



RSA/RSI Začetni - uvodni tečaj

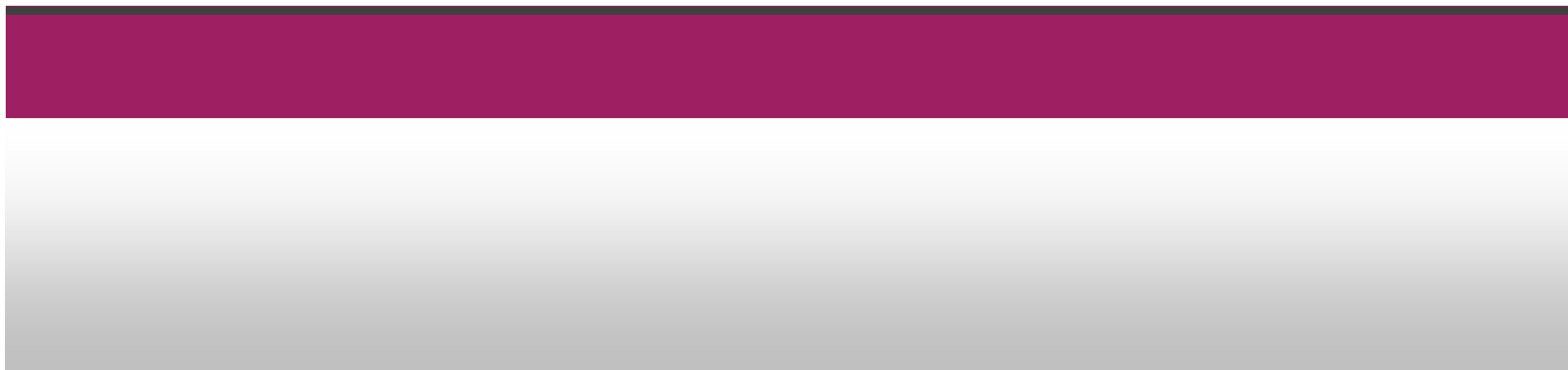
3. Road Safety Audit

PP8/WP₄ vodja UL FGG-PTI



Izvedenci so ljudje, ki vedo vedno več o vedno manj stvareh, dokler nazadnje ne vedo vse o nečem in nič o vsem.

Danny Kaye





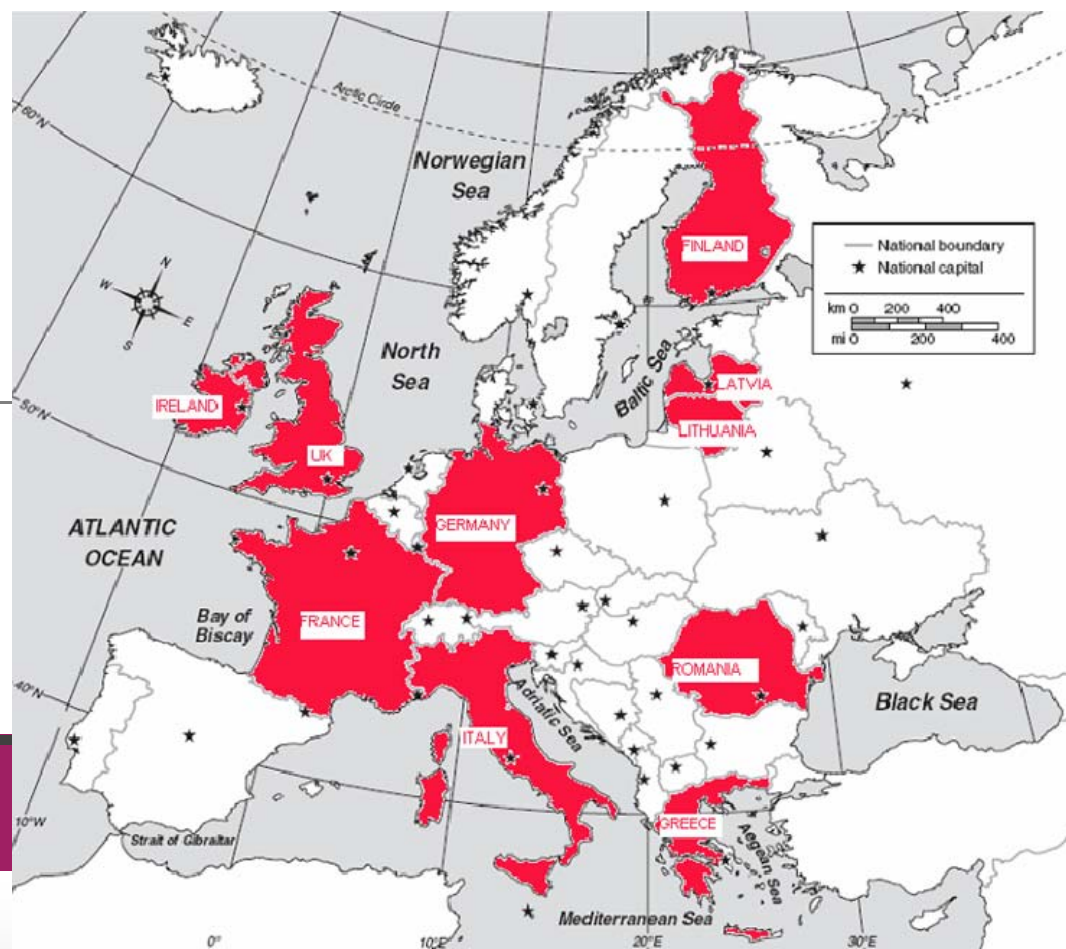
Deus ex machina



Proces RSA je bil prvotno razvit v Veliki Britaniji okoli leta 1980 predvsem zaradi nadzora kvalitete manjših privatnih podjetij, ki so se ukvarjale z načrtovanjem in izgradnjo prometnic. Prvi je tak pregled opravil je Malcolm Bulpitt, ki je prenesel ta postopek iz varnostnega pregledovanja železniške infrastrukture, ki je bila običajna že v obdobju kraljice Viktorije.

Leta 1990 so podobne postopke prevzeli še Danska, Avstralija in Nova Zelandija, od leta 1996 naprej pa še Irska, ki je imela v teh letih najslabšo prometno varnost v EU. V letu 1994 je Austroads izdal prvi priročnik za Road Safety Audit. Od leta 1997 se RSA izvaja tudi v 20 državah ZDA.

Direktiva 2008/96/EG evropskega parlamenta z dne 19 novembra 2008 o upravljanju prometne varnosti je med drugim predvidela tudi Road Safety Audit (RSA) - „preverjanje varnosti v cestnem prometu“. Države članice EU morajo zagotavljati, da se preverjanje varnosti v cestnem prometu izvaja za vse infrastrukturne objekte. Vse države članice morajo do 18. Novembra 2011 zagotoviti implementacijo tega procesa na celotnem TEN omrežju.



Države, v katerih je RSA zahtevan



Definicija 1:

Preverjanje varnosti v cestnem prometu (RSA) pomeni neodvisno podrobno sistematično tehnično varnostno preverjanje glede konstrukcijskih lastnosti projekta cestne infrastrukture, ki obsega različne faze od načrtovanja do začetnega delovanja (direktiva 2008/96)

Definicija 2:

RSA je formalni postopek za oceno o možnostih za nesreče in zmožnostjo ceste za varno odvijanje prometa. Lahko se ga uporablja za novogradnjo ali za rekonstrukcijo obstoječe ceste. Preverjanja naj podajo potencialna problematična mesta z vidika uporabnika in naj podajo možne rešitve za reševanje takšnih mest. Pomembno je minimizirati možnost nesreče že v načrtovalski fazi, tako da se lahko izognemo večjim vložkom v kasnejši fazi. Presojevalci varnosti so tako orodje za preprečevanje nesreč na novih ali rekonstruiranih cestah. Ponavadi predlagajo nizkoprorračunske ukrepe.



RSA je:

- se ukvarja s prometno varnostjo
- je formalni postopek
- izvaja ga multidisciplinarna ekipa
- izvaja ga ekipa, ki je popolnoma neodvisna od projektanta
- izvaja ga ekipa, ki je kvalificirana – posamezno in kot celota
- ukvarja se s prometno varnostjo vseh uporabnikov

RSA ni:

- ni sredstvo za kritiko projektantov
- ni sredstvo za preverjanje skladnosti projekta s predpisi
- ni sredstvo za medsebojno primerjavo projektov
- ni sredstvo za primerjavo različnih projektnih rešitev
- ni sredstvo za revizijo projekta
- ni sredstvo za oceno nesreč

CILJI RSA

Glavni cilj RSA je zagotoviti, da vse nove cestne povezave delujejo čim bolj varno. Varnost je treba upoštevati v celotnem procesu od priprave pa do izgradnje.

Ostali cilji pa so:

- čim bolj zmanjšati število in stopnjo nesreč, ki se bodo dogajale na novi ali rekonstruirani cesti,
- izogniti se rešitvam, ki bi povzročili nesreče nekje drugje na cestnem omrežju,
- omogočiti vsem možnim uporabnikom te ceste možnost, da spoznajo, kako se lahko varno vozijo po njej



KORISTI IZVAJANJA RSA

- RSA se aktivno ukvarja s prometno varnostjo
- Posledica RSA je manj nesreč
- RSA predlaga nizkopproračunske ukrepe z visoko učinkovitostjo
- RSA promovira kulturo prometne varnosti
- RSA omogoča stalen napredek pri reševanju problemov prometne varnosti
- RSA omogoča povratne informacije, ki so koristne za bodoče projekte
- RSA omogoča prihranke pri denarju, času in pri življenjih



