

Projektiranje prometno varnih kolesarskih površin

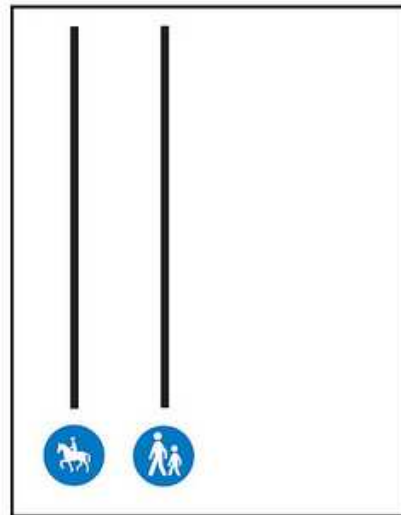
Peter Lipar

FGG-PTI

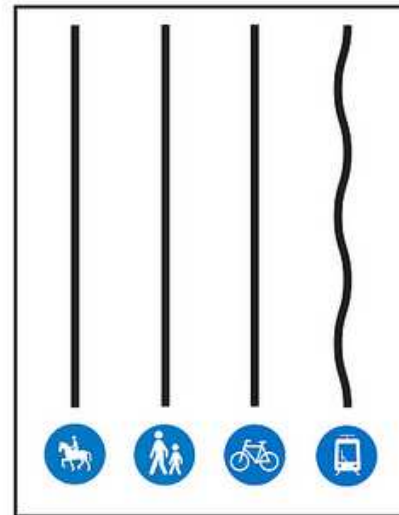
plipar@fgg.uni-lj.si

Ljubljana, 27. 3. 2013, Grand hotel Union

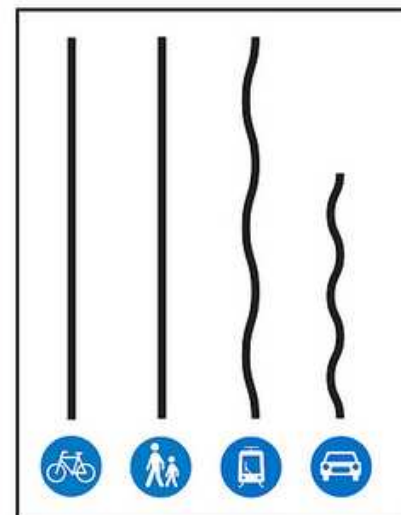
A Short History of Traffic Engineering



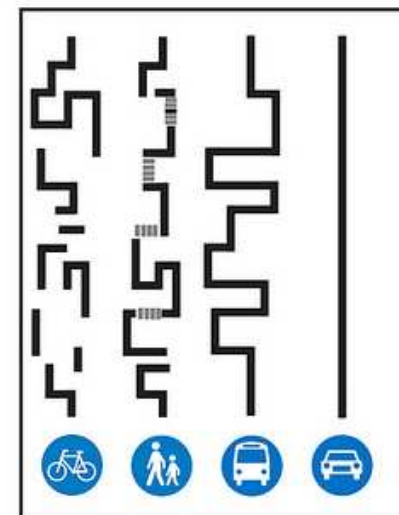
1800



1900

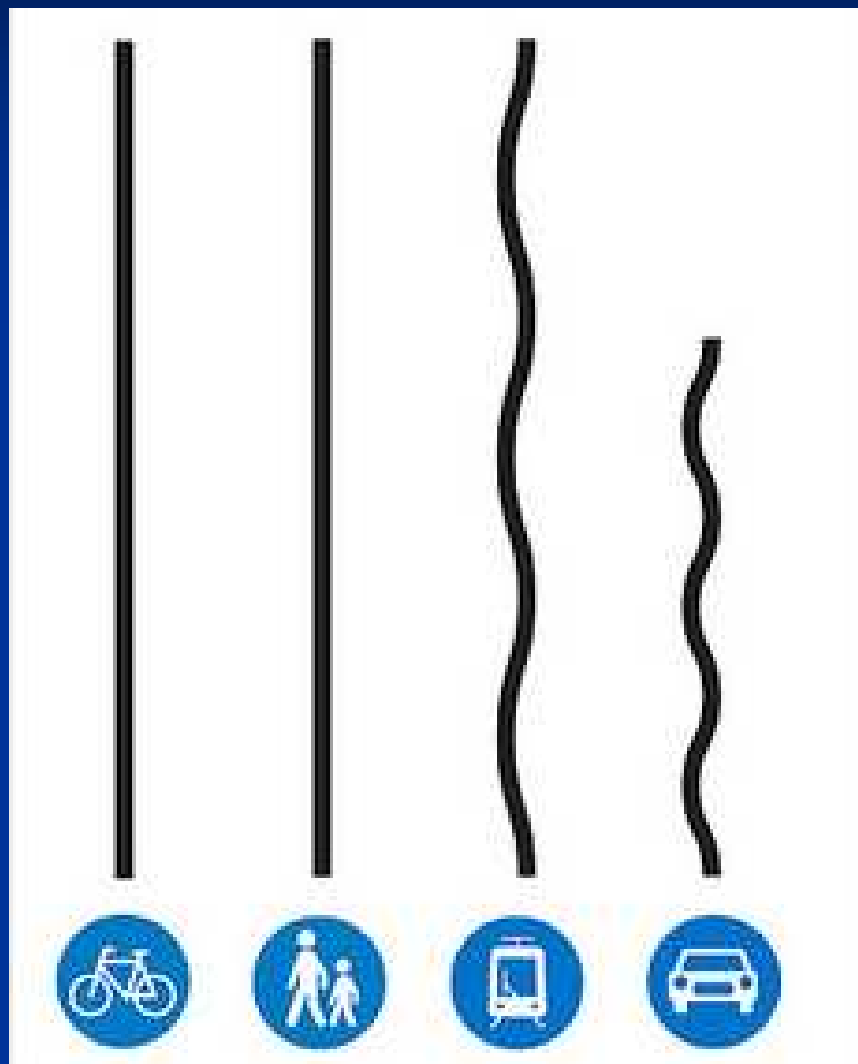


1920



1950 - present

...v budoče...?



Peltzmanov efekt



"The safer skydiving gear becomes, the more chances skydivers will take, in order to keep the fatality rate constant"



Sam Peltzman
Chicago Booth School of
Business

Peltzmanov efekt



Image credit: John Hendrix

There is a fair amount of scientific evidence that backs up Vanderbilt's insights. Give people antilock brakes, airbags and other safety devices, and they "consume" the safety improvements by driving more aggressively. This phenomenon is called the Peltzman Effect, after economist Sam Peltzman, who first wrote about it in 1976.

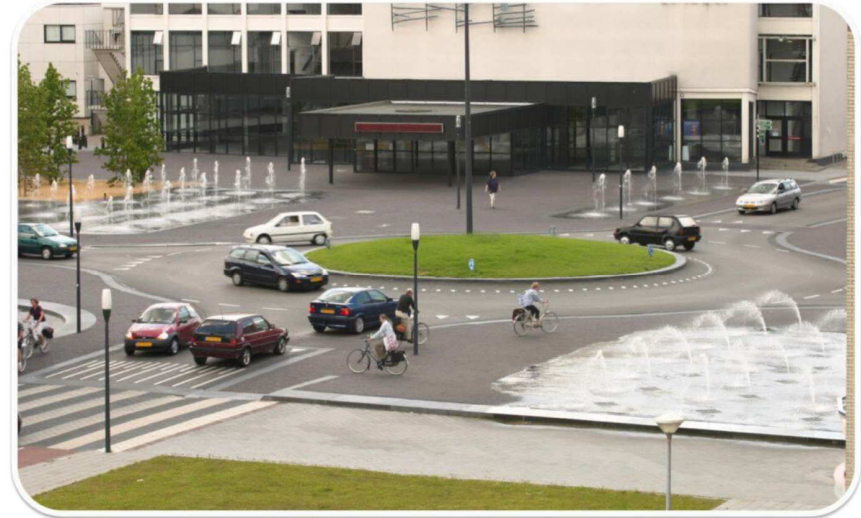
The decades-long effort to make highways straighter, wider and better-marked, with more guardrails and rumble strips, has eliminated one class of dangers only to foster another: the complacent driver with a cellphone in one hand and a cup of coffee in the other, steering the vehicle with a knee while occasionally glancing at what's ahead.

'A safe street is a street which tells us about its past, its present and the wishes and hopes of the people who are living there.'

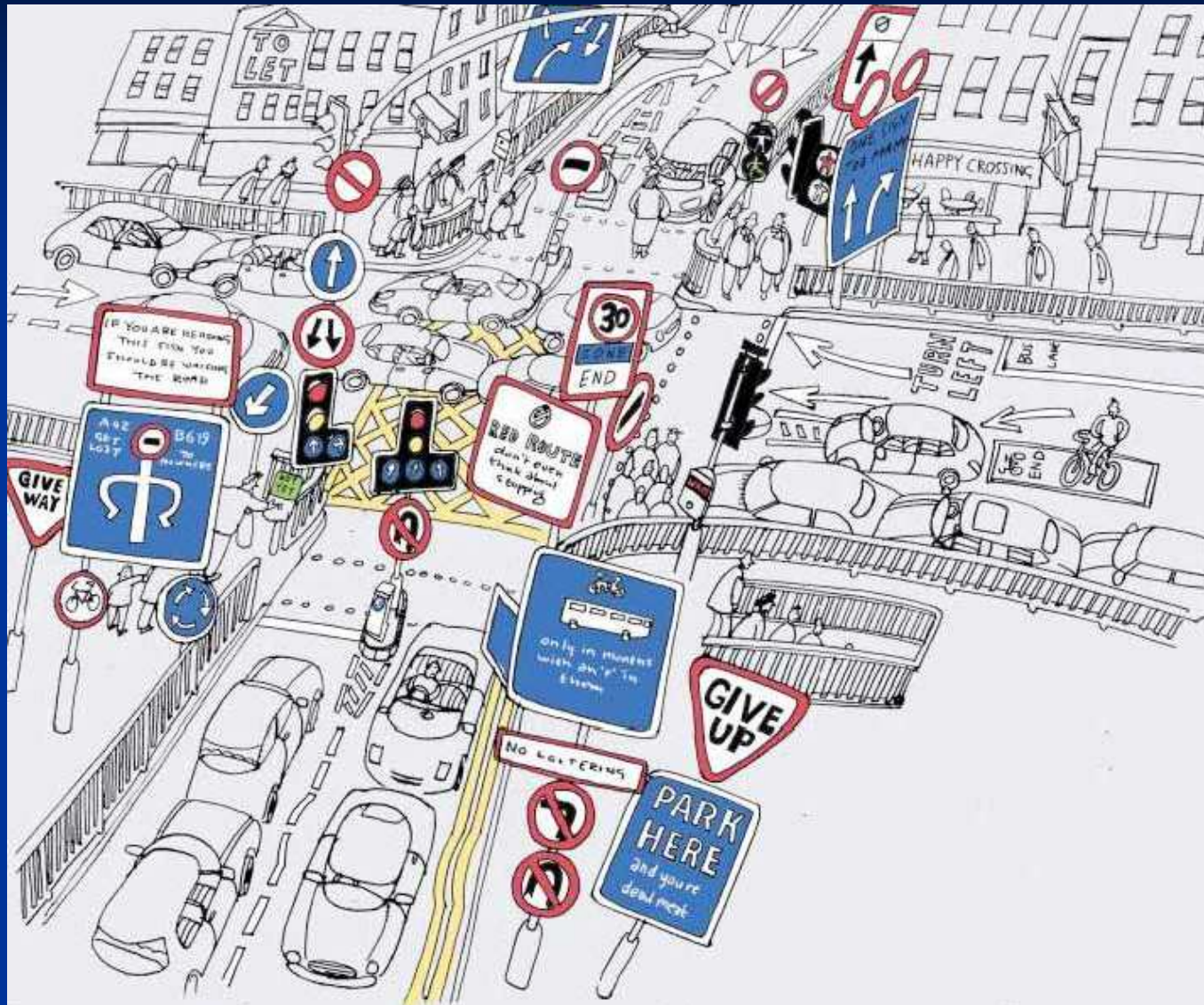


This publication is dedicated to Hans Monderman, the head of our Shared Space-expert team, who died unexpectedly on January 7th 2008.

Hans Monderman pioneered the concept of *Shared Space* by removing what was supposed to make it safe for car drivers, cyclists and pedestrians: traffic lights, railings, kerbs and road markings. His maxim was: 'Never treat anyone in the public realm as an idiot, always assume they have intelligence.' He built a world-wide reputation for innovating street design under which vehicles and pedestrians shared the same space and negotiated by contact from person to person. Due to his radical ideas he initially was considered a dangerous fool by his fellow engineers, and he had to overcome the deeply ingrained view of road safety engineering. Through remarkable persistence and professional commitment he has managed to help putting in place countless *Shared Space*-schemes, transforming the urban and rural traffic landscapes into real people's space.



In shared space design signs, signal, lines play a subordinate role





Lesson 5 Better chaotic than pseudo-safe

What feels safe is not necessarily safe. The biggest mistake you can make is to give people the illusion of safety.

What feels safe is not necessarily safe. And conversely what feels unsafe may actually be quite safe. Shared Space is successful because the perception of risk may be a means or even a prerequisite for increasing objective safety. Because when a situation feels unsafe, people are more alert and there are fewer accidents.

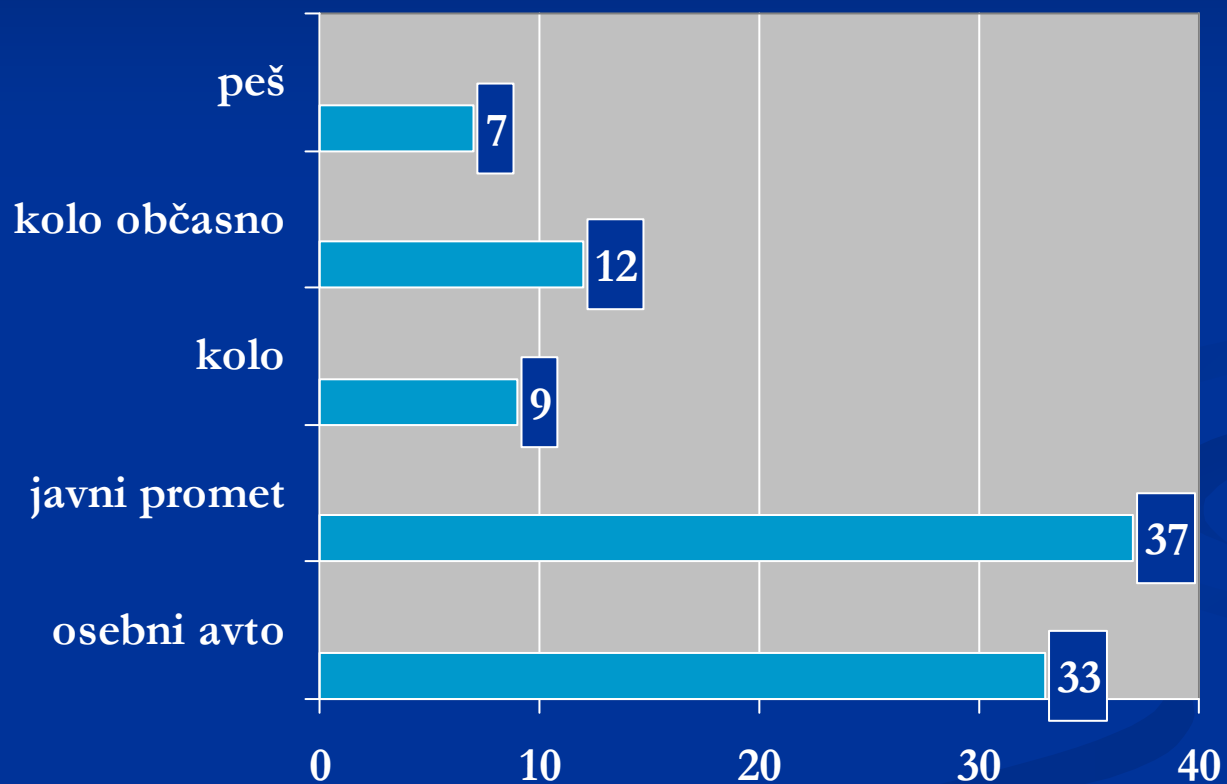
Separating traffic flows often increases the feeling of safety, but in practice it appears to be counterproductive – the number of accidents with injuries increases. Separating traffic flows blinkers people and causes an increase in speed. Because everyone has their own lane, people take less account of other road users.

