Interaction between cyclists and right turning motor vehicles at signalised intersections

Field observations and interviews with cyclists

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Work Package Report

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– Field observations and interviews with cyclists

Document information

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Summary

The aim of the study presented in this report was to investigate what cues cyclists use to interpret the intention of motor vehicles (MVs) they interact with. This was done with help of on-site observations of cyclists' interactions with motor vehicles (MV) at signalised intersections with different bicycle infrastructure facilities: A) no dedicated cycle facility, B) cycle lane and C) cycle path.

Interactive situations, when cyclists aiming to cycle straight through the intersection and MVs aiming to turn right approached the intersection simultaneously were observed and cyclists' visual search behaviour was categorised. The field observations were carried out by human observers during morning and afternoon peak hours of working days, during September 2018 to August 2019 in the cities of Kristianstad, Lund and Malmö in Sweden. Totally, at the three different types of sites, 1416 situations were observed.

Cyclists were interviewed on-site at the three different types of sites to explore their general strategy in searching for cues to interpret the intention of the driver of the MV and their behaviour generally in an encounter. At each of the three different types of sites, around 100 cyclists were stopped (after they passed the intersection in straight direction), and interviewed. The interviews were made on working days during 7:00 and 17:30.

The majority of the interviewed cyclists said that when arriving at an intersection just after a motor vehicle they usually pass it on its right side. The observations showed that at sites with cycle lane and sites with cycle path, the great majority of the cyclists passed the motor vehicle on its right side. If the motor vehicle was a heavy vehicle (bus or lorry), then somewhat fewer cyclists passed it on its right side. At sites with mixed traffic (no cycle facility), only about one third passed the MV. The largest share of cyclist at sites with cycle lane and sites with cycle path did not look at the MV at all, while at sites with mixed traffic (no cycle facility) the largest part of the observed cyclists scanned the whole motor vehicle. At sites with cycle path, the cyclists looked for eye contact with the driver of the MV to a much larger extent than cyclists at the other two types of sites, where they either scanned the whole motor vehicle or looked at its turning indicator. Those cyclists who passed the MV on its right side were more active in their visual search behaviour than those not passing the MV. Cyclists at sites with mixed traffic (no cycle facility) were more active in their visual search behaviour than cyclists at the other two types of sites. The share of critical situations indicates that the infrastructure solution with mixed traffic (no cycle facility) is the safest one and cycle lane solution is least safe. However, it must be kept in mind that traffic volumes are much lower at intersection without dedicated cycle facility, since municipalities tend to apply cycle lane or cycle path solutions if the traffic volume is high at the intersection. The majority of the respondents prefer the design solution with cycle path. Further studies under controlled conditions (e.g. in cycling simulator) are needed to investigate in detail cyclist's behaviour and eye movement when approaching an intersection and at the same time a motor vehicle in the same direction arrives/stands ahead.

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1. Introduction

1.1 Overview

This interim report is part of the "Interaction between cyclists and motor vehicles - the role of infrastructure design and vehicle characteristics" research project conducted with support from the Strategic Vehicle Research and Innovation Programme (FFI) and Ramboll.

The aim of the research project is to examine interactions between motor vehicle drivers and cyclists with a focus on driver/cyclist behaviour at intersections and how infrastructure design and motor vehicle characteristics affect behaviour and conflict outcomes – especially at locations with high incident frequency.

The research project comprises five work packages, and this interim report is part of work package three, which focuses on the cues cyclists use to interpret the intention of motor vehicles they interact with at signalised intersections with different cycle facilities.

1.2 Aim

The aim of the study presented in this report was to investigate what cues cyclists use to interpret the intention of motor vehicles (MVs) they interact with at signalised intersections with different bicycle infrastructure facilities (no dedicated space, cycle lane or cycle path) and different types of MVs (car/van/bus/lorry).

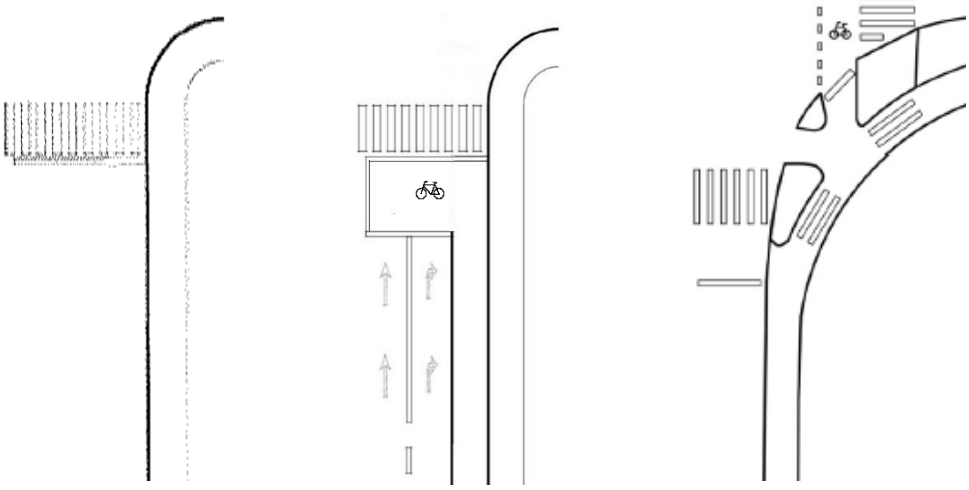
2. Method

2.1 On-site observations

Situations, when cyclists aiming to cycle straight through the intersection and MVs aiming to turn right approached the intersection simultaneously were observed and cyclists' visual search behaviour was categorised.

Regarding cycle infrastructure at the intersection, three types of sites were selected for the study (see Figure 1):

A. No cycle facility at all (cyclists use the same lane as MVs),
B. Cycle lane,
C. Cycle path.



Type A Type B Type C

Figure 1. Types of sites for the field observations.

The selected sites are located in the cities of Kristianstad, Lund and Malmö in Sweden, and are further described in section 3.

The field observations were carried out by human observers during September 2018 to August 2019. The observations were made during morning and afternoon peak hours of working days. The number of straight passing cyclists and right turning MVs on the approach of interest were counted at each intersection during morning (7:00-8:30) and afternoon (16:00-17:30) peak hours.

The criteria for an encounter to be recorded were:

- a cyclist and a MV approach the observational zone (appr. 30 meter before the stop line at the intersection) with a time difference below 2 seconds.
- if more than one cyclist approached simultaneously, the behaviour of the first cyclist was observed.

The observational variables were as follows:

- Weather: sunny/cloudy/rainy
- Road surface: dry/wet
- Type of MV involved: car/van/bus/Lorry
- Use of turning indicator by the MV: in good time / too late / not at all
  - Arrival of cyclist: just ahead of a MV / head to head with a MV / just after a MV - if arriving just after a MV: a) the cyclist stays behind the MV or b) passes the MV
- Cyclist's visual search of intention of the MV: looks at the entire MV / looks at turning indicator of MV / looks for eye contact with driver / other / does not look at MV at all
- State of traffic signal: green/amber/red
- Traffic signal phase: start of phase / end of phase
- Who passes first: MV/cyclist
- Open comments if anything particular during the encounter.

For the observation protocol, see Appendix 1.

2.2 On-site interviews

Cyclists were interviewed on-site at the three different types of sites (see Figure 1) to explore their general strategy in searching for cues to interpret the intention of the driver of the MV and their behaviour generally in an encounter. At each of the three different types of sites, around 100 cyclists were stopped (after they passed the intersection in straight direction), and interviewed. The interviews were made on working days during 7:00 and 17:30. For the interview questions, see Appendix 2.

3. Studied sites

3.1 Sites for observations

Type A sites

Lund:

- Östra Vallgatan – Östra Mårtensgatan: approach Östra Vallgatan North bound

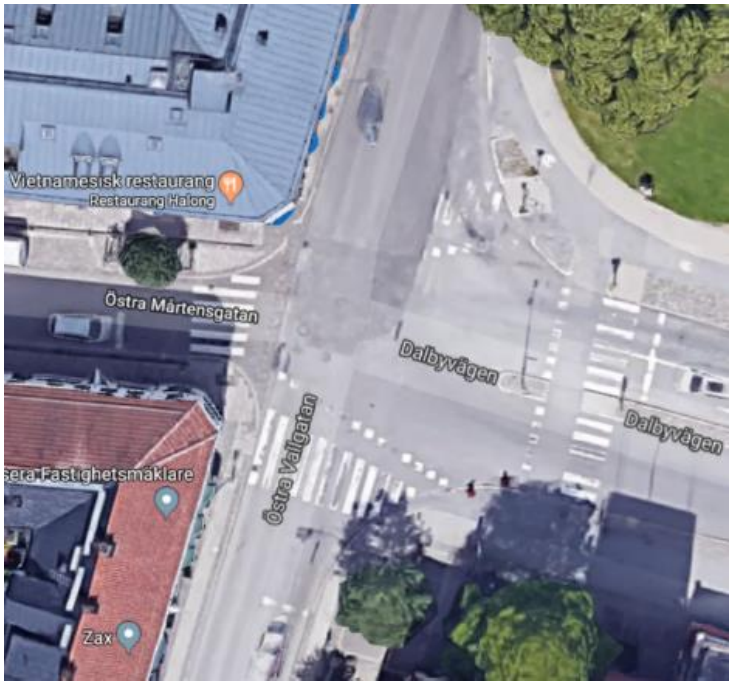


Figure 2. Östra Vallgatan – Östra Mårtensgatan in Lund (Google maps).

Malmö:

- Nobelvägen – Spånehusvägen: approach Spånehusvägen East and West bound

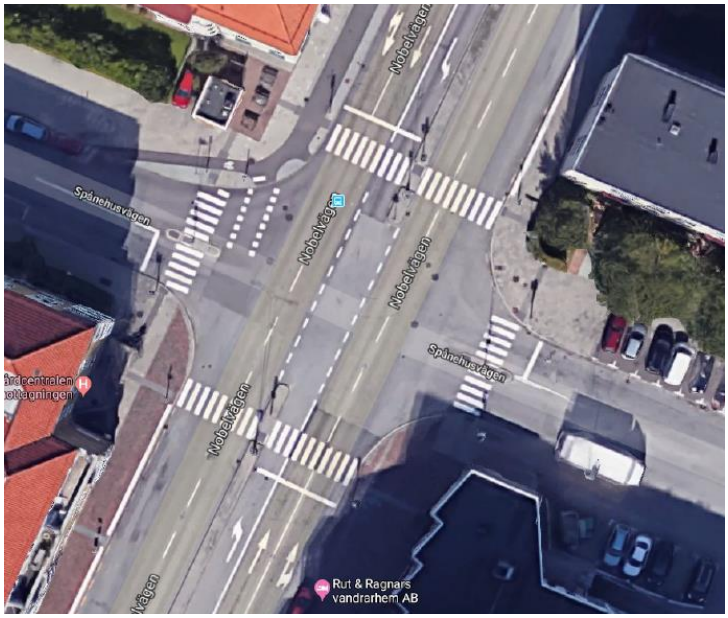


Figure 3. Nobelvägen – Spånehusvägen in Malmö (Google maps).

- Linnégatan – Järnvägsgatan: approach Järnvägsgatan North and South bound

Figure 4. Linnégatan – Järnvägsgatan in Malmö (Google maps).