STOPNJE IZVEDBE RSA

Stopnja 1 – faza idejne zasnove

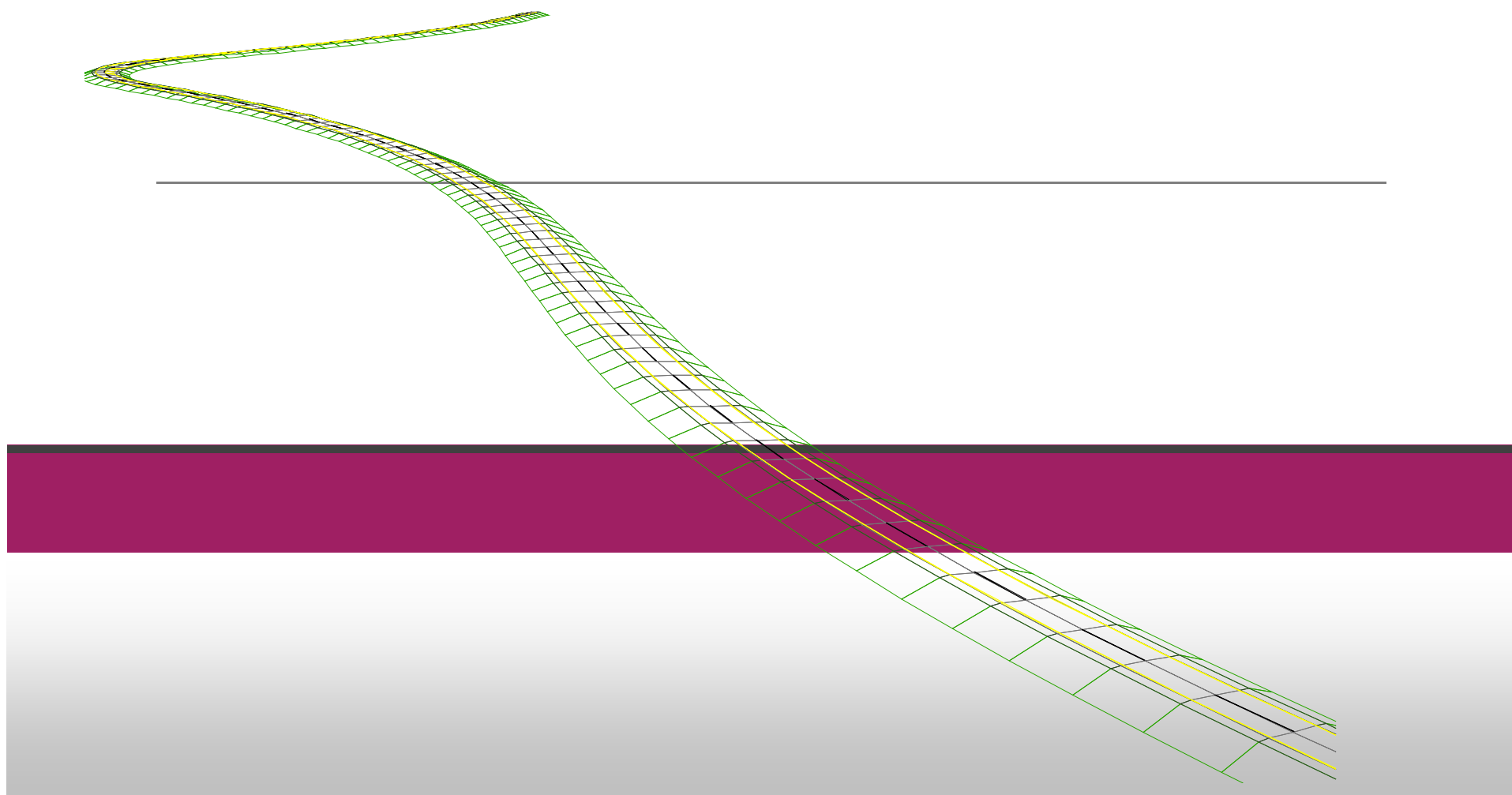
Stopnja 2 – faza PZI

Stopnja 3 – pred prepustitvijo ceste prometu

Stopnja 4 – do 6 mesecev po odprtju ceste

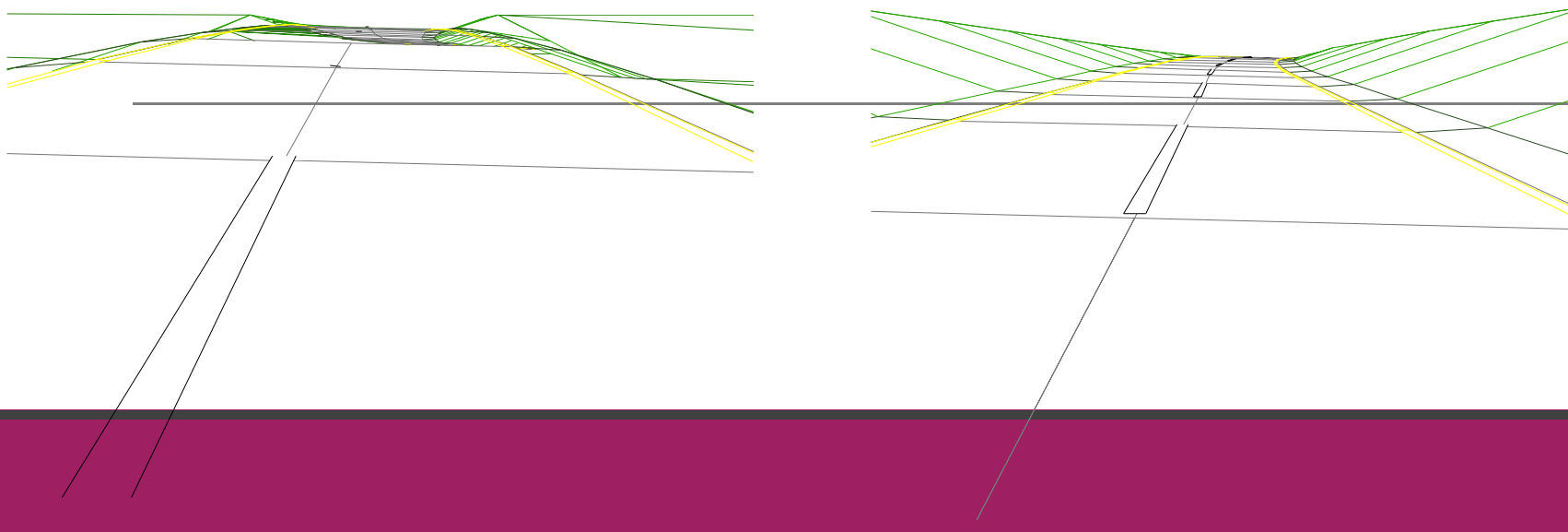


- neprimerno zaporedje horizontalnih radijev



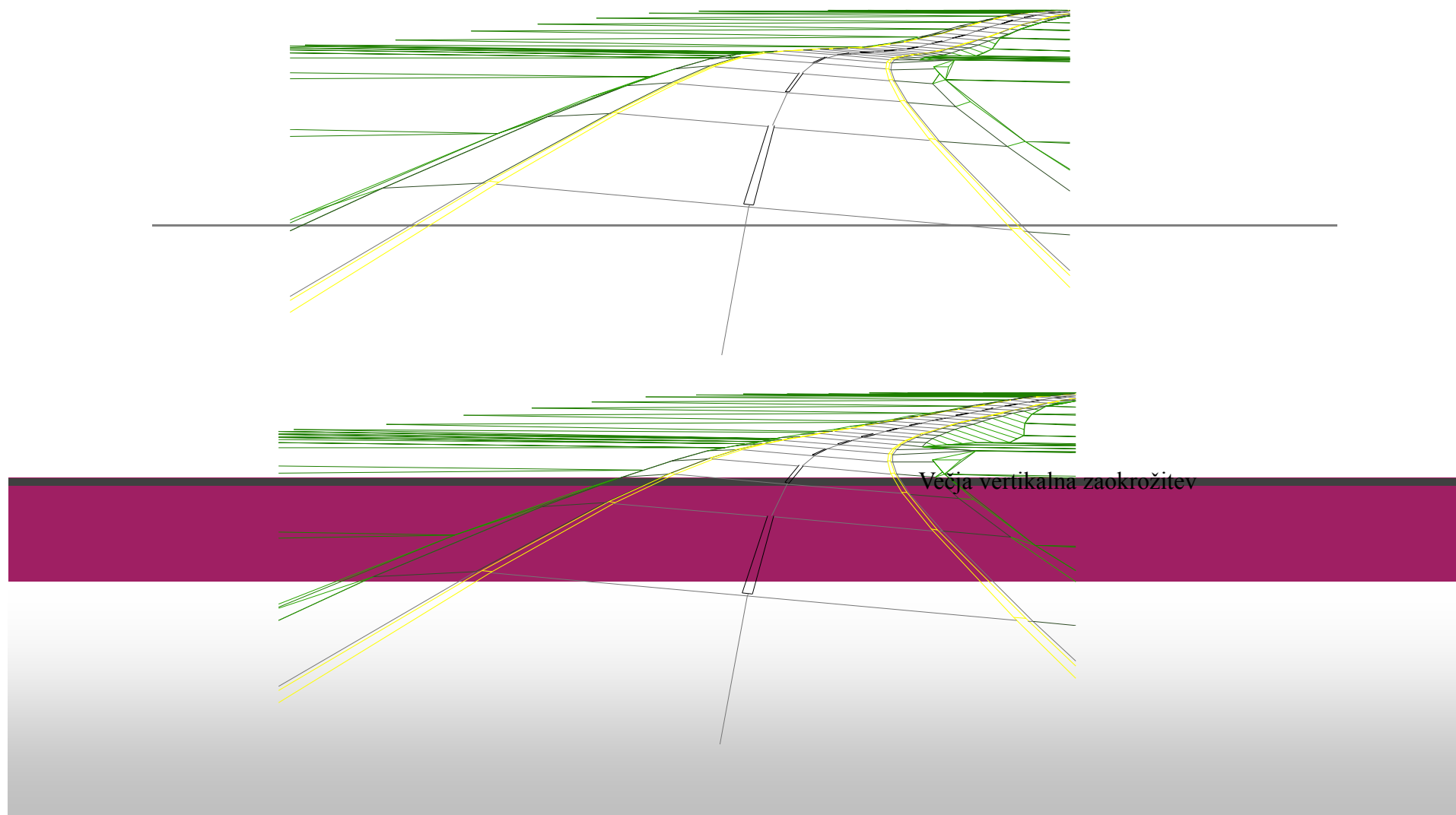


Kako poteka cesta v nadaljevanju?



