money is to be spent;
    - monitor returns on investments.

Road funds:

- comprise of revenues from fuel taxes, vehicle registration, licensing fees and road user charges for heavy vehicle
- usually not administered by the Ministries of Finance.

User fees:

- regular funding source resulting from various types of testing and licensing (i.e. driver trainings, road-worthiness testing);
- used to cover road safety costs.

Insurance:

- highly focused, sustainable approach which yields direct results;
- requires an active partnership between government and insurance sector;
- the insurer typically a governmental organization;
- not so far used in Europe, good practice examples from the Australian States, New Zealand and the provinces of Canada (e.g. Victoria, Australia operates a 10% levy on premiums which goes to road safety investment – over $1 billion has been allocated to investments in rural roads between 2016-2020).

2.2. Ring-fenced resources

Road safety funding through dedicated ring-fenced funds was one of the key topics for the UK Study visit, together with iRAP Safer Roads Investment Plans (SRIP) implementation. The ring-fencing principle is increasingly used to allocate resources to defined priority areas and measures. Two best practices were named in this respect:

- UK earmarks a portion of taxes and road fund elements for specific actions funded by the Safer Roads Fund.
- Swedish road safety authority provides special allocations to the police for various road safety outputs as well as earmarked funding for road safety engineering.

The value of this approach is focus, transparency and conditionality. But in order to work best, national strategy with targets and action plans shall exist.

Safer Roads Fund

Safer Roads Fund is a good practice example from UK, a ring-fenced fund, which has seen to date grant expenditure of £100 million to be spent on 49 highest-risk local authority road sections in England.

Estimated benefits of this action expect a reduction of 1450 (23 %) of fatal and serious injuries over the next 20 years with a benefit-cost ratio (BCR) of 4.4. There is also potential for additional £117 million funding to prevent 3450 fatal and serious injuries on similar roads over the next 20 years.

UK funding on road safety at present

Mrs. Breen also provided an overview of the present and planned features of a road safety funding system in UK, mentioning the following specifics:

- The annual value of preventing reported deaths and serious injuries in road crashes in Britain is estimated at £8.3 billion.
- Difficult to estimate what is being spent on road safety at central or local governmental level.
- Level of spending is not commensurate with the current value of prevention – **still persisting low priority for safety in investment choices, despite positive rates of return for safety measures.**
- Removal of the ring-fenced Road Safety Grant, substantial reductions in local highway investments and in traffic policing levels contribute to flattened road safety progress.
- Safe System is not yet integrated into the mainstream of network operation.
- Asset management and road maintenance activity still focuses on the life of the asset as opposed to life-saving treatments e.g. safety barriers which will need repair.

On the other hand, there are several promising indications that the existing conditions mentioned above will improve and the potential for safety investments will grow thanks to:

- recent and planned changes for the management and funding of the strategic and main roads network;
- new investments in highway maintenance;
- new allocations to active travel and cities;
- the availability of safety rating tools such as iRAP;
- the establishment of the Safer Roads Fund.

Planned road infrastructure funding in England

Mrs. Breen introduced the plans for new road safety targeted investments in England. National Roads Fund (NRF) is the main mechanism funded by Vehicle Excise Duty (VED) within which a variety of ring-fenced funds are planned for strategic, major and local roads - £28.8 bn for 2020-2025.

Within this, the draft Roads Investment Strategy 2 plans to allocate funding of £25.3bn for the Strategic Road Network and £3.5bn for the Major Road Network and Large Local Major schemes, with additional local highways maintenance funding of £420 million in 2018/19.

To sum up the introductory session on road infrastructure safety budgeting and investments, Jeanne Breen highlighted **the necessary pre-conditions to be met for successful national resource allocation:**

- An agreed framework for project evaluation and resource allocation is established.
- Typically, the tools are 1) cost-effectiveness analysis; 2) multi-criteria analysis; and 3) cost benefit analysis which uses the 'willingness to pay' approach. **(This allows road safety to compete successfully with other policy investments).**
- Measuring problems, identifying evidence-based measures, targeting and monitoring results using tried and tested tools is vital for achieving the road safety objectives.
- Aligning with other societal objectives to strengthen business cases is recommended.
- It is important to take into account long-term benefits (20 years) in cost benefit assessments of schemes, including small schemes and maintenance investments.

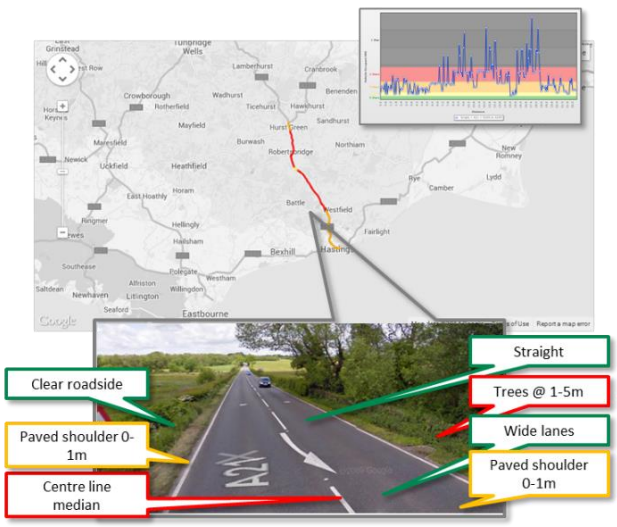
2.3. SRIP development and outcomes

After Jeanne Breen´s contribution, the floor was given to Marko Sevrovic of EIRA-EuroRAP (RADAR´s Lead partner), who provided the introduction to the session dedicated to Safer Roads Investment Plans implementation and benefits of such procedures. Since there is a completely separate Thematic report 1 of RADAR WP4 dedicated to SRIPs, summarizing both detailed technical information, as well as RADAR RSEG expert contributions to this topic, only the key points are included in this Study visit report, primarily focusing on UK´s experience with implementing SRIPs. The topic was in detail introduced by John Fletcher of TRL the next day of the Study visit.