Type B sites

Lund:

- Tornavägen – Sölvegatan: approach Sölvegatan West bound
- Tornavägen – Sölvegatan: approach Sölvegatan East bound

Figure 5. Tornavägen – Sölvegatan in Lund (Google maps).

- Tornavägen – Tunavägen: approach Tunavägen West bound
- Tornavägen – Tunavägen: approach Tornavägen South bound

Figure 6. Tornavägen – Tunavägen in Lund (Google maps).

Malmö:

- Bergsgatan - Friisgatan: approach Friisgatan East bound
- Bergsgatan - Friisgatan: approach Friisgatan West bound

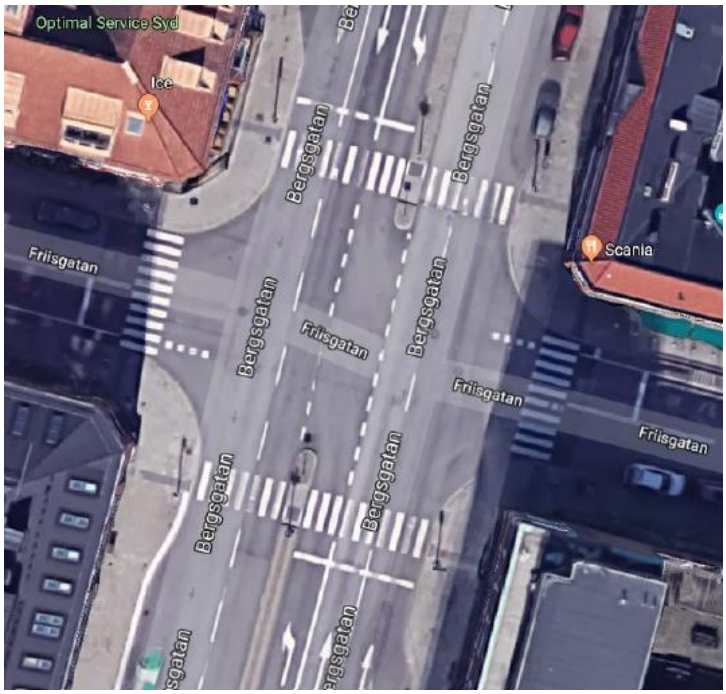


Figure 7. Bergsgatan - Friisgatan in Malmö (Google maps).

Type C sites

Kristianstad:

- Snapphanevägen - Kanalgatan: approach Kanalgatan South bound

Figure 8. Snapphanevägen - Kanalgatan in Kristianstad (Google maps).

- Snapphanevägen - Götgatan: approach Snapphanevägen South bound

Figure 9. Snapphanevägen - Götgatan in Kristianstad (Google maps).

Lund:

- Getingevägen – Baravägen: approach Getingevägen West bound

Figure 10. Getingevägen – Baravägen in Lund (Google maps).

- Ringvägen – Malmövägen: approach Ringvägen East bound

Figure 11. Ringvägen – Malmövägen in Lund (Google maps).

- Dalbyvägen – Tornavägen: approach Dalbyvägen West bound
- Dalbyvägen – Tornavägen: approach Tornavägen North bound

Figure 12. Dalbyvägen – Tornavägen in Lund (Google maps).

3.2 Sites for Interviews

Cyclist passing the site of interest in the relevant studied direction (same as for the observations) were stopped and interviewed.

Type A sites

Östra Vallgatan - Östra Mårtensgatan, Lund, see Figure 2.

Type B sites

Tornavägen - Sölvegatan, Lund, see Figure 5.

Tornavägen - Tunavägen, Lund, see Figure 6.

Type C sites

Ringvägen - Malmövägen, Lund, see Figure 11.

Dalbyvägen - Tornavägen, Lund, see Figure 12.

4. Observational results

4.1 Traffic volumes

The number of straight passing cyclists and right turning MVs per hour on the approach of interest during morning- and afternoon- peak traffic periods are shown in Table 1.

Table 1. Number of straight passing cyclists and right turning MVs on the approach of interest per hour during the morning (07:00-08:30) and afternoon (16:00-17:30) peak traffic periods.

Site		Approach	MV turning right		Cyclist straight	
Type	Name		Morning	Afternoon	Morning	Afternoon
A	Östra Vallgatan – Östra Mårtens gata	Östra Vallgatan North bound	13	24	38	12
A	Östra Vallgatan – Östra Mårtens gata	Östra Vallgatan South bound	15	43	7	16
A	Nobelvägen – Spånehusvägen	Spånehusvägen East bound	12	30	11	64
A	Nobelvägen – Spånehusvägen	Spånehusvägen West bound	47	34	105	40
A	Linnégatan – Järnvägsgatan	Järnvägsgatan North bound	16	62	24	17
A	Linnégatan – Järnvägsgatan	Järnvägsgatan South bound	11	54	20	6
B	Tornavägen – Sölvegatan	Sölvegatan West bound	29	64	117	46
B	Tornavägen – Sölvegatan	Sölvegatan East bound	34	70	171	120
B	Tornavägen – Tunavägen	Tunavägen West bound	7	7	119	168
B	Tornavägen – Tunavägen	Tornavägen South bound	130	108	84	35
B	Bergsgatan - Friisgatan	Friisgatan East bound	29	79	87	134
B	Bergsgatan - Friisgatan	Friisgatan West bound	7	13	104	89
C	Snapphanevägen - Kanalgatan	Kanalgatan South bound	58	101	91	54
C	Snapphanevägen - Götgatan	Snapphanevägen South bound	160	99	82	50
C	Getingevägen – Baravägen	Getingevägen West bound	197	332	69	76
C	Ringvägen – Malmövägen	Ringvägen East bound	66	137	85	167
C	Dalbyvägen – Tornavägen	Dalbyvägen West bound	458	215	167	63
C	Dalbyvägen – Tornavägen	Tornavägen North bound	129	180	70	15

4.2 Number of observed situations

The number of observed situations at the different types of sites is presented in table 2.

Table 2. Number of observed situations at the different types of sites.

Type of site		
Type A	**Type B**	**Type C**
174	453	789

The great majority of the MVs were passenger cars, see Table 3.

Table 3. Share of different types of MVs at the different types of sites.

Type of MV	**Type of site**		
	Type A N=174	**Type B N=453**	**Type C N=789**
Car	96.6 %	83.0 %	85.2 %
Van	2.9 %	4.0 %	4.2 %
Bus	0.0 %	10.6 %	7.9 %
Lorry	0.6 %	2.4 %	2.8 %

Use of turning indicator by the MVs was similar at all three types of sites, see Table 4.

Table 4. Use of turning indicator by the MV (%).

Use of turning indicator by MV	**Type of site**		
	Type A N=174	**Type B N=453**	**Type C N=789**
In good time	86.8 %	89.2 %	88.7 %
Too late	9.2 %	7.7 %	5.8 %
Not at all	4.0 %	3.1 %	5.4 %

4.3 Weather-, road surface conditions and traffic signal phase

The great majority of the observations were made in dry weather conditions, see Table 5.

Table 5. Weather conditions (%).

Weather	**Type of site**		
	Type A N=174	**Type B N=453**	**Type C N=789**
Sunny	69.5 %	47.2	28.5
Cloudy	30.5 %	48.3	64.8
Rainy	0.0 %	4.4	6.7

When it comes to the road surface conditions, there are some differences. While at type A sites the great majority of the observations (77.6 %) were made during dry surface conditions, at type B sites, around half of the observations (56.5 %) were made during dry conditions and at type C sites the majority of the observations (60.5 %) were made during wet road conditions, see table 6.

Table 6. Road surface conditions (%).

Road surface conditions	**Type of site**		
	Type A N=174	**Type B N=453**	**Type C N=789**
Dry	77.6 %	56.5	39.5
Wet	22.4 %	43.5	60.5

The great majority of the observed cyclists arrived during green traffic signal phase at the observation sites, see table 7.

Table 7. Traffic signal phase (%).

Traffic signal phase	**Type of site**		
	Type A N=174	**Type B N=453**	**Type C N=789**
Green	96.0 %	73.7	93.2
Amber	4.0 %	4.0	4.3
Red	0.0 %	22.3	2.4

4.4 Observed behaviour

4.4.1 Cyclists arriving just after a MV

Situations, when a cyclist arriving at the intersection just after a MV and passes the MV on its right side may become hazardous, since the appearance of the cyclist "from nowhere" may surprise the driver of the MV. Hence, it was observed whether those cyclists who arrived just after a MV stayed behind the MV or passed it on its right side.

At type A sites, 67 cyclists arrived just after a MV, and of those, 35.8 % passed the MV on its right side, see figure 13. At type B sites, 219 cyclists arrived just after a MV, and of those, 73.5 % passed it on its right side. At type C sites, 212 cyclists arrived just after a MV and of those, 74.5 % passed it on its right side.

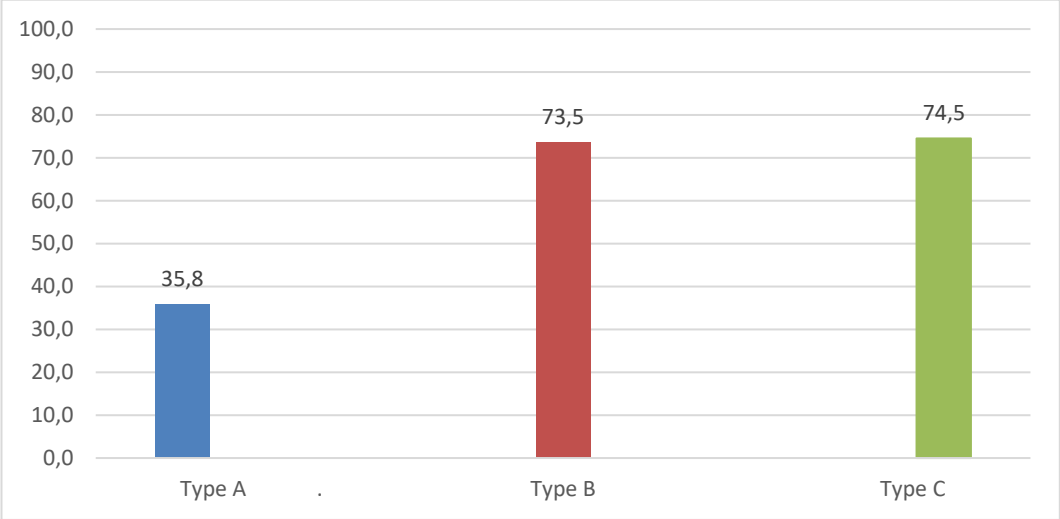


Figure 13. The share of cyclists, who arriving just after a MV passed the MV on its right side.

Regarding motor vehicle type, only at site types B and C could any analyses be made, due to the low number of MV types other than passenger car at type A sites. At B and C type of sites, the share of buses/lorries was 11-13 % of all MVs. At both these site types, there are some indications that cyclists arriving just after a MV pass it to a larger extent if the MV is a passenger car than if it is a heavy vehicle, see Table 7. However, the number of situations involving buses/lorries is too low to make definite conclusions.

Table 7. Share of cyclists who, when arriving after a MV, passes it on its right side - depending on MV type: car versus bus/lorry at site types B and C.