45

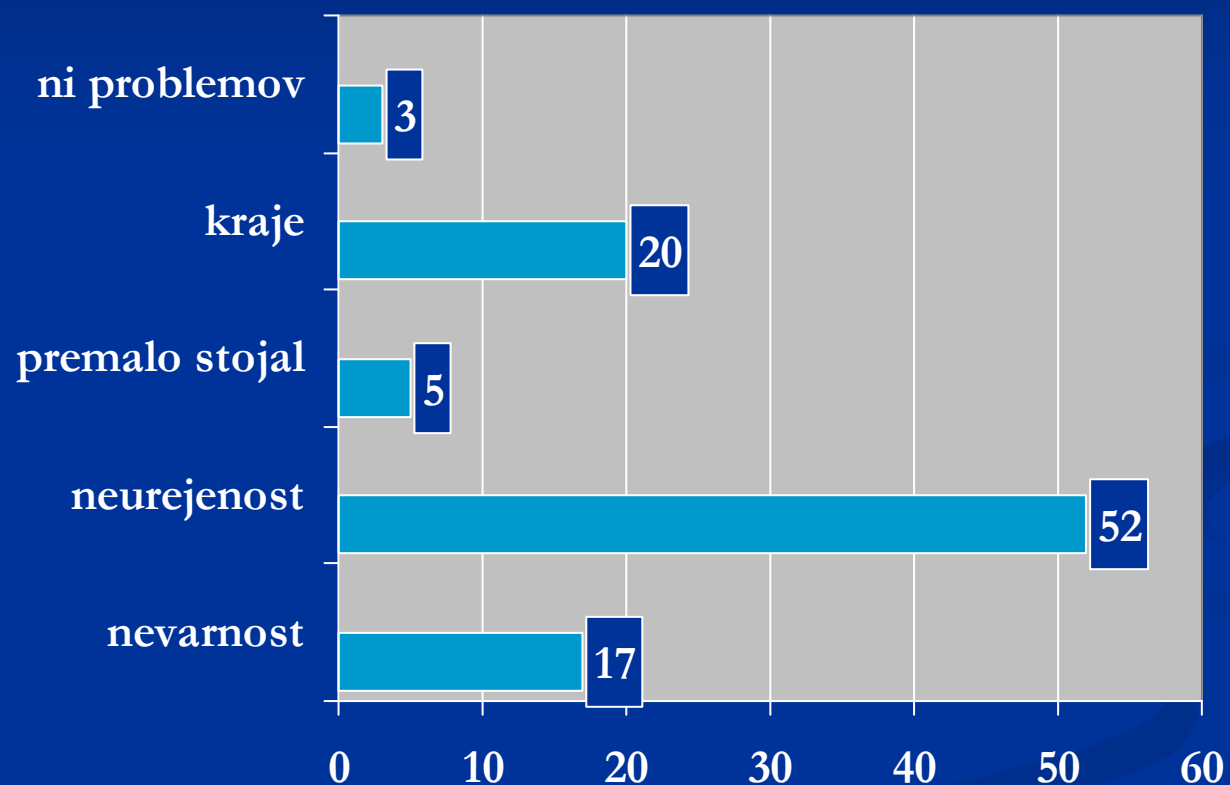


Do not try to remove that unsafe feeling, but use it to best effect.

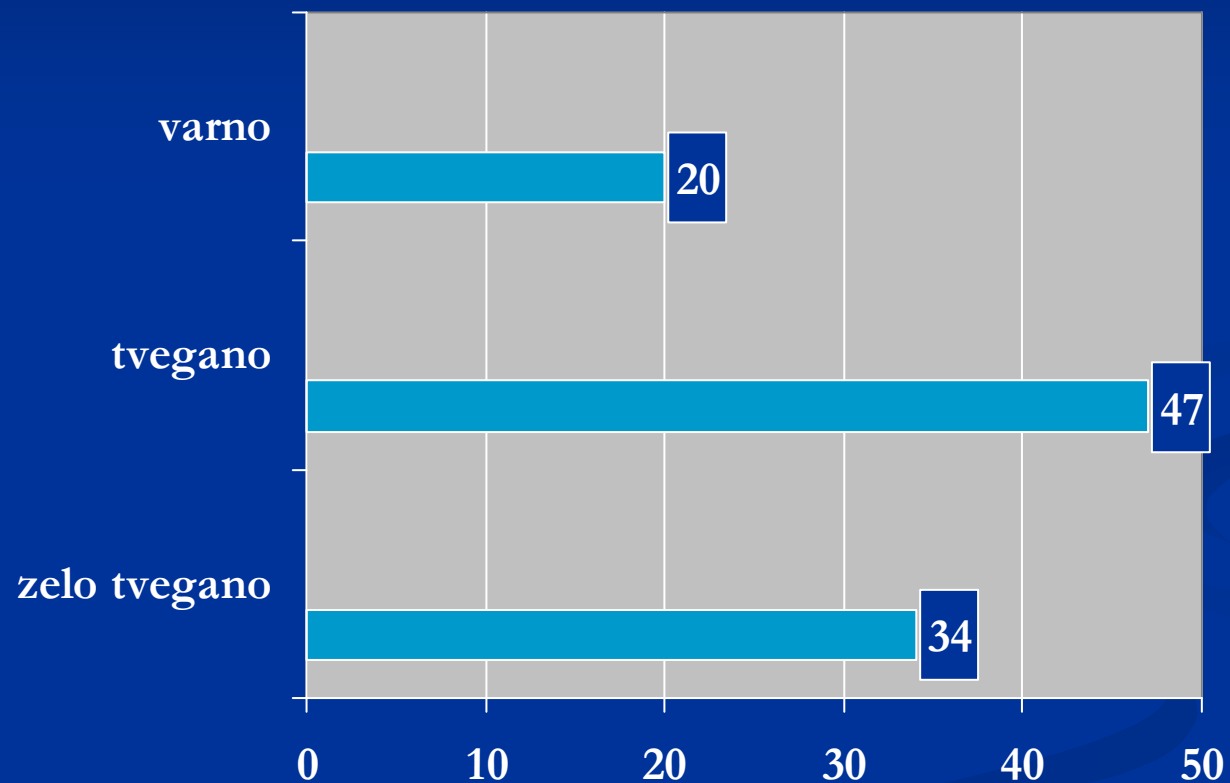
Izbira prometnega sredstva za prevoz na FGG - študenti