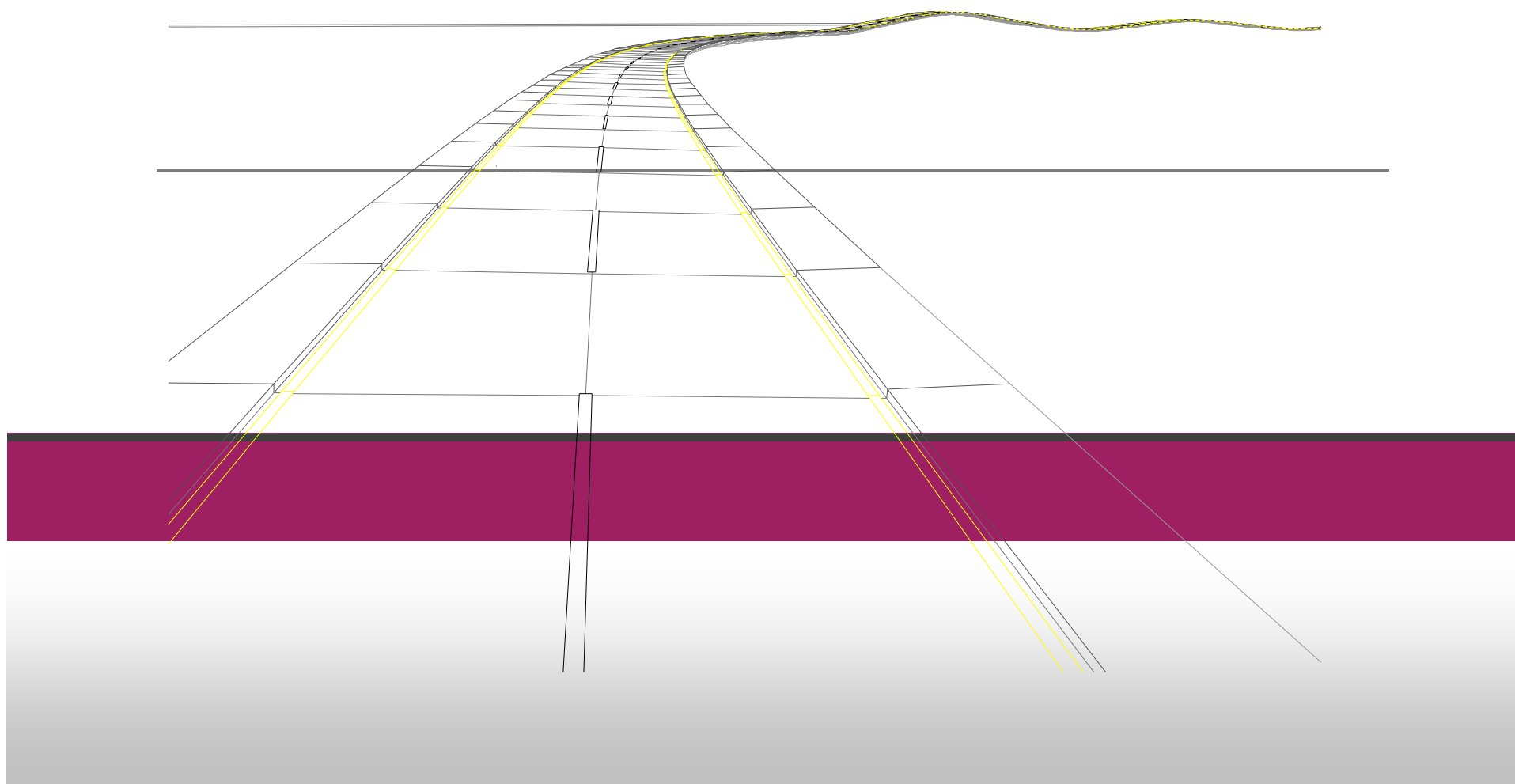


Premajhna vertikalna zaokrožitev v krivini





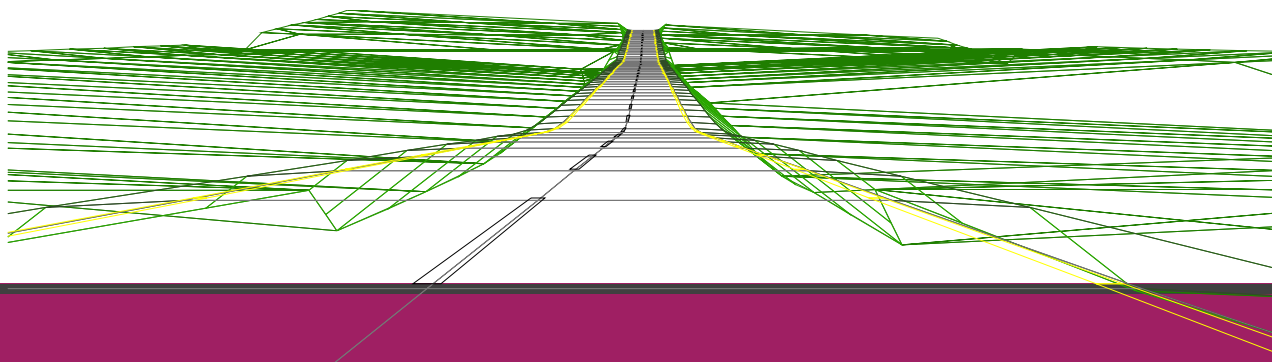
Frifotanje trase





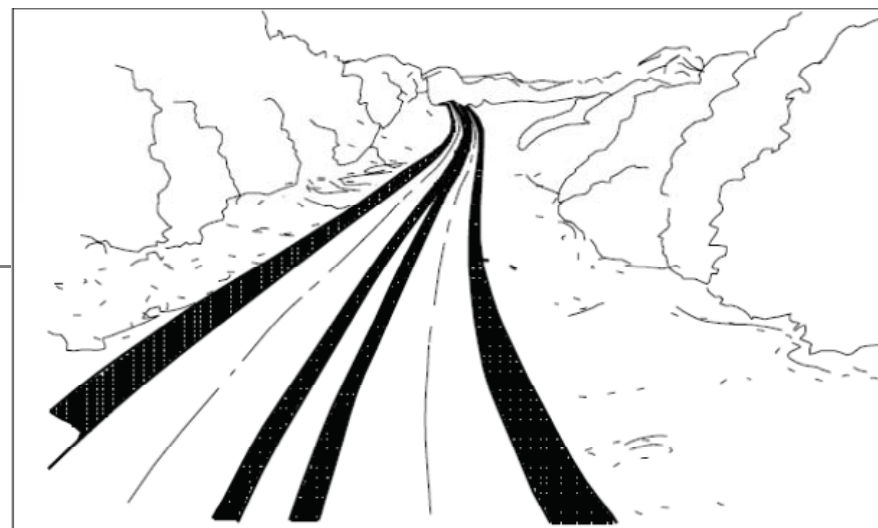
Vertikalno zlomljena trasa

Dve kratki konkavni vertikalni zaokrožitvi - vertikalno zlomljena trasa



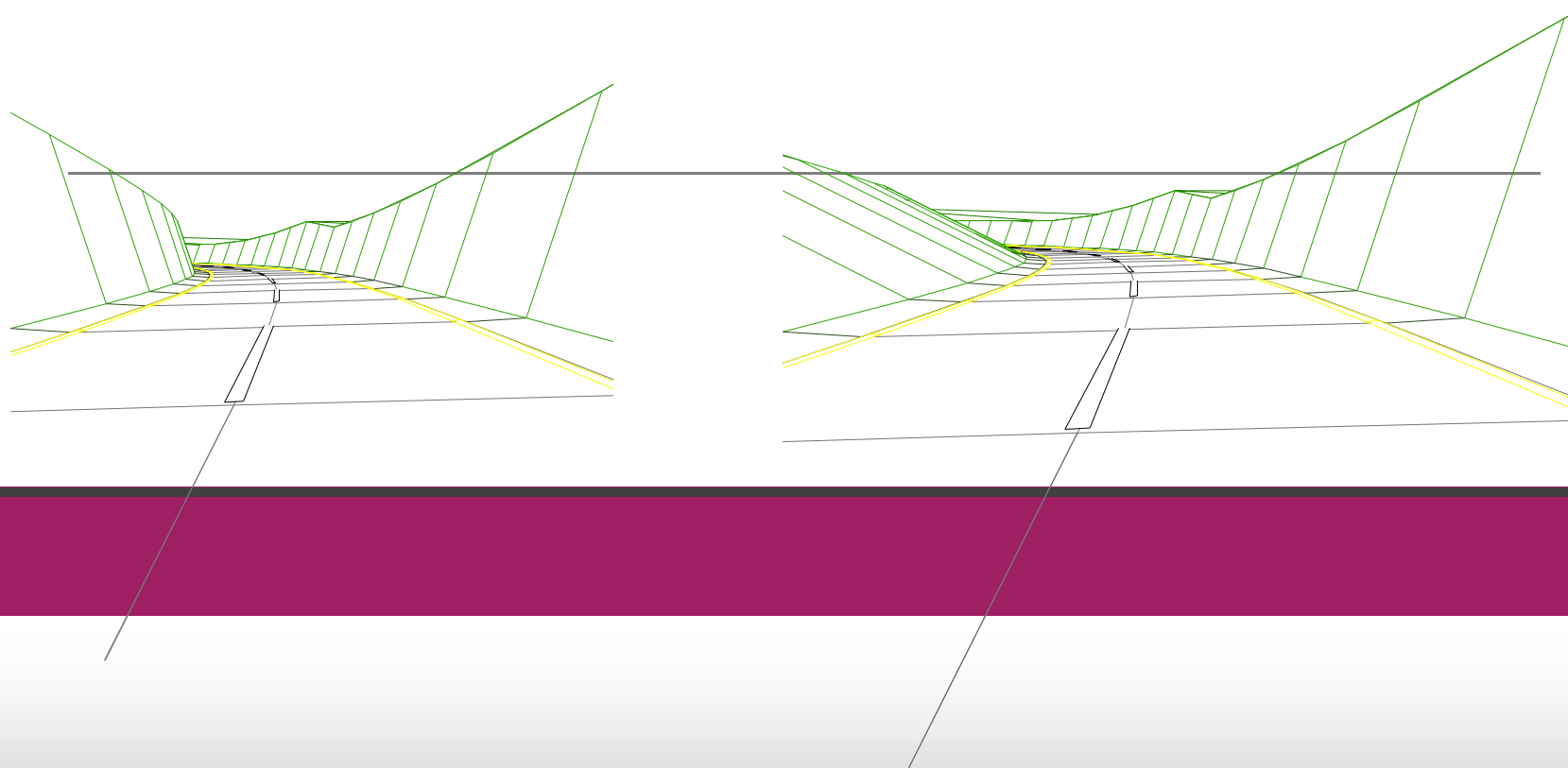


Neželena in želena koordinacija horizontalnega in vertikalnega vodenja trase



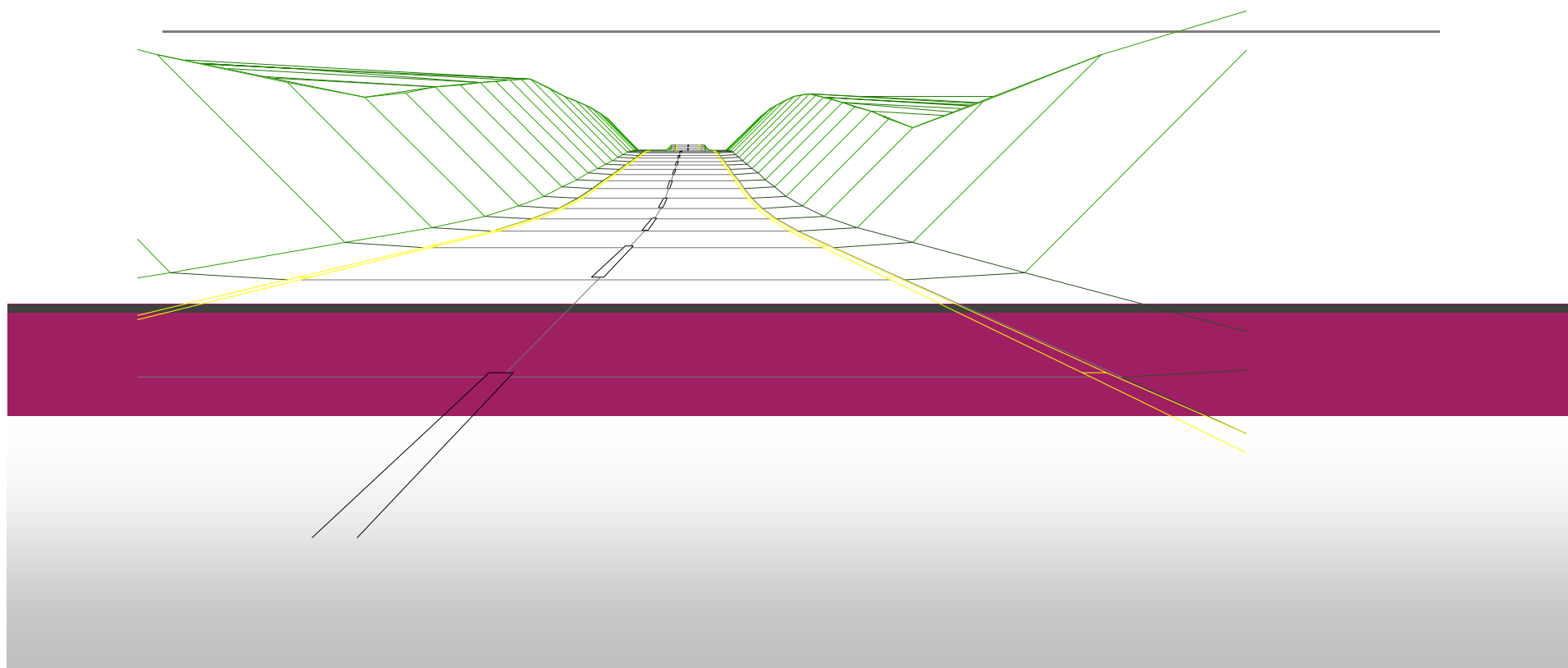


Naklon brežin v krivinah



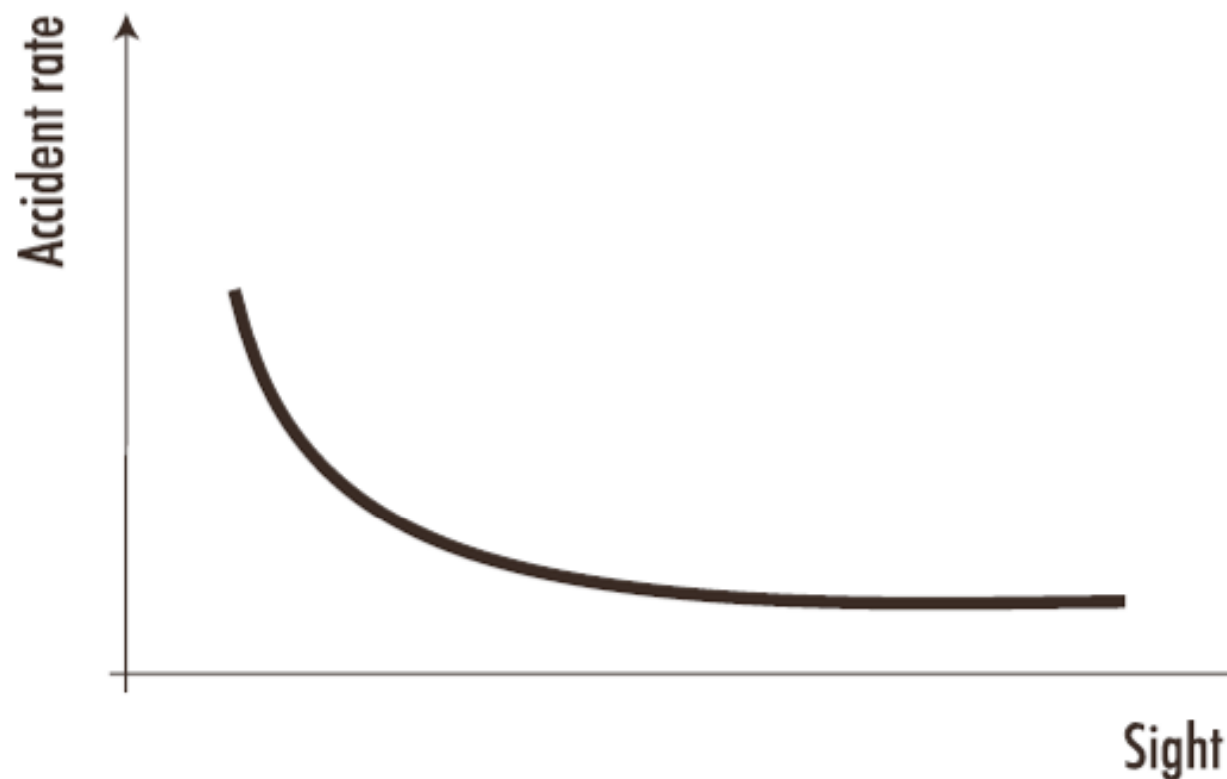


Majhna konveksna zaokrožitev





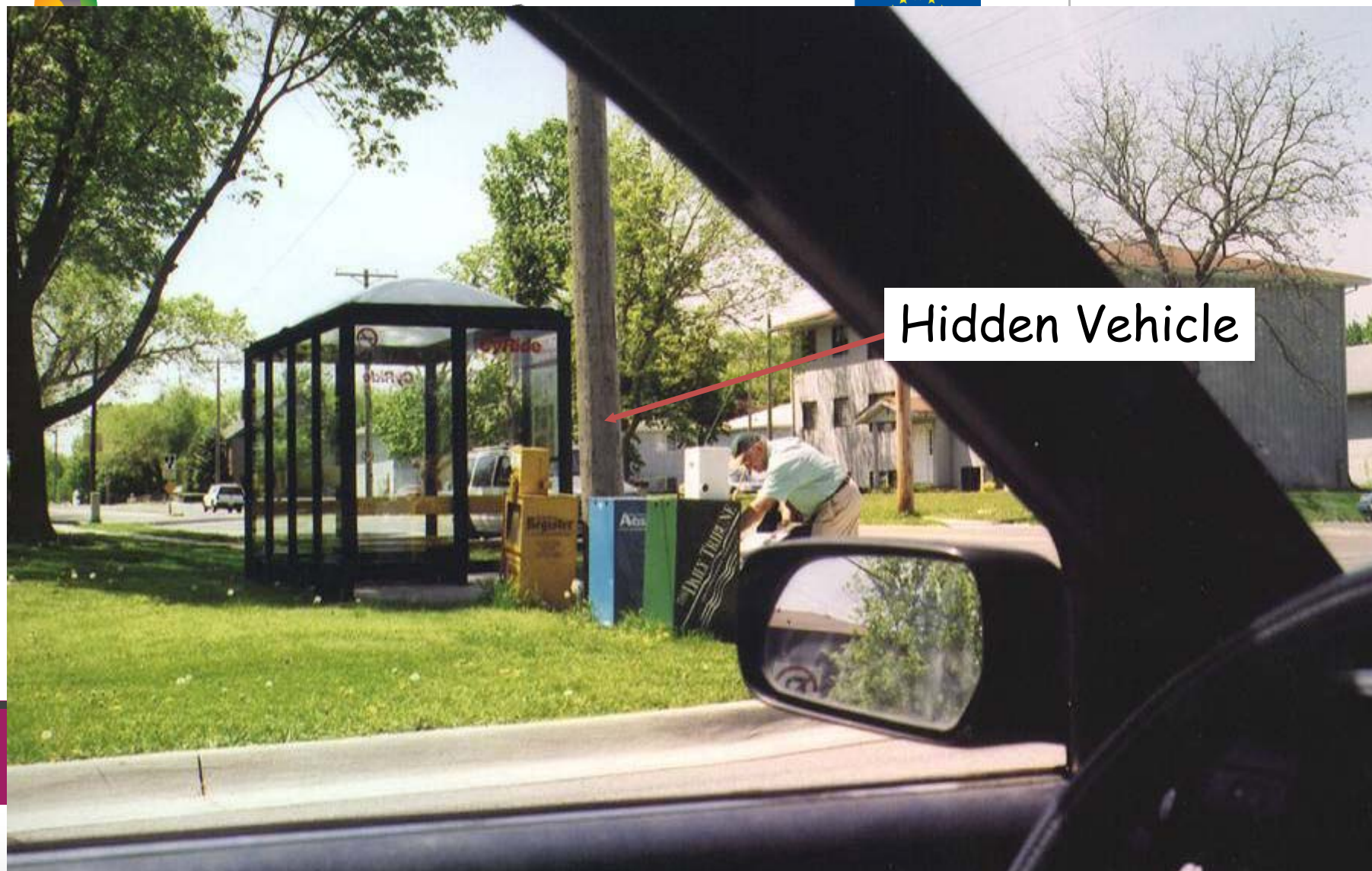
Preglednost : stopnja nesreč





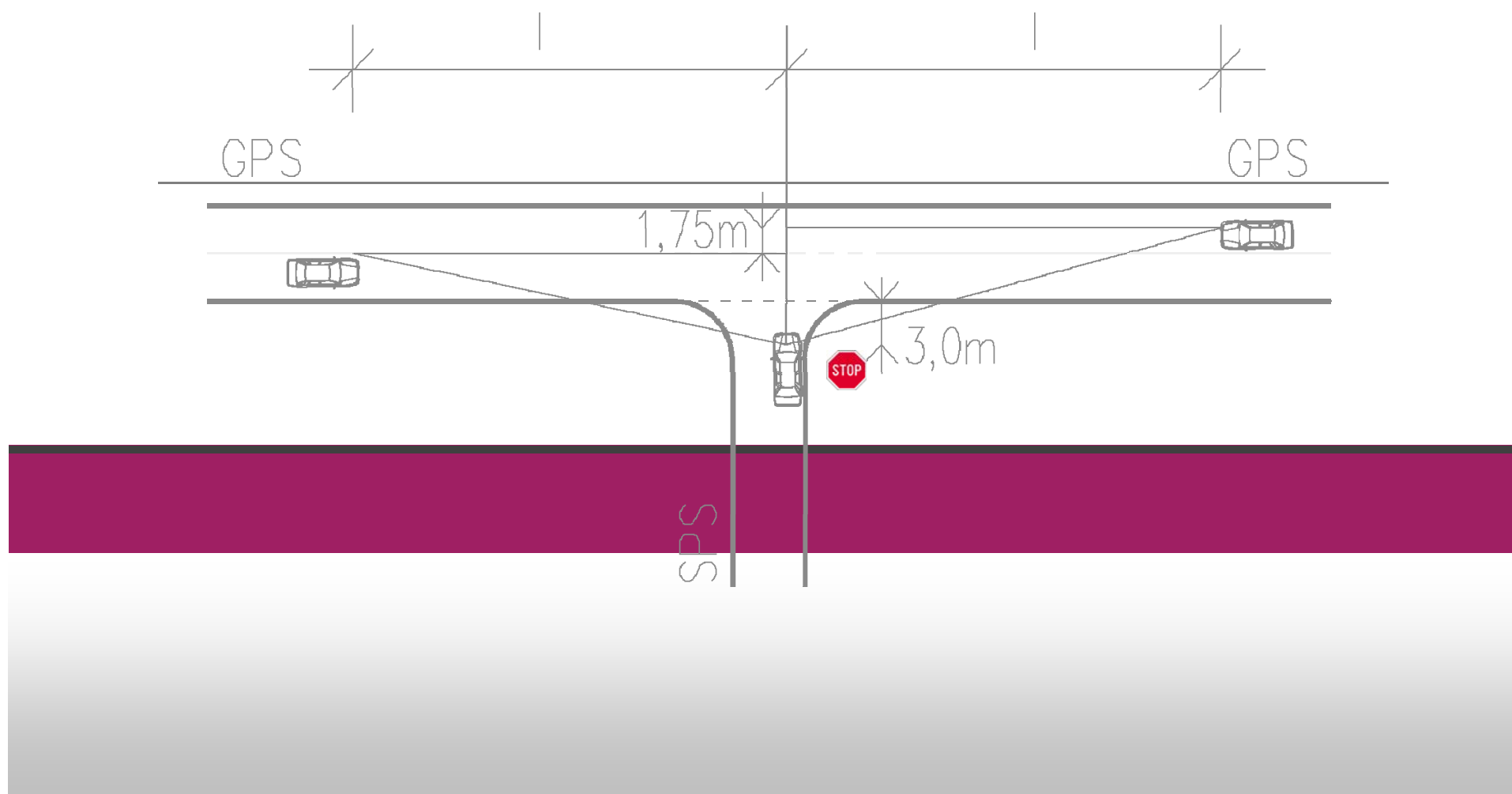
Ureditev pregledne berme







Preglednost pri uvozu v križišče

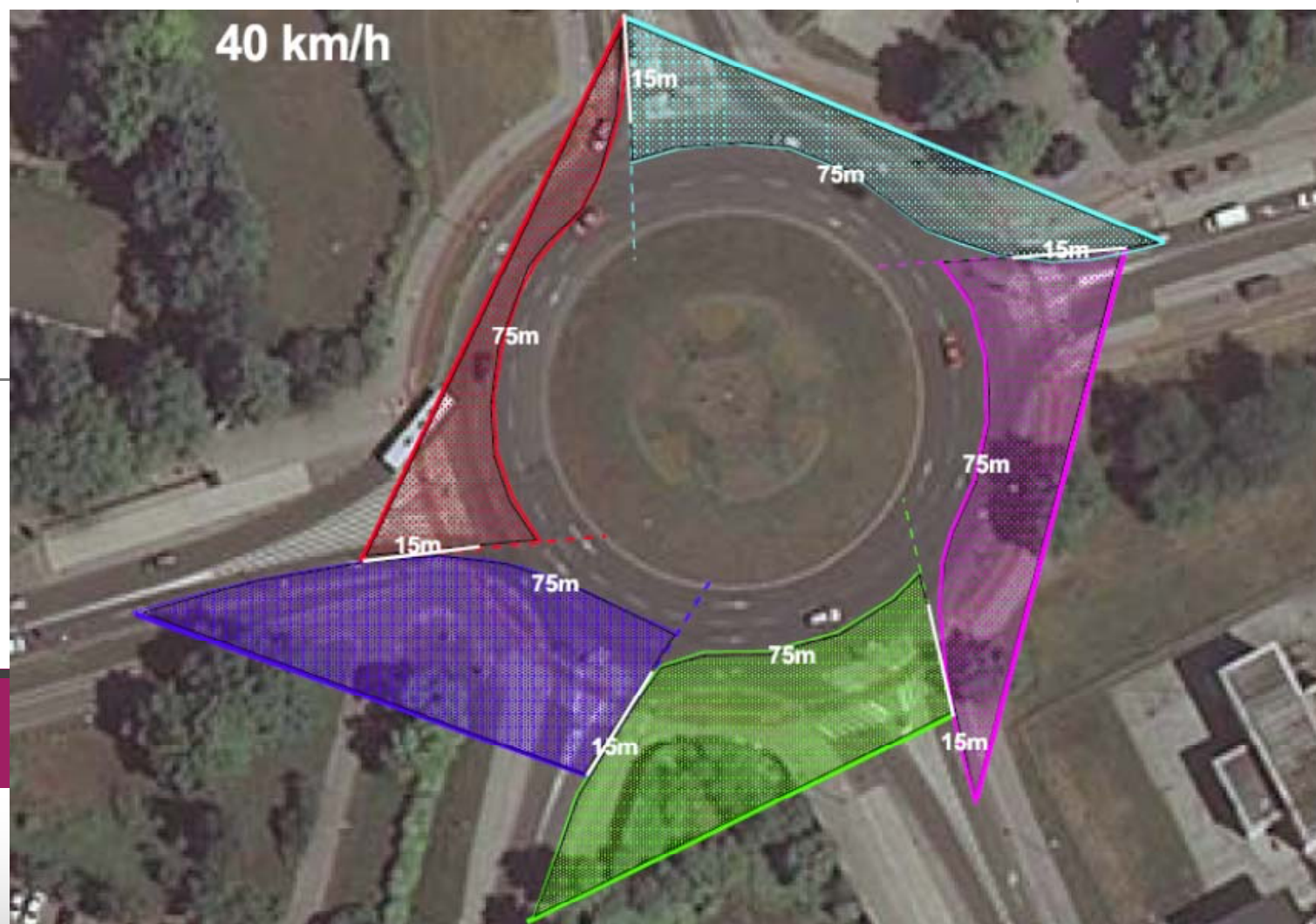




Ne - preglednost











Neprimerna lokacija prehoda za pešce: slaba preglednost





Mednarodna banka

Stage 1: Planning Phase

Stage 2: Preliminary Design Phase

Stage 3: Detailed Design Phase

Stage 4: Construction Phase

Stage 5: Monitoring Existing Roads

Stopnja 1 – faza idejne zasnove

V tej fazi se formira narava in obseg del pri projektu ceste. Izdela se generalni horizontalni in vertikalni potek trase. V tej fazi se pregleduje horizontalno in vertikalno vodenje trase, dimenzije prečnih profilov in generalno reševanje križanj.

Poleg tega se v tej fazi preveri tudi kako se bo predlagana prometnica vklopila v celotno prometno omrežje in kako bo vplivala nanj.

1. Faza idejne zasnove – primer za državno cesto

Značilnosti	Št.	Vprašanje
1.1 Funkcija ceste	1	Ali predvidena funkcija ceste ustreza predvideni rabi?
	2	Ali so bili upoštevani vsi učinki ceste na ostalo prometno omrežje?
1.2 Projektni elementi	1	Ali je bila upoštevana struktura prometa?
	2	Ali je primerno izbrana funkcija ceste?
	3	Ali so bili upoštevani rezultati predhodnih pregledov?
	4	Ali je projektna hitrost primerna?
	5	Ali je projektna hitrost na dovoznih rampah primerna?
1.3 Prečni prerez	1	Ali je bila upoštevana struktura prometa?
	2	Ali je bila sprejeta najustreznejša oblika križišča?
	3	Ali so rešitve na enakem nivoju kot so na sosednjih prometnicah?



1.4	Trasiranje	1	Ali je bila upoštevana struktura prometa (počasni pasovi za tovorna vozila)?
		2	Ali je prehod na obstoječo cesto predviden pravilno?
		3	Ali je zaključek predvidenega projekta zadosti odmaknjen od možnih konfliktnih točk (ovinek, hud vzpon ali padec, slaba preglednost)?
		4	Ali je horizontalno in vertikalno vodenje pravilno koordinirano?
		5	Ali so projektni elementi izbrani tako, da bo optično vodenje pravilno?
		6	Ali so bili upoštevani principi kontinuiranega vodenja trase?
		7	Ali so projektni elementi izbrani tako, da se v isti stacionaži ne pojavi hkrati minimalni horizontalni in minimalni vertikalni element?

1.6 Počivališča	1	Are entrances and exits clear of critical areas?
	2	Are stopping facilities planned at points with interesting views?
	3	Are there sufficient parking areas to prevent parking on the entrances and exits and/or carriageways?
	4	Is the layout appropriate for the different traffic movements?
	5	Is there a sufficient distance to the adjacent junctions?
1.7 Križanja z železnico	1	Is a railway crossing at-grade required?
1.8 Postaje javnega prometa	1	Are public transport stops clear of critical areas?
	2	Have the needs of public transport and its users been taken into consideration?
	3	Are further crossing aids required to reach the public transport stops?

Značilnosti	Št.	Vprašanje
1.9 Križanja peš in kolesarskega prometa	1	Ali so bile izbrane prave lokacije za prehode za pešce, tako da jih bodo pešci zares uporabljali?
	2	Have the requirements of pedestrians and cyclists been considered?
	3	Is the crossing safely designed if footpaths and cycle paths end on a road or are directed across the road?
	4	Are further crossing aids required?
	5	Have the needs of horse riders been taken into consideration?
1.10 Parkirne površine	1	Have specific traffic composition characteristics been taken into consideration?
	2	Ali je predvideno dovolj parkirnih površin, da vozila ne bodo parkirala ob cesti?



Stopnja 2 – faza PZI

V tej fazi so v projektu podani vsi detajli. Pregledovalci pregledujejo vse cestne elemente, instalacije, znake in opremo ceste. Presoja se varnostni vidik posameznih elementov. To je hkrati zadnja priložnost, da se opravijo spremembe v projektu pred samo izvedbo na terenu.

Večjih sprememb projekta v tej fazi ni možno predvideti

2. Faza PZI – primer za državno cesto

Značilnosti	Št.	Vprašanje
3.1 Prečni prerez	1	Ali so bili upoštevani rezultati predhodnih pregledov?
	2	Ali je pravilno predviden prehod iz mestnega v zunajmestno področje – predvsem glede osvetljenosti ceste?
	3	Ali so zadostne širine vozni in ostalih pasov?
	4	Ali so predvidene zadostne čakalne površine za pešce in kolesarje?
	5	Ali je prečni sklon pravilen?
	6	Ali je pravilno odvodnjavanje?
	7	Does the road surface provide the required grip over the long term where small radii occur (e.g. also on ramps)?
	8	Are the road verges strong and stable enough?
	9	Is the transition of a safe design when cycle paths end on a road?
	10	Are parking areas large enough to prevent parking on the road?

3.2	Trasiranje	11	Is there a sufficient division between the traffic lane for motor vehicle traffic and the path for cyclists and pedestrians?
		12	Are planted trees out of reach of skidding cars?
		13	Have sufficient measures been taken on cutting slopes to prevent falling material?
		14	Are unavoidable bottlenecks of a safe design?
		15	Is stopping sight obstructed, for example by safety barriers, plants?
		16	Are fixed obstacles avoidable, set up at sufficient distances or safeguarded?
		17	Can road maintenance service vehicles be parked safely?
		18	Are passive safety installations set up at the required locations?
		19	Do compensatory measures provide a sufficient degree of safety when deviating from guidelines?
		1	Have the audit results from the previous audit phase been taken into consideration?
		2	Has the transition zone to the adjacent road sections been set up correctly?
		3	Is the transition from a built-up to a rural road or from an illuminated to an unilluminated road of a safe design?
		4	Is the end of the construction area away from critical points, e.g. summits, downgrades, curves, areas with restricted sight distance or distractions?
		5	Have the critical changes been located correctly for roads of the operational type?



Značilnosti	Št.	Vprašanje
	6	Ali je zmanjšanje števila pasov pravilno predvideno?
	7	Is there sufficient drainage for the new road?
	8	Is there sufficient cross / diagonal fall?
	9	Is access from abutting properties safe?
	10	Are lane shifts by use of islands or carriageway narrowing required when entering towns and villages?