Type B sites		Type C sites	
Car (N=197)	**Bus/lorry (N=22)**	**Car (N=196)**	**Bus/lorry (N=16)**
74.1 %	68.2 %	75.0 %	68.8 %

4.4.2 Cyclist's visual search behaviour to foresee the intention of MV

Cyclist's visual search to foresee the intention of MV was observed in terms of whether the cyclist: 1) looked at the entire MV; 2) looked at the turning indicator of the MV; 3) looked for eye contact with driver of the MV; 4) looked at any other things; 5) Did not look at the MV at all.

At type A sites, among all cyclists (N=174), 63.2 % did not look at the MV at all, while 28.7 % scanned the MV to foresee its intention, see Figure 14. None of the cyclists looked for eye contact with the driver of the MV.

At type B sites, among all cyclists (N=453), 59.2 % did not look at the MV at all, while 26.0 % scanned the MV to foresee its intention and 12.1 % looked at the turning indicator of the MV. Very few looked for eye contact with the driver of the MV.

At type C sites, among all cyclists (N=789), 53.8 % did not look at the MV at all, while 27.7 % scanned the MV to foresee its intention and 9.1 % looked at the turning indicator of the MV. Only 8.4 % looked for eye contact with the driver of the MV.

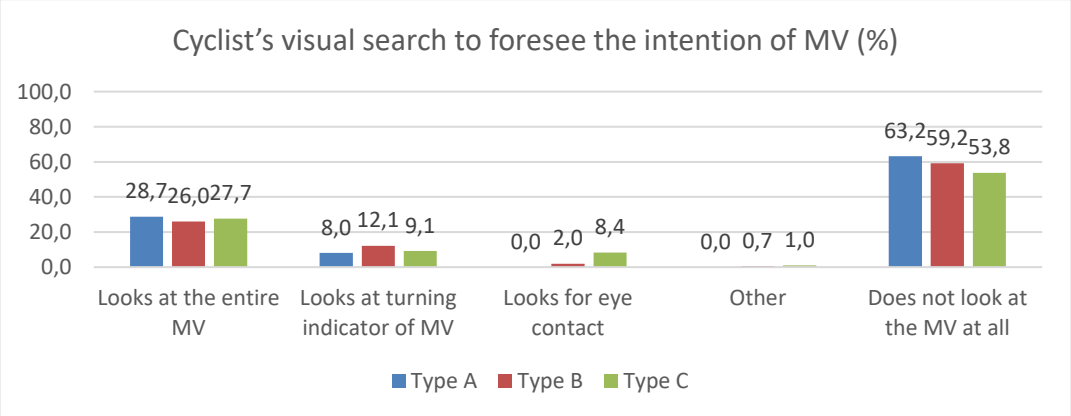


Figure 14. Visual search by cyclists to foresee the intention of MV at the three different types of sites.

Regarding vehicle type, only at site types B and C could any analyses be made, due to the low number of MV types other than passenger car at type A sites. At these types of sites, the share of buses/lorries was 11-13% of all MVs. At site type B, if the MV was a bus/lorry, cyclists looked more at the entire MV, looked less at the turning indictor of the MV, and to a larger extent did not look at the MV at all, if the MV was a car, see Table 8. At site type C, cyclists did not look at the MV at all to a larger extent if the MV was a bus/lorry.

Table 8. Visual search by cyclists to foresee the intention of car versus bus at site types B and C.

Cyclist's visual search	Type B sites		Type C sites	
	Car/van (N=394)	Bus/lorry (N=59)	Car/van (N=705)	Bus/lorry (N=84)
Looks at the entire MV	24.1 %	39.0 %	22.7 %	21.4 %
Looks at turning indicator of MV	12.9 %	6.8 %	16.2 %	8.3 %
Looks for eye contact	2.0 %	1.7 %	5.5 %	2.4 %
Other	0.8 %	0.0 %	0.6 %	0.0 %
Does not look at the MV at all	60.2 %	52.5 %	55.0 %	67.9 %

Among those cyclists who arrived just after a MV and passed it on its right side, at type A sites (N=24), 33.3 % did not look at the MV at all, while 54.3 % scanned the MV to foresee its intention and 12.5 % looked at the turning indicator of the MV. None of them looked for eye contact with the driver, see Figure 15.

At type B sites, among those cyclists who arrived just after a MV and passed it on its right side (N=161), 62.7 % did not look at the MV at all, while 19.3 % scanned the MV to foresee its intention and 15.5 % looked at the turning indicator of the MV. Also here, very few looked for eye contact with the driver of the MV.

At type C sites, among those cyclists who arrived just after a MV and passed it on its right side (N=158), 43.0 % did not look at the MV at all, while 32.3 % scanned the MV to foresee its intention and 13.3 % looked at the turning indicator of the MV. Only 10.1 % looked for eye contact with the driver of the MV.

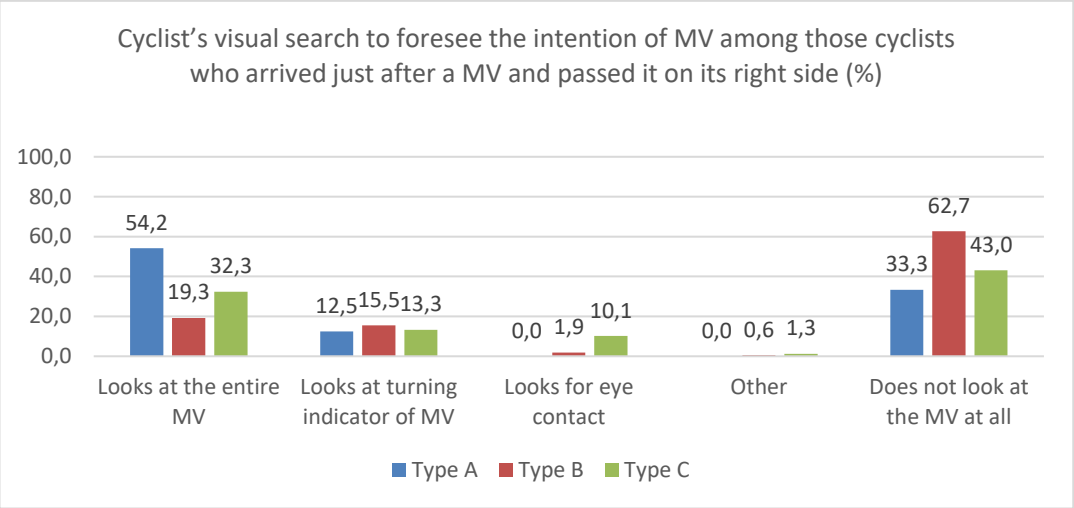


Figure 15. Visual search by those cyclists who arrived just after a MV and passed it on its right side, to foresee the intention of MV.

4.4.3 Who passes the conflict point first?

It was observed whether the MV or the cyclist passed the conflict point first, see Figure 17.

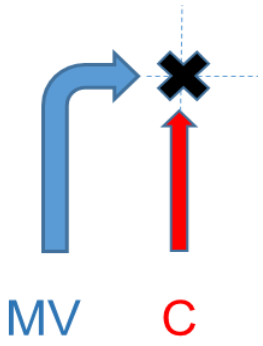


Figure 16. Illustration of the conflict point of passing MV and Cyclist

At type A sites, in 74.7 % of the observed situations (of the total N=174), the cyclist passed the conflict point first, see figure 17. However, in all 24 cases when the cyclist who arrived just after a MV and passed it on its right side the cyclists passed first the conflict point. One of these cases ended up in a critical situation demanding an evasive action from the MV driver to avoid a collision.

At type B sites, in 87.9 % of the observed situations (of the total N=453), the cyclist passed the conflict point first. However, in all 98 % cases when the cyclist who arrived just after a MV and passed it on its right side the cyclist passed first the conflict point. Fifteen of these cases ended up in a critical situation demanding an evasive action. In fourteen cases, the MV driver made an extreme braking to avoid a collision.

At type C sites, in 86.5 % of the observed situations (of the total N=789), the cyclist passed the conflict point first. However, among those cyclists who arrived just after a MV and passed it on its right side, in 98 % of the cases the cyclists passed first the conflict point. Seven of these cases ended up in a critical situation demanding an evasive action. In six cases, the MV driver made an extreme braking to avoid a collision.

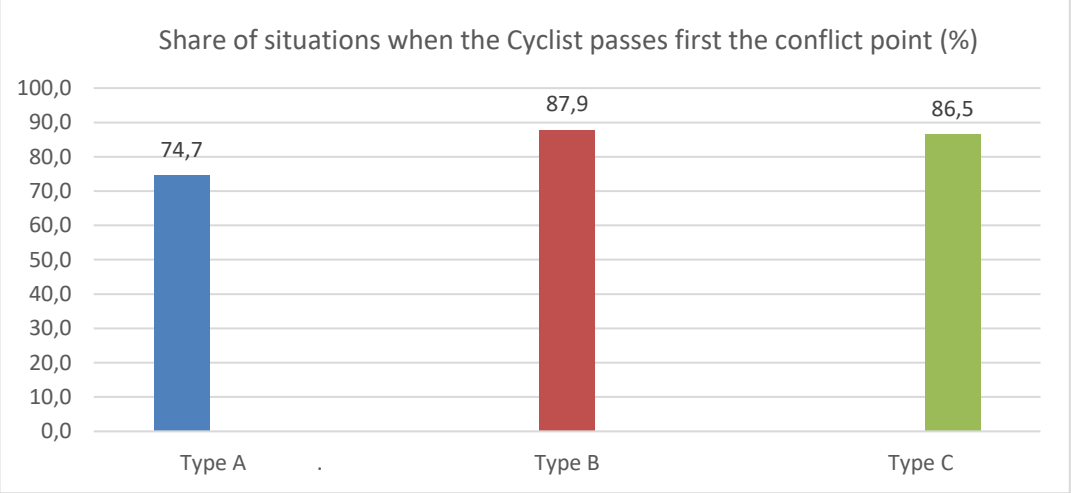


Figure 17. Share of situations when the Cyclist passes the conflict point first.

4.4.4 Critical situations demanding evasive action

Totally, of all observed situations, at type A sites 0.011 % ended up in a critical situation demanding evasive action from one or both of the involved road users. At type B sites 0.15 % and at type C sites 0.076 % ended up in a critical situation, see Figure 18.

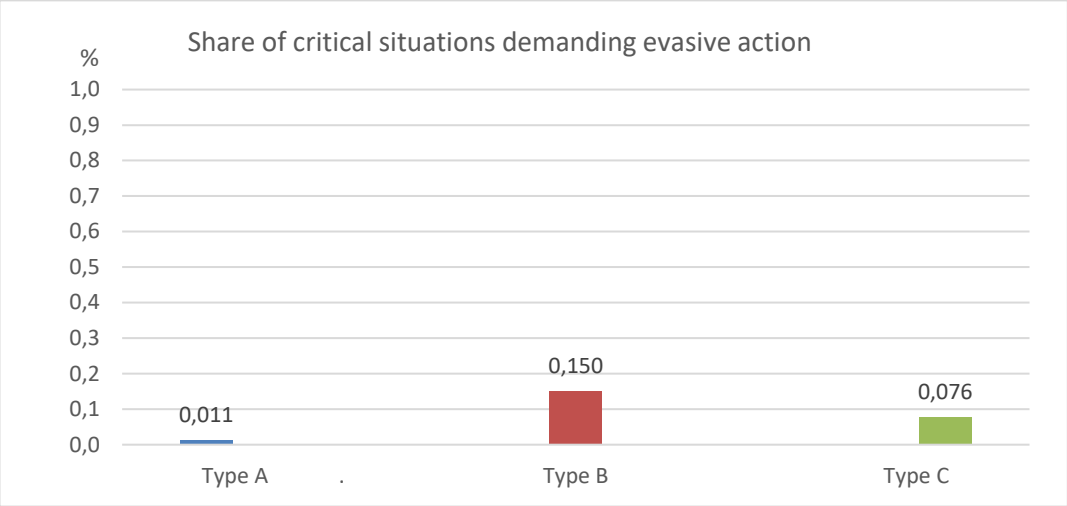


Figure 18. Share of critical situations demanding evasive action from one or both of the involved road users.