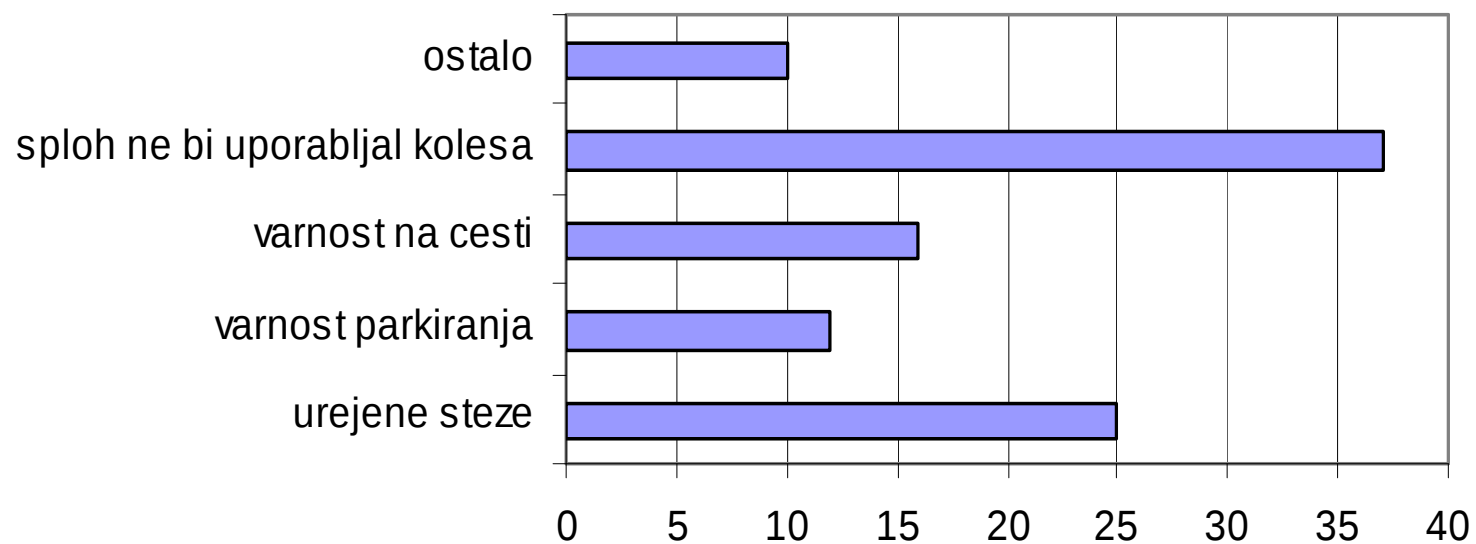
Problemi pri uporabi kolesa



Varnost kolesarjenja

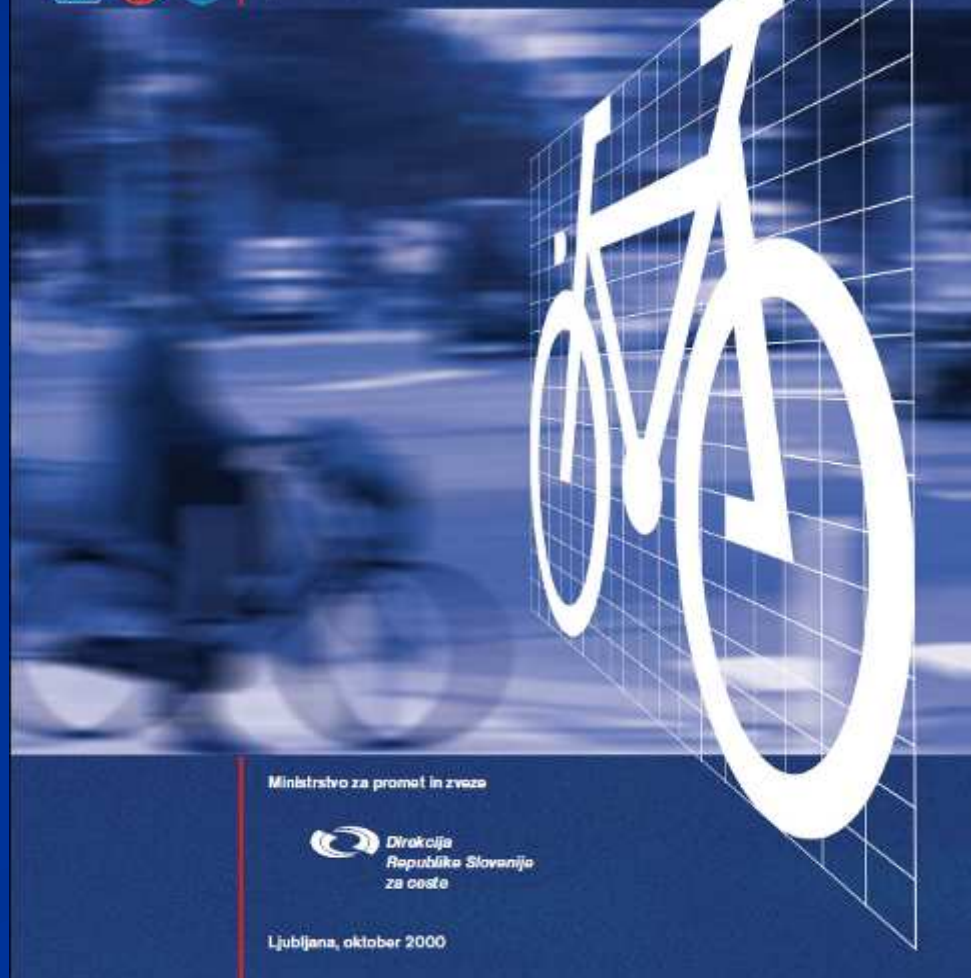


Pod kakšnimi pogoji bi uporabljali kolo - tisti, ki ga do sedaj niso



Oktober 2000

Navodila za projektiranje kolesarskih površin



Ministrstvo za promet in zveze



*Direkcija
Republike Slovenije
za ceste*

Ljubljana, oktober 2000

Junij 2012

Navodila za projektiranje kolesarskih površin

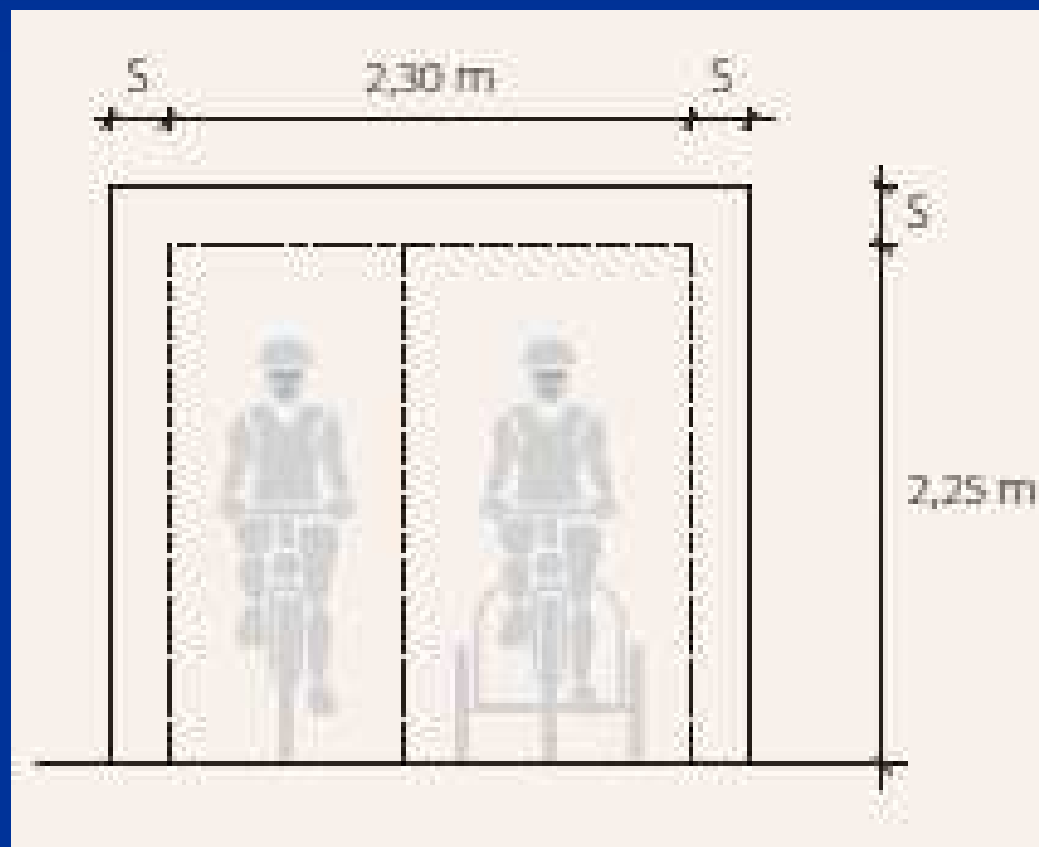


REPUBLIKA SLOVENIJA
MINISTRSTVO ZA INFRASTRUKTURO IN PROSTOR
DIREKCIJA REPUBLIKE SLOVENIJE ZA CESTE

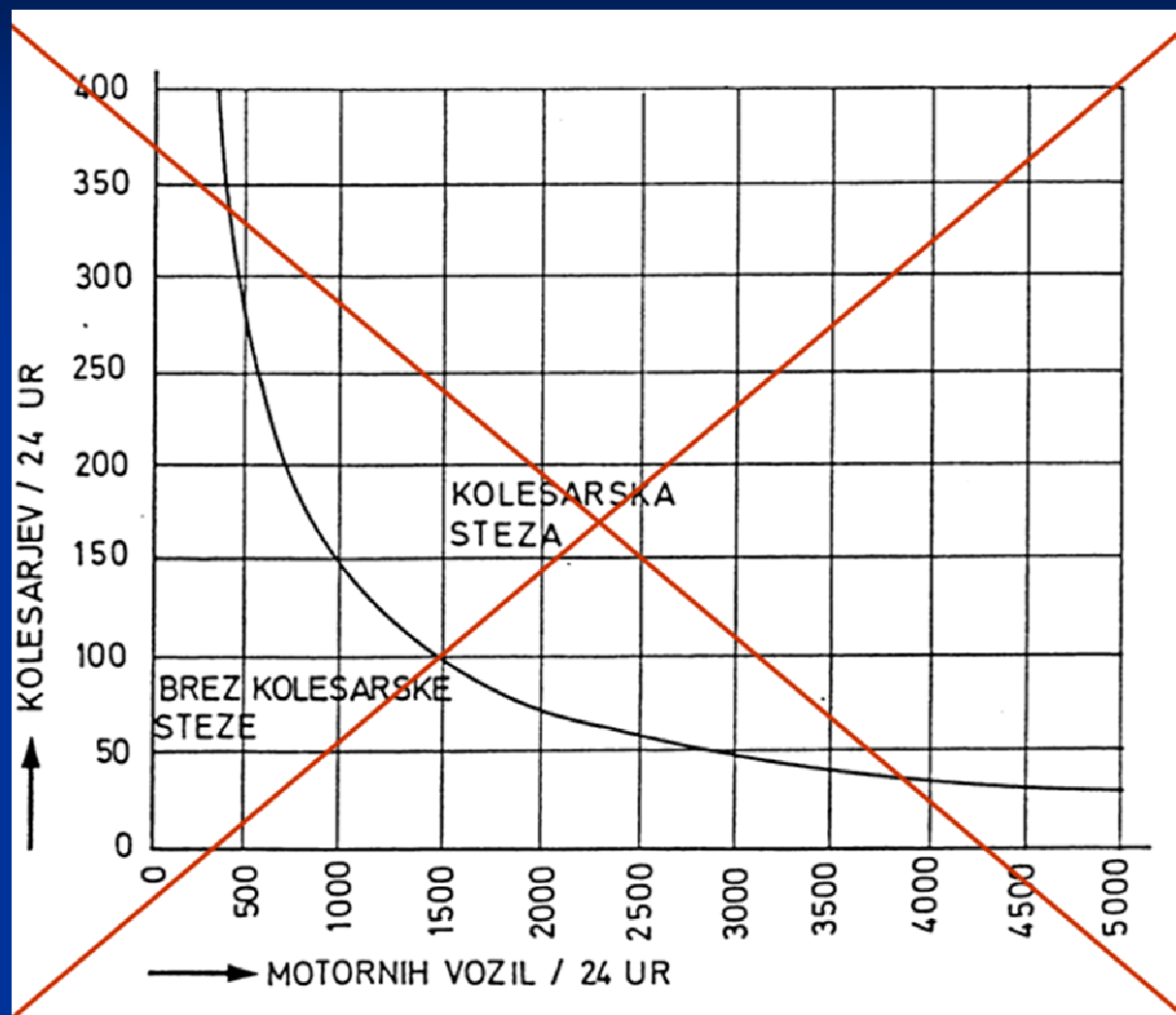
Novelacija Junij 2012

Kaj je novega...

Svetli profil



Določitev vrste kolesarske površine



Vrste kolesarskih površin se določajo na osnovi hitrosti $V_{85\%}$ in urne prometne obremenitve vozil, ki vozijo ob kolesarski površini.

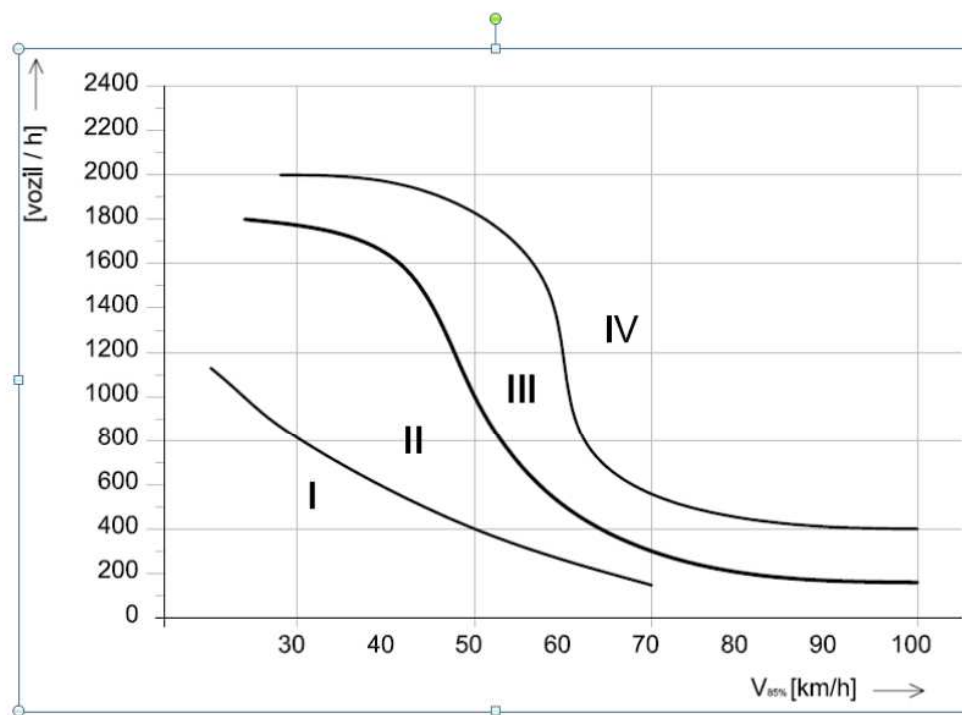


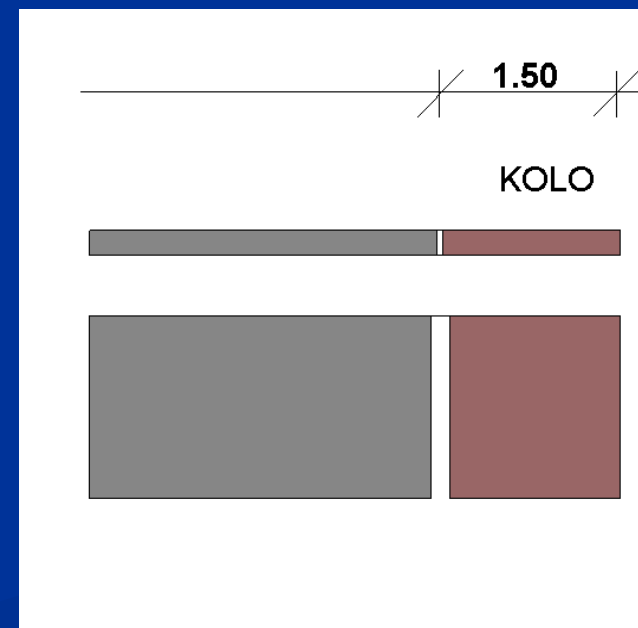
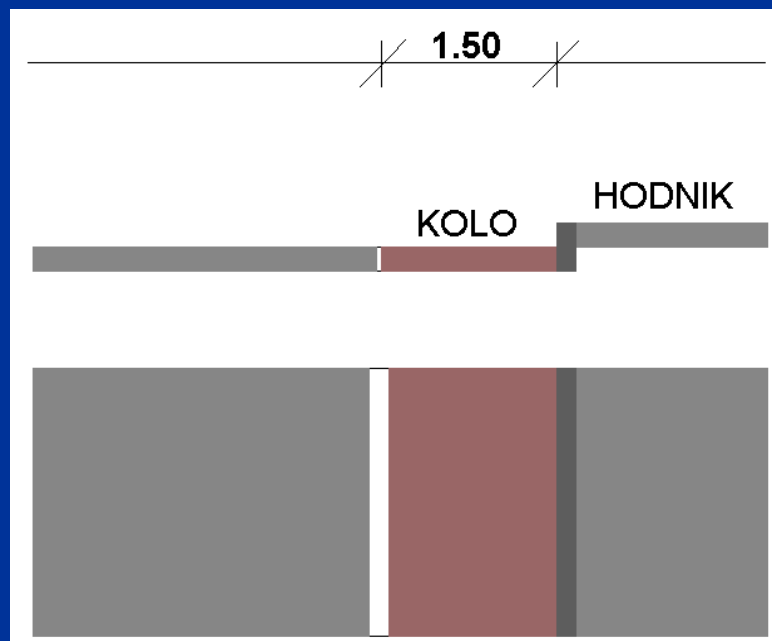
Diagram 2: Kriteriji za uvedbo kolesarske površine (Vir: ERA 08)

Legenda:

- I – kolesarji na vozišču skupaj z motornim prometom
- II- kolesarski pas
- III – kolesarska steza
- IV – kolesarska pot