Difference between reactive and pre-emptive approach to road safety assessment:

Reactive: **Risk Mapping**
Crashes per vehicle km travelled

Pre-emptive: **Star Rating**
Infrastructure risk



SRIP is a tool developed by the International Road Assessment Programme (iRAP) in order to provide measurements of risk on roads for individual roads users and – subsequently – it identifies ways, by which fatal and serious injuries can be improved in a cost-effective way. **iRAP SRIP consider more than 90 proven road improvement options to generate affordable and economically sound road improvements that save lives.** These road improvement options range from low-cost road markings and pedestrian refuges to higher-cost intersection upgrades and full highway duplication.

SRIP produces information on:

- where the most affordable and cost-effective road improvements can be made on the network;
- the number of deaths and serious injuries that would be avoided if the plan were to be implemented;
- the economic benefit of the plan, in terms of the benefit-cost ratio (BCR) showing returns on investment;
- the cost of the plan, incorporating capital and maintenance costs;
- the estimated cost per death and serious injury avoided.

The results of SRIP can either be displayed for the entire road network or filtered for individual road sections.

The stages to creating a Safer Roads Investment Plan:

1. Setting up the economics: How much a countermeasure would cost to implement and what benefit in your economy you could expect to get out of it.
2. Customising countermeasures
3. Calibrating the model: Getting the fatality estimation to reflect the behaviour and vehicle fleet using the network.

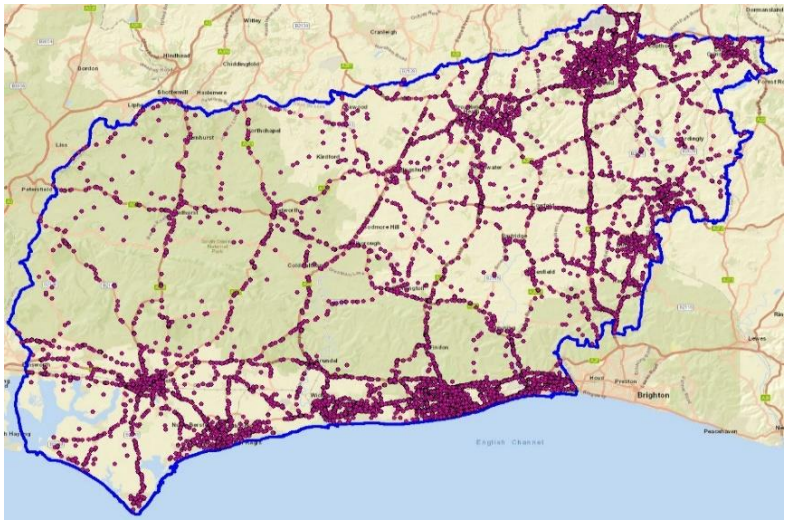
Countermeasures are potential modifications to a length of road that will reduce the risk to one or more of the road user groups. There is a default countermeasure pack that contains the countermeasures to suit each of the road user groups and reduce the risk in wide variety of situations.

Each countermeasure can be defined in relation to:

- what its outcomes are;
- what its unit of cost is;
- minimum spacing or length rquired;
- how it should be applied with respect to the number of carriageways a road has.

2.4. Road network safety investments at regional level – West Sussex County

Shifting towards a practical part of the Study visit, John Forster (Road Safety Group Manager of WSCC) and Brian Lawton of Road Safety Foundation (RSF) introduced to the participants their experience with funding and implementing road safety upgrades across regional networks. As a demonstration project, the representatives of WSCC shared good practices of safety risk assessments and upgrades on one of the riskiest road sections in UK – A285 between Chichester and Petworth.

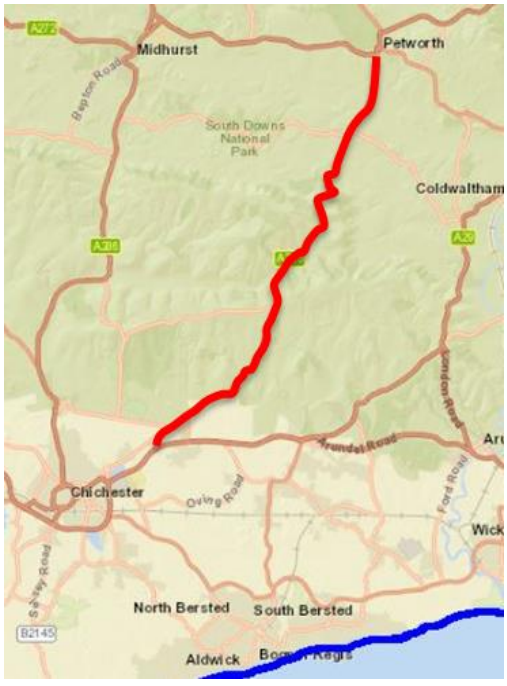


West Sussex - 2018
Population 859,638
Road Network length - 4,042 km
4.59 Billion Vehicle Miles Travelled
Collisions: 1989 5 Year Annual Average
Fatals 21 – Serious 410 – Slight 1,558