	11	Is sight obstructed, for example by safety barriers, plants?
	12	Is stopping sight distance guaranteed along the entire section?
	13	Are there enough possibilities to overtake safely (overtaking sight distances /
	14	Does the ambient lighting present any special requirements?
	15	Do compensatory measures provide a sufficient degree of safety when deviating from guidelines?
3.3 Križanja	1	Have the audit results from the previous audit phase been taken into consideration?
	2	Have specific traffic composition characteristics been taken into consideration?
	3	Is the type and design of the selected junction suitable for the safety of the road and the intersecting roads?
	4	Has the construction standard and, if applicable, the transition area been adapted to the adjacent road sections?
	5	Have all approaches for small roundabouts been aligned radially to the centre of the circle?



	28	Does the ambient lighting present any special requirements?
	29	Is it clear to the motorist whether he is crossing a one-way or two-way cycle path?
	30	Is a reduction in speed required in the direction of the junction?
	31	Are the crossings for pedestrians and cyclists provided with low kerbs?
	32	Do compensatory measures provide a sufficient degree of safety when deviating from guidelines?
3.4 Servisne površine	1	Have the audit results from the previous audit phase been taken into consideration?
	2	Are the dimensions of the parking areas sufficient for parking for passenger vehicles, trucks and buses?
	3	Are parking areas easily accessible and do they provide sufficient manoeuvring space?
	4	Is the layout of the service or rest area appropriate for the different traffic movements?
	5	Are pedestrian facilities of a safe design?



3.5 Pasivna varnost	1	Ali so bili upoštevani rezultati predhodnih pregledov?
	2	Are fixed obstacles avoidable, set up at sufficient distances or safeguarded?
	3	Are passive safety installations set up at the required locations?
	4	Will growth of plants lead to safety problems in the future?
3.6 Signalizacija	1	Have appropriate speed limits been planned (start, end, height, location)?
	2	Is prohibition of overtaking required and, if so, appropriately assigned?
	3	Are no-stopping zones to be planned?
	4	Is sight obstructed (of or by the signs)?
	5	Will growth of plants lead to safety problems in the future?
	6	Can the signs be clearly recognised and read (size of signs)?
	7	Have old signs been completely removed?
	8	Do all signs and markings correspond without any contradictions?
	9	Is direction signing logical and consistent?
	10	Have variable direction signing or traffic control systems been taken into consideration?



	11	Are signs located in such a way as to avoid restricting visibility from approaches or intersecting roads?	
	12	Are the installations shared by pedestrians and cyclists, including underpasses and bridges, properly signposted?	
	13	Is pedestrian/cyclist routing at junctions adapted to the actual conditions and clearly signposted?	
	14	Is right of way clearly defined at points where cyclists come into contact with motorised traffic?	
	15	Is it clear to the motorist whether he is crossing a one-way or two-way cycle path?	
	16	Is a reduction in speed required in the direction of the junction?	
	17	Does the obligation to yield right of way need to be reinforced (e.g. using repetition)?	
	18	Are advanced warnings planned for traffic signals that cannot be seen in time?	
3.7	Oznake	1	Have the audit results from the previous audit phase been taken into consideration?
		2	Are the road markings clear?



Značilnost	Št.	Vprašanje
	3	Ali so bile odstranjene stare oznake?
	4	Do all signs and markings correspond without any contradictions?
	5	Is pedestrian/cyclist routing at junctions adapted to the actual conditions and clearly marked?
	6	Is the transition safely designed if cycle paths end on a road or are directed across the road?
3.8 SSN	1	Have the audit results from the previous audit phase been taken into consideration?
	2	Are protected phases provided for left-turning movements or are the fast driven approaches signalled separately?
	3	Have specific traffic composition characteristics been taken into consideration?
	4	Have the requirements of pedestrians and cyclists been considered?
	5	Are special measures required for particular groups, e.g. blind people?
	6	Are traffic signals easily recognisable?
	7	Is the right-turning movement included in signal control?



8	Are additional areas for left-turning movements required and is storage length sufficient?
9	Are exclusive green phases required for pedestrians and cyclists?
10	Are the green times long enough for cyclists and pedestrians?
11	Are high intensity signals and/or contrast louvres required if the signals are affected at dawn/dusk by direct sunlight?
12	Are the traffic signals co-ordinated with other traffic signals within the road segment or the network?
13	Are advanced warnings planned for traffic signals that cannot be seen in time?
14	Have the locations for the signals been selected correctly (additional signals, overhead signals, etc.)?
15	Are secondary signals required in the vicinity?
16	Are pedestrian crossings clearly marked? Is each section equipped with signals
17	If there is no exclusive pedestrian phase, is a leading pedestrian interval provided?
18	Are separate signals provided for cyclists? (Are the signal aspects correctly located for the cyclists? Estimate clearance times for cyclists?)
19	Is the maximum delay reasonable for cyclists? Can cyclists be partially or totally removed from signal control?
20	Is lighting of the sections, junctions, service and rest areas planned, in relation to the ambient lighting?



Značilnost	Št.	Vprašanje
3.9 Osvetlitev	1	Have the audit results from the previous audit phase been taken into consideration?
	2	Are fixed obstacles avoidable, set up at sufficient distances or safeguarded (masts)?
	3	Does stationary lighting need to be changed so that crossing pedestrians are clearly visible?
	4	Is contrast lighting required at the junction?
	5	Is stationary lighting required at junctions/ service and rest areas and, if required, of an appropriate design?
	6	Is the transition from a built-up to a rural road or from an illuminated to an unilluminated road appropriately designed?
3.10 Ostala oprema ceste	1	Have the audit results from the previous audit phase been taken into consideration?
	2	Are the emergency telephones in appropriate and safe positions with regard to traffic?
	3	Are antidazzle screens required?
	4	Are game fences required?
	5	Is sight obstructed, for example by game or snow fences?
	6	Is suitable road equipment (e.g. snow fences) required and/or planned based on particular weather requirements?