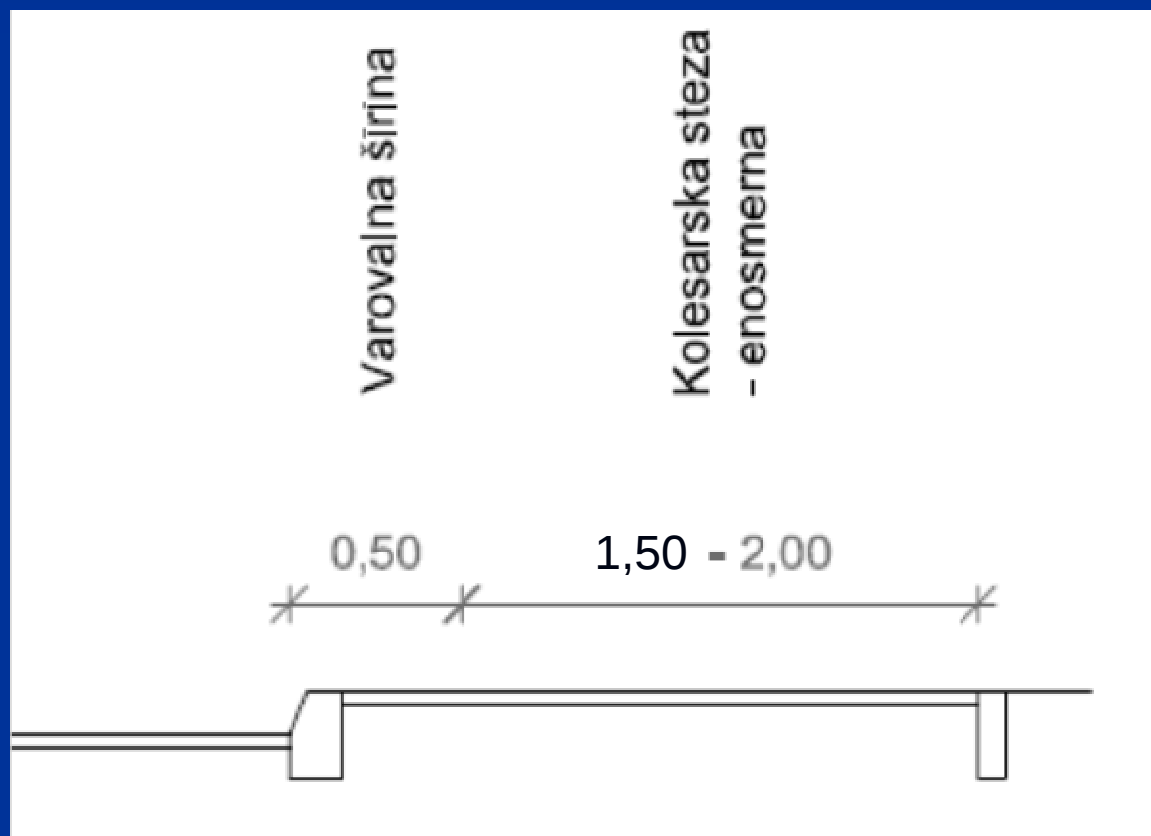
Pas

	Optimalno	Minimalno
Kolesarski pas	1.60 m	1,00 m

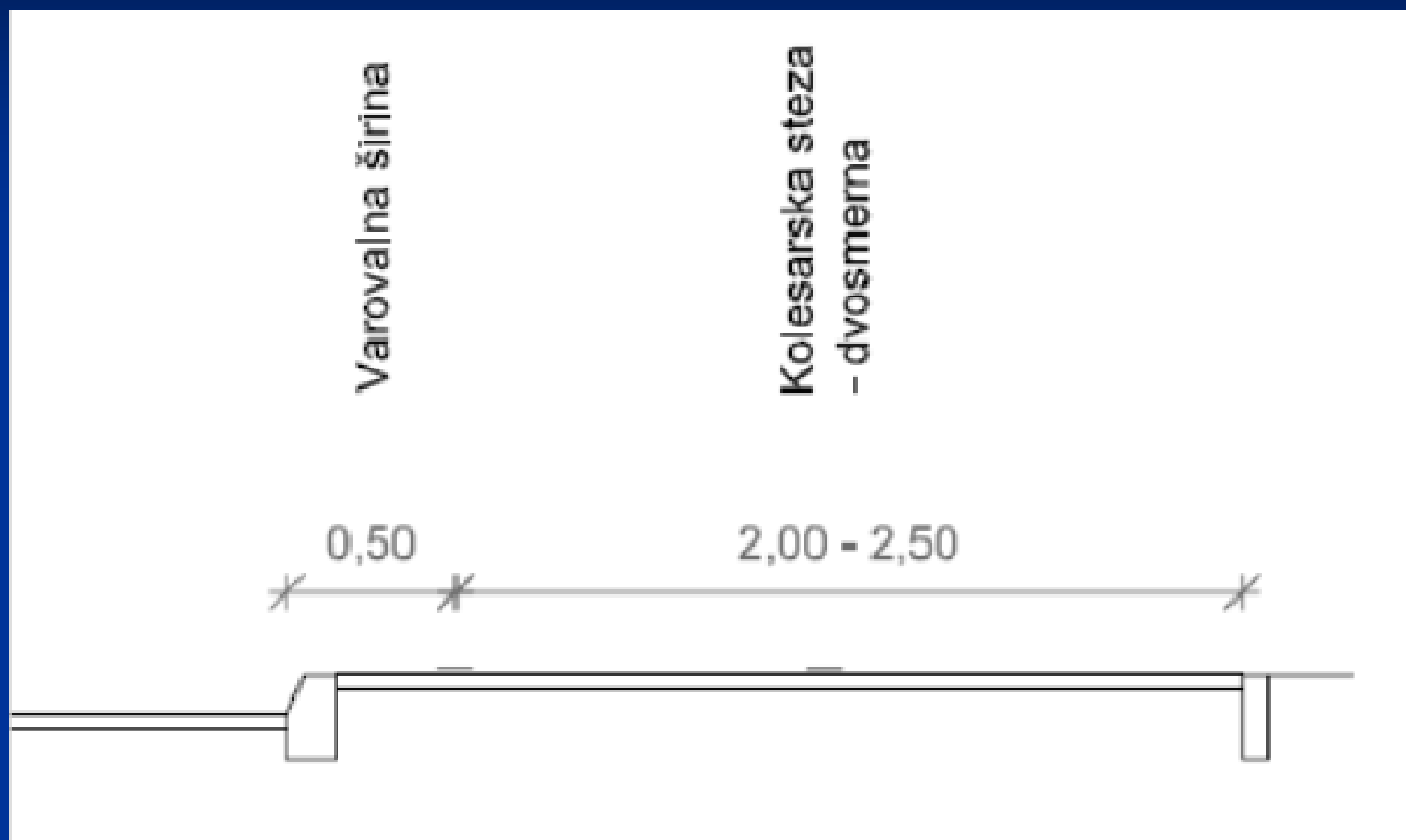


Steza

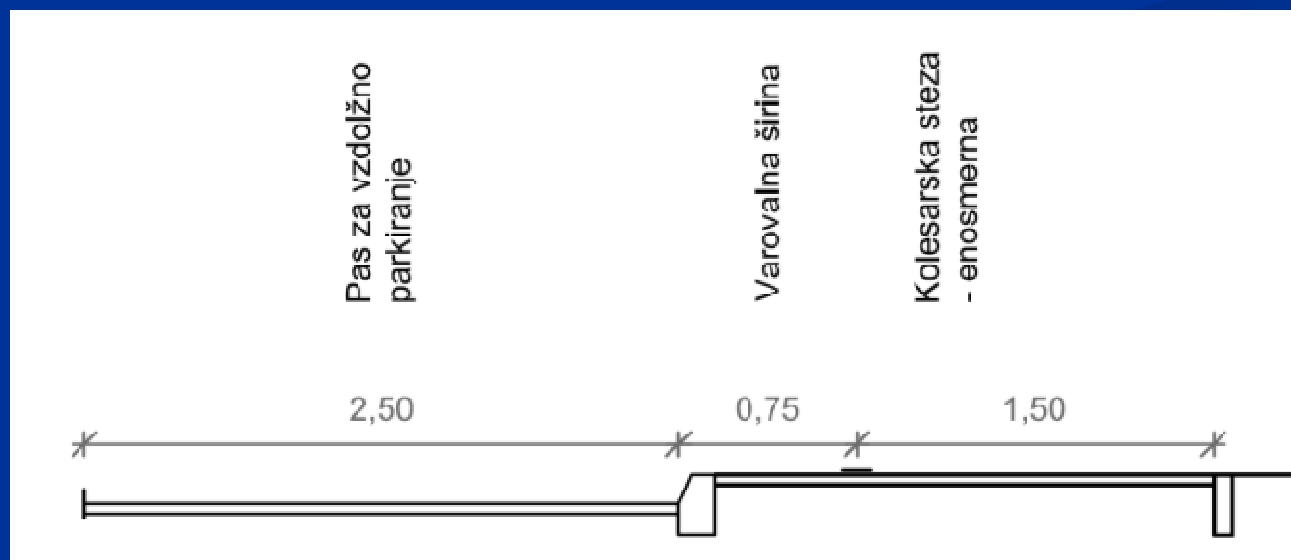
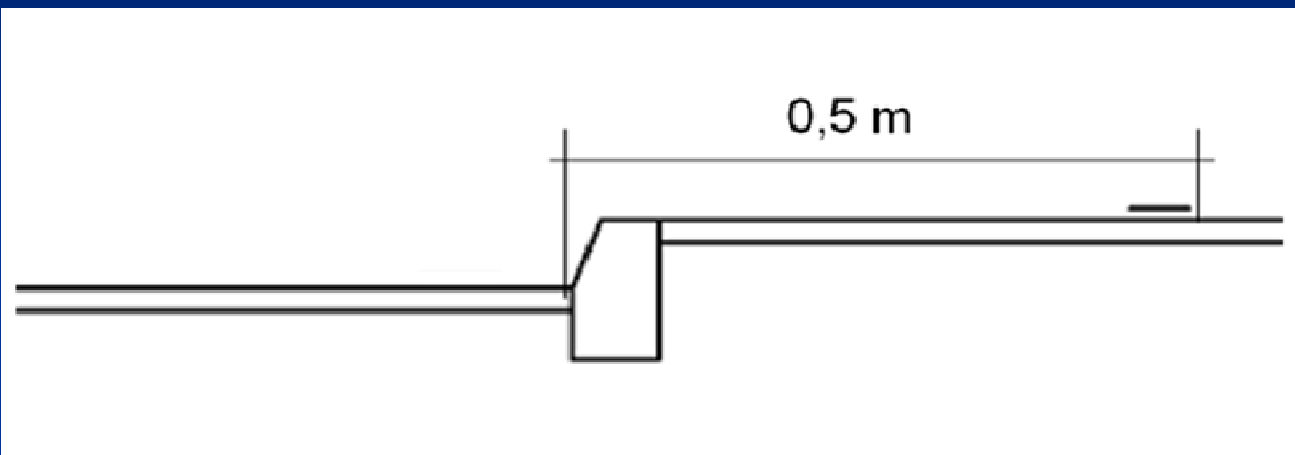
	Optimalno	Minimalno
Enosmerna dvostranska kolesarska steza	2.00 m	1,50 m
Dvosmerna enostranska kolesarska steza	2.50 m	2,00 m



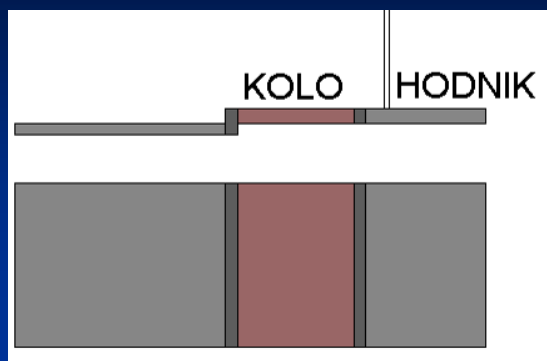
Dvosmerna



Varovalna širina

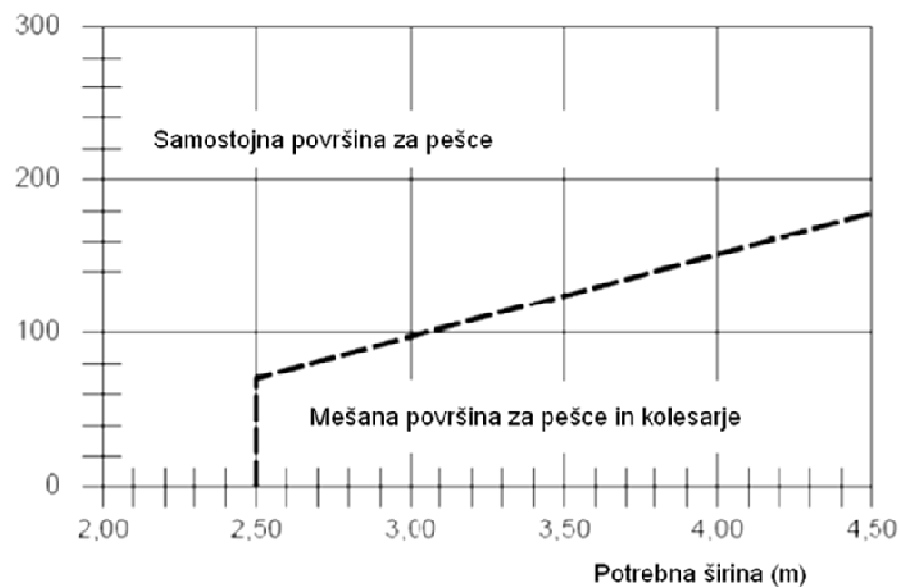


Skupna površina za pešce in kolesarje

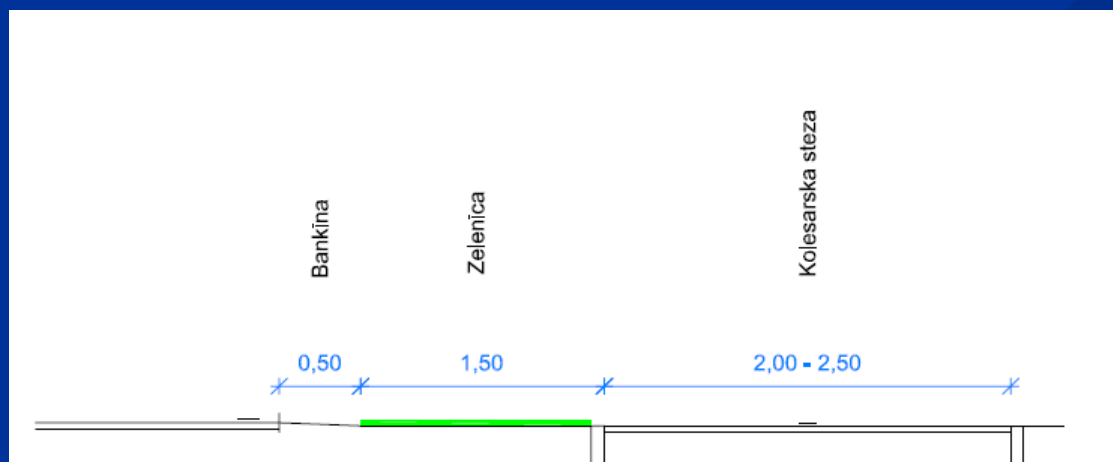
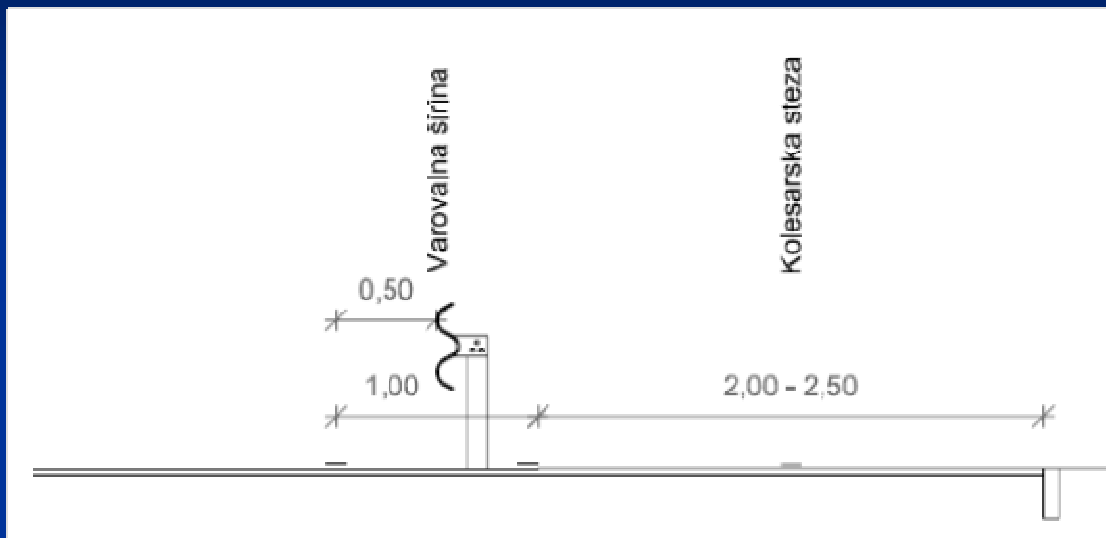