2.4.1. Introduction to A285 road

The critical section of regional road A285 is depicted in the below map and can be described with the following characteristics:

- 18 km in length;
- runs north south through South Downs National Park;
- rural single carriageway – not designed;
- AADT of ca. 5500 veh./day;
- 165 collisions in total over last 10 years (272 people injured, 11 of whom killed and a further 68 with serious injuries);
- 96 % of the deaths and serious injuries were to vehicle occupants and motorcyclists;
- EuroRAP risk rating of 199.6 fatal or serious crashes per billion kilometres travelled (Risk mapping results 2012-2014).

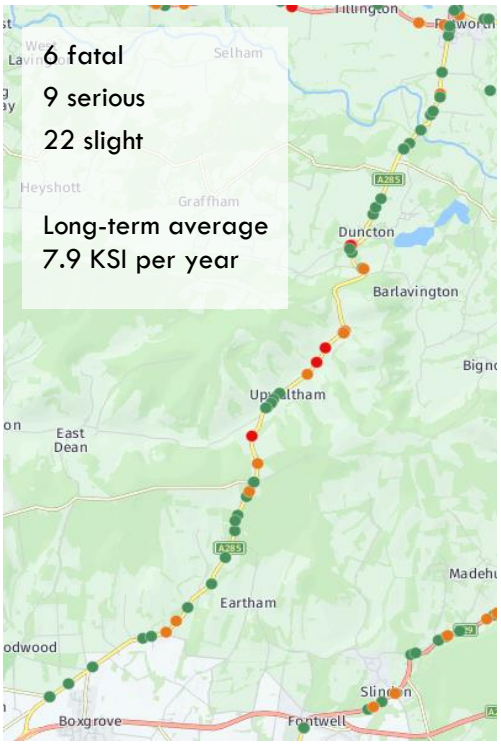


Britain's persistently higher risk roads (EuroRAP Risk mapping 2009-11 & 2012-14):

Road	Route description	Region/country	Length (km)	Road type	F&S crashes (09-11)	EuroRAP Risk Rating (09-11)[1]	F&S crashes (12-14)	EuroRAP Risk Rating (12-14)[1]	% of crashes with motorcyclist involvement (12-14)	% contribution of crash types (12-14)[2]					
										Pedestrians/ cyclists	Junctions	Run-offs	Head-ons	Rear end shunts	Other
A285*	A27 (Chichester) to Petworth	SE	19	Single	17	149.1	23	199.6	39%	4%	22%	48%	17%	4%	4%
A18*	Laceby to Ludborough	EM/ Y&H	16	Single	10	131.8	16	189.7	31%	6%	31%	44%	13%	0%	6%
A588*	A585 (Blackpool) to Lancaster	NW	29	Single	24	153.1	28	179.2	50%	7%	46%	43%	4%	0%	0%
A27*	M27 J12 to J11	SE	6	Mixed	16	101.9	22	140.0	55%	36%	55%	0%	0%	0%	9%
A532*	A530 to A534 (Crewe)	NW	5	Single	10	154.6	9	134.3	22%	56%	44%	0%	0%	0%	0%
A32*	M27 J10 to Gosport	SE	11	Mixed	24	91.9	33	130.1	39%	48%	39%	0%	0%	3%	9%
A6*	M6 J33 to Lancaster	NW	9	Single	29	170.8	21	129.3	19%	67%	10%	10%	0%	5%	10%
A361*	Chipping Norton to Banbury	SE	21	Single	15	86.9	22	128.7	18%	36%	27%	23%	5%	0%	9%
A36*	M3 J2 to A35 (Southampton)	SE	7	Single	15	150.2	12	123.7	33%	42%	50%	8%	0%	0%	0%
A643*	Brighouse to Morley	Y&H	12	Single	11	119.3	11	117.7	36%	27%	27%	18%	9%	0%	18%

iRAP Star rating before countermeasures

A285 accidents 01/2016 – 31/2018



2.4.2. Road Safety Fund grant provision

In order to eliminate highest risks along A285, WSCC had been investing for many years into a high number of low-cost measures implemented on this priority section. The authority was also one of eight "pathfinder authorities" that were successful in submitting bids in the first rounds of funding from a DfT Safer Roads Fund.

The fund of £175 million was allocated for upgrading some of England's most dangerous local roads, based on the UK EuroRAP results 2016 report, which lists 50 highest risk roads, and DfT invited project proposals from local and regional road authorities. Therefore in 2017 WSCC took the chance and submitted 2 bids to extend and complement the previous works done and further improve road along the route.

