



Support for implementing measures for the South East Europe Core
Regional Transport Network Multi Annual Plan 2008-2012
EuropeAid/125783/C/SER/MULTI



WYG International part of the WYG group
creative minds safe hands



Project Office: Omladinskih Brigada 1/5th floor, 11070 Novi Beograd, Serbia
Tel: +381.11.3131799 / Fax: +381.11.3131800 / E-mail: RWRRSasecretariat@seetoint.org

CHECKLISTS FOR MOTORWAYS

Annex 2.1

to Road Safety Audit Manual

(REVISED FINAL)

July, 2009

creative minds safe hands

WYG International Limited, Newstead Court, Little Oak Drive, Sherwood Business Park, Annesley, Nottinghamshire NG15 0DR
Tel: +44 (0)1623 684 500 Fax: +44 (0)1623 684 545 Email: enquiries@wyginternational.com www.wyg.com

WYG International Ltd Registered in England Number: 3195485 Registered office: Arndale Court, Otley Road, Headingley, LS6 2UJ

Annex 2.1 – Checklists Audit Stage 3 and 4

Structure of the Checklists				
		Road Categories		
Audit stages		Motorways	Interurban Highways	Urban Main Roads
1	Preliminary Design	Annex 1.1.1	Annex 1.2.1	Annex 1.3.1
2	Detailed Design	Annex 1.1.2	Annex 1.2.2	Annex 1.3.2
3 and 4	Pre Traffic Opening and Post Traffic Opening	Annex 2.1	Annex 2.2	Annex 2.3

Notes:

The Audit stages 1 and 2 are done with the project documentation on the paper. The Audit stages 3 and 4 are related to the road site. Therefore is there a strong relationship with the Road Safety Inspection method for existing roads. Because the checklists are in fact the same they are collected in a separate way in the annex 2.

The Checklists for the Interurban Highways are also including questions about the typical situation regarding the through road section in small villages etc.

RSA Checklist				
Motorway Number from km,... to km,... Date:				
Characteristic	No.	Question	Yes (✓) No (X)	Comments
1. Function, operating elements and surrounding	0	Are there any information about previous RSA?		
	1	Are there any issues from accident data if available?		
	2	Is the Motorway - a long distance Motorway, - a regional Motorway or - an urban Motorway		
	3	Is the current situation of the motorway according to its category?		
	4	Do we realize the change of characteristics early enough (orientation sight)? 120 km/h ►500 m ahead 100 km/h ►300 m ahead 80 km/h ►200 m ahead		
	5	Are there anywhere accumulations of events such as curves + hilltops + interchanges etc?		
	6	Are speed limits required and applied in the best way?		
	7	Is stopping sight distance guaranteed along the entire section? (for 120km/h= 250 m, 100 km/h =170 m, 80 km/h=110 m, long fall = 0%)		
	8	Are all fixed or planted obstacles that can be dangerous placed outside the safety zone? 120km/h► 12 m 100 km/h ►9 m 80 km/h ► 6 m (away from the carriage way)		
2. Cross section	1	Is the cross section appropriate to the category?		
	2	Does the road surface provide the required grip over the long term where small radii occur (e.g. also on ramps of interchanges)?		
	3	Are there any doubts regarding the surface grip because of excess bleeding or polished components?		
	4	Is the surface even and free from grooves, ruttings, potholes?		
	5	Is the surface free from short or long waves?		
	6	Is there sufficient drainage for the road and its surrounding?		
	7	Is there sufficient superelevation in curves, long fall and diagonal fall in the case of the change of the direction of the cross fall?		
	8	Is the cross fall in straight sections constant?		
	9	What is the medium width of the road shoulders?		
	10	Are there stable shoulders (like hard shoulders or gravel shoulders)?		