Število pešcev in
kolesarjev v
konični uri

Število kolesarjev ne sme biti
večje od 1/3 celotne obremenitve

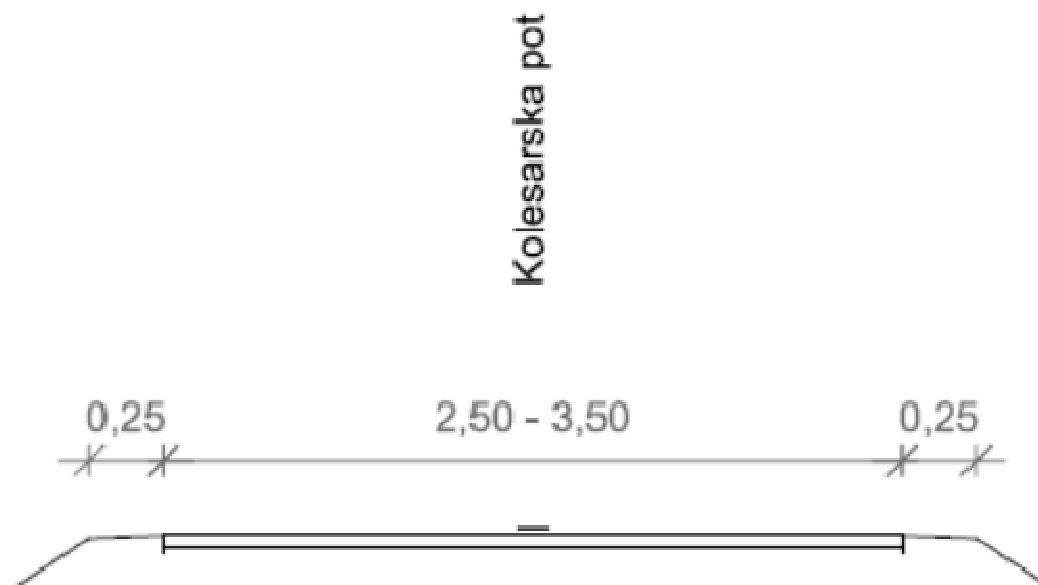


Zunaj naselja



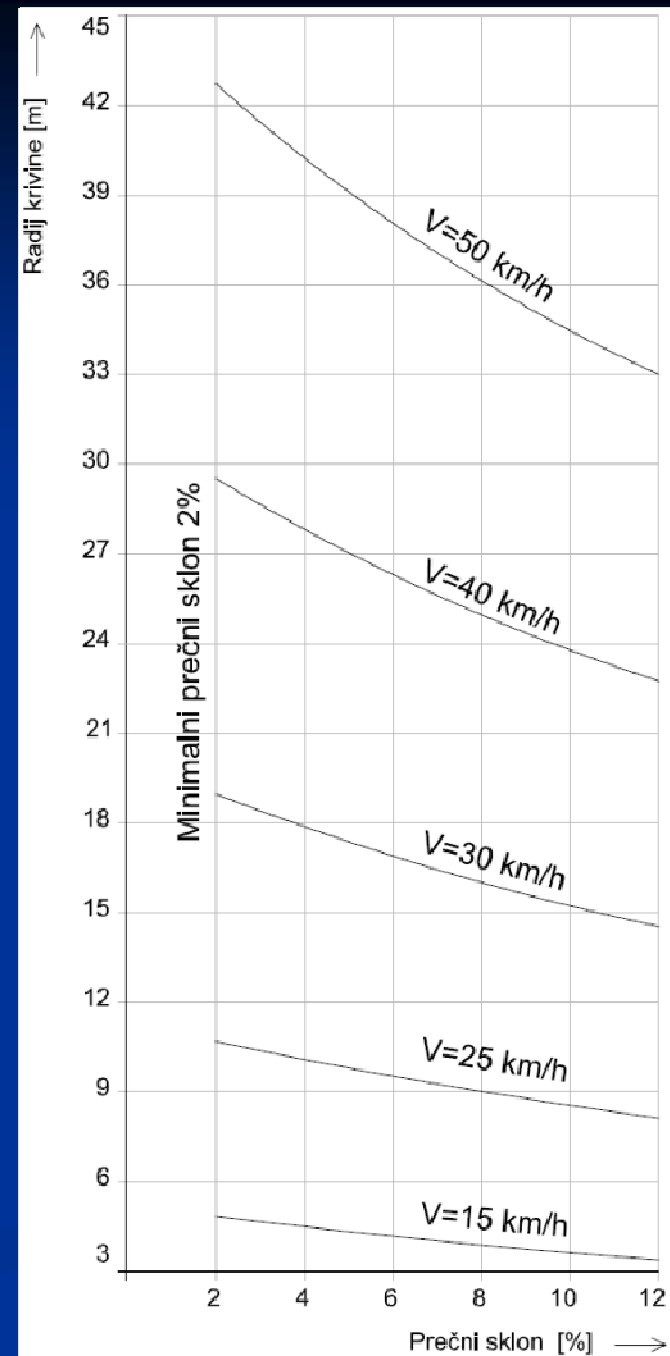
Kolesarska pot

	Optimalno	Minimalno oziroma izjemoma lokalno
Kolesarska pot	3.50 m	2,50 m





Prečni nagibi

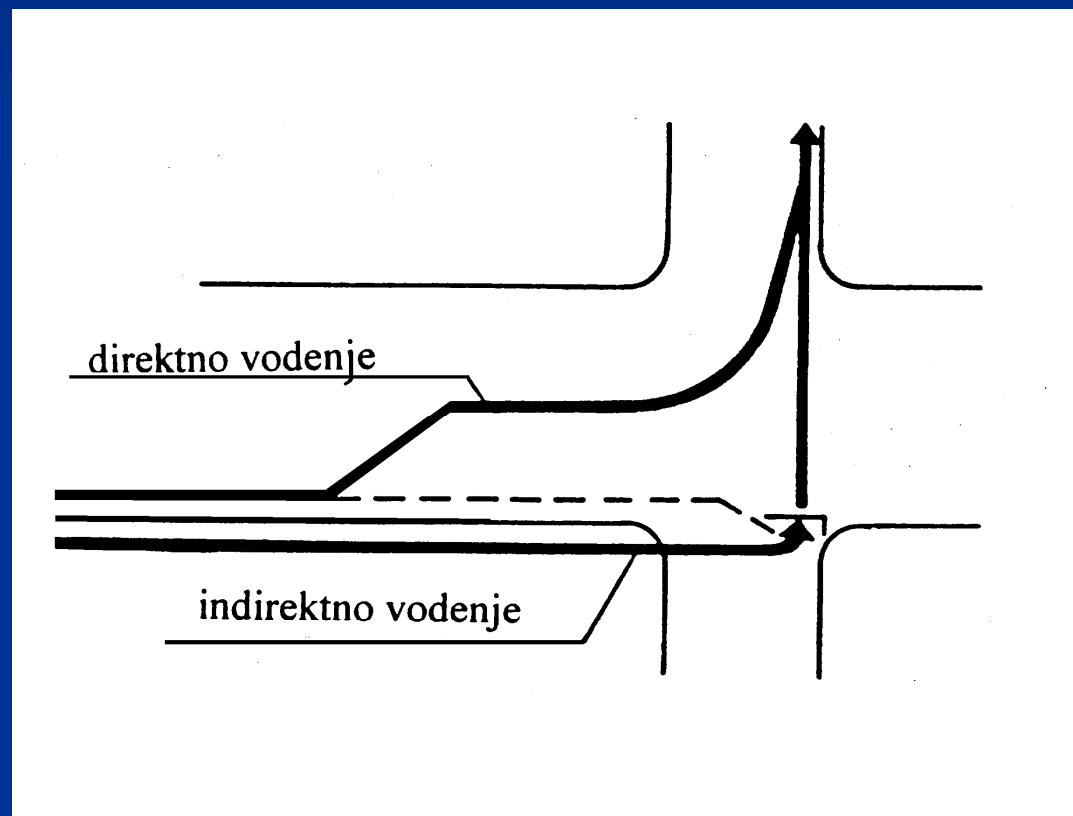


Vzdolžni sklon

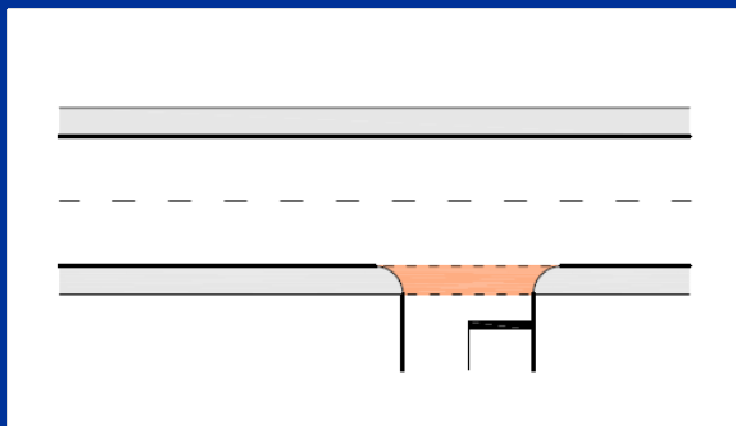
Vzpon (%)	Maksimalna dolžina vzpona (m)
10	20
6	65
5	120
4	250
3	>250

Kjer zaradi konfiguracije terena ni možno zagotoviti ustreznih vzdolžnih sklonov ($>10\%$), je potrebno predvideti širšo kolesarsko površino, tako da je omogočeno potiskanje kolesa in hkrati nemotena vožnja ostalih kolesarjev mimo. V kolikor razmere dopuščajo, se na takem odseku predvidijo počivališča.

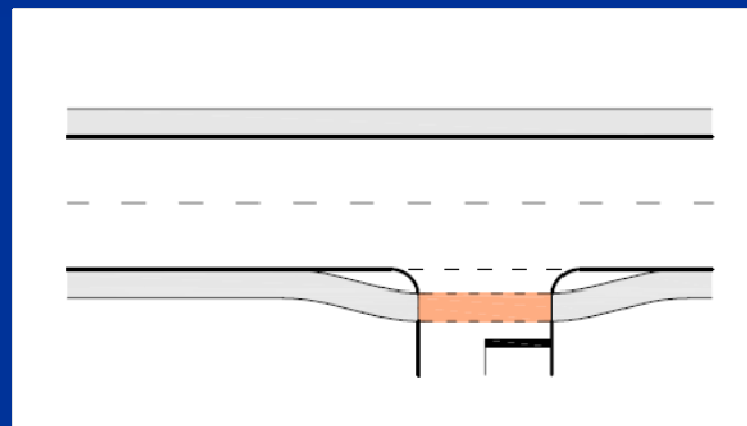
Vodenje kolesarjev v križiščih



Vodenje kolesarjev preko kraka neprednostne ceste

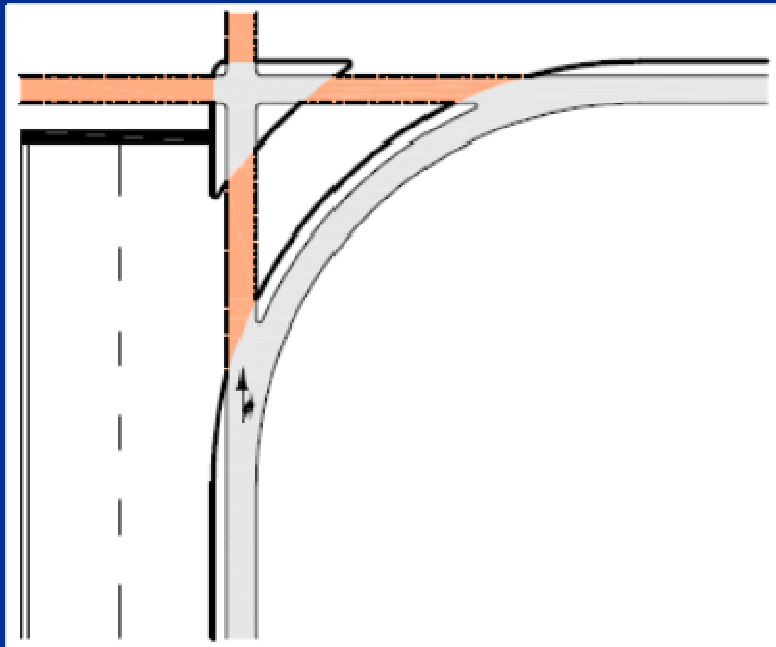


Neposredno

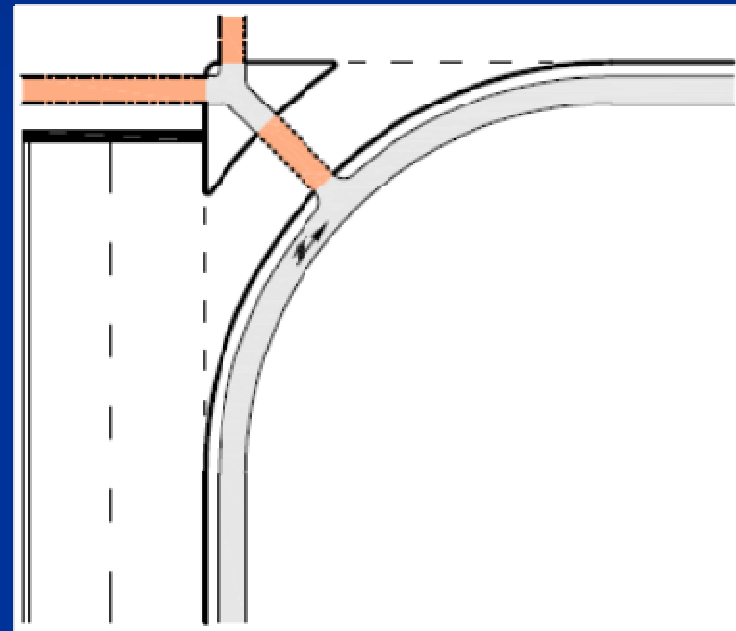


Posredno

Vodenje kolesarjev preko otoka v križišču



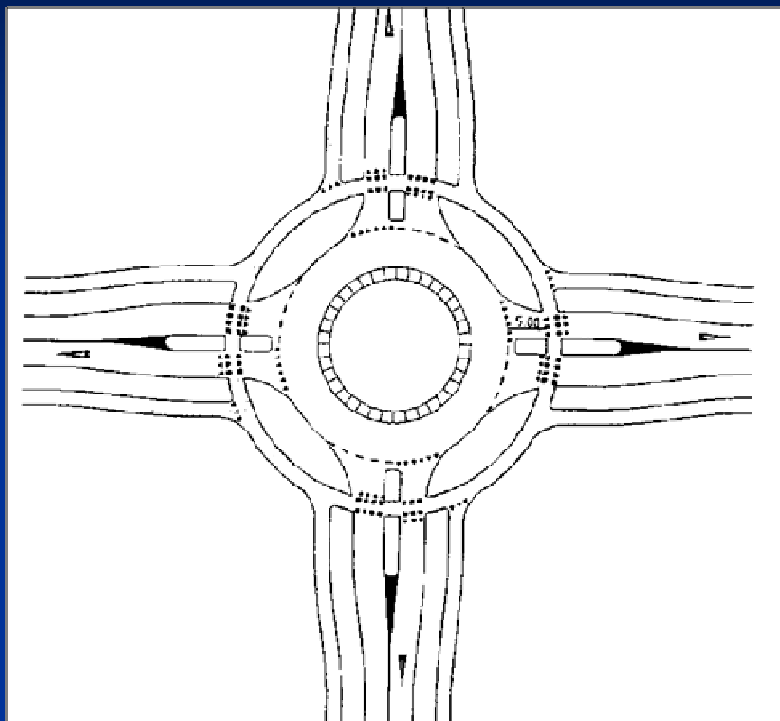
Neposredno



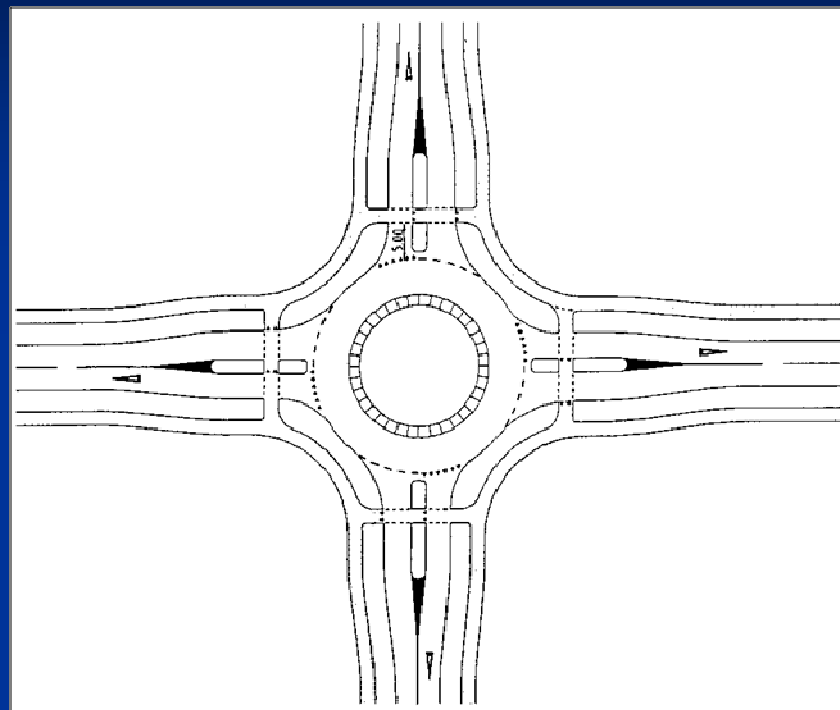
Posredno

Vodenje kolesarjev v krožnih križiščih





Kolesar ima prednost



Kolesar nima prednosti

Vodenje kolesarjev – 4m do 5m zamika





Shranjevanje koles



Dimenzioniranje parkirišč

Dejavnost	Število parkirnih mest za kolesa (pmk)	
	Evropski normativ (Crowl, vol. 25)	Priporočilo SLO
Poslovne dejavnosti	1–3 pmk / 100m ² bruto površine (za zaposlene)	1 pmk / 100m ² bruto površine (za zaposlene)
Nakupovalni centri	5–10 pmk / 100m ² bruto površine (za obiskovalce)	3 pmk / 100m ² bruto površine (za obiskovalce)
Šole	1 pmk / 2 šolarja (za obiskovalce) 1 pmk / 5 zaposlenih (za zaposlene)	1 pmk / 5 šolarjev (za obiskovalce) 1 pmk / 10 zaposlenih (za zaposlene)
Rekreacijski centri in športne dvorane	30 pmk / 100 sedežev (za obiskovalce)	5 pmk / 100 sedežev (za obiskovalce)
Gledališča in kino dvorane	25 pmk / 100 sedežev (za obiskovalce)	10 pmk / 100 sedežev (za obiskovalce)
Avtobusne in železniške postaje	Stojala za 10 do 20% dnevnih potnikov na postaji	Stojala za 5 do 10% dnevnih potnikov na postaji
Bolnice	15–30 pmk / 100 postelj (za obiskovalce)	10 pmk / 100 postelj (za obiskovalce)