3.11	Zasaditev	7	Is there a risk of pedestrian underpasses and bridges being bypassed? Are suitable measures (e.g. fences) planned?
		1	Have the audit results from the previous audit phase been taken into consideration?
		2	Are planted trees out of reach of skidding cars?
		3	Is sight obstructed by the planting?
		4	Will growth of greenery lead to future safety problems, (e.g. as a result of obstructed sight, expected trunk diameter greater than 8 cm, hidden road signs, light and shadow effects, leaves falling on the road)?
		5	Does the greenery and type of planting preclude irritations to the road users (e.g. alignment)?
3.12	Objekti	1	Have the audit results from the previous audit phase been taken into consideration?
		2	Have pedestrian and cyclist requirements been considered (e.g. pedestrian and cycle paths)?
		3	Does the structure have sufficient drainage?
		4	Are passive safety devices planned at the required locations and appropriately designed?
		5	Can road maintenance service vehicles be parked safely?
		6	Are parapets and overpasses at a safe distance from the road?
		7	Is there a risk of pedestrian underpasses and bridges being bypassed? Are suitable measures (e.g. fences) planned?



3.14 Postajališča javnega prometa	1	Have the audit results from the previous audit phase been taken into consideration?
	2	Have the needs of public transport and its users been taken into consideration?
	3	Are public transport stops planned at junctions? Are stops easily accessible to pedestrians?
	4	Are areas for waiting pedestrians and cyclists sufficient?
	5	Is recognisability guaranteed?
	6	Are special measures required for particular groups, e.g. blind people?
	7	Is lighting required and, if so, appropriately designed?
3.15 Prehodi za pešce in kolesarje	1	Have the audit results from the previous audit phase been taken into consideration?
	2	Are crossings plausible and safe?
	3	Have pedestrian crossings been appointed in such a way that collective use is guaranteed and the road will not be crossed at other points?
	4	Is the transition safely designed if cycle paths end on a road or are directed across the road?
	5	Are further crossing aids required?

	6	Are areas for waiting pedestrians and cyclists sufficient?
	7	Are refuges large and wide enough for crossing pedestrians and cyclists to stand and wait?
	8	Is recognisability guaranteed?
	9	Is sight obstructed, for example by safety fences, safety barriers, road equipment, parking areas, traffic signs, plants, buildings?
	10	Are the islands clearly visible and of a suitable design?
	11	Will growth of plants lead to safety problems in the future?
	12	Are special measures required for particular groups, e.g. blind people?
	13	Is lighting required and, if so, appropriately designed?
	14	Does the ambient lighting present any special requirements?
	15	Is it clear to the motorist whether he is crossing a one-way or two-way cycle path?
	16	Are the crossings for pedestrians and cyclists provided with low kerbs?
	17	Does lighting need to be changed so that crossing pedestrians are clearly visible?
3.16 Parkiranje	1	Have the audit results from the previous audit phase been taken into consideration?
	2	Are parking areas easily accessible?

Stopnja 3 – faza pred predajo ceste v promet

V tej fazi, tik pred predajo ceste prometu, presojevalci pregledujejo cesto ob različnih obdobjih dneva in ugotavljajo, če so vsi uporabniki ceste enakovredno obravnavani.

V tej fazi je potrebno presoditi, če je bil projekt verodostojno prenesen v naravo. Pregledati je potrebno tudi vse spremembe projekta, ki so bile narejene v teku izvedbe.



Značilnost	No.	Vprašanje
4.1 Prečni prerez	1	Ali so bili upoštevani rezultati predhodnih pregledov?
	2	Is there sufficient drainage for the new road?
	3	Is there sufficient cross fall?
	4	Does the road surface provide the required grip over the long term where small radii occur (e.g. also on ramps)?
	5	Are the road verges strong and stable enough?
	6	Is the transition safely designed if cycle paths end on a road?
	7	Are planted trees out of reach of skidding cars?
	8	Have sufficient measures been taken on cutting slopes to prevent falling material
	9	Are unavoidable bottlenecks of a safe design?
	10	Is stopping sight obstructed, for example by safety barriers, plants?
	11	Have fixed obstacles been sufficiently safeguarded?



	12	Can road maintenance service vehicles be parked safely?
	13	Are passive safety installations set up at the required locations?
4.2 Trasiranje	1	Have the audit results from the previous audit phase been taken into consideration?
	2	Is access from abutting properties appropriate for road safety?
	3	Are lane shifts by use of islands or carriageway narrowing planned when entering towns and villages?
	4	Is sight obstructed, for example by safety barriers, plants?
	5	Is stopping sight distance guaranteed along the entire section?
4.3 Križišča	1	Have the audit results from the previous audit phase been taken into consideration?
	2	Is the type and design of the selected junction suitable for the safety of the road and the intersecting roads?
	3	Is the transition safely designed if cycle paths end on a road or are directed across the road?
	4	Is right of way clearly defined at points where cyclists come into contact with motorised traffic?
	5	Is safe serviceability guaranteed?
	6	Are areas for waiting pedestrians and cyclists sufficient?

7	Ali je predvideno zadostno odvodnjavanje križišča?
8	Is there sufficient cross / diagonal fall?
9	Are traffic signals / stationary speed monitoring required?
10	Is the right-turning movement included in signal control?
11	Is the junction clearly visible and recognisable in advance from all approaches?
12	Is good sight ensured at the junctions and are the required sight triangles clear?
13	Are the islands clearly visible and of a suitable design?
14	Is the central island of the roundabout free of fixed obstacles?
15	Is through visibility effectively stopped by the roundabout?
16	Are the sight lines sometimes restricted, e.g. as a result of parking or traffic jams?
17	Can motorists turning left see past oncoming left-turn vehicles?
18	Does the ambient lighting present any special requirements?
19	Is it clear to the motorist whether he is crossing a one-way or two-way cycle path?
20	Is a reduction in speed required in the direction of the junction?

	21	Are the crossings for pedestrians and cyclists provided with low kerbs?
4.4 Servisne površine	1	Have the audit results from the previous audit phase been taken into consideration?
	2	Are the dimensions of the parking areas sufficient for parking for passenger vehicles, trucks and buses?
	3	Are parking areas easily accessible and do they provide sufficient manoeuvring space?
	4	Is the layout of the service or rest area appropriate for the different traffic movements?
	5	Are pedestrian facilities of a safe design?
4.5 Pasivna zaščita	1	Have the audit results from the previous audit phase been taken into consideration?
	2	Have fixed obstacles been sufficiently safeguarded?
	3	Have passive safety installations been set up at the required locations?
	4	Will growth of plants lead to safety problems in the future?

4.6	Signalizacija	1	Ali so bili upoštevani rezultati predhodnih pregledov?
		2	Have appropriate speed limits been planned and designed (start, end, height, location)?
		3	Is prohibition of overtaking appropriately designed and located?
		4	Are no-stopping zones appropriately designed and located?
		5	Is sight obstructed (of or by the signs)?
		6	Will growth of plants lead to safety problems in the future?
		7	Can the signs be clearly recognised and read (size of signs)?
		8	Have old signs and protruding foundations been completely removed?
		9	Do all signs and markings correspond without any contradictions?
		10	Is direction signing logical and consistent?
		11	Have variable direction signing or traffic control systems been installed and are they fully functional?
		12	Are signs located in such a way as to avoid restricting visibility from approaches or intersecting roads?



	13	Are the installations shared by pedestrians and cyclists, including underpasses and bridges, properly signposted?
	14	Is pedestrian/cyclist routing at junctions adapted to the actual conditions and clearly marked and signposted?
	15	Is right of way clearly defined at points where cyclists come into contact with motorised traffic?
	16	Is it clear to the motorist whether he is crossing a one-way or two-way cycle path?
	17	Is a reduction in speed when approaching the junction assigned to the correct place and properly designed?
	18	Does the obligation to yield right of way need to be reinforced (e.g. using repetition)?
4.7 Oznake	19	Are advanced warnings planned for traffic signals that cannot be seen in time?
	1	Have the audit results from the previous audit phase been taken into consideration?
	2	Are the road markings clear and recognisable?
	3	Have old markings been removed?
	4	Do all signs and markings correspond without any contradictions?
	5	Is pedestrian/cyclist routing at junctions adapted to the actual conditions and clearly marked?
	6	Is the transition safely designed if cycle paths end on a road or are directed across the road?



4.8	SSN	1	Ali so bili upoštevani rezultati predhodnih pregledov?
		2	Are protected phases provided for left-turning movements or are the fast driven approaches signalled separately?
		3	Have specific traffic composition characteristics been taken into consideration?
		4	Have special measures been planned for particular groups, e.g. blind people?
		5	Is recognisability guaranteed?
		6	Are signals covered (e.g. by traffic signs, lighting masts or plants)?
		7	Are the signals and detectors correctly angled?
		8	Is the right-turning movement included in signal control?
4.9	Osvetlitev	9	Have the audit results from the previous audit phase been taken into consideration?
		10	Have fixed obstacles been sufficiently safeguarded?
		11	Is stationary lighting required at junctions/ service and rest areas and, if required, of an appropriate design?



4.10	Ostala oprema	12	Have the audit results from the previous audit phase been taken into consideration?
		13	Are the emergency telephones in appropriate and safe positions with regard to traffic?
		14	Are antidazzle screens required?
		15	Is the beginning and end of game fencing correctly determined?
		16	Is sight obstructed, for example by game or snow fences?
		17	Has suitable road equipment (snow fences etc.) been installed and is it fully functional?
		18	Is there a risk of pedestrian underpasses and bridges being bypassed? Are suitable measures (e.g. fences) planned?
4.11	Zasaditev	19	Have the audit results from the previous audit phase been taken into consideration?
		20	Are planted trees out of reach of skidding cars?
		21	Will growth of greenery lead to future safety problems, (e.g. as a result of obstructed sight, expected trunk diameter greater than 8 cm, hidden road signs, light and shadow effects, leaves falling on the road)?
		22	Does the greenery and type of planting preclude irritations to the road users (e.g. alignment)?
		23	Is sight obstructed by the planting?



4.12	Objekti	1	Ali so bili upoštevani rezultati predhodnih pregledov?
		2	Does the structure have sufficient drainage?
		3	Are passive safety devices planned at the required locations and appropriately designed?
		4	Can road maintenance service vehicles be parked safely?
		5	Are parapets and overpasses at a safe distance from the road?
		6	Is there a risk of pedestrian underpasses and bridges being bypassed? Are suitable measures (e.g. fences) planned?
4.13	Prehodi	1	Have the audit results from the previous audit phase been taken into consideration?
		2	Are traffic control devices required and optimally set up with regard to future traffic developments?
		3	Are particular safeguards required as a result of seasonal use of the railway crossing?
		4	Is recognisability guaranteed?
		5	Is good sight guaranteed?
		6	Is lighting required and, if so, appropriately designed?
		7	Does the ambient lighting present any special requirements?



Ali so postajališča ob križiščih? Ali so lahko dostopna?

Ali so čakalne površine za pešce in kolesarje zadostne?

4.14 Postajališča javnega prometa	1	Ali je zagotovljena prepoznavnost? taken into consideration?
	2	Are public transport stops planned at junctions? Are stops easily accessible to pedestrians?
	3	Are areas for waiting pedestrians and cyclists sufficient?
	4	Is recognisability guaranteed?
	5	Have special measures been planned for particular groups, e.g. blind people?
	6	Is lighting required and, if so, appropriately designed?
4.15 Prečkanja za pešce in kolesarje	1	Have the audit results from the previous audit phase been taken into consideration?
	2	Have pedestrian crossings been appointed in such a way that collective use is guaranteed and the road will not be crossed at other points?
	3	Is the transition safely designed if cycle paths end on a road or are directed across the road?
	4	Is sight obstructed, for example by safety fences, safety barriers, road equipment, parking areas, traffic signs, plants, buildings?



Značilnosti	Št.	Vprašanje
	5	Ali so otoki vidni in narejeni po pravilniku?
	6	Ali bo vegetacija lahko v bodoče problematična zaradi preglednosti?
	7	Ali so bili izvedeni ukrepi za hendikepirane?
	8	Je osvetlitev primerna?
4.16 Parkiranje	1	Ali so bili upoštevani izsledki prejšnjih preverjanj?
	2	Ali so parkirne površine enostavno dostopne?

Stopnja 4 – faza na začetku obratovanja ceste

V tej fazi je možna ocena varnosti v cestnem prometu z vidika dejanskega vedenja uporabnikov. Preveri se lahko že podatke o nesrečah, ki so se zgodile od odprtja ceste. Na osnovi tega se lahko predvidi tudi potencialno nevarna mesta, kjer se bodo nesreče še lahko dogajale. Preverjanja v vseh fazah lahko vključujejo potrebo po ponovni preučitvi meril iz prejšnjih faz.

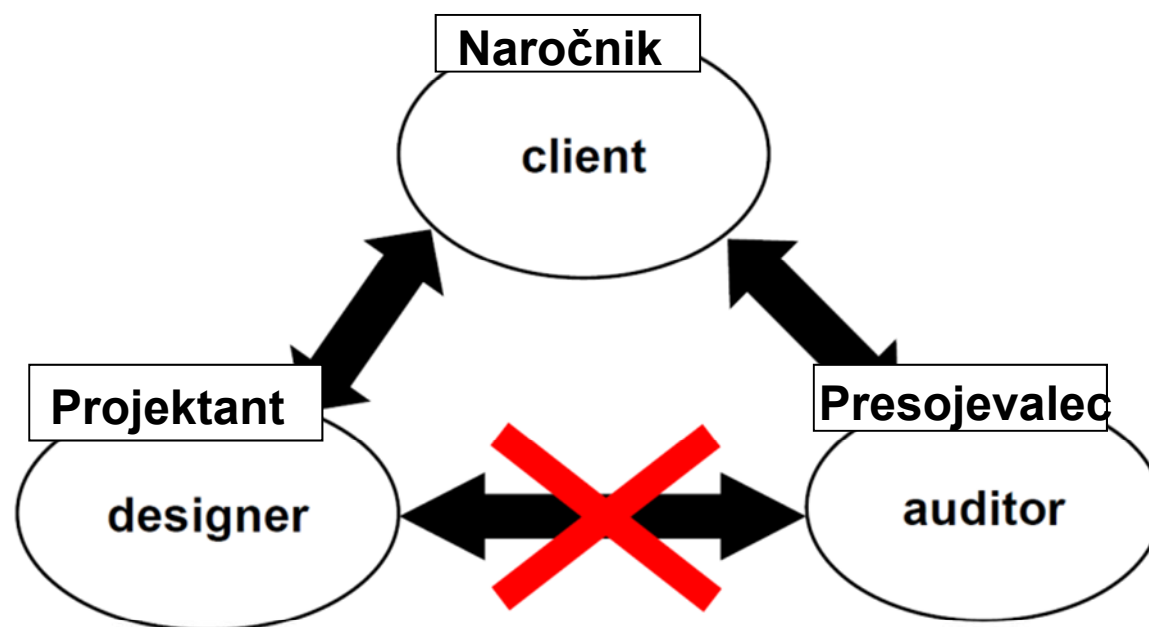
Pregled se mora izvršiti najkasneje 6 do 12 mesecev od predaje ceste prometu.