The second bid from April 2017 was successful and provided an opportunity to implement the safety upgrading scheme on A285 with the following specifications:

- scheme cost £1532.4k;
- expected to save 13 KSI casualties over 20 years;
- BCR = 1.96;
- based on the following input information:
    - improving the Star Rating – lift from 1 star;
    - road inspection completed by RSF;
    - counter measures determined in SRIP;
    - calculation of scheme benefits primarily driven by iRAP's ViDA software;
    - methodology accepted by DfT;
    - BCR calculated on the projected reductions in fatal and serious casualties – likely to be higher.

2.4.3. A285 project implementation

The upgrade scheme prepared for A285 under Safer Roads Fund had quite a simple project´s objective – **to ensure consistent lane width along the whole route,** which is (due to its delineation and character) very popular with motorcyclists, who contribute significantly to road´s accident record.

The works consisted of introducing a safety edge comprising of shoulder widening to provide a hard strip and a rumble edge lining along approximately 12 km of the route.

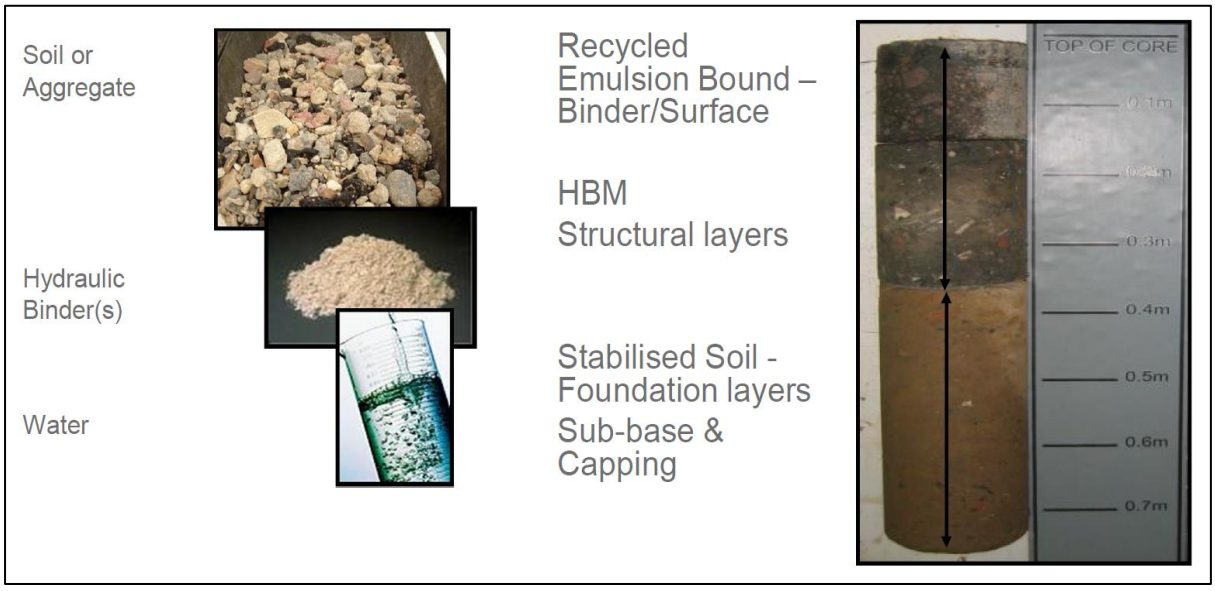
The session included a presentation of WSCC´s contractor, too. The representative of Balfour Beatty introduced the technology and innovative materials used for the surface upgrade.

Despite project´s simplicity in terms of technical solution, there were several potential constraints to the implementation, which needed a careful treatment and considerations from the very beginning:

- environmental issues – route going through the South Downs National Park;
- landownership and timescales – works to be within the existing delineation of A285;
- traffic management – diversion of traffic not possible due to long alternative routes, extensive road closures thus not an option;
- archaeology – area of rich Roman and pre-historic record.

The SV participants also learned a lot on the technology of hard shoulder and surface treatment with the use of both modern machinery and innovative materials based on recycled aggregates. For the A285 project, the Hydraulically Bound Mixtures (HBM) were used as a mid-layer in order to achieve extra hard and quality surface.

As the name indicates, HBM is used to describe soil or aggregate mixtures that incorporate binders based on cement, lime, gypsum and fly ash. By adding water to the mixture, the hydraulic reaction hardens and binds the mixture. The following figure depicts the surface composition.



Besides its technological/functional characteristics, further advantage and benefits of HBM technology clearly lies in its ecological aspects, when the waste material from re-surfacing can again be used for the new surface layers.

2.4.4. Photo documentation from A285

There were numerous pictures shown by WSCC representatives to illustrate the conditions along A285 and individual treatments applied. The following chapter brings a couple of selected ones, while much more were taken during the Day 2 bus tour.


East Dean 2
Charlton 3
Singleton 4
savills
LET


THE STAR GARTER


GIVE
WAY

2.5. Workshop on safe system principles and measures

The last session of SV day 1 was dedicated to a workshop and discussions on principles of the Safe System approach – particularly with respect to UK´s experience with it and measures that can help to achieve it. The presentation and discussion lead were again facilitated by Jeanne Breen and RADAR representatives Marko Sevrovic and Olivera Rozi.