The share of critical situations demanding evasive action from the involved road users at type B sites is more than ten times higher than at type A sites and twice as high than at type C sites.

4.5 Summary of observational results

Totally, at the three different types of sites, 1416 situations were observed. While the great majority, 74 % of cyclists arriving just after a MV passed it on its right side at type B and C sites, at type A sites only 36 % did so. At site types B and C, if the MV was a passenger car then 74-75 % of the cyclists passed it on its right side, while if the MV was a heavy vehicle (bus/lorry) then somewhat less, i.e. 68 % of the cyclists passed it on its right side.

Regarding cyclist's visual search behaviour to foresee the intention of the MV, the majority (54-63 %) of the cyclists did not look at the MV at all. The next largest group (26–28 %) scanned the MV, and only 8-12 % looked at the turning indicator of the MV. The largest difference between the different sites was that at type C sites, 8 % of the cyclists looked for eye contact with the driver of the MV, while only 0-2 % did it at the other types of sites. Among those cyclists who arrived just after a MV and passed it on its right side, the differences were larger between the various sites. At type A sites, 54 % scanned the MV to foresee its intention and only 33 % did not look at the MV at all, while at type B and C sites the share of cyclists not looking at the MV at all was larger than the share of those looking at the entire MV or its turning indicator.

While at type A sites, the share of situations when the cyclist passed first the conflict point was 75 %, at the other types of sites the cyclist passed the conflict point first in 86-88 % of the situations. The share of critical situations demanding evasive action from the involved road users at type B sites was more than ten times higher than at type A sites and twice as high than at type C sites.

5. Interview answers

The number of interviewed cyclists at the different types of sites is presented in table 6.

Table 6. Number of interviewed cyclists at the different types of sites.

Type of site			All
Type A	Type B	Type C	
63	155	109	327

5.1 Answers at type A sites

Background variables of respondents

The majority of the 63 respondents (70 %) are from the age group 18-64 and 51 % are females, see Table 7.

Table 7. Respondents by gender and age group at type A sites.

Gender	Age				All
	<18	18-44	45-64	>64	
Female	5	15	8	4	32
Male	9	17	4	1	31
All	14	32	12	5	63

The great majority, 92 % cycle daily, and 5 % 2-4 times per week.

The great majority, 97 % use "normal" (comfort or city) cycle. See categorisation of cycle types in Appendix 2.

To the question "What do you usually look at to find out if the motor vehicle on your left side will turn right, and if so, will it give you the right of way?" the following answers were given, see Figure 19:

- 42.9 % said they looked at the vehicle's turning indicator,
- 31.7 % said they kept track of the vehicle's movement,
- 19.0 % said they looked for eye contact with the driver,
- 6.3 % said "other" (such as "trust the traffic light").

Braking down the answers to this question by gender, it can be seen that a larger share of females than males look at the vehicle's turning indicator, keep track of the vehicle's movement, look for eye contact with the driver of the motor vehicle, while a much larger share of males (12.9 %) than females (0.0 %) look at other things.

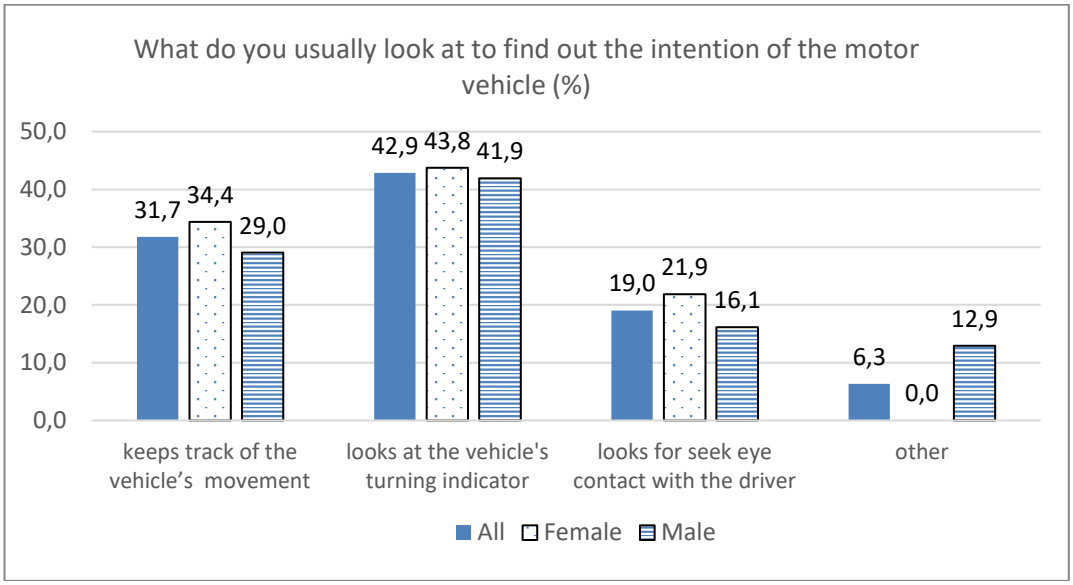


Figure 19. What do cyclists usually look at to find out if the motor vehicle on their left side will turn right, and if so, it will it give the cyclist the right of way - at type A sites.

To the question "What do you usually do when you perceive that the vehicle on your left will turn right and you judge that both of you will arrive at the point where your trajectories cross each other's at the same time?" the following answers were given, see Figure 20:

- I do nothing special, just cycle as usual: 17.5 %.
- I take it safe before the uncertain, even if it means I need to brake and possibly stop to let the vehicle pass: 41.3 %.
- Since you never know what the vehicle will do, I keep a close eye on the vehicle and slow down if necessary: 36.3 %.
- Since the vehicle has to yield, I cycle and signal through my action that I intend to pass the crossing point first and only brake if it really becomes necessary but then I can feel some irritation: 4.8 %.

Braking down the answers to this question by gender it can be seen that the largest share of both female and male respondents said that they are ready to brake and possibly stop to let the vehicle pass. The largest difference between genders is in the answer alternative "do nothing special, just cycle as usual" which was chosen by 22.6 % of male respondents but only by 12.5 % of female respondents, which indicates a somewhat more cautious behaviour of female respondents, see Figure 20.

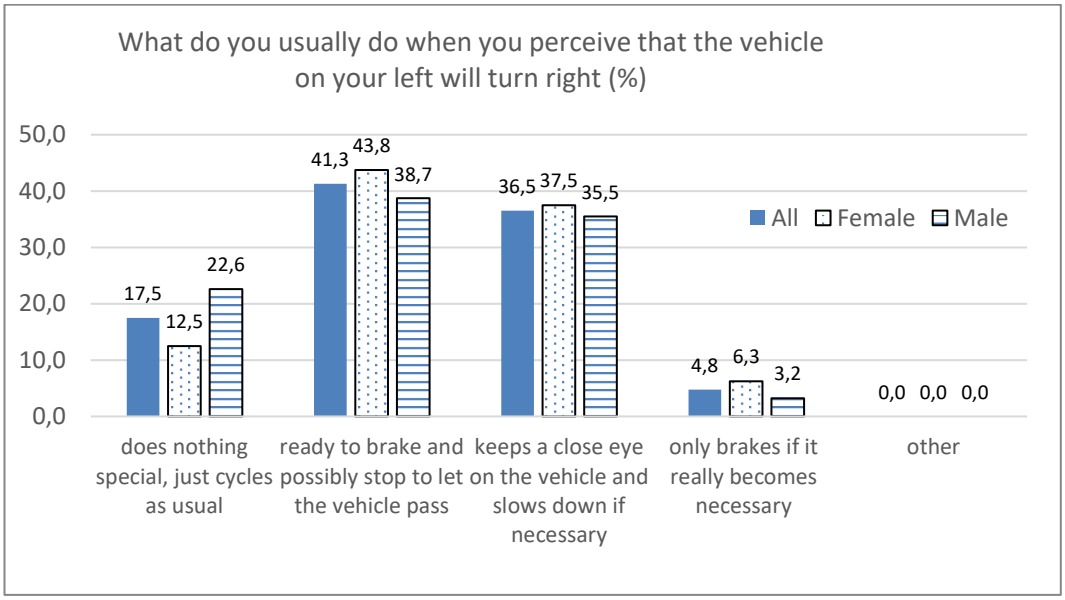


Figure 20. What do cyclists usually do when they perceive that the vehicle on their left will turn right and they judge that they arrive at the point where their trajectories cross each other's – at type A sites.

Answering the question "If you arrive at such a crossing just after a motor vehicle (car, bus or lorry) do you usually pass it on its right side?" around half of the respondents answered yes. Male respondents' answers show that they seem to be bolder than female cyclists, see Figure 21.

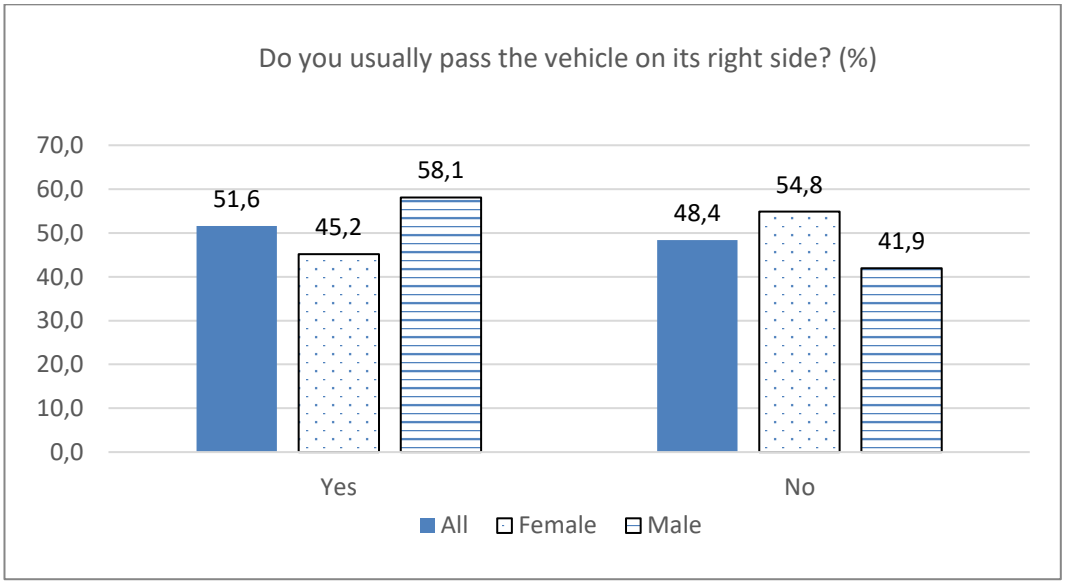


Figure 21. Distribution of answers to the question "Do you usually pass the vehicle on its right side?" – at type A sites.