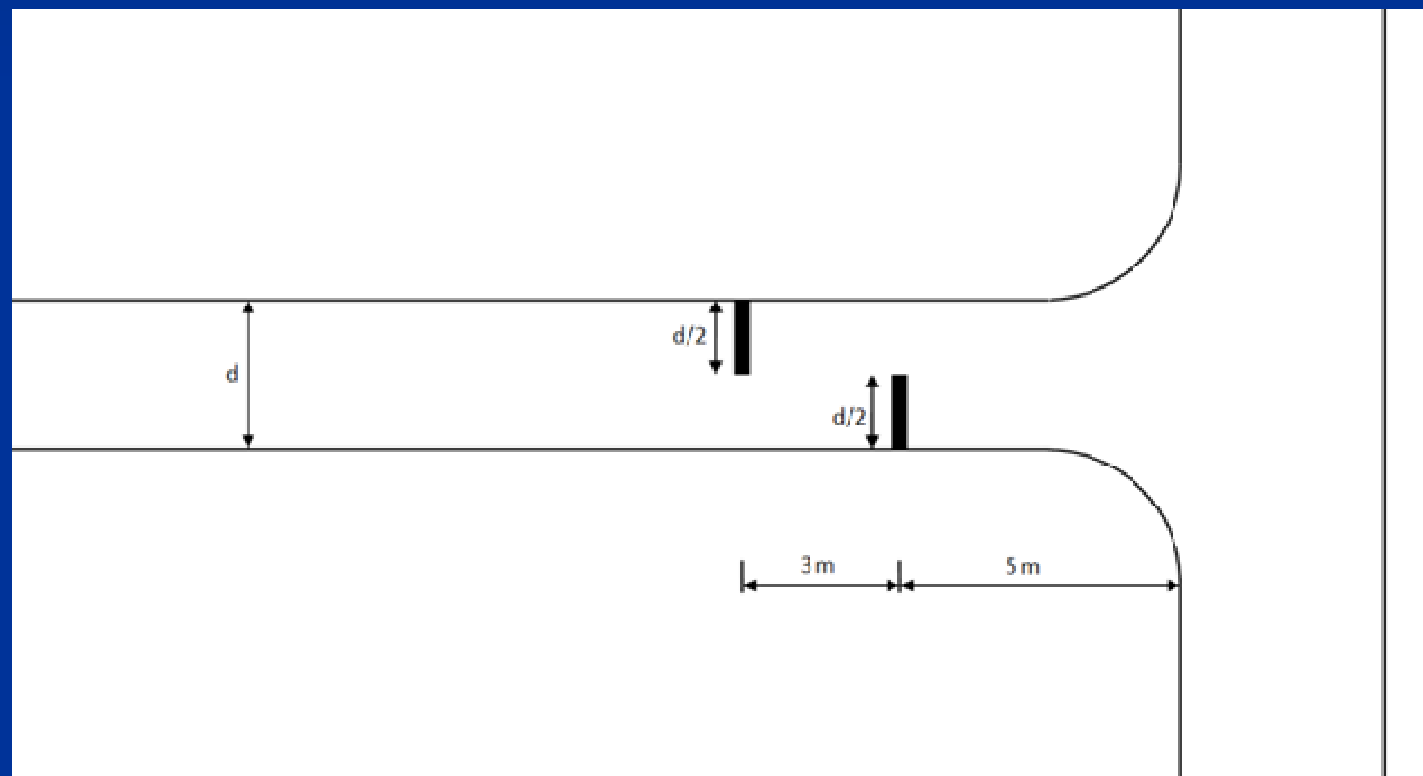
FIETS  BERAAD



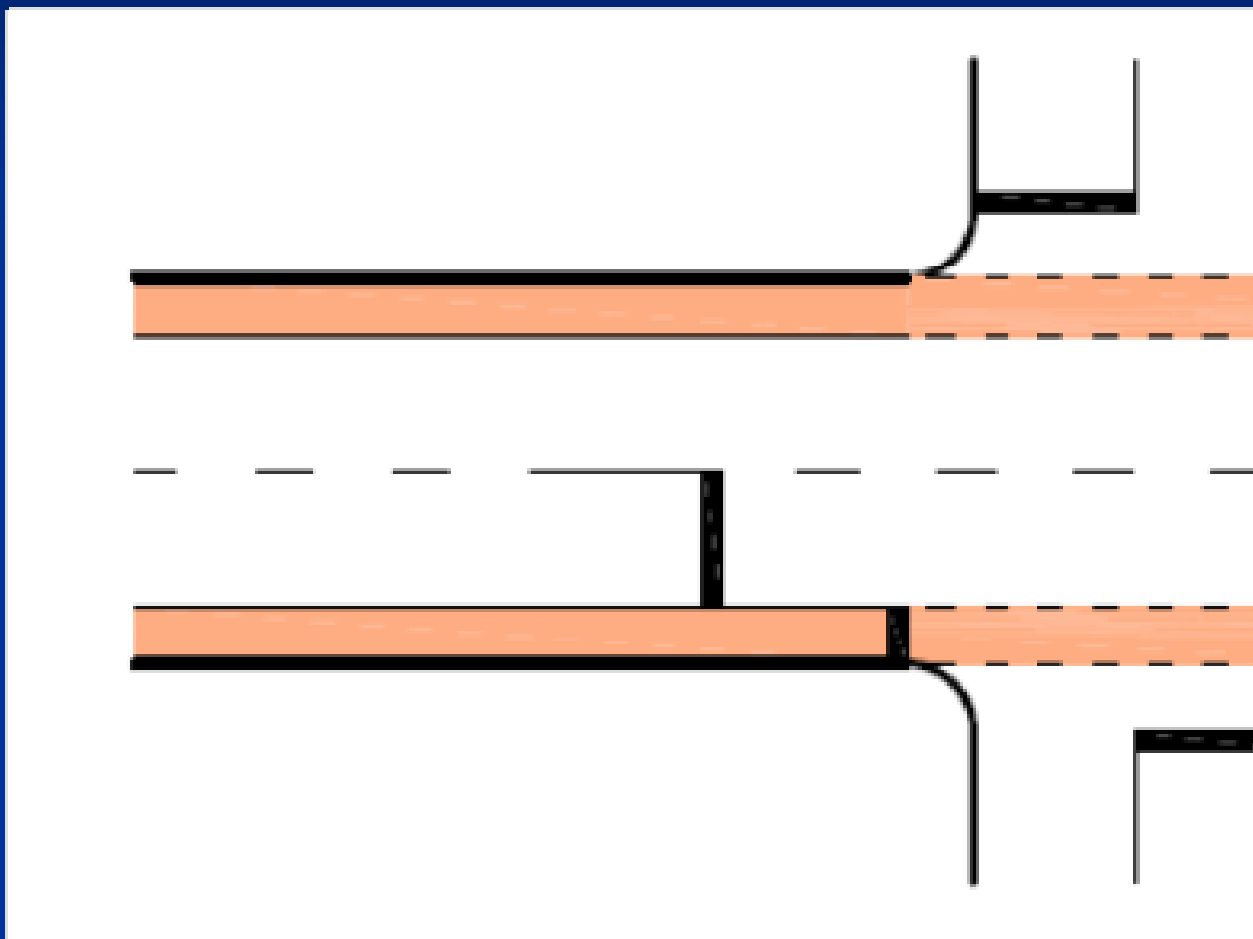


DETAJLI

Zaključek kolesarske poti



Naprej pomaknjena “STOP” črta







Sikkerhedseffekter af tilbagetrukne stopstreger

For-efter uheldsevaluering af 123 signalregulerede kryds.



Thomas Skallebæk Buch
Søren Underlien Jensen

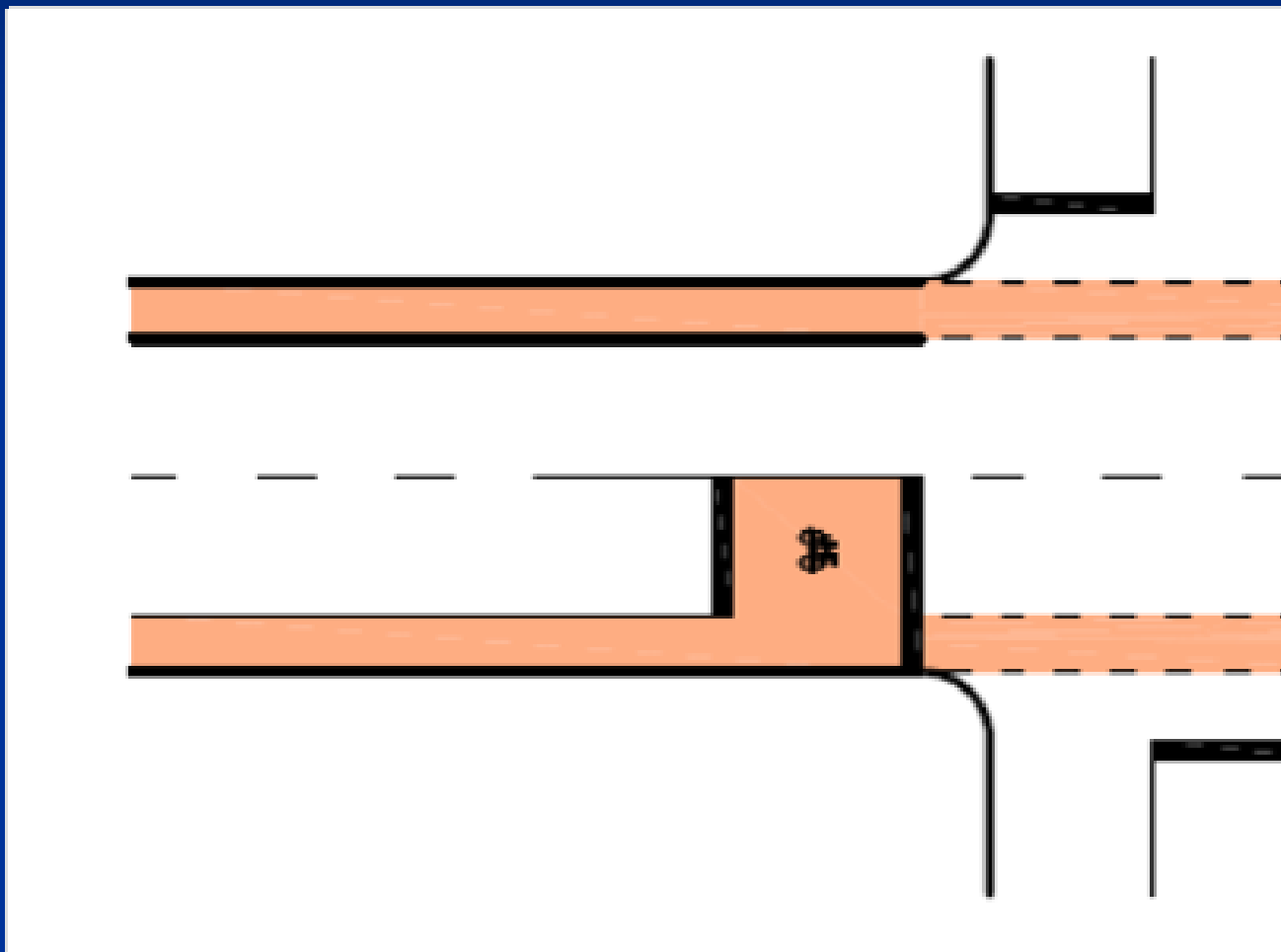
December 2012

Results

Staggered stop lines have only a limited impact on the total number of accidents in the junctions as the safety effect is comparable to the development of other accidents in the junctions. On the other hand, the number of personal injuries increases slightly. The number of accidents with motor vehicles entering from an arm, where the stop line has been staggered, has increased by 10% whilst the number of personal injuries has increased by 4%. By comparison, the number of other accidents in the junctions has increased by 7%, whilst the number of personal injuries was reduced by 8%.

Staggered stop lines have resulted in 35% more personal injuries in accidents between motor vehicles only. By comparison, there were 56% fewer personal injuries (almost significant, but heterogeneous) in accidents between motor vehicles where none of the parties entered from an arm where the stop lines have been staggered.

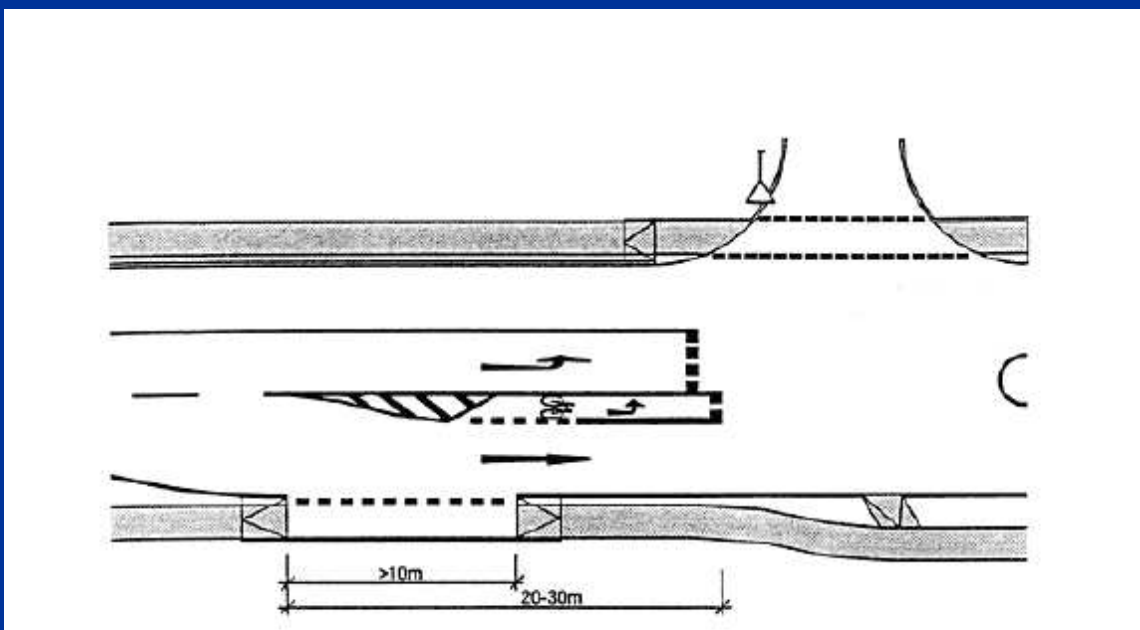
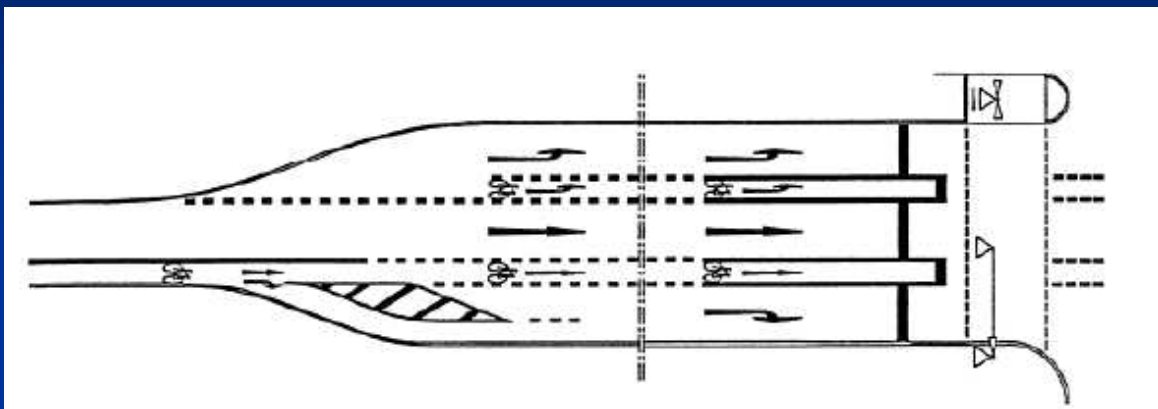
Boks za kolesarje



V Ljubljani



Še ne upamo...



Varovani pas (schutzstreifen)



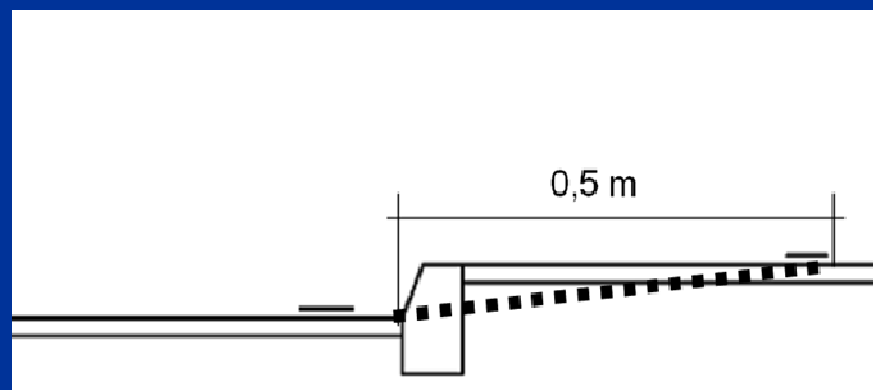
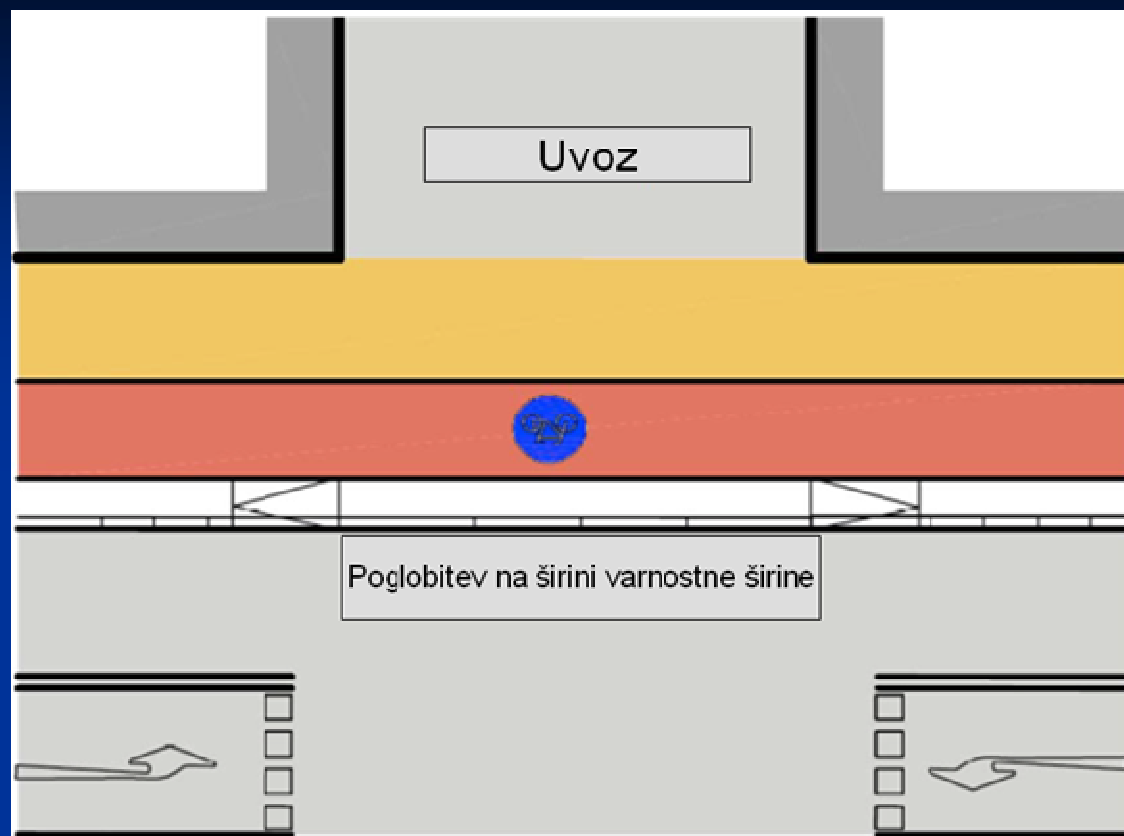
Uvozi