2.5.1. Principles and objectives

In order to understand better the differences between the traditional approach to road safety and the safe system approach, the following comparison was shared with the RADAR participants:

PAST APPROACH	SAFE SYSTEM APPROACH
Safety is a function of mobility.	Mobility is a function of safety. Safe mobility is the goal.
Focus on crash prevention – all outcomes.	Focus on serious and fatal injury prevention. Accept lesser crash outcomes. Safe not safer.
Non-complaint users are considered the main problem.	Shared responsibility across system planners, designers, operators and users to address known common error and human vulnerabilities and avoid severe crash outcomes.
Road safety ambition limited to a specified period.	Ultimate prevention of death and serious injury via time-limited targets.
Safety is an add-on.	Safety is embedded in mainstream policy/processes and designed in.
Reactive treatments after the event.	Proactive measuring, targeting and treatment of KSI risk.
Short term safety benefits accounted for in investments (eg. asset management, FYRR).	Long-term safety benefits accounted for e.g. over 20 years.

One of the key discussions on safe system concerned learning and exchanging of knowledge and opinions on what are basic principles of such a system. There were 4 fundamental characteristics defined and explained in detail by Jeanne Breen:

- **People make mistakes.**
  Only ca. 30 % of serious crashes involve deliberate, risky behaviour. Most result from errors in perception or judgement or missed signals.

- **People are vulnerable.**
  The human body has a known, limited physical ability to tolerate crash forces before harm occurs – talking speed, it is 70 km/h for head-on crashes, 50 for junction crashes, 40 for run-offs and only 30 km/h for pedestrians and cyclists involved in car crashes. On contrary, allowable speeds of many roads across the EU are higher than the protection afforded by roads, roadsides and vehicle design.

- **Shared responsibility for results**
  Safe System vitally requires a joint multi-sectoral responsibility of all players involved – professional planners and designers, road traffic system operators, road users, governments, as well as businesses and civil society. All have their roles to play in order to achieve promising results.

- **Strengthened management**
  It is necessary that all responsible top management structures cooperate and follow the same strategic, results-focused approach in longer term. This goes to all stakeholders involved – governments, road network operators and agencies, civic organizations and charities, etc. To achieve success, it is key to align the efforts with other important societal goals and to measure and target desired outcomes related directly to the prevention of death and serious injury.

Key system design objectives

Workshop participants also discussed the objectives, which shall be met in order to enable safe system to perform efficiently. Covering road infrastructure, speeds, vehicles, as well as post-crash care, the following has been considered as crucial:

- safe separation of opposing flows of high-speed motorised traffic where possible;
- safe separation of non-motorized users and high-speed motorised traffic;
- protective road and vehicle design and speed management;
- efficient post-crash response and trauma care to reduce injury consequences.

2.5.2. Summary of effective practice

To sum up the workshop session on Safe System approach, Mrs. Breen highlighted the key messages and success factors of the system implemented in UK and shared further good practices, namely from Sweden.

UK´s best practices with safe system implementation include:

- 'Measuring to manage' is taking place with a sharper focus on operational targets using a range of validated evaluation tools.
- High-risk (death and serious injury risk) sections and areas of the network are identified through iRAP risk mapping and road protection score.

- More ambitious, accountable safety performance targeted for short and long-term is evident.
- Interim targets are not seen as ends in themselves or acceptable performance levels but on a path towards zero.
- Innovation is evident, where standards are clearly deficient, based on well-established safety principles.
- Increased budgets and specifically allocated resource.
- Carry out multi-sectoral Safe System demonstration projects e.g. on high volume/high-risk sections of the network, urban areas with high VRU volumes in line with international good practice.
- Capacity review is carried out to assess capacity for Safe System implementation to inform future investment, start-up plans and projects.

Good practice in Sweden – Safe speeds policy

Jeanne Breen also introduced key elements of Swedish good practice with introduction of latest speed enforcement policy. Aiming to balance safety, environment, accessibility, navigability, favourable regional development and equality, the new policy strategy and large-scale actions shall (under full-compliance condition) result in saving 150 lives annually and reducing carbon dioxide emissions by around 700,000 tonnes (equivalent of emissions from 240,000 passenger cars).

In the Safe speeds policy, posted speed limits are determined by the crash-protective quality of road sections and vehicles, which take account of human tolerance thresholds. Practically, the following measures have been implemented:

- new supplementary posted speed limits of 40, 60, 80,100 and 120 km/h;
- widespread roll-out of 30 km/h on residential roads.

Since Sweden surely belongs among the "path-finding" countries and has been implementing various road safety measures among the first, there already is evidence and benefits to support and recommend certain proven (even low-cost) measures, such as:

- 2+1 schemes have reduced deaths by 80 % and KSI by 50-60 %;
- At roundabouts, 80-90 % fewer deaths occur compared to classic junctions;
- Roadside barriers have been assessed as highly cost-effective;
- Distance driven on major single-carriageway roads with median crash barriers nearly doubled between 2003 – 2010.

3. Day 2 – site visit and SRIP implementation in UK

3.1. A285 bus tour

On the second day the RADAR team met in the morning to board for a commented bus tour along the A285 road section that faced the safety upgrades presented the day before, the participants had thus a chance to observe the implemented measures in practice. Additionally, it was a good opportunity to observe general road marking and signing practices on regional roads in UK, which itself provided an interesting inspiration and examples to follow at larger scale in Danube Region countries.