Cyclists' preference of infrastructure design type

Considering the design of the cycle infrastructure at signalised intersections, the majority of the respondents, 58.7 % prefers type C, 36.5 % prefers type B and only 4.8 % prefers type A. In answering this question, the difference between females and males is small, see Figure 22.

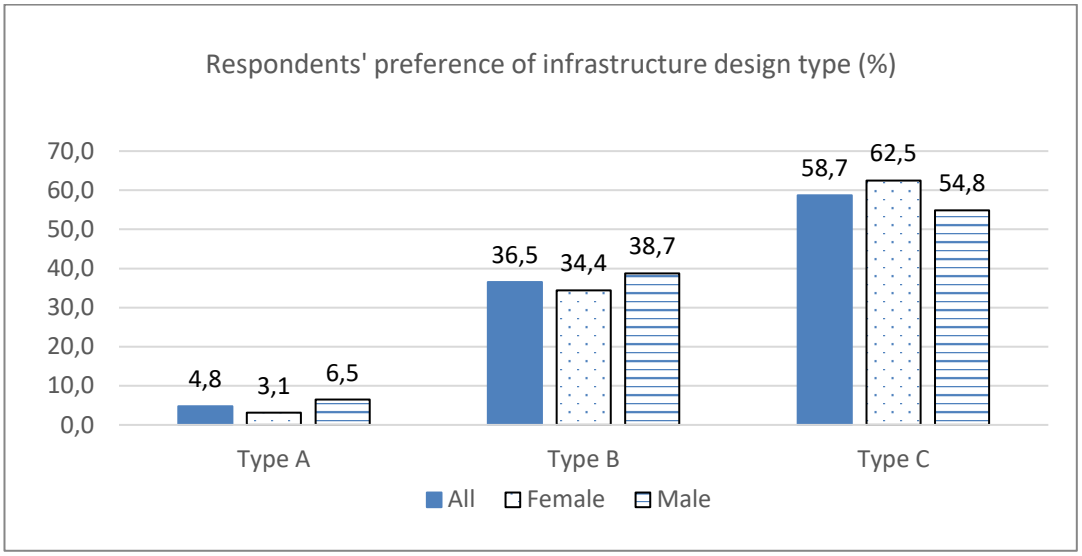


Figure 22. Cyclists' preference of infrastructure design type - answers at type A sites.

Respondent's comments

Nine respondents had comments on the infrastructure at type A sites, see all comments in Appendix 3. The comments can be categorised as follows:

- Two persons said they did not like making left turn.
- Two persons said they rather choose the pedestrian crossing and walk over there.
- One person commented that it was generally quite uncertain crossing situation.
- One person commented that he/she was quite used to the situation, drivers usually get used to cyclists.
- One person thought cycle lane (type B) is better than no bicycle facility (type A) and another person thought the opposite, type B worse than type A.

5.2 Answers at type B sites

Background variables of respondents

The majority of the 155 respondents (94 %) are from the age group 18-64 and 49 % are females, see Table 8.

Table 8. Respondents by gender and age group at type B sites.

Gender	Age				All
	<18	18-44	45-64	>64	
Female	1	52	18	5	76
Male	0	61	15	3	79
All	1	113	33	8	155

The great majority, 88 % cycle daily, and 10 % 2-4 times per week.

The great majority, 88 % use "normal" (comfort or city) cycle. See categorisation of cycle types in Appendix 2.

To the question "What do you usually look at to find out if the motor vehicle on your left side will turn right, and if so, will it give you the right of way?" the following answers were given, see Figure 23

- 53.5 % said they looked at the vehicle's turning indicator,
- 31.0 % said they kept track of the vehicle's movement,
- 11.6 % said they looked for eye contact with the driver,
- 3.9 % said "other".

The distribution of the different answer alternatives does not differ between males and females.

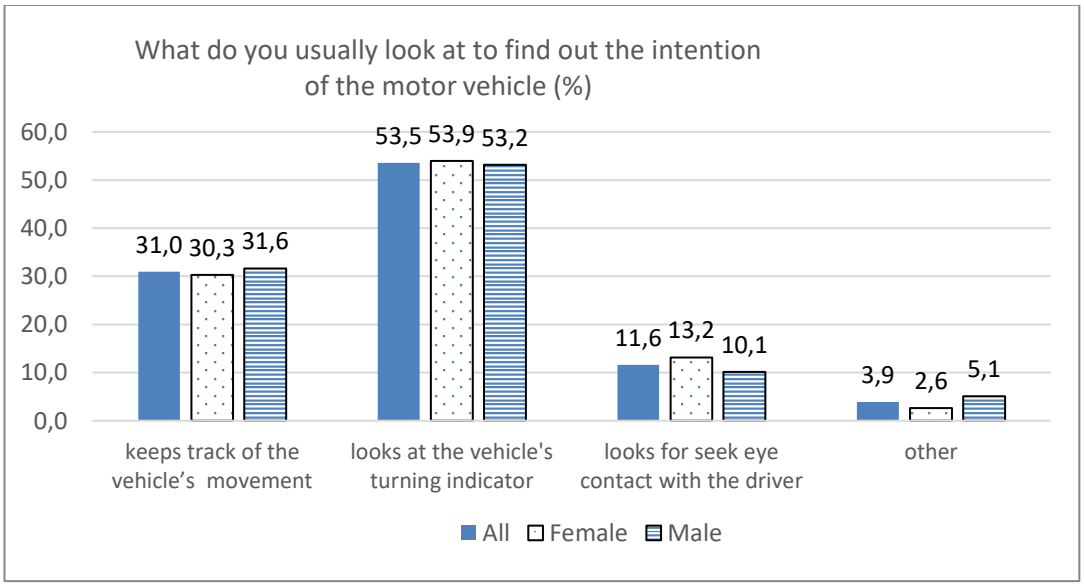


Figure 23. What do cyclists usually look at to find out if the motor vehicle on their left side will turn right, and if so, it will it give the cyclist the right of way - at type B sites.

To the question "What do you usually do when you perceive that the vehicle on your left will turn right and you judge that both of you will arrive at the point where your trajectories cross each other's at the same time?" the following answers were given, see Figure 24:

- I do nothing special, just cycle as usual: 21.3 %.
- I take it safe before the uncertain, even if it means I need to brake and possibly stop to let the vehicle pass: 27.7 %.
- Since you never know what the vehicle will do, I keep a close eye on the vehicle and slow down if necessary: 36.8 %.
- Since the vehicle has to yield, I cycle and signal through my action that I intend to pass the crossing point first and only brake if it really becomes necessary but then I can feel some irritation: 12.9 %.

There are large differences between the answers of female and male respondents indicating somewhat more cautious behaviour of female cyclists, see Figure 24.

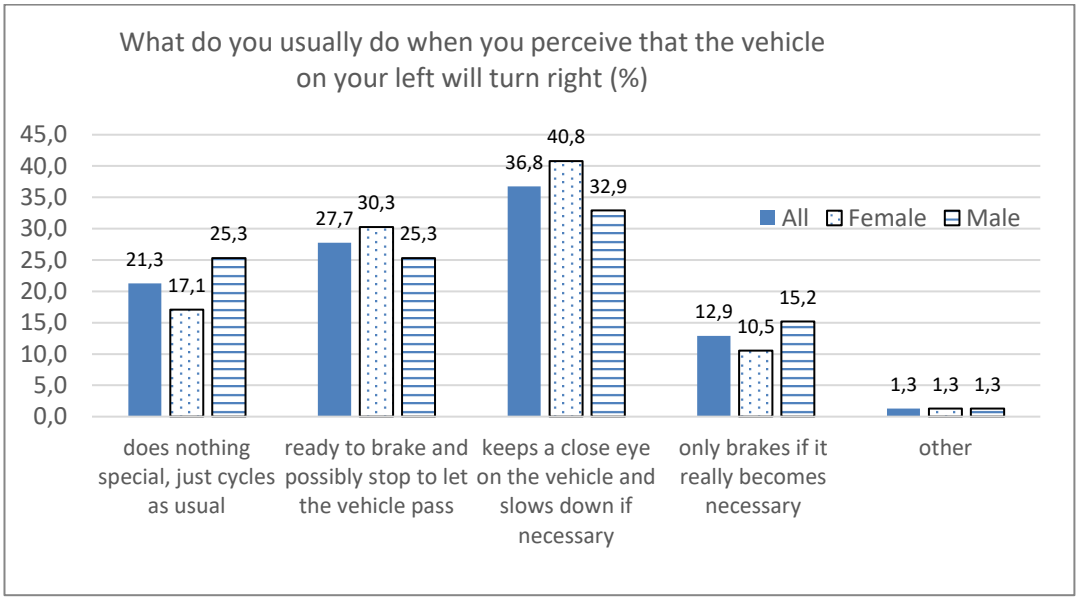


Figure 24. What do cyclists usually do when they perceive that the vehicle on their left will turn right and they judge that they arrive at the point where their trajectories cross each other's – at type B sites.

Answering the question "If you arrive at such a crossing just after a motor vehicle (car, bus or lorry) do you usually pass it on its right side?" 58.1 % of the respondents answered yes. Male respondents' answers also here seem to show that they are bolder than female cyclists, see Figure 25.

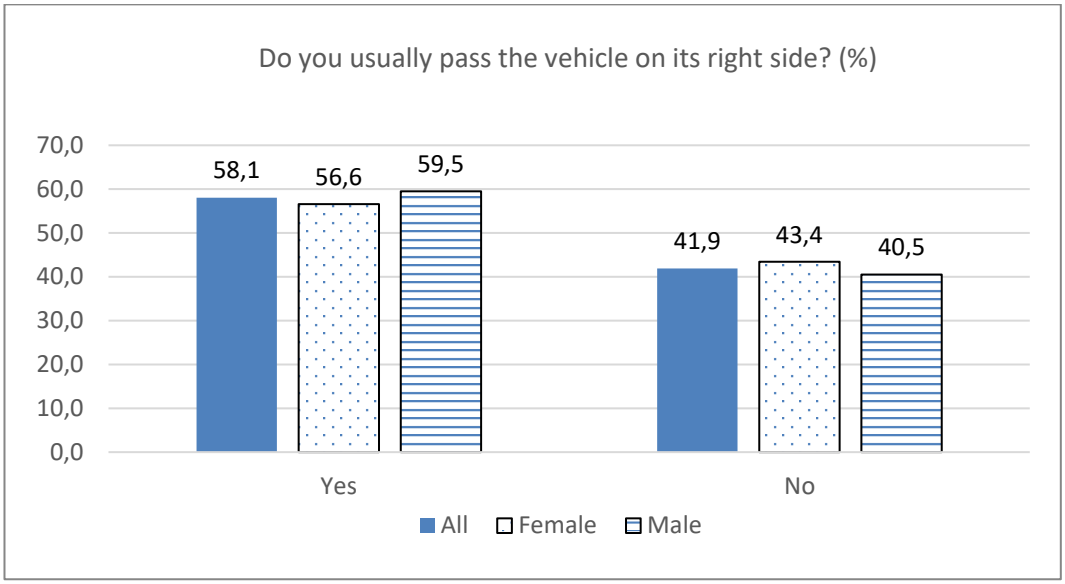


Figure 25. Distribution of answers to the question "Do you usually pass the vehicle on its right side?" – at type B sites.