Alešovčeva ulica



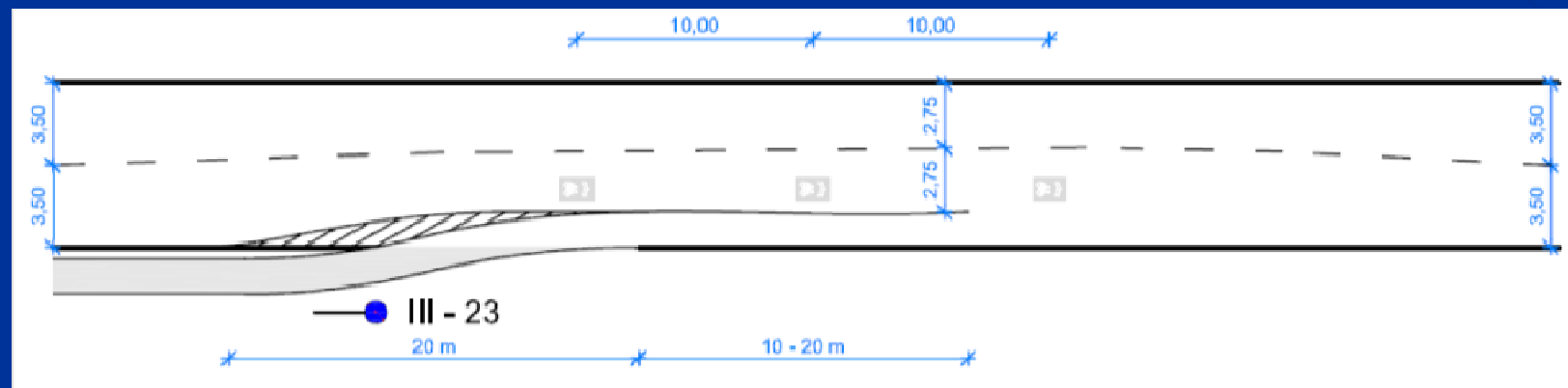
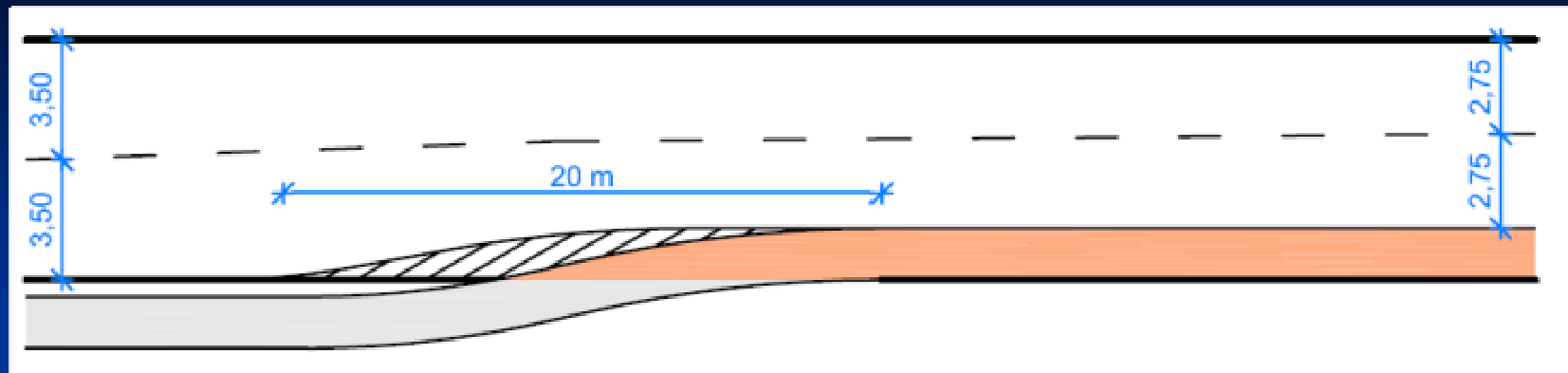






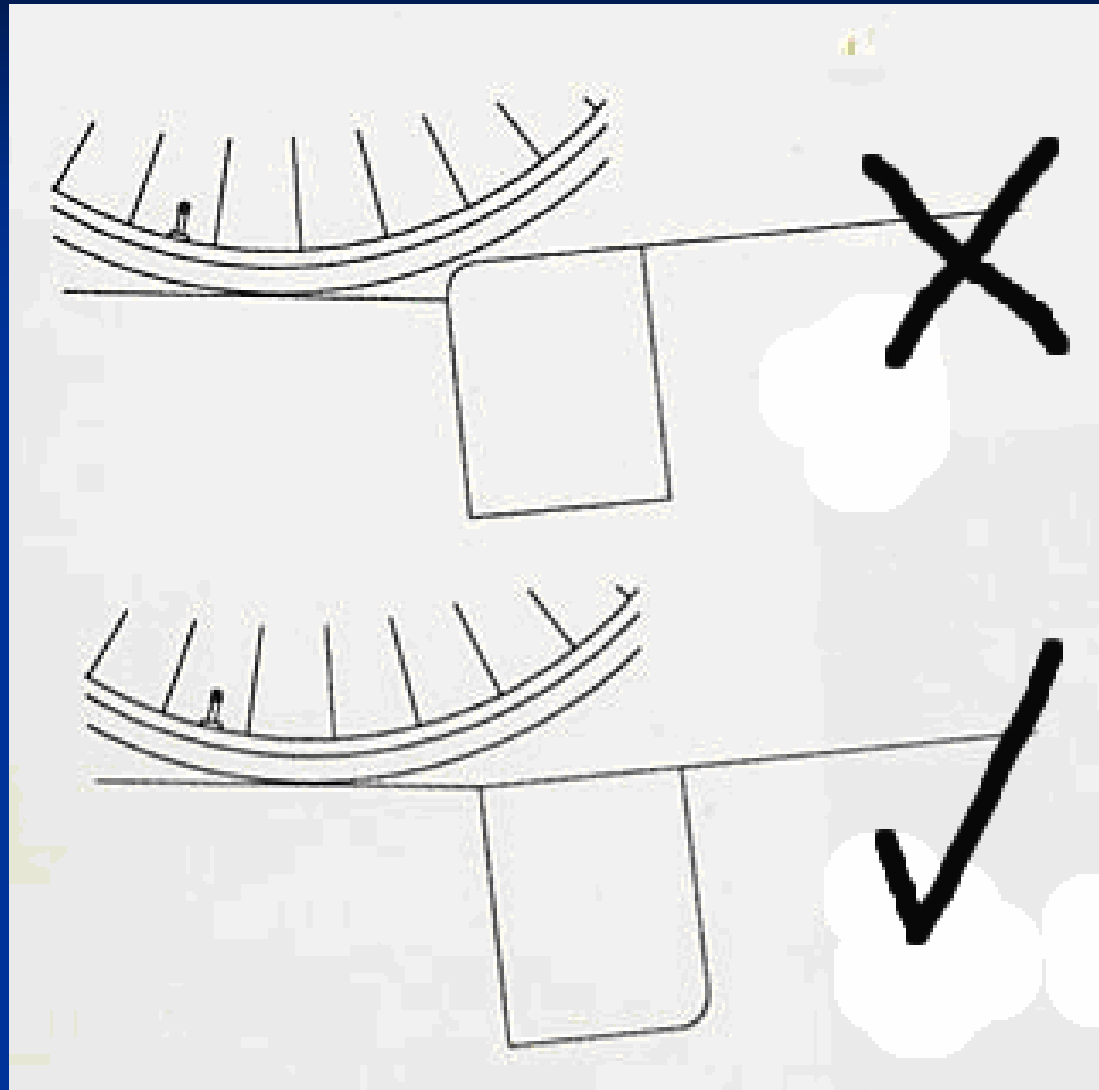
Prehod s kolesarske steze ali poti na kolesarski pas ali
kolesarjenje na vozišču



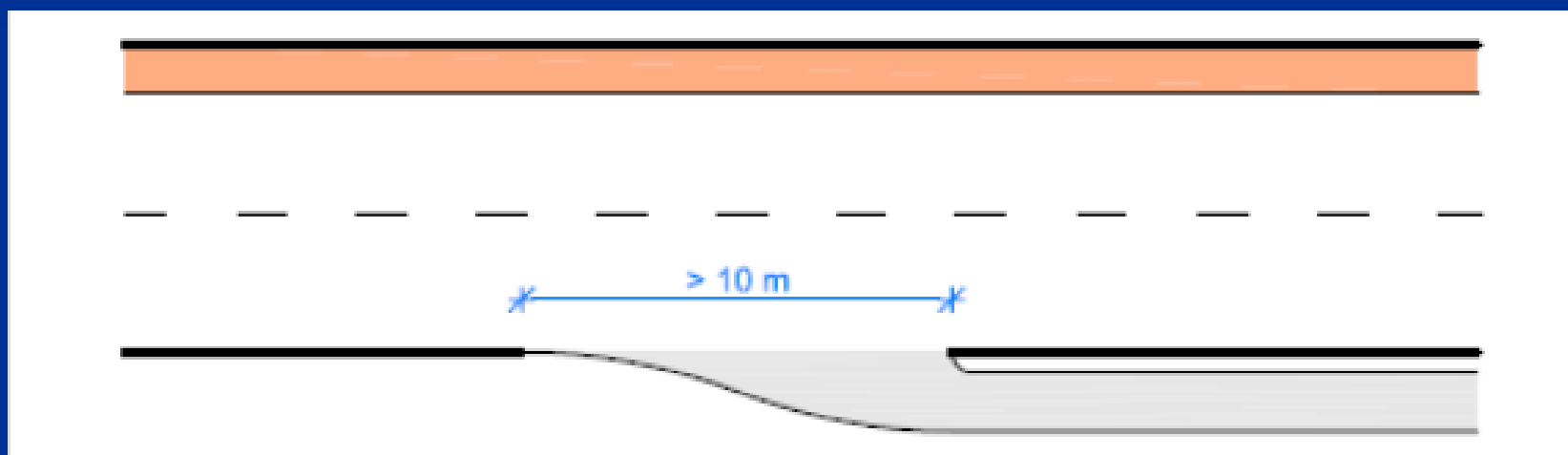


Robniki

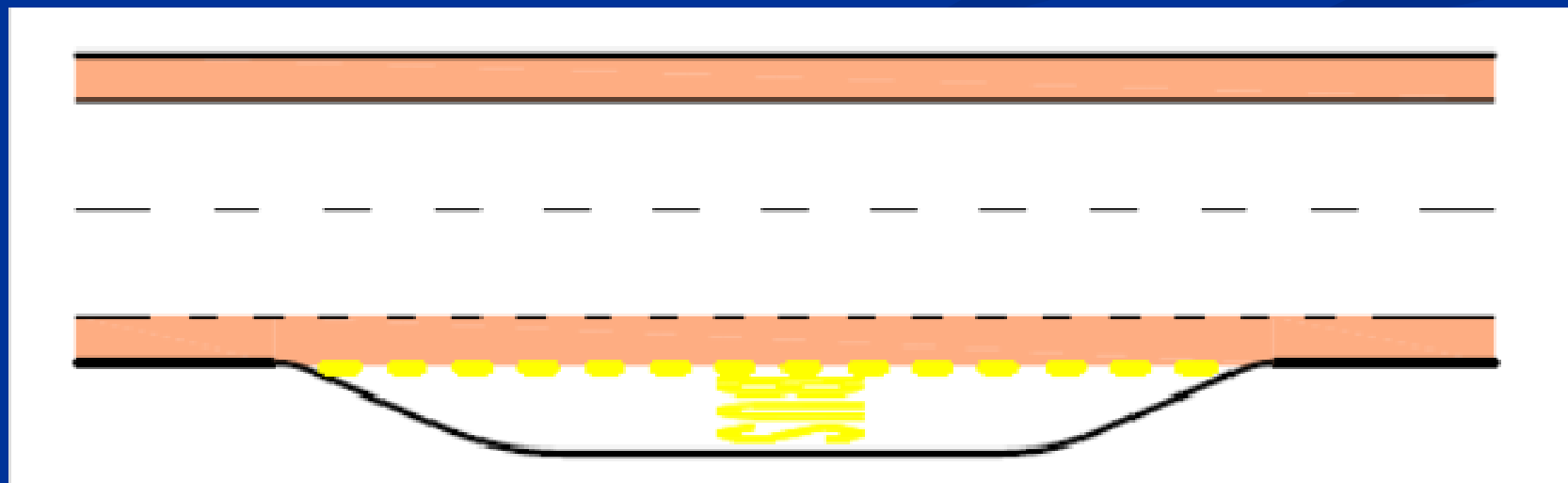
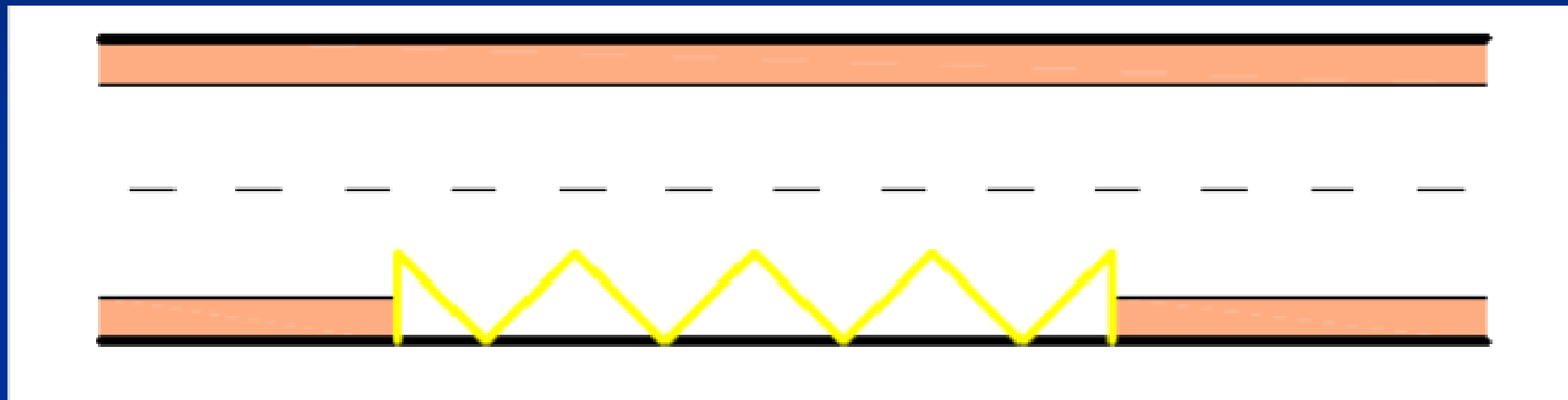