Podatki o nesrečah v obdobju delovanja ceste	
Obisk terena (podnevi in ponoči)	
Ocena vseh elementov , tehničnih in okoljskih (raba zemljišč, vidljivost v nočnem času...), ki bi lahko kakorkoli vplivale na možnost nesreč	
Oceniti možne povezave med izbranimi tehničnimi elementi in okoljem	
Opazovati kako uporabniki ceste zaznavajo in uporabljajo novo cestno povezavo	
Oceniti ali so bile potrebe vseh uporabnikov primerno upoštevane	
Ugotoviti ali so bile vse prehodne ugotovitve primerno upoštevane	
Analizirati podatke o morebitnih nesrečah in ugotoviti vzroke	
Določiti morebitna nevarna mesta iz podatkov o nesrečah ali pa na osnovi terenskega ogleda	
Napisati poročilo in pripraviti predloge za morebitne izboljšave	



Partnerji v procesu preverjanja



Za naročanje PVP je odgovoren Naročnik oz. investitor objekta cestne infrastrukture ali objekta ob njej, ki ima vpliv na promet vseh ali posameznih vrst udeležencev v prometu. Naročnik mora pripraviti navodilo za izvedbo PVP. V primerih, ko naročnik ni zadosti strokovno usposobljen za pripravo naročila, ga v obliki osnutka lahko:

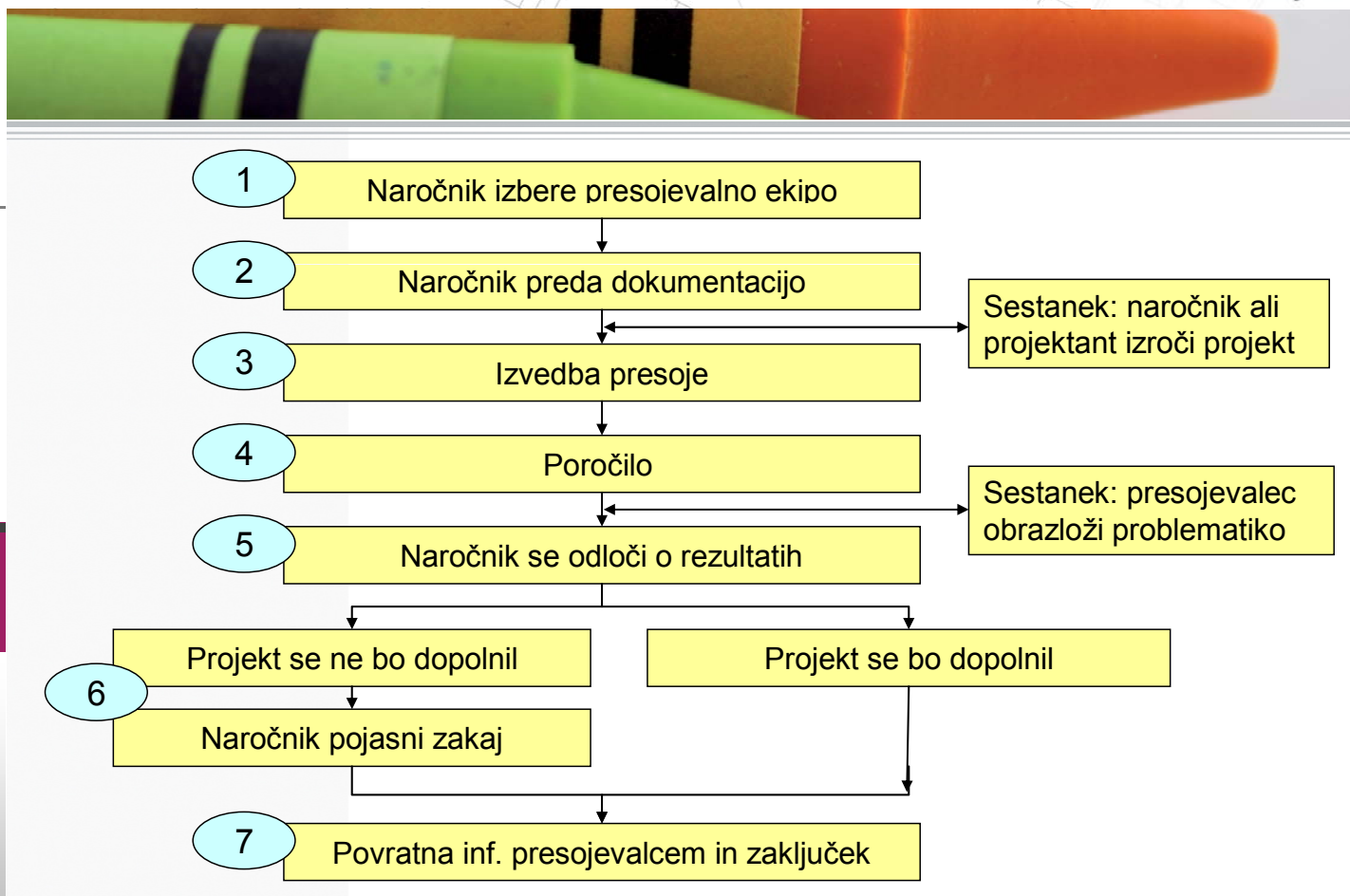
- posreduje Agenciji za varnost v prometu, kjer dokument preuči strokovni kolegij presojevalcev in naročniku posreduje strokovne usmeritve za dopolnitev dokumenta, ali
- posreduje enemu izmed presojevalcev, ki dokument ustrezno dopolni.

Pri izvajanju presoje enostavnih projektov (manjše obnove in rekonstrukcije in manj prometni priključki) za izvedbo presoje zadostuje imenovanje enega presojevalca. Pri bolj zahtevnih projektih (gradnja odsekov avtocest in hitrih cest, obvoznice, obsežnejše rekonstrukcije) je priporočljivo, da presojo izvede skupina presojevalcev, v kateri mora biti imenovan vodja skupine. Ta je običajno najbolj izkušen presojevalec. Presojevalec ali vodja skupine presojevalcev presodi, ali je potrebno v presojo vključiti tudi zunanje sodelavce, ki niso presojevalci, so pa strokovnjaki za posamezna področja, ki nastopajo v postopku načrtovanja in izdelave projektne dokumentacije.



Partners for Roads

RSA proces



Implementacija RSA

- Implementacija je odvisna od vrste projekta (novogradnja, rekonstrukcija), od lokacije projekta (v naselju, zunaj naselja) in od stopnje izvedbe (od idejne zasnove do obratovanja).
- Presojevalci opravijo presojo na osnovi lastnih znanj. Da ne bi spregledali _____ posameznih detajlov je potrebno uporabljati v naprej pripravljene vprašalnike, vendar se je potrebno zavedati, da **le rutinsko izpolnjevanje vprašalnikov ni zadosti**.
- Zelo pomembna je sestava ekipe presojevalcev. V različnih fazah pregledovanja se pojavijo specifične značilnosti projekta. Temu mora biti prilagojen tudi nabor presojevalcev.



Poročilo in odziv na RSA

Naslov projekta
Tip ukrepa
Faza pregleda
Naročnik
Projektant
Imena presojevalcev
Pregledani dokumenti
Manjkajoči dokumenti
Datumi pregleda in obiska terena
Podrobnejše informacije o projektu Kategorija ceste Dolžina odseka Tip prečnega prereza PLDP, % tovornjakov Informacija o ranljivih uporabnikih
Glavne opazke
Spisek posameznih pomanjklivosti po možnosti dokumentirano s foto posnetki ali dokumentacijo Predlogi za eventualne izboljšave
Datum priprave poročila
Podpisi presojevalcev



Osnovni podatki

Opis projekta: Obvozna cesta

Naročnik:

Projektant:

Faza projekta: Idejni projekt

Datum nastanka: 1996/2000

Dokumentacija:

- Dokument 1 (Tehnično poročilo)
- Dokument 2 (Pregledna karta), merilo 1 : 25,000
- Dokument 3 (Pregledna situacija), merilo 1 : 5,000
- Dokument 7 (Situacija), merilo 1 : 1000
- Dokument 8 (Niveleta), merilo 1 : 2000/100
- Dokument 12 (Hortikultura)

Presojevalec

Ime: FGSV ad-hoc group 2.0.2



Posebni detajli projekta

Stran 2/3

Opis: Obvozna cesta
od km x + xx do km x + xx

Tip projekta: Novogradnja

Dolžina: 3.85 km

Prečni prerez: Standardni RQ10.5

Širina vozišča 8.00 m

Prometni volumen: Prognoza za 2016: PLDP = 8000 – 10,000 voz

Kategorija ceste: R I

Zasnovalna hitrost: 80 km/h

Cena izvedbe: cca. 8 milijonov €



Rezultati

Stran 3/3

Med pregledovanjem so se izoblikovale naslednje pripombe:

Trasiranje

1. Zaporedje uporabljenih krivin ni skladno s (radij $R = 250$ m je priključen na premo). Namesto preme predlagamo radij $R \geq 400$ m – po pravilniku za projektiranje
2. Preveriti je potrebno, če se lahko namesto uporabljenih sestavljenih dveh radijev ($R1 = 900$ m, $R2 = 1900$ m) predvidi en sam večji radij.
3. Izbrani prečni skloni so ali nad ali pa pod predpisanimi v Pravilniku za projektiranje; odstopanja niso razumljiva.
4. V km x+xxx, je v območju vijačenja nagib le $s = 0.5 \%$ (območje s slabim odvodnjavanjem).
5. Potrebno je boljše optično vodenje, da se poudari potek nove trase v primerjavi s staro traso.



Križišča

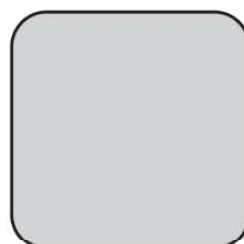
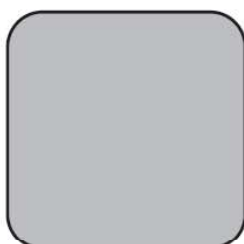
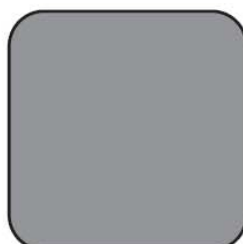
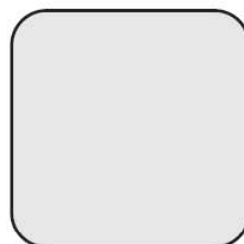
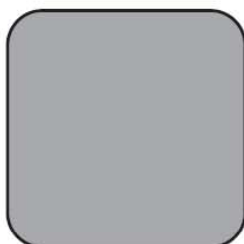
6. Potrebno je preveriti vse tipe križišč.
7. Potrebno je preveriti smiselnost križišča 2 in ugotoviti, če se lahko to križišče nadomesti s sosednjima križiščema.
8. Potrebno je preveriti dolžino pasov za leve zavijalce glede na predvideno prometno obremenitev. Glede na velik volumen levih zavijalcev je najbrž dolžina pasov za leve zavijalce v prvem križišču prekratka (prekratek la in prekratek lv).
9. Na nesemaforiziranih križiščih je potrebno spremeniti število pasov. Prehod za pešce mora biti drugače opremljen.
10. Ponovno je potrebno preveriti ustreznost priključkov in omrežja poljskih poti. Cilj bi moral biti čim manj direktnih priključkov na obvozno cesto (zmanjšanje števil konfliktnih točk).

Preglednost

11. Potrebno je preveriti, če je ovirana preglednost – še posebno v območju mostov (pregledni trikotniki).

Pešci in kolesarji

12. Ponovno naj se preuči nepopolno enostransko vodenje in prečkanje pešcev in kolesarjev
13. V križišču 4 je predvideno prečkanje pešcev in kolesarjev pred STOP črto – preveriti pravilnost izbire.