Cross section continued	11	Are the shoulders at the same level of the carriage way?		
	12	Have sufficient measures been taken on cutting slopes to prevent falling material (e.g. falling rocks)?		
	13	Is stopping sight obstructed, for example by safety barriers, plants?		
	14	Have the median a safe design, e. g. safety barrier or sufficient width to prevent head on collisions?		
	15	Does the embankment or obstacles beside the motorway require passive safety installations?		
	16	Do the elements of the cross section realize the situation for the road users?		
3. Alignment	1	Is the existing speed limit adequate for the horizontal and vertical elements of the alignment?		
	2	Is sight obstructed, for example by safety barriers, fences, road equipment, parking areas, traffic signs, landscaping/greenery, bridge abutments, buildings?		
	4	Is visibility in curves ensured (check esp. the inner lane in left hand curves – side obstruction by guardrails, greenery...)?		
	5	Is the super elevation in curves sufficient?		
	6	Has the uphill sector a passing lane for overtaking slow traffic?		
	7	Has the passing lane a sufficient length in order to insure that the vehicles can overtake and return safely?		
	8	Are arrester beds necessary in downhill sections (depend on the percentage of heavy trucks and the gradient)?		
	9	Is the alignment consistent and easily recognized by the road users? Or full of „surprises“ for the drivers?		
	10	Are changes (surprises) indicated by transitions like signing, points of fixation?		
	11	Are the outside of the curves framed parallel and consistent eg. with bushes?		
	12	Are the insides of curves in ramps of interchanges free from side obstructions?		
	13	Are there any optical illusions?		
	4. Interchanges (Separate answers for each interchange!)	1	Are type and design of the interchange suitable for the category and traffic volume of the intersecting roads?	
2		Are the movements guided clearly and easily to understand? Are traffic flows guided by markings?		
3		Are the auxiliary lanes or tapers for turning movements large enough?		

Interchanges continued	4	Is the interchange fully visible and recognizable in time from all approaches for different driver eye heights of: Cars, trucks, motorcycles, bicycles, etc, and are the required sight triangles clear?		
	5	Does the ambient lighting present any special requirements?		
	6	Is sight obstructed, for example by safety barriers, fences, road equipment, parking areas, traffic signs, landscaping/greenery, bridge abutments, buildings?		
	7	Is a reduction in speed required in the direction of the interchange?		
	8	Is the design helpful to avoid wrong way driving in a sufficient way or confusing the driver?		
		<i>For checking the intersection at the secondary roads please use the checklists for Interurban or Urban mainroads.</i>		
5. ITS measures. Telecommunication	1	Are ITS measures for communication and driver assistance installed?		
	2	Are the information clearly recognisable and understandable?		
	3	Is the motorway equipped with a SOS telephone system?		
6. service and rest areas	1	Are service and rest areas and parking facilities in a sufficient number on both sides of the motorway?		
	2	Are there deceleration and acceleration lanes or tapers at the entrance and exit?		
	3	Is the number of parking areas for parking for passenger vehicles, trucks and buses sufficient?		
	4	Are the dimensions of the parking areas sufficient for parking for passenger vehicles, trucks and buses?		
	5	Are areas for busses and passenger cars separated from the truck traffic?		
	6	Is the layout and cross section of the service or rest area appropriate for the different traffic movements?		
	7	Is the layout in such a way, that vehicles are running at the appropriate speed?		
	8	Are the parking areas physically separated from the carriageway (guardrail, kerb, green area etc.)?		

Service and rest areas continued	9	Are there safe footpath connection to restaurants, rest rooms etc.(including safe crossings of) ?		
	10	Have measures been taken to ensure safe access for rescue vehicles/maintenance vehicles/fire service?		
	11	Are sufficient parking areas provided to minimize illegal parking on footpaths and on the carriageway with the corresponding hazards or have corresponding preventative measures been taken?		
	12	Is sight obstructed by parking areas or by illegally parked vehicles?		
7. Public transport	1	Is Public transport using the motorway (e.g. on urban motorways – in exceptional cases)?		
	2	Are bus stops separated from the traffic flow, are there measures to prevent pedestrian traffic on or along the motorway?		
8. Needs of vulnerable users		<i>please see " rest areas" and "public transport"</i>		
9. Traffic Signing, Marking, Lighting 9.1 Signing	1	Have appropriate speed limits been signed appropriately (start, end, height, location)?		
	2	Is the visibility of the road course assisted by edge delineation?		
	3	Is the vertical signing properly emplaced and complete?		
	4	Can the signs be clearly recognized and read (size of signs)? And do the signs conform to the conventions of Vienna and Geneva?		
	5	Are there more than 2 different traffic signs at one place?		
	6	Are there repeating signs in the median stripe?		
	7	Is the signing for service and rest areas clear? Is there a sufficient numbers of repeating signs to announce the rest area in advanced (e.g. 1000m and 500 m in advance – first and second panel)?		
	8	Is the signing for interchanges clear and understandable? Is the information about destination sufficient (but not more than 5 different destinations)?		
	9	Is there a sufficient numbers of repeating signs to announce the rest area in advanced? Are the directional signs placed in a proper way? (e.g. 1000m and 500 m in advance – first and second panel)?		
	10	Does the overhead directional signing correspond with the traffic lanes?		
	11	Are advanced warnings in place for features that cannot be seen in time?		
	Traffic signing continued	12	Are signs retro reflecting or are they illuminated at night? In daylight and darkness, are signs satisfactory regarding visibility?	