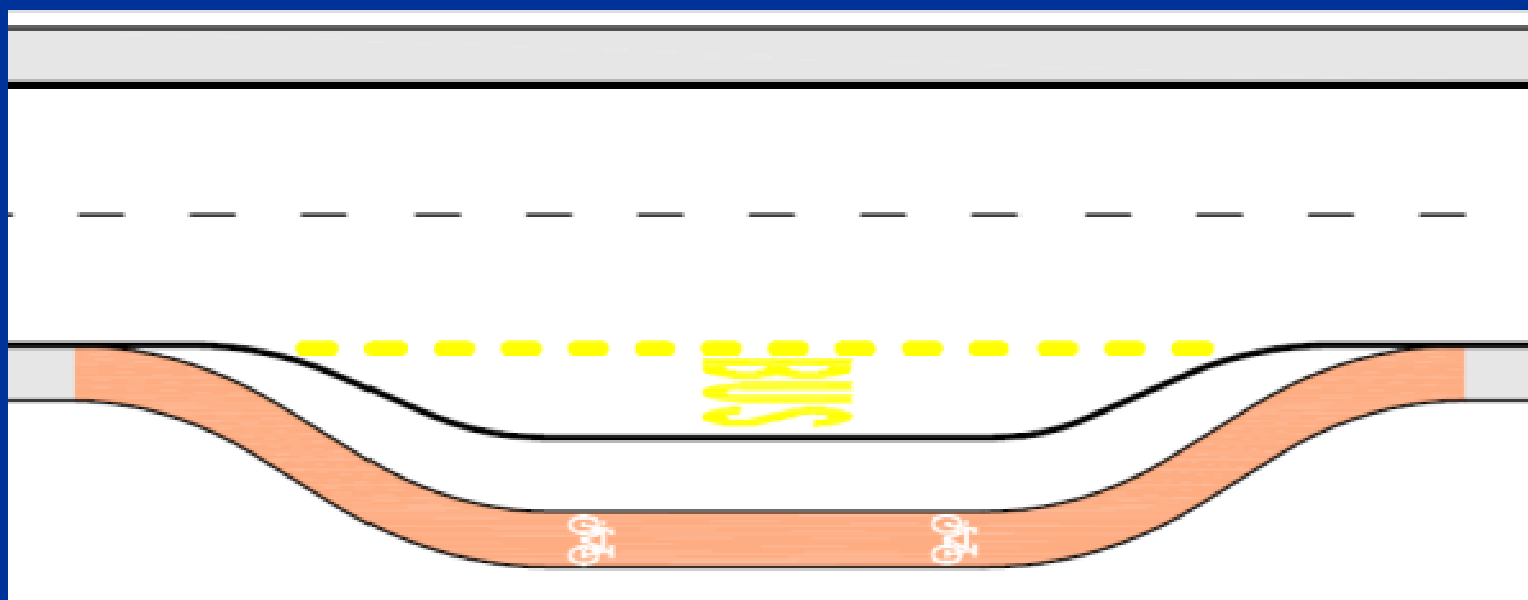
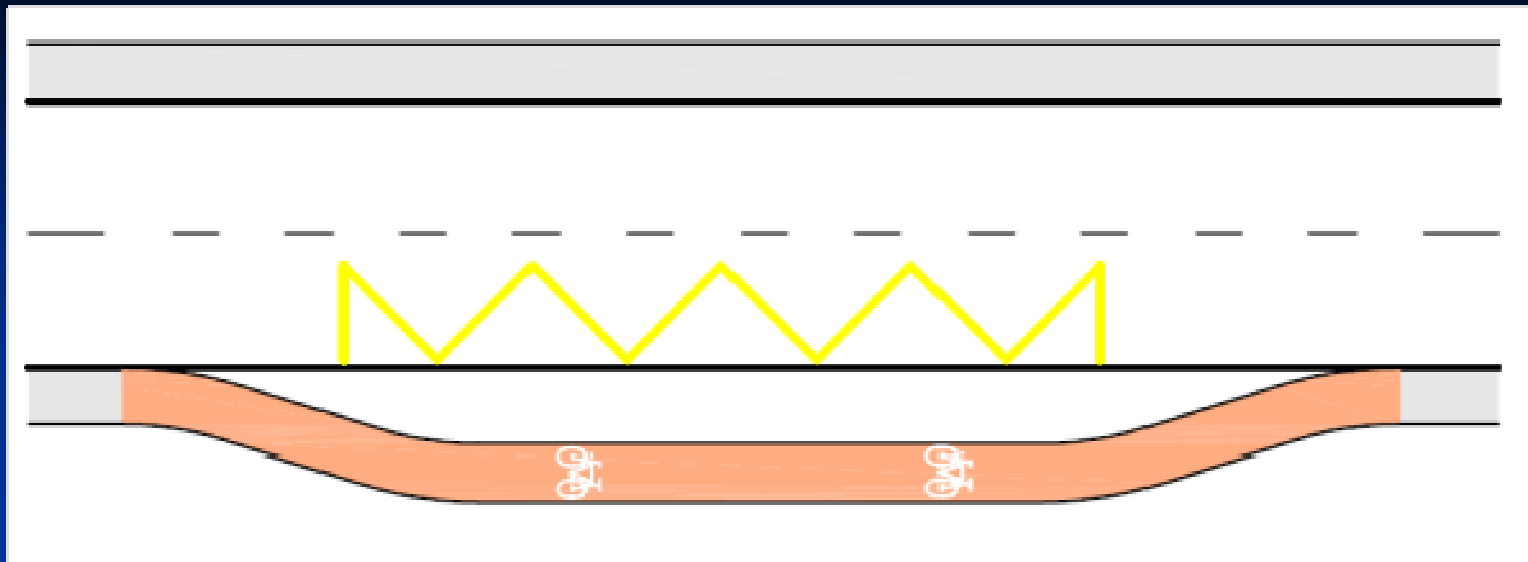


Začetek kolesarske steze



Vodenje v območju avtobusnih postajališč

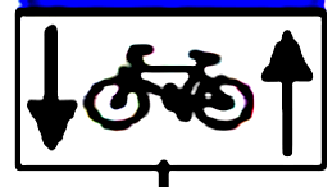
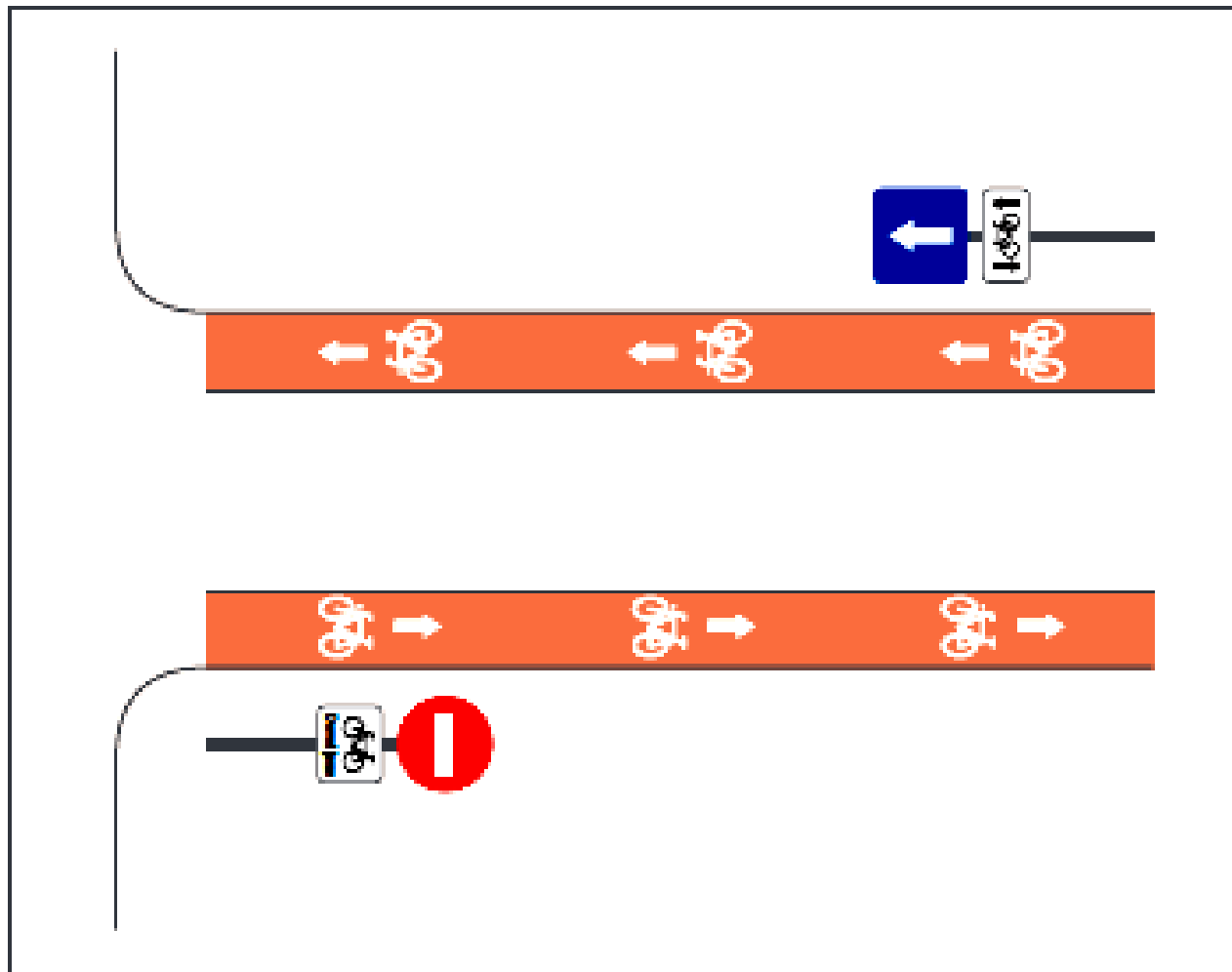




Nivojsko križanje z železnico



Kolesarski pas na enosmerni cesti – vožnja v nasprotni smeri



Sharrow line



V Mariboru je že...





**POZOR
KOLESARJI!**



↑ 2,5 km ↑

A ni ta znak za kolesarje...se pravi, da moramo kolesarji paziti, ker se nahajamo na cesti, kjer so avtomobili in da če je za nami avto se mu moramo umaknit na bankino ?

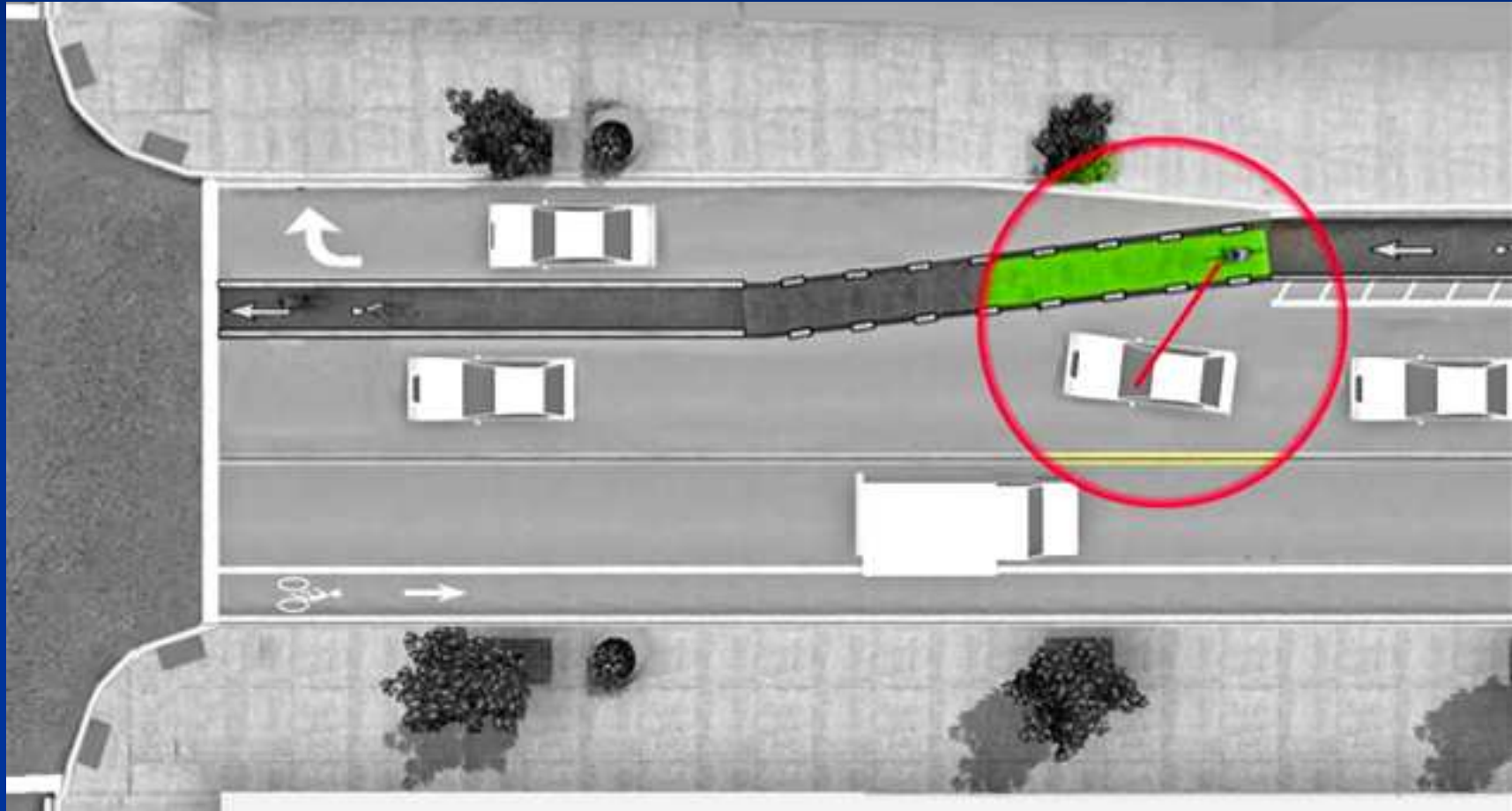
Za besedo pozor, bi morala biti vejica ali klicaj, če naj bi to pomenilo, da naj pazijo vozniki ker tako kot je napisano res pomeni, da naj bi mi kolesarji pazili.



NACTO - is this safe???



Bad angle of crossing



Dutch solution



Zakonodaja...

U K A Z o razglasitvi Zakona o cestah (ZCes-1)

Razglašam Zakon o cestah (ZCes-1), ki ga je sprejel Državni zbor Republike Slovenije na seji 20. decembra 2010.

Št. 003-02-11/2010-15

Ljubljana, dne 28. decembra 2010

9. člen

(gradnja in vzdrževanje javnih cest)

(5) Če javne ceste ali njenega dela zaradi prostorskih, okoljevarstvenih, tehničnih ali ekonomskih razlogov, varstva kulturne dediščine, posebno težkih terenskih razmer ali drugih posebej utemeljenih razlogov ni mogoče načrtovati, projektirati ali graditi z elementi, ki v celoti ustrezajo njenemu prometnemu pomenu in vrstam prometa, ki jim je namenjena, se lahko načrtuje, projektira ali gradi s slabšimi elementi. Za vsa odstopanja mora biti v postopku načrtovanja in projektiranja izvedena primerjava z rešitvami, skladnimi s predpisi s področja projektiranja cest. Predlagane rešitve, ki odstopajo od predpisanih s predpisi, ki urejajo projektiranje javnih cest, morajo biti posebej utemeljene in jih odobri za državne ceste minister, pristojen za promet, za občinske ceste pa župan.

FHWA

- ...it is important to note that many urban situations are complex; treatments must be tailored to the individual situation. **Good engineering judgment** based on deep knowledge of transportation should be a part of road design. Decisions should be thoroughly documented.