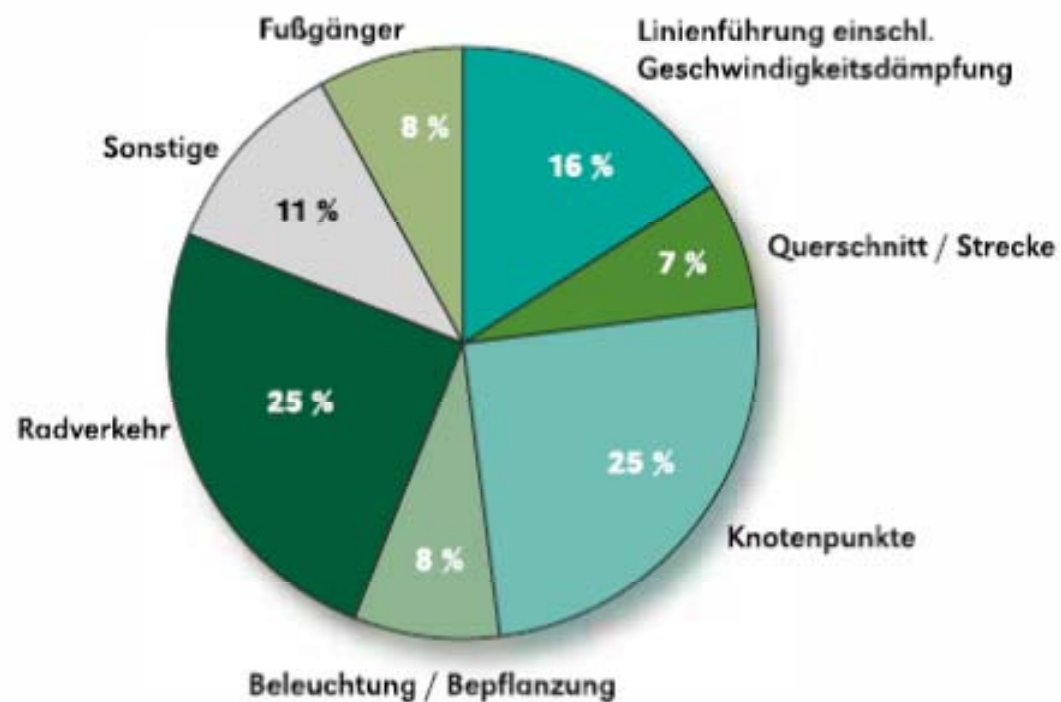


Slovenian Road Safety Audit Guidelines



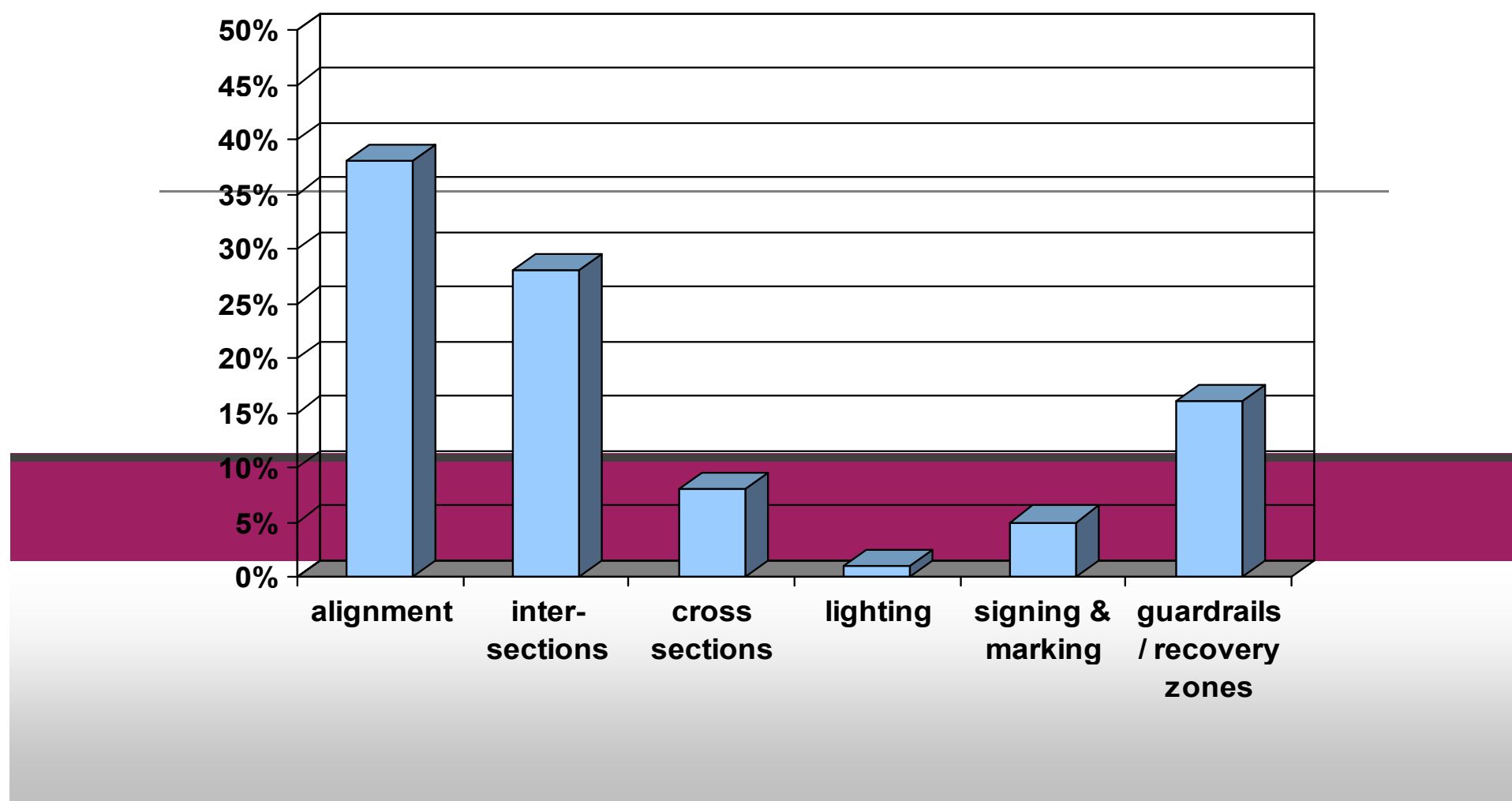
Ugotovljene pomanjkljivosti po RSA v Nemčiji

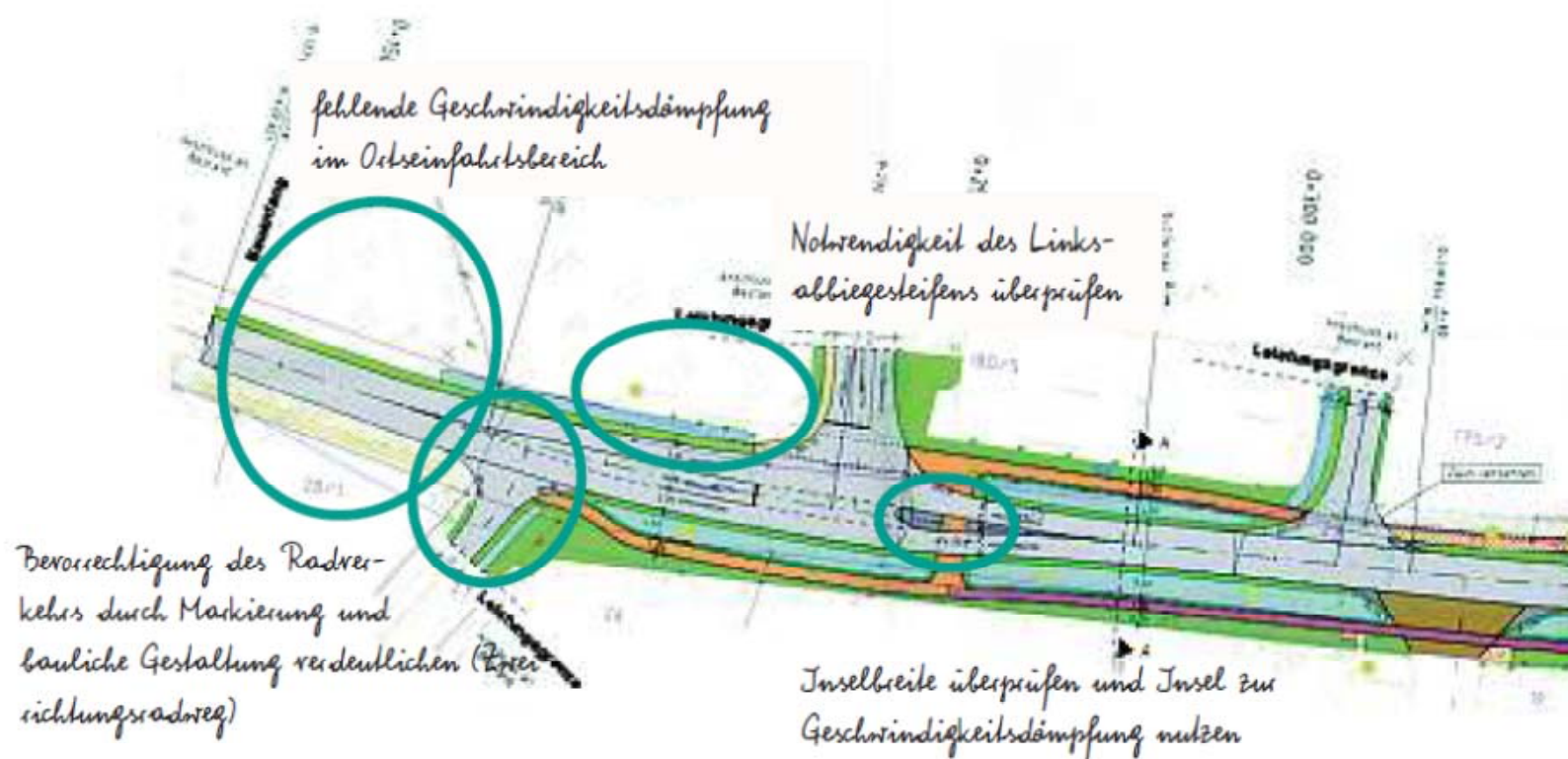
Festgestellte Defizite Ortsdurchfahrten-Brandenburg



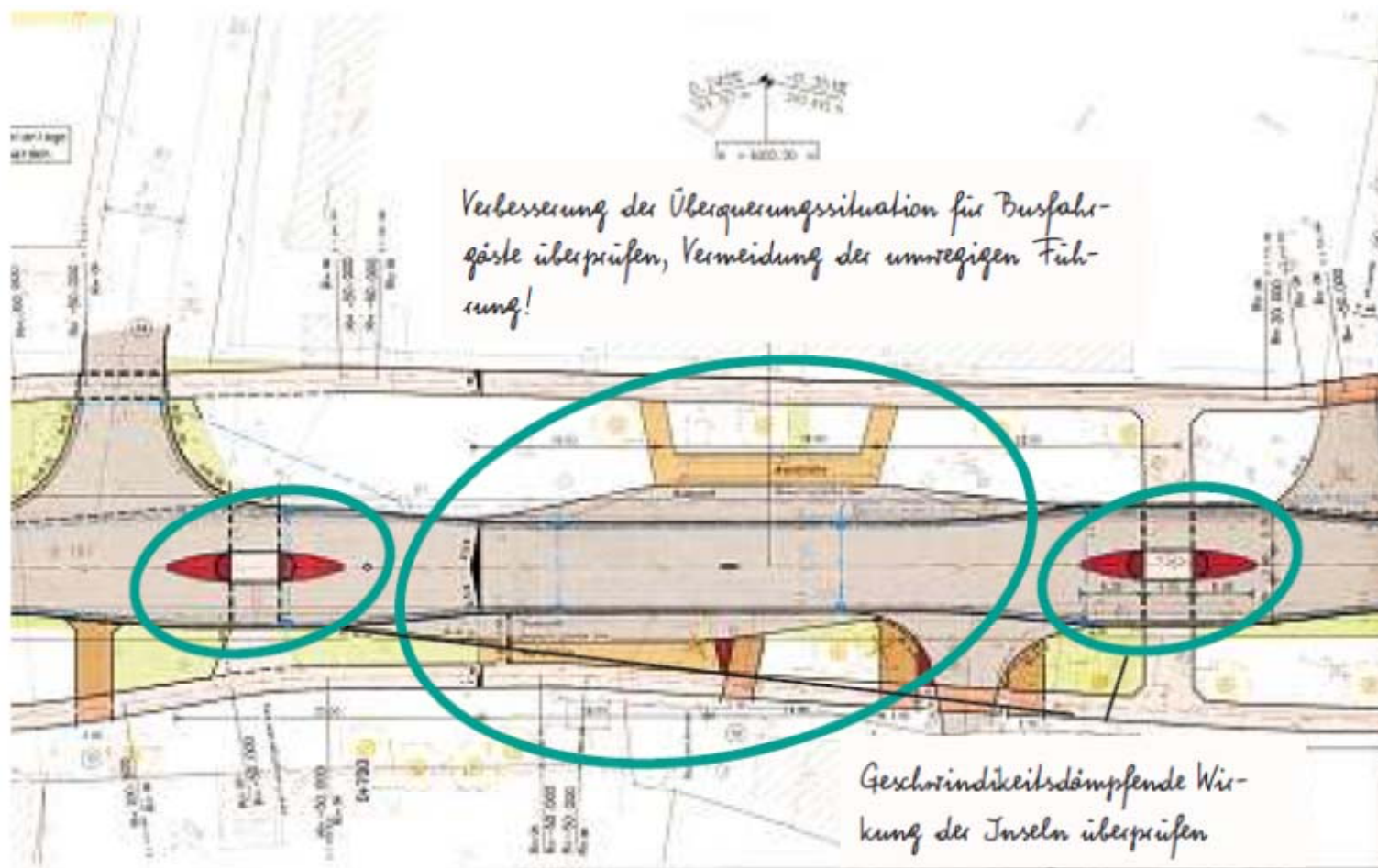


Tipične pomanjkljivosti na AC in HC v UK (source: Bakaba/Butterwegge, 2005)