Cyclists' preference of infrastructure design type

Considering the design of the cycle infrastructure at signalised intersections, the majority of the respondents, 64.3 % prefers type C, 35.1 % prefers type B and only 0.6 % prefers type A. In answering this question, the difference between females and males is small, see Figure 26.

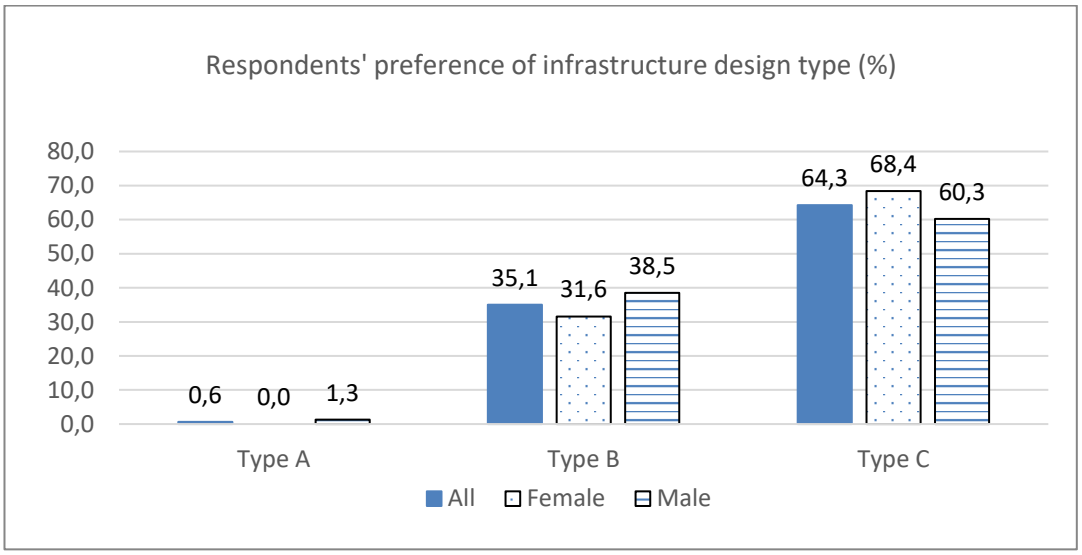


Figure 26. Cyclists' preference of infrastructure design type - answers at type B sites.

Respondent's comments

Sixteen respondents had comments on the infrastructure at type B sites, see all comments in Appendix 3. The comments can be categorised as follows:

- Three persons thought that it worked well, there was good visibility with one-way cycle lines and it was smooth if everybody acted as expected.
- Other three persons were of the opinion that it was unpleasant and unsafe.
- Two persons were of the opinion that it was messy.
- Two persons thought that the traffic volume was too high.
- Two persons thought that cyclists not following the one-way rule was a problem.
- One person said that motor vehicles had too high speeds.
- Left turning movement for cyclists felt insecure for one person.
- Three persons preferred the solution with separate cycle paths (type C).

5.3 Answers at type C sites

Background variables of respondents

The majority of the 109 respondents (87 %) are from the age group 18-64 and 65 % are females, see Table 7.

Table 7. Respondents by gender and age group at type C sites.

Gender	Age				All
	<18	18-44	45-64	>64	
Female	2	37	19	7	65
Male	1	27	12	4	44
All	3	64	31	11	109

The great majority, 83.5 % cycle daily, 12.8 % 2-4 times per week and 2.8 % 2-4 times per month.

The great majority, 86.3 % use "normal" (comfort or city) cycle and 8.3 % use "racer cycle". See categorisation of cycle types in Appendix 2.

To the question "What do you usually look at to find out if the motor vehicle on your left side will turn right, and if so, will it give you the right of way?" the following answers were given:

- 40.4 % said they kept track of the vehicle's movement,
- 39.4 % said they looked for eye contact with the driver,
- 16.5 % said they looked at the vehicle's turning indicator,
- 3.7 % said "other" (such as "trust the traffic light").

Braking down the answers to this question by gender, it can be seen that a larger share of females (44.6 %) than males (31.8 %) look for eye contact with the driver of the motor vehicle, while a larger share of males (45.5 %) keep track of the vehicle's movement, and look at the vehicle's turning indicator (20.5 %) than females (13.8 %)

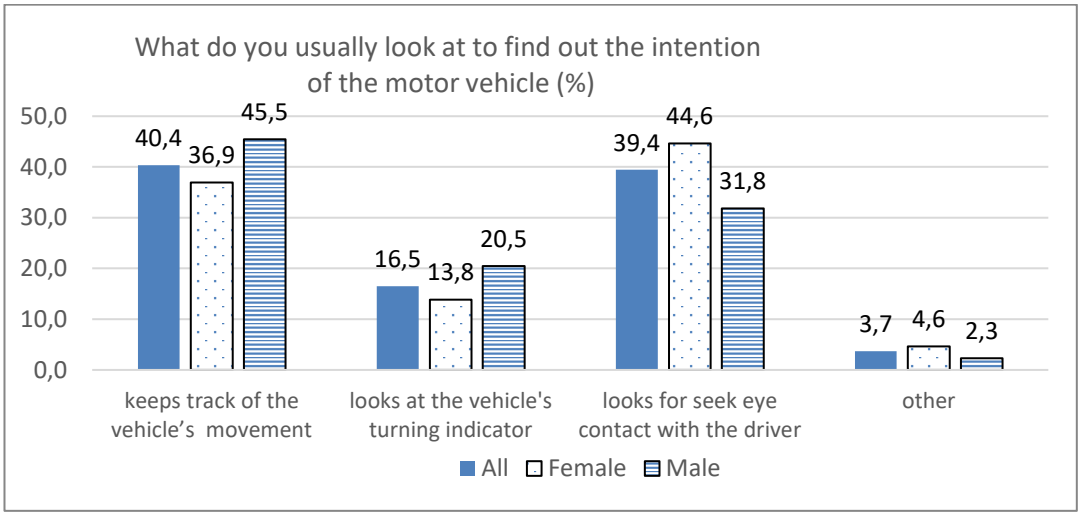


Figure 27. What do the cyclists usually look at to find out if the motor vehicle on their left side will turn right, and if so, it will give the cyclist the right of way – at type C sites.

To the question "What do you usually do when you perceive that the vehicle on your left will turn right and you judge that both of you will arrive at the point where your trajectories cross each other's at the same time?" the following answers were given:

- I do nothing special, just cycle as usual (11 %).
- I take it safe before the uncertain, even if it means I need to brake and possibly stop to let the vehicle pass (43.1 %).
- Since you never know what the vehicle will do, I keep a close eye on the vehicle and slow down if necessary (30.3 %).
- Since the vehicle has to yield, I cycle and signal through my action that I intend to pass the crossing point first and only brake if it really becomes necessary but then I can then feel some irritation (13.8 %).
- 1,8 % indicated "other".

Braking down the answers to this question by gender it can be seen that the largest share of both female and male respondents (43 %) said that they are ready to brake and possibly stop to let the vehicle pass. The largest difference between genders is in the answer alternative "do nothing, special, just cycle as usual" which was chosen by 15.9 % of male respondents but only by 7.7 % of female respondents, which indicates a somewhat more cautious behaviour of female respondents, see Figure 28.

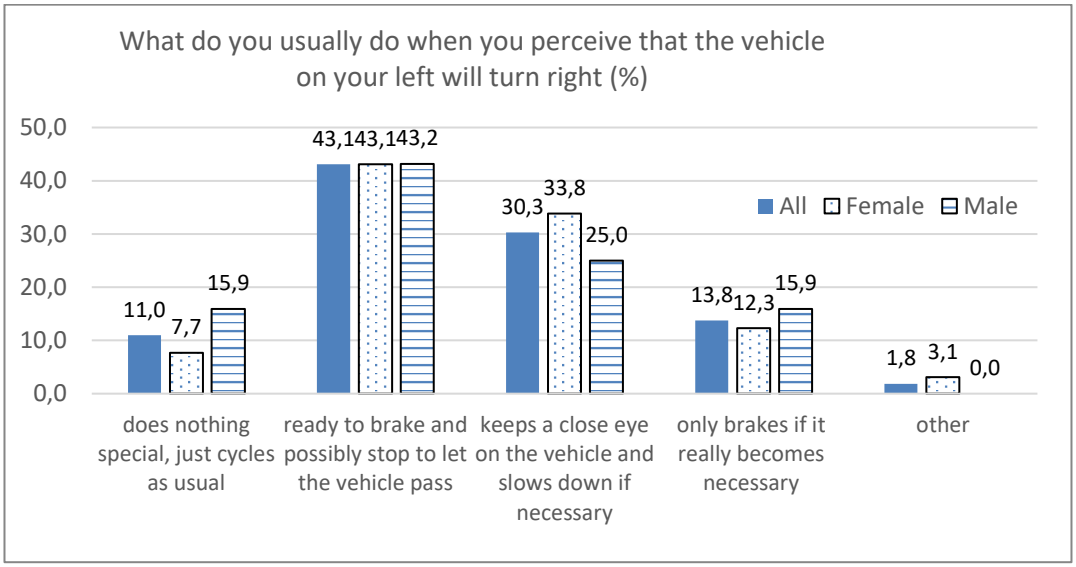


Figure 28. What do cyclists usually do when they perceive that the vehicle on their left will turn right and they judge that they arrive at the point where their trajectories cross each other's – at type C sites.

Answering the question "If you arrive at such a crossing just after a motor vehicle (car, bus or lorry) do you usually pass it on its right side?", the following answers were given: 63.3 % said yes; one person commented: yes, to come first; another said: yes, for being noticed and another: yes if it is slow. Thirty-six point seven percent answered no; one person commented that he/she awaits and another said he/she stays next to the vehicle. In answering this question, the difference between females and males is very small, see Figure 29.

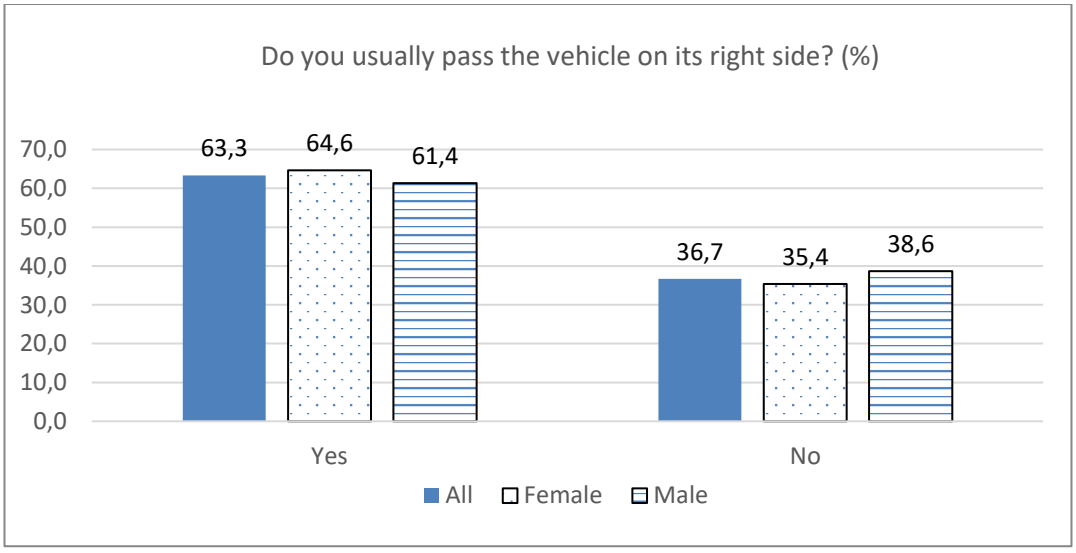


Figure 29. Distribution of answers to the question "Do you usually pass the vehicle on its right side?" – at type C sites.