	13	Are there misunderstanding or misguiding traffic signs or additional information panels?		
	14	Is readability ensured at the required distance? Are there background problems?		
	15	Where needed have signs been located above the carriageway?		
	16	Are the signs provided with protective edges?		
	17	Are the signs at a uniform position, compared to the pavement?		
	18	Are the sign masts and foundations sufficiently protected against collisions?		
	19	Do the traffic signs including their supports have a sufficient passive safety by: low mass or/and? Break away structure or/and? Are they beyond the safety zone? Passive safety installations?		
	20	Do delineators have a break away structure?		
	21	Could greenery lead to safety problems if the vegetation grows (e.g. as a result of covered road signs)?		
9.2 Markings	1	Do all signs and markings correspond without any contradictions?		
	2	Are the road markings clear and recognizable?		
	3	Are the markings in a parallel line to the edge of the road surface?		
	4	Are the markings appropriate for the function and category of the road?		
	5	Are the markings likely to be effective under all expected conditions (day, night, wet, dry, fog, rising and setting sun)?		
	6	Is there profiled marking in use e.g. as warning for drivers in the case of run off?		
9.3 Lighting	1	Is the road sufficiently illuminated?		
	2	Is the stationary lighting appropriate?		
	3	Is the lighting of special situations (transition zones, changes in cross section) suitably designed?		
	4	Is contrast lighting required at the interchanges?		
	5	Does the ambient lighting present any special requirements?		
	7	Can the stationary lighting cause problems in recognizing the traffic signs or the alignment of the road?		
	8	Are the lighting masts situated outside of the safety zone or properly protected?		
	9	Is stationary lighting at intersections/service and rest areas properly situated?		
10. Road side features and passive safety	1	Are there any features within the safety zone? 100 km/h ► 9 m 80 km/h ► 6 m		

installations 10.1 Other road equipment	2	Are antidazzle screens (e.g. in the median stripe) provided as required?		
	3	Has suitable road equipment (fog warning signs, automatic sprinklers for de-icing agents, snow fences etc.) been installed and is it fully functional?		
	4	Are there game fences? Is the beginning and end of game fencing correctly determined?		
	5	Is there a milage system and will it be clear signposted?		
10.2 Plantings	1	Is there any vegetation along the motorway?		
	2	Are there trees within the safety zone?		
	3	Does the greenery or will the growth of greenery lead to future safety problems?		
	4	Does the greenery and type of planting preclude irritations to the road users (e.g. alignment)?		
	5	Does vegetation protect the road from natural disasters like land slides etc?		
	6	Is the vegetation along the motorway old and could lead to safety problems?		
	7	Does road side vegetation guide the drivers in curves continuously?		
	8	Is the vegetation monotonous? Or does it help to avoid a monotonous character of the road?		
10.3 Civil engineering structures	1	Is reconcilability guaranteed?		
	2	Are passive safety installations set up at the required locations?		
	3	Are parapets and overpasses at a safe distance from the road?		
	4	Have masts, abutments, supporting walls, bridge railings etc. been safeguarded?		
	5	Are lighting poles appropriately placed?		
	6	Are there at bridges sufficient passive safety installations, are there properly connected with the guardrails along the motorway?		
	7	Is the drainage system a linear obstacle with deep ditches in the safety zone?		
	8	Are the constructions of culverts obstacle like?		
	9	Are there tunnels in the road section?		
	10	Are the tunnels safe, are there emergency ways, sufficient illumination etc. (the use the demands of EU – Tunnel directive 2004/54/EC is recommended)?		
	11	Is the vertical clearance under overpasses sufficient?		

10.4 Other obstacles	1	What is the distance of the road directional signing to the pavement? Is there a need for passive safety installation?		
	2	Are there unprotected supports for other cables than lighting in the obstacle-free zone?		
	3	Are traffic signs (other than road directional signs) to be considered as dangerous obstacles?		
	4	Are there unprotected advertisement boards or other fixed obstacles outside the safety zone are they avoidable, or safeguarded?		