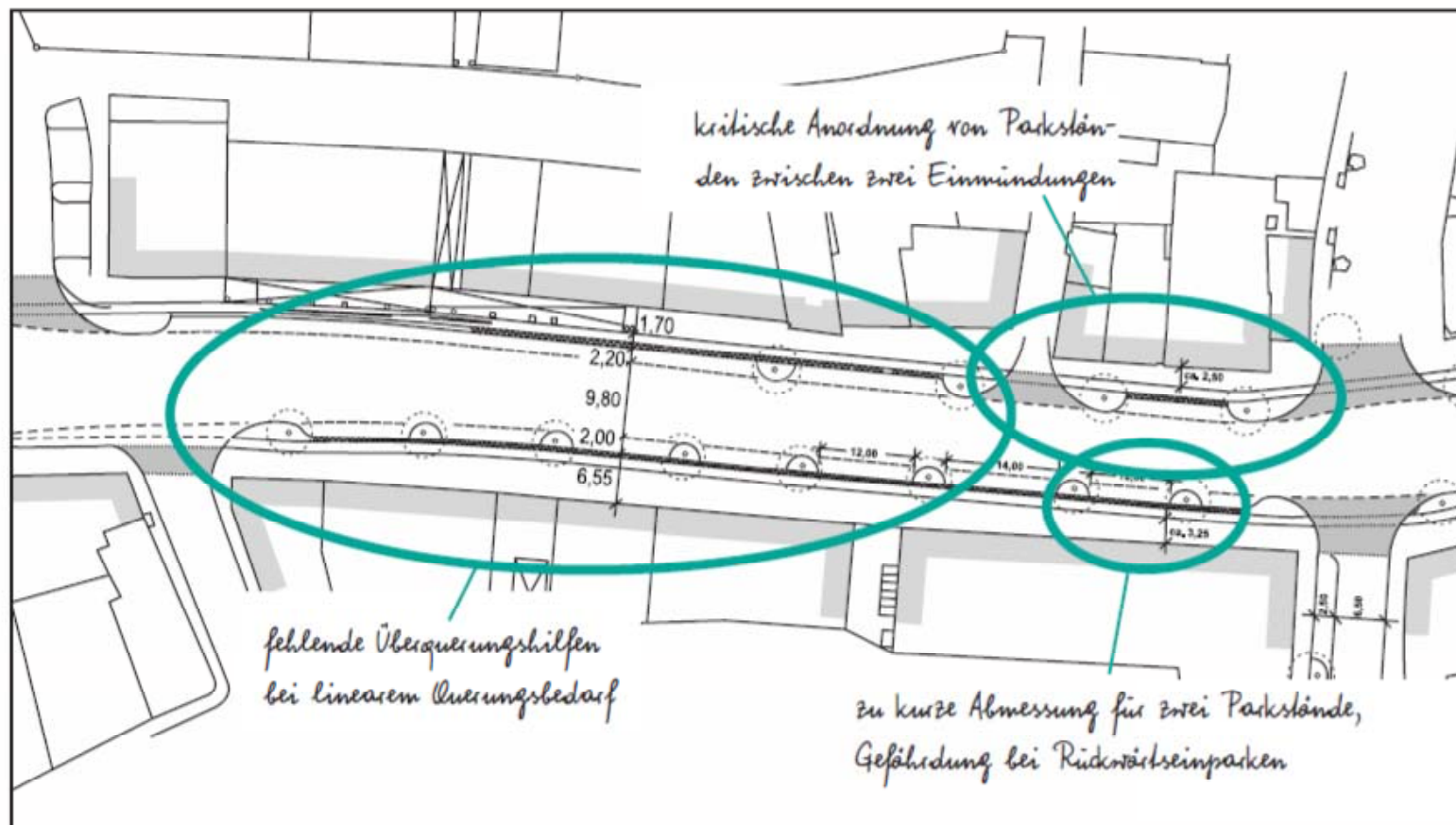




Beispiel Ortsdurchfahrt: Ortseinfahrt



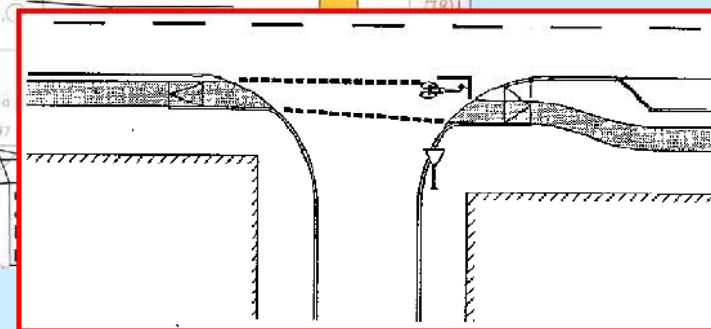
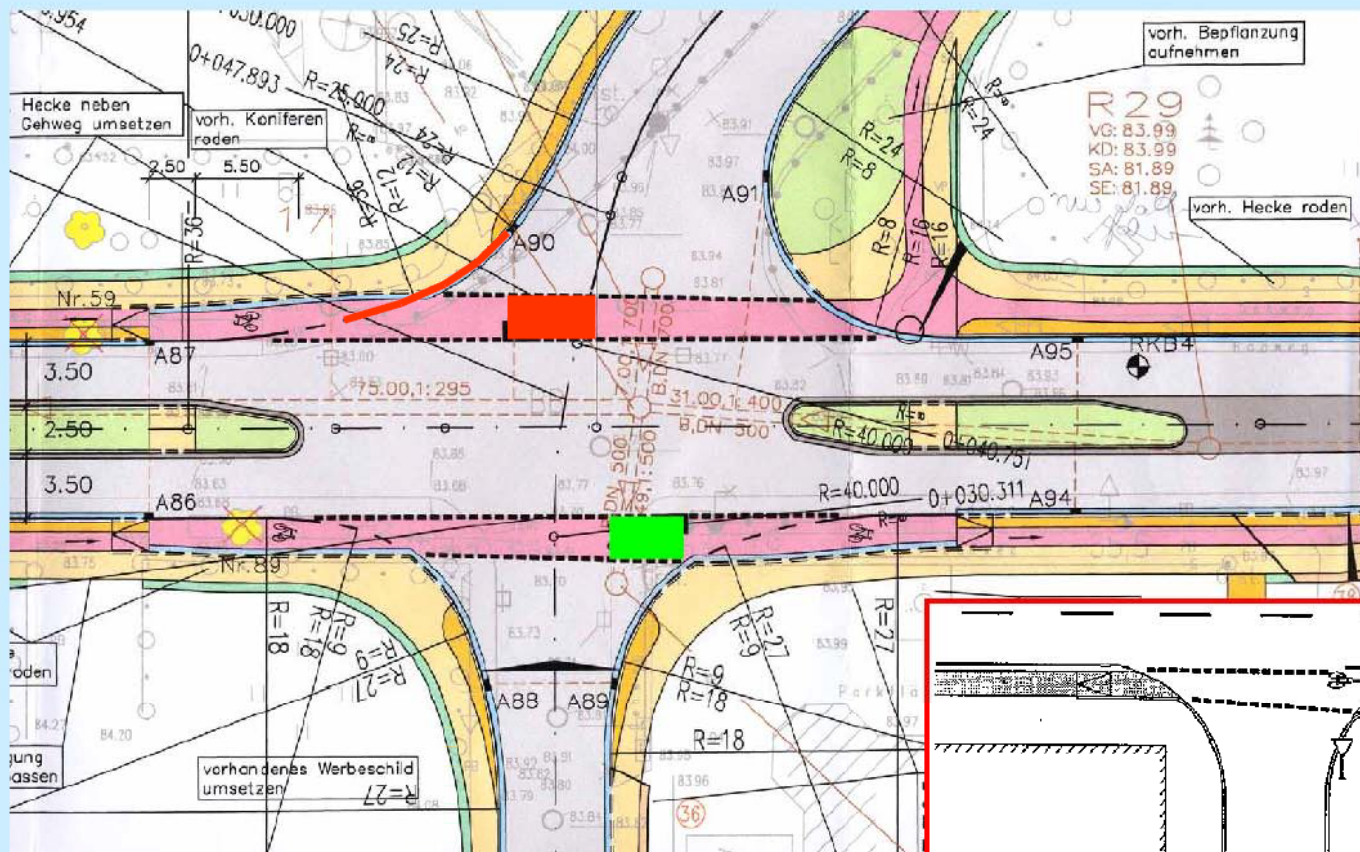
Beispiel Ortsdurchfahrt: Bushaltestelle



Beispiel Hauptverkehrsstraße

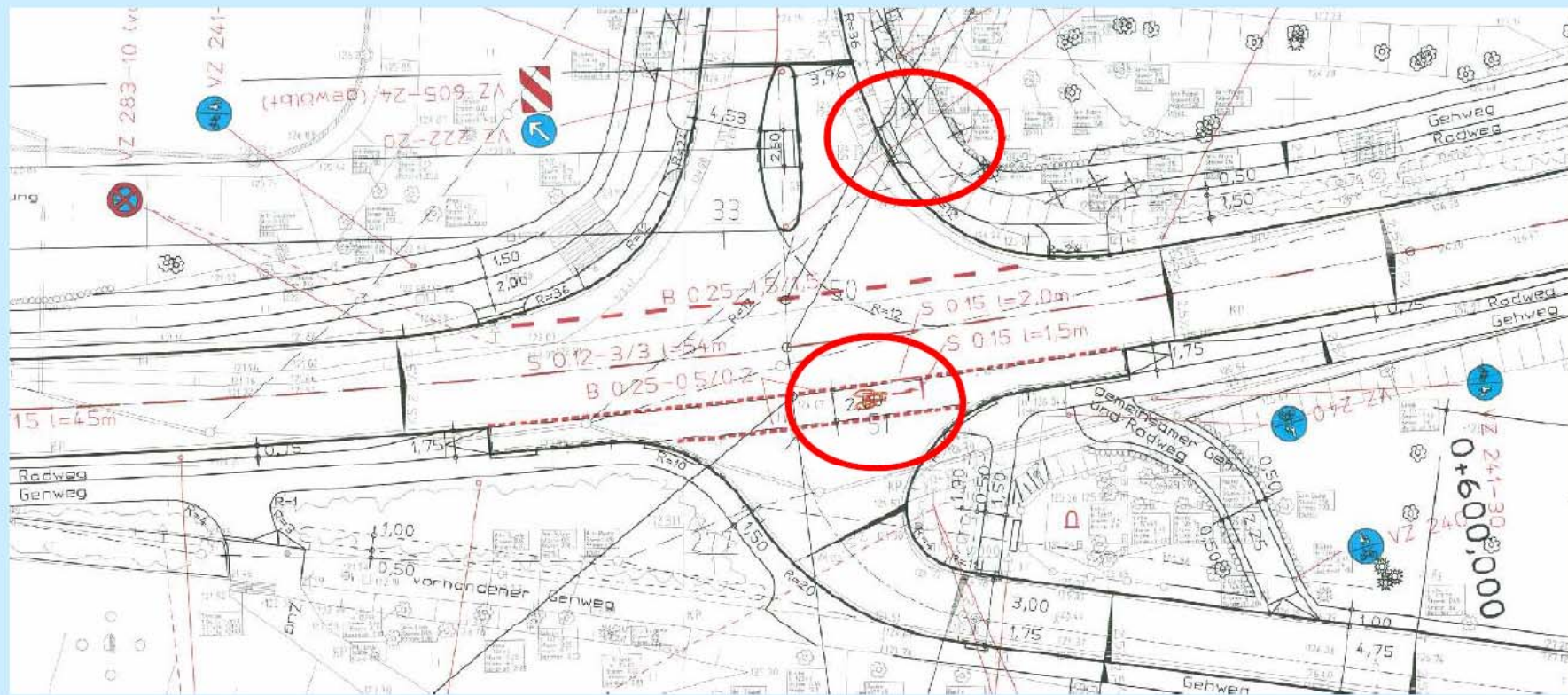


Unsichere Aufstellfläche für Linksabbieger

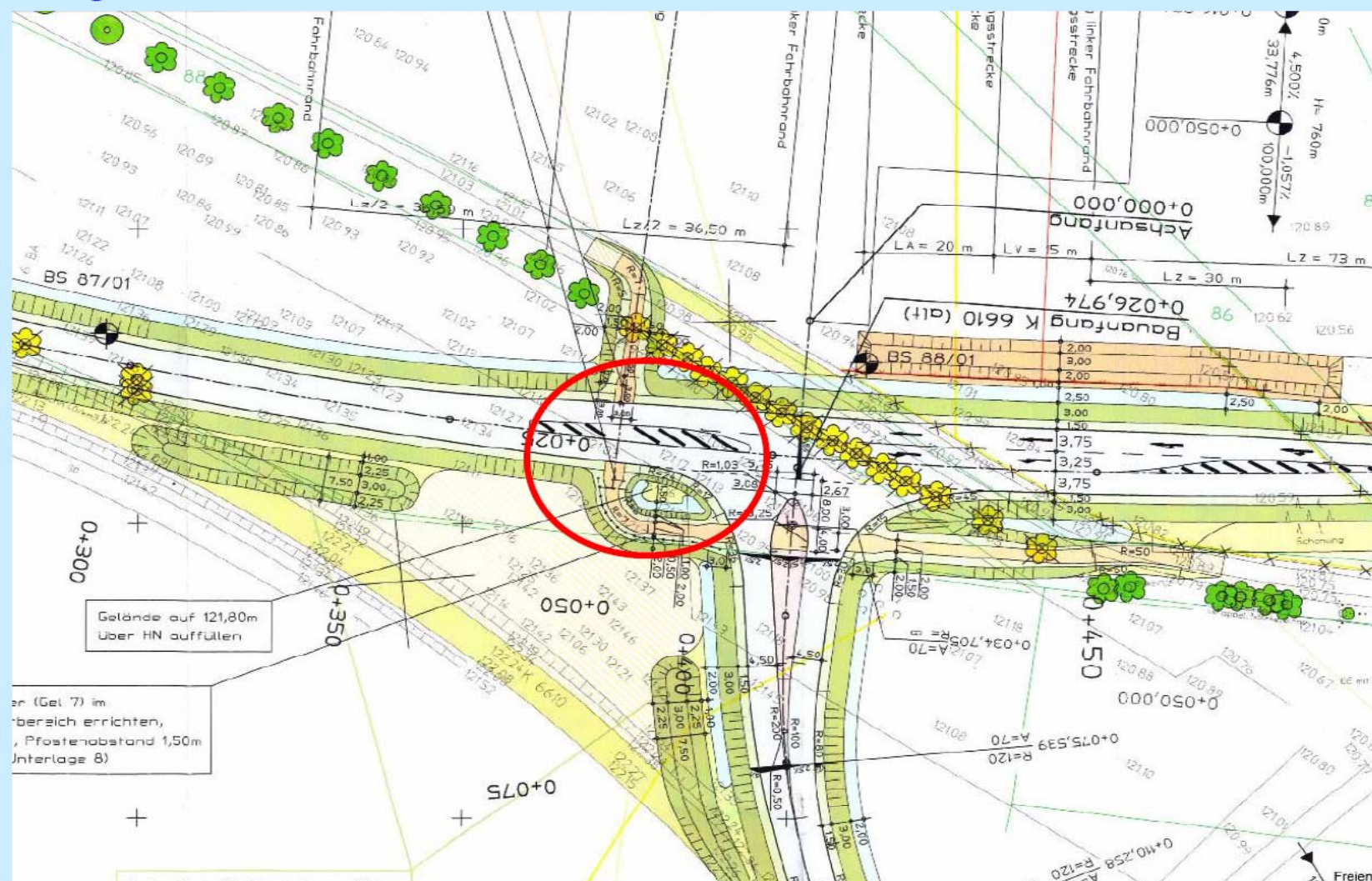


Bildquelle:
FGSV - Empfehlungen für Radverkehrsanlagen ERA 95

Unsichere Aufstellfläche und unklare Führung

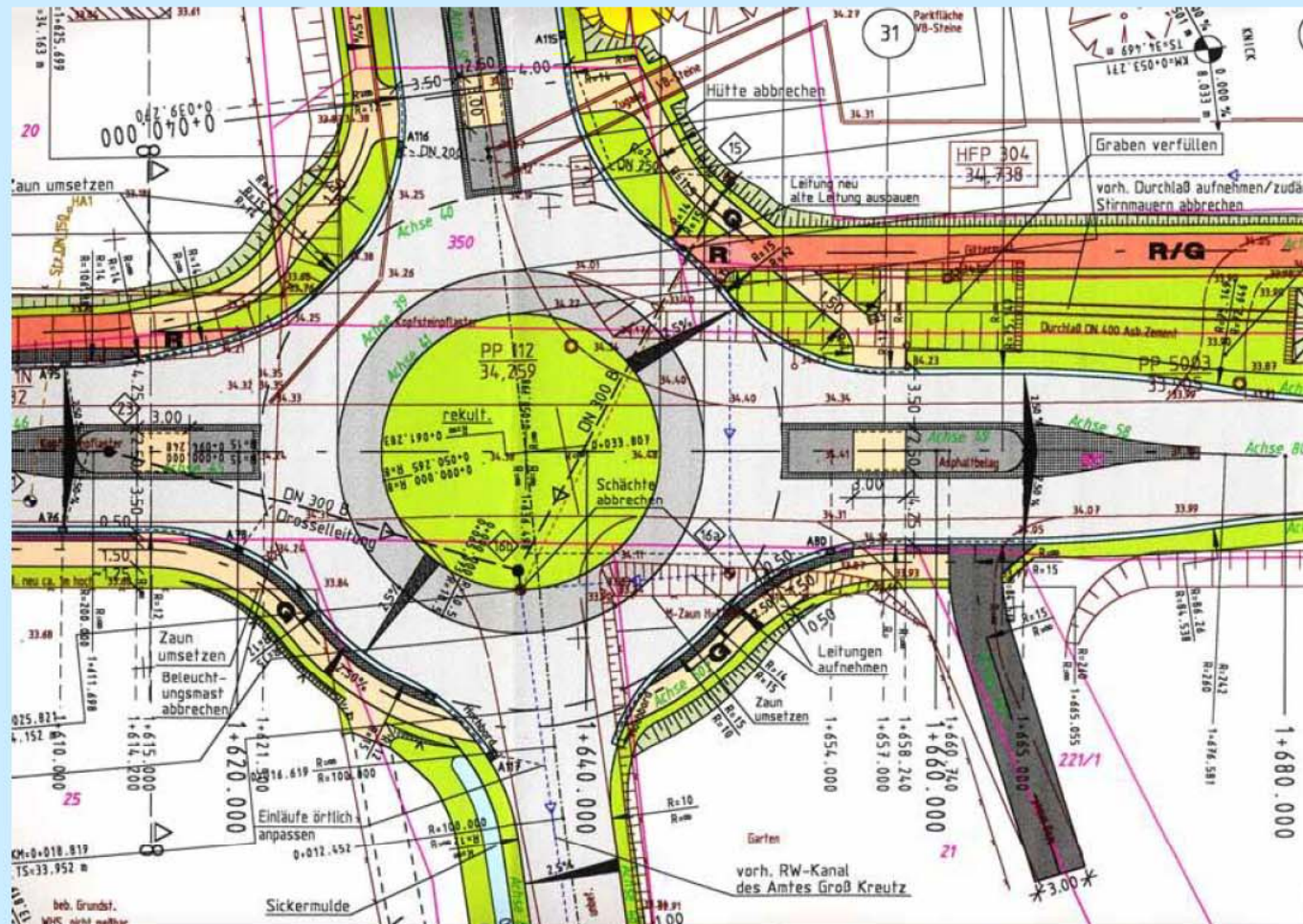


Ungesicherte schmale Wartefläche





Unsichere Radverkehrsführung





Unsicheres Radwegende