Since the previous chapter provides technical details on the scheme, only pictures taken during the bus tour are presented here in order to illustrate the scale and types of scheme treatments.


30
30


SLOW
REDUCE SPEED NOW


Oncoming vehicles in middle of road


Bignor
Sutton
Coates
Burton Mill


30
Speed Cameras
30


REDUCE SPEED NOW

3.2. SRIP implementation on the Highways England network

After returning back to the WSCC office, the programme continued with a final session dedicated to the implementation of SRIPs across the strategic network of Highways England, presented by John Fletcher of Transport Research Laboratory (TRL).

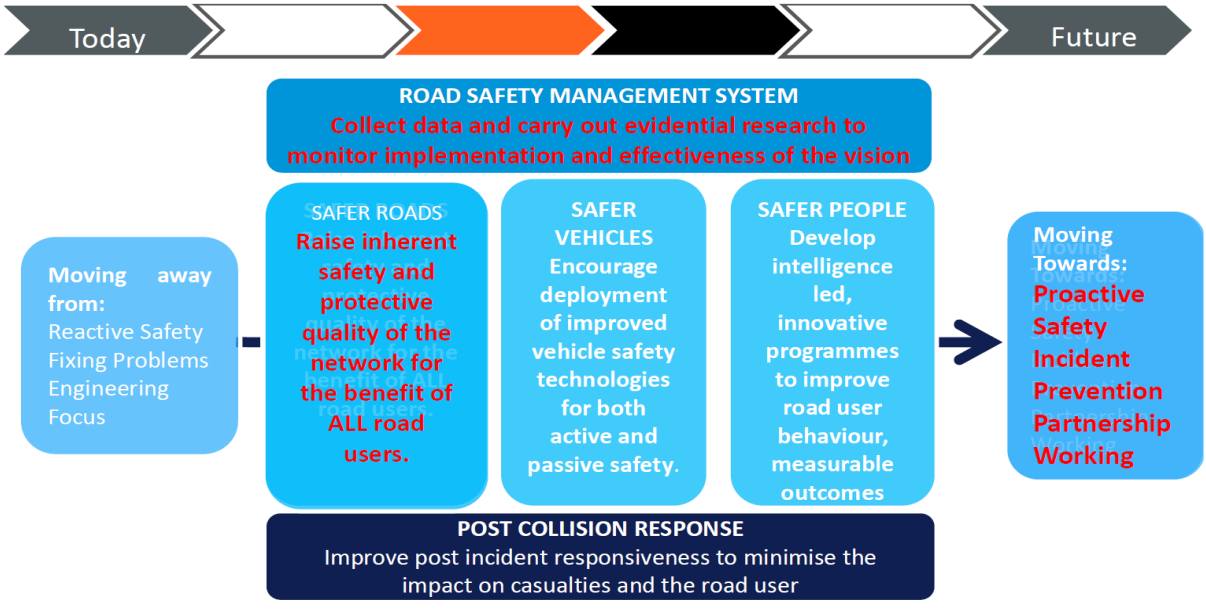
TRL has always been is a world-known Centre of Excellence for iRAP, building scientific evidence and methodologies around various safety assessment procedures and categories of countermeasures. As such, TRL has been step-by-step developed a close relationship and cooperation framework with Highways England (HE; public road authority managing the Strategic Road Network (SRN) of England. Mr. Fletcher introduced to RADAR participants the scope of this collaboration and the ambitious **Vision 2040**, which build on the Safe System approach and uses iRAP Star Rating and SRIPs as tools to achieve road safety objectives set within the strategy.

Collaboration of iRAP and Highways England

iRAP helps HE to achieve the strategic goals, which HE set for road safety performance on the SRN. This KPI target is **to reduce killed and serious injury casualties by at least 40 % by the end of 2020 against a 2005-09 baseline.**

Moreover, HE adopted its **Vision 2040, which expects no-one travelling or working on the SRN will be harmed.** In order to achieve such ambitions, HE established the framework, which includes iRAP tools as key methodological instruments to support decision-making. The characteristics and indicators for such a systematic approach are:

- adoption of a proactive 'Safe System' approach;
- iRAP Star Rating considered the key Safe System approach to manage road safety risks across the HE network;
- **PI: Commitment for 90 % of travel on the SRN to be at three stars or above by the end of 2020;**
- **PI: Reduction in length of one- and two-star roads on the SRN.**



Strategic Road Network of HE

- 6,880 km (40 % motorway and 60 % high quality non motorway; 14,500 km total carriageway length);
- accounts for 34 % of all road travel and 67 % of HGV travel;
- 4 million vehicles use the network daily;
- Traffic Officer Service attends and clears over 7,000 live lane incidents every month;
- comprise of motorways, other dual carriageways, as well as undivided primary roads