Cyclists' preference of infrastructure design type

Considering the design of the cycle infrastructure at signalised intersections, the majority of the respondents, 73.4 % prefers type C, 24.8 % prefers type B and only 1.8 % prefers type A. In answering this question, the difference between females and males is very small, see Figure 30.

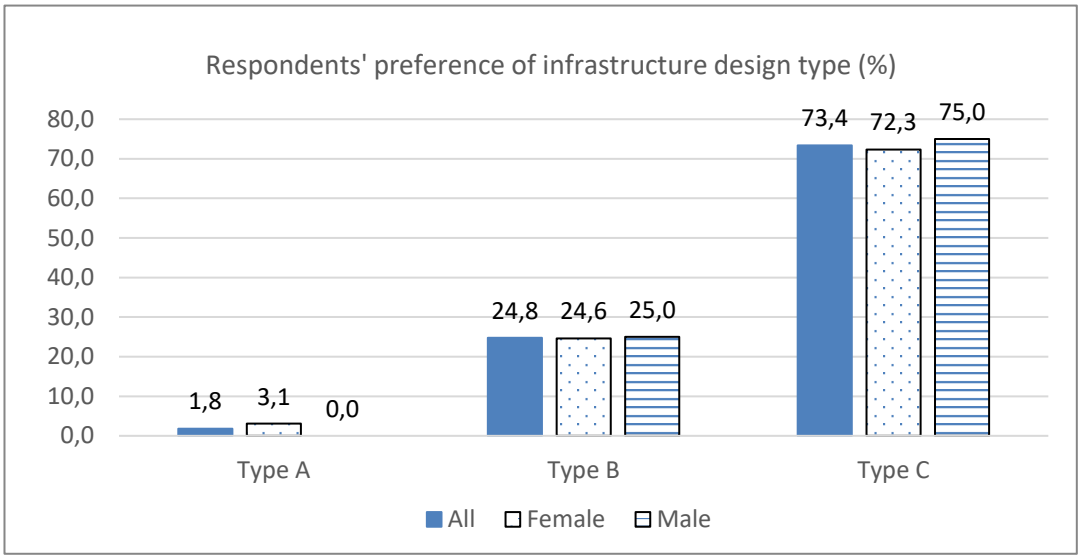


Figure 30. Cyclists' preference of infrastructure design type - answers at type C sites.

Respondent's comments

Thirty-four respondents had comments on the infrastructure at type C sites; see all comments in Appendix 3. The comments can be categorised as follows:

- It feels insecure at the site due to many cars passing the intersection (7 comments),
- Too small area for all road users to share, it is difficult when pedestrians and cyclists have to use the same space (7 comments),
- Cyclists do not comply with the one-way rule, it is difficult to see if it is a one-way cycle path (5 comments),
- Bicycle paths crossing each other is a bad solution; a cyclist waiting for green at the signal can get hit by a cyclist on the crossing cycle path (3 comments),
- Bad visibility at the corner (2 comments),
- Cyclists should always yield (as it is in the Netherlands) (2 comments),
- Cyclists have to push for green (2 comments),
- Too long waiting time for green (one comment),
- Give green light for cyclists earlier than for cars (one comment),
- Make it more visible that cyclists have green light (one comment),
- Asphalt surface for cycle path is better than cement plates (one comment),
- Do better road maintenance in winter (one comment),
- Good crossing with wide bike paths (one comment),
- Some cyclists are too fast (one comment),
- People are crazy (one comment),
- Motorists show more consideration (one comment).

5.4 Comparison of answers at the different types of sites

Regarding the question "What do they usually look at to find out if the motor vehicle on their left side will turn right…" , the largest differences in answers at the different types of sites were as follows (see Figure 31):

- The largest group of respondents at type A and B sites (43 %, respectively 53 % said they looked at the vehicle's turning indicator, while only a small part did so at type C sites.
- Those interviewed at type C sites stated to a much larger extent, that they looked for eye contact with the driver than the respondents at the other two types of sites.

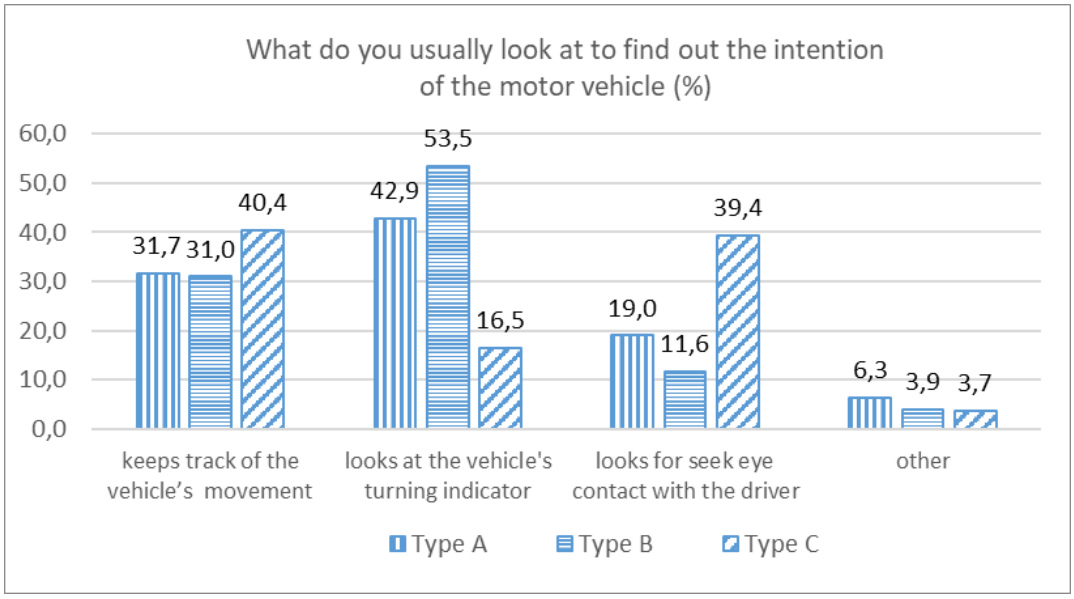


Figure 31 What do the cyclists usually look at to find out if the motor vehicle on their left side will turn right, and if so, it will give the cyclist the right of way at the different types of sites.

Concerning the question "What do you usually do when you perceive that the vehicle on your left will turn right …", the largest differences in answers at the different types of sites were as follows (see Figure 32):

- The largest group of respondents at type A and C sites (41 %, respectively 43 % said they usually were ready to brake and possibly stop to let the vehicle pass, while only 28 % at type B sites said so.
- Respondents at type C sites said they "did nothing, just continued as usual" to a much smaller extent than the respondents at the other types of sites.
- Respondents at type A sites said to a much lesser extent that they "only braked if it really became necessary" than the respondents at the other two types of sites.

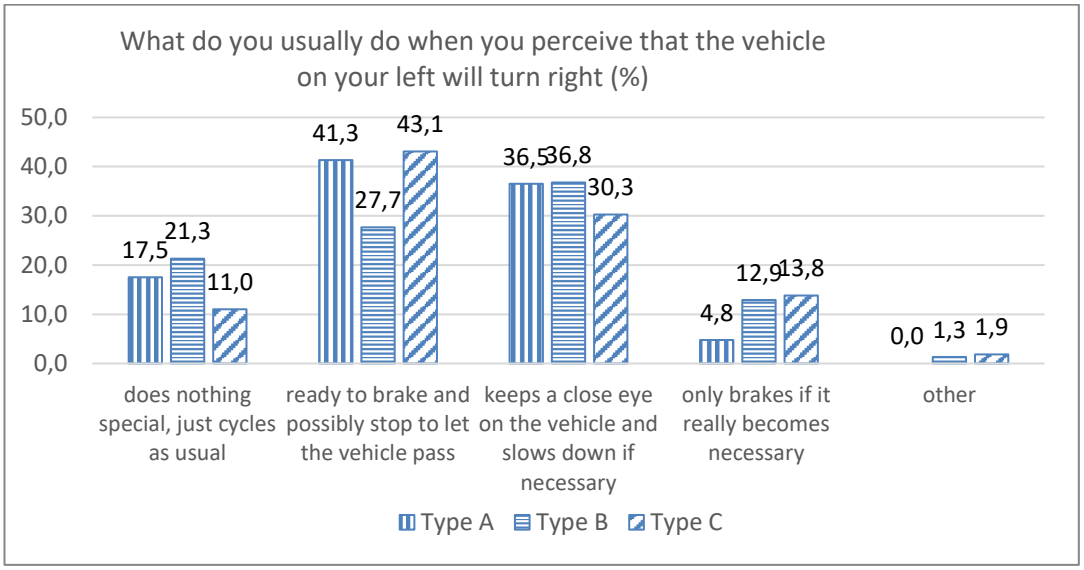


Figure 32. What do cyclists usually do when they perceive that the vehicle on their left will turn right and they judge that they arrive at the point where their trajectories cross each other's at the different types of sites.

Answering the question "… do you usually pass the motor vehicle on its right side", more than half of the respondents answered yes at all three types of sites. However, a larger share (58 %) answered yes at type B sites than at type A sites and an even larger share (63 %) did so at type C sites, see Figure 33.

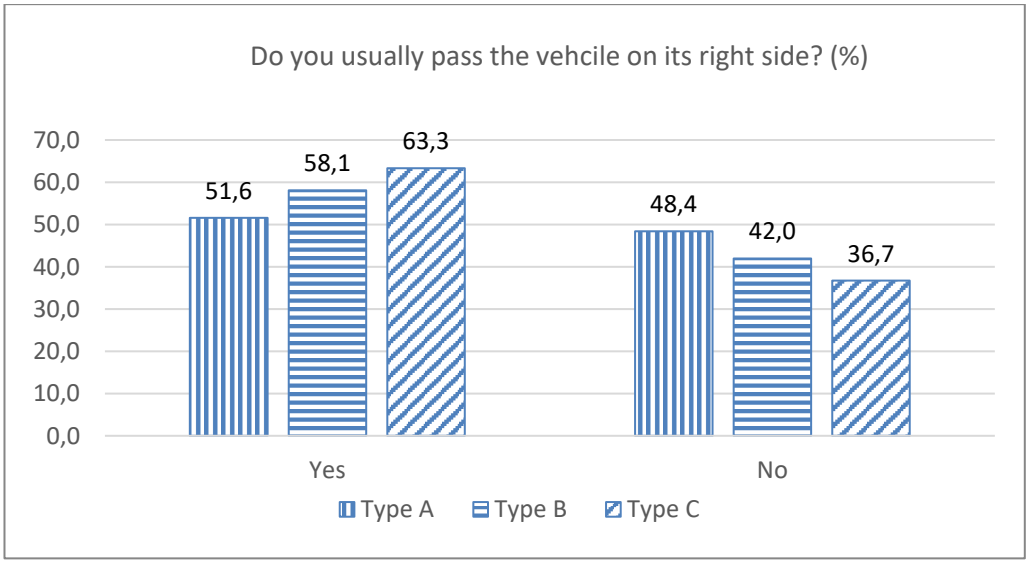


Figure 33. Distribution of answers to the question "Do you usually pass the vehicle on its right side?" at the different types of sites.