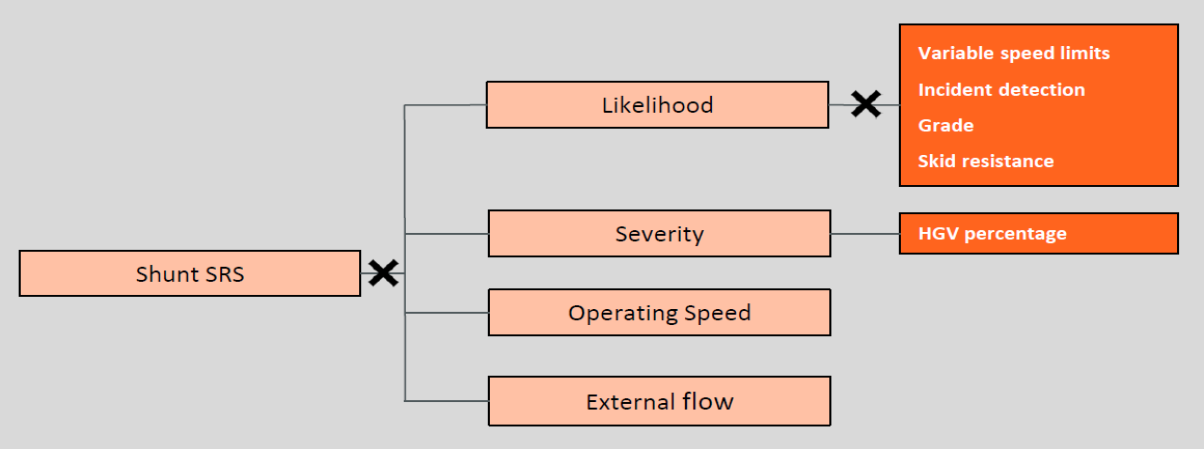
The programme introduced by HE expects tight cooperation links among the road authority, iRAP and TRL as technical support lead.

Programme´s objectives are to:

- apply iRAP Star Rating to assist client to manage safety on the SRN;
- use Star Rating as a safety performance indicator for travel;
- assist in the understanding of the model operation;
- assist iRAP to further develop Star Rating methodology (funding research and development activities);
- coordination with other stakeholders;
- achieve practical outcomes and casualty reductions.

In addition to the regular update of traditional Star Rating model used in the past, TRL began to work with HE on innovative approaches to modelling Road Protection Score and Star Rating in order to incorporate the type of collision previously not considered and modelled within Star ratings models – **collision of vehicles driving along the same direction** (so called "shunts").

In addition, the newly developed and tested SRS model takes into account further ITS factors, which were introduced under the "smart motorway" concept implementations (e.g. speed management through variable signing) and incorporates them as attributes and countermeasures into the model. The scheme below shows the **Shunt model structure**:



Innovative enhancements to existing SRS model involved the review of risk factors, coding representation of SRN road attributes and further research and collation of evidence. Key features discussed and tested are:

- Junctions on dual carriageway:
  - median gaps present, short slips;
  - Clarifications for coding roundabouts;
  - Staggered junction representation;
- Formalising:
  - Fixed (spot) cameras speed management;
  - Average speed cameras (point to point).

As part of the cooperation of TRL and HE, a training course has been developed for engineers of both the agency and its suppliers across England. The focus of trainings was given to:

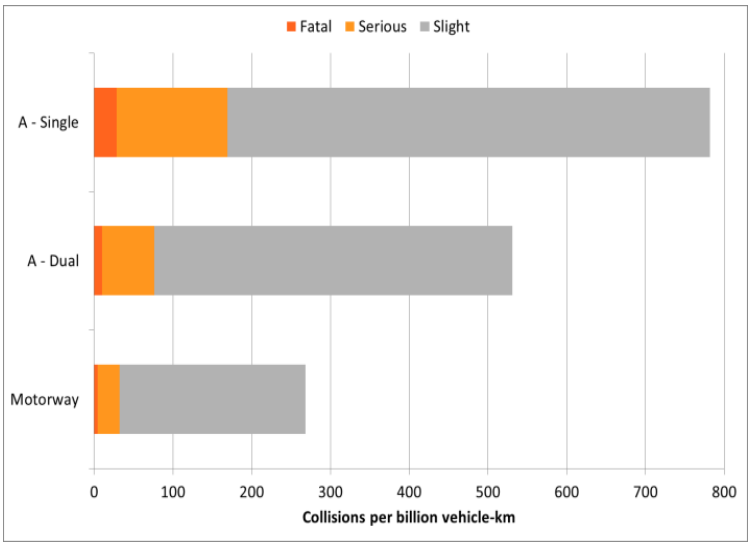
- safe systems;
- iRAP Star Rating theory;
- Safer Roads Investment Plans (SRIPs);
- SRIP feeding into safer design of road schemes;
- UDIPs – User Defined Investment Plans (plans with flexibility to vary elements).

At the end of his presentation, John Fletcher dedicated time to explain an important aspect of future road safety focus for HE – single carriageways. It is widely known within the professional community that single carriageways are on average more severe in accident consequences and the data analyses by TRL across the HE network (2011 – 2015) showed similar results, which are depicted in the below figures.

Single carriageways account for 13 % of total collisions, but are more severe on average, accounting for 24 % of fatal collisions. The fatal collision rate on single carriageways is 2.8 times higher than on dual-carriageway A-roads and 6.8 times higher than on motorways.

Mr. Fletcher also introduced to the participants the on-going test cases and piloting of actions focused on single carriageways and selected countermeasures taken to reduce the risk of run-offs on this road category.

The case of A550 was presented, together with BCR modelling results for measures of shoulder and centreline rumble strips (or flexi-posts) installation.



4. Lessons learned

The second RADAR Study visit brought the team of PPs and ASPs to Chichester, UK in order to introduce and exchange the best practices of English road authorities with managing investments to road safety and increasing road networks safety performance through implementation of the Safe System approach and the iRAP tool of Safer Road Investment Plans.

The lessons learned included both theoretical background and pre-conditions to be met for the efficiently working system, as well as practical experience and views of different road authorities on iRAP methodology and analytical instruments.

Recommendations on road safety investments and budgets planning:

- Road safety funding is often 'lost' in national infrastructure investment and needs to be explicit.
- Safety investments for projects and programmes need a focus on outcomes.
- Planned, systematic approach, informed by risk mapping, star rating tools, evidence-based actions, road investment plans.
- Targeting high-volume, medium to high-risk sections with proactive treatments can achieve high returns on investment.

Priority intervention towards Safe System implementation:

- start Safe System policy reviews in identified areas e.g. road hierarchy and speed limit policies, asset management;
- embed Safe System in processes, guidance, tools;
- formalise how Safe System objectives are considered during project development, traffic and asset management.

UK is one of the path-finding countries in the implementation of modern assessment tools of iRAP, particularly the development of Safer Roads Investment Plans thanks to the modelling tools of ViDA software. Even though the procedures are quite familiar to RADAR community, it was very valuable to learn and understand various opinions and comments of road safety authority representatives related to these tools, as they shall be the primary beneficiaries of delivered results, or even active users of certain tools, with a high focus on practicalities.

Authority views and notes on SRIP development and ViDA utilization:

- The system represents a significant change to the past approach of road safety assessment and management, with a more strategic perspective and the Safe System thinking "at the heart" of interventions.
- SRIPs provides a different perspective and valuable engineering analytical tools to assess and improve safety across road networks.
- Possibility to model and assess alternative options was highly appreciated, together with further recommendations on potential improvement of various functionalities of ViDA software (e.g. on/off switching of measures for discreet sections, upload/download functions).

4.1. General key success factors

The road safety themes introduced during the RADAR Study visit to Chichester and the practices shared by both experts and authorities provided an important insight to how the UK (or England, specifically) performs and plans in terms of road safety. The UK for sure represents a good practice example to vast majority of RADAR project countries, even though things to improve always exist.

There were many recommendations and conditions to meet already mentioned for different Safe System elements, as well as for the SRIP implementation process. To summarize further pre-conditions, the following was found important to highlight:

- **Road safety strategy in place**

  In order to systematically assess safety performance of road network, apply targeted countermeasures and monitor efficiency, the strategic framework is needed, with clearly defined objectives, targets and priorities.

- **Shared responsibility in mind**

  All stakeholders involved in the Safe System environment need to clearly understand their roles and actively contribute to the development of such a system.

- **Ring-fenced funds/budgets**

  The example of Safer Roads Fund was found as a good practice to share, providing a targeted and transparent use of public resource to address network safety targets and demonstrate the benefits of Safe System treatments.

- **Local engineering and analytical skills essential**

  Although there is a set of tools and system elements available for knowledge transfer and drafting the road safety strategic framework in different countries, it only constitutes a starting point of the Save System development. Local expertise, experience and engineering judgment is irreplaceable and vital for the measures to be both effective and well-accepted.

- **Planning of road safety upgrades based on advanced analytical tools**

  It was clear from the contributions that road authorities of all levels need user-friendly and reliable engineering tools to help them plan safety measures efficiently. Even though the space for improvements always exists, the general availability of iRAP tools across the globe is an essential success factor towards the Safe System approach implementation.

4.2. Critical issues

There were also several critical aspects mentioned during the 2-day Study visit with respect to the Safe System principles and SRIP methodology implementation. Besides not meeting the important factors stated above, it is further essential to prevent the following from hampering the progress:

- political reluctance or unwillingness to establish a broad multi-level and multi-sectoral consensus among all players involved in the road safety system, vital for the implementation of the Safe System principles;
- unavailability of dedicated financial resources linked to concrete strategic measures for road safety improvement – safety still largely considered as an "add-on", despite many positive recent changes;
- lack of professional acceptance of the engineering tools offered by iRAP (particularly SRIPs) – based on insufficient understanding or low level of trust in the system developed externally;
- poor adjustments and calibration of the ViDA environment for SRIP development to local (national) conditions in order to receive truly valuable outcomes of road safety modelling exercises.

4.3. Potential for transfer across DTP countries

The Study visit to the UK was highly relevant in terms of shared experience with developing the road safety frameworks, implementing safety policies, planning budgets and managing road safety performance. A lot of DTP (as well as RADAR) countries is rather far from achieving a similar level of professional and public awareness, as well as a joint political support to all necessary Safe System pre-conditions.

However, it is clear from the RADAR activities carried out at national levels (and also from the lessons learned in previous European projects aiming at iRAP methodology introduction and piloting) that the general interest of national public road authorities (ministries, infrastructure managers) exist. The more professionals of respective road network managers will learn to understand how to create, use and adjust the models of SRIPs available through ViDA software, the more reliable results it will generate at different network levels. Sound and valid results are crucial for gaining the political support, so much important for setting up the whole Safe System architecture in different RADAR countries. Some of them have already vast experience and even iRAP results, others still struggle to find proper support or resources to pilot first projects.