Regarding the design of the cycle infrastructure, the majority of the respondents at all three types of sites (59 - 73 %) preferred type C, and only a very small share (1 - 5 %) preferred type A.

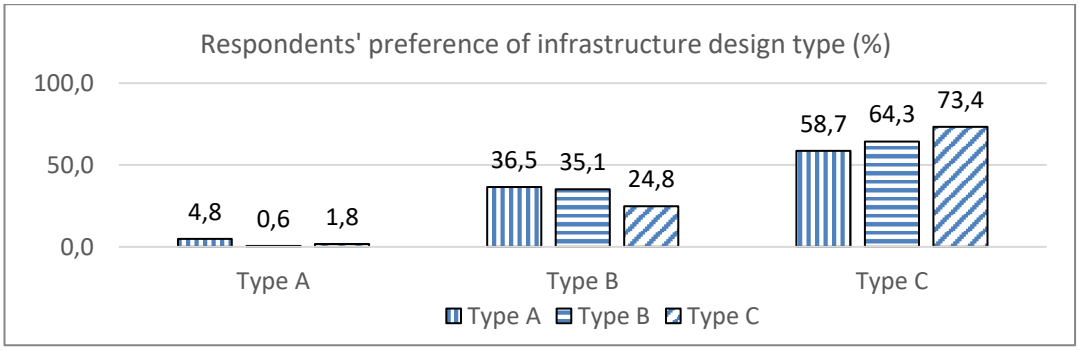


Figure 34. Cyclists' preference of infrastructure design type - answers at the different types of sites.

5.5 Summary of interview answers

Totally, 327 cyclists were interviewed at the three different types of sites. The majority of them (87 %) were from the age group 18-64 and 53 % were females. The main findings from the interview answers are as follows:

- The largest group of respondents at type A and B sites (43 %, resp. 53 %) said they looked at the vehicle's turning indicator, while only a small part did so at type C sites.
- Respondents at type C sites stated to a much larger extent, that they looked for eye contact with the driver than respondents at the other two types of sites.
- The largest group of respondents at type A and C sites (41 %, respectively 43 %) said they usually were ready to brake and possibly stop to let the vehicle pass, while only 28 % at type B sites said so.
- Respondents at type C sites said they "did nothing, just continued as usual" to a much smaller extent than the respondents at the other types of sites.
- Respondents at type A sites said to a much lesser extent that they "only braked if it really became necessary" than the respondents at the other two types of sites.
- More than half of the respondents answered that they usually passed the motor vehicle on its right side. A larger share (58 %) answered yes at type B sites than at type A sites (52 %) and an even larger share (63 %) did so at type C sites.
- The majority of respondents at all three types of sites (59 - 73 %) preferred type C design, 25 – 36 % preferred type B and only a very small share (1 - 5 %) preferred type A design.

Respondents' comments at type A sites revealed that some cyclists did not like making left turn and they rather chose the pedestrian crossing and walked over there. At type B sites, some respondents said it worked well and it was smooth if everybody acted as expected. Some respondents, on the other hand, were of the opinion that it was unpleasant and unsafe. Some thought that it was messy and that cyclists not following the one-way rule was a problem. At type C sites, some respondents felt that it was insecure due to many cars passing the intersection. Some meant that it was a too small area for all road users to share – "it is difficult when pedestrians and cyclists have to use the same space". Some said that bicycle paths crossing each other was a bad solution: a cyclist waiting for green at the signal can get hit by a cyclist on the crossing cycle path. Some commented that cyclists do not comply with the one-way rule.

6. Discussion

The aim of the present study was to investigate what cues cyclists use to interpret the intention of motor vehicles they interact with. The observations in the field revealed that the majority (54-63 %) of the cyclists did not look at the MV at all. The next largest group (26–28 %) scanned the MV, and only 8-12 % looked at the turning indicator of the MV. The interview answers contradict the findings of the observations: at type A sites 43 %, at type B sites 53 % and at type C sites 16 % said they looked at the turning indicator of the MV. Of course, cyclists may use their peripheral vision to detect if the turning indicator of the MV is on. An observer on the site only can discriminate if a cyclist looks at the direction of the turning indicator or not, but cannot judge whether he/she uses his/her peripheral vision.

The largest difference between the different types of sites was that at type C sites, 8 % of the cyclists looked for eye contact with the driver of the MV, while only 0-2 % did so at the other types of sites. The interview answers are in line with the findings of the observations: respondents at type C sites stated to a much larger extent (39 %), that they looked for eye contact with the driver than respondents at the other two types of sites (12-19 %).

Among those cyclists who arrived just after a MV and passed it on its right side, the differences were larger between the various types of sites. At type A sites, 54 % scanned the MV to foresee its intention and only 33 % did not look at the MV at all, while at type B and type C sites the share of cyclists not looking at the MV at all was larger than the share of those looking at the entire MV or its turning indicator. This finding indicates that those who pass the MV on its right side are more active in their visual search behaviour since they take a certain risk when they pass the MV. The findings also may indicate that cyclists experience type A design (no cycle facility) less secure and hence they are more active in their visual search behaviour.

The observations also revealed that while the great majority of cyclists arriving just after a motor vehicle (MV) passed it on its right side at type B sites (cycle lane) (73 %) and type C sites (cycle path) (74 %), at type A sites (no cycle facility) only 36 % did so. It might, of course be due to the fact, that if the MV kept to the right at type A sites it could block physically the way for the cyclists, which is actually the safest way for the driver, aiming to turn right - making sure that no cyclists pass the MV on its right side. In this respect, the "no cycle facility" design at the intersection ought to be the safest solution – if drivers of right turning MVs always place their vehicle close to the right edge of the right lane. The interview answers are in line with the findings of the observations. More than half of the respondents answered that they usually passed the MV on its right side. A larger share said they usually do so at type B sites (58 %) and at type C sites (63 %) than at type A sites (52 %).

In case of the MV was a heavy vehicle (bus or lorry) (at site types B and C), then somewhat fewer (68 %) cyclists passed it on its right side. This finding indicates that cyclists were somewhat more (clearly far from enough) careful than if the MV was a car. They might be aware of the fact that the driver of a heavy vehicle has difficulties to notice a cyclist coming from behind on its right side.

The share of critical situations at type B sites was twice as high as at type C sites and more than ten times higher than at type A sites, which may be an indication that the "no cycle facility" at the intersection is the safest solution and the cycle lane solution is the least safe one. However, the type of cycle facility at an intersection highly correlates with traffic volumes. Municipalities tend to apply type B or type C solutions if the traffic volume is high at the intersection.

The drawbacks of the different types of design solutions were formulated by the respondents as follows:

- At type A sites, some cyclists do not like making left turn and they rather choose the pedestrian crossing and walk over there.
- At type B and type C sites, cyclists not following the one-way rule is a problem.
- At type C sites, some respondents meant that bicycle paths crossing each other was a bad solution: a cyclist waiting for green at the signal can get hit by a cyclist on the crossing cycle path.

At all three types of sites, the majority of the respondents (59-73 %) preferred type C design, 25–36 % preferred type B and only a very small share (1-5 %) preferred type A design.

Further studies under controlled conditions (e.g. in cycling simulator) are needed to investigate in detail cyclist's behaviour and eye movement when approaching an intersection and at the same time a motor vehicle in the same direction arrives/stands ahead.

7. Conclusions

The majority of the interviewed cyclists said that when arriving at an intersection just after a motor vehicle they usually pass it on its right side. This was seen in observations on sites with cycle lane or cycle path but not on sites with mixed traffic.

If the motor vehicle was a heavy vehicle (bus or lorry), somewhat fewer cyclists passed it on its right side.

At sites with mixed traffic (no cycle facility), compared to with cycle lane or cycle path, the cyclists' scanning behavior was more complete. At sites with cycle path, the cyclists looked for eye contact with the driver of the motor vehicle to a much larger extent than cyclists at the other two types of sites.

Cyclists at sites with mixed traffic (no cycle facility) were more active in their visual search behaviour than cyclists at the other two types of sites. Also, those cyclists who passed the motor vehicle on its right side were more active in their visual search behaviour than those who did not pass the motor vehicle.

The share of critical situations indicates that sites with mixed traffic (no cycle facility) is the safest solution and cycle lane solution is the least safe one.

The majority of the respondents prefer the design solution with cycle path.

Further studies under controlled conditions (e.g. in cycling simulator) are needed to investigate in detail cyclist's behaviour and eye movement when approaching an intersection and at the same time a motor vehicle in the same direction arrives/stands ahead.

Appendix 1. Observation protocol

Cyclists visual search of right turning motor vehicles on the approach to a signalised intersection

Page nr...

Observer:_____ Date:_____ Time:_____

City:_____

Intersection:_____ Approach:_____

Weather: ☐ Sunny ☐ Cloudy ☐ Rainy

Surface: ☐ Dry ☐ Wet

North

Nr	Motor vehicle turning right				Cyclist straight									Traffic signal					Who passes first? MV or C	Comment (Sudden braking or acceleration or swerwing or other)
	Type: Car Van Bus Truck	Use of turning indicator			Approaching				Visual search of intention of MV					Green	Amber	Red	Start of phase	End of phase		
		in good time	too late	not at all	Just ahead of MV	Head by head with MV	Just after MV		Looks at the entire MV	Looks at turning indicator of MV	Looks for eye contact with driver	Other (see comment)	Not at all							
							Keeps behind MV	Passes MV												
1																				
2																				
3																				
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9																				
10																				

Comments:

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Appendix 2. Interview questions (in Swedish)

Hej,

Vi är från Lunds universitet och genomför en studie om cyklisters uppfattning av olika korsningstyper. Går det bra att ställa några enkla frågor? Det tar inte mer än 5 minuter att svara på dem.

Frågor

1. Hur ofta cyklar du under din cykelsäsong?
   - I stort sett dagligen
   - Ca 2-4 gånger per vecka
   - Ca 2-4 gånger per månad
   - Mer sällan

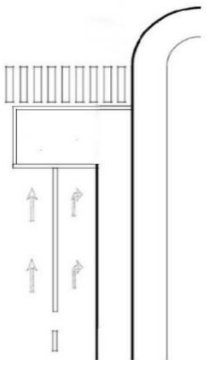
2. Tänk dig att du som cyklist kommer fram till en sådan här korsning och skall fortsätta rakt fram genom den, och det på din vänstra sida finns en bil, buss eller lastbil. Vad brukar du hålla koll på för att ta reda på om det kommer att svänga till höger, och om det iså fall kommer att ge dig företräde?
   - Håller koll på fordonets rörelse
   - Tittar på fordonets blinkers
   - Söker ögonkontakt med föraren
   - Annat …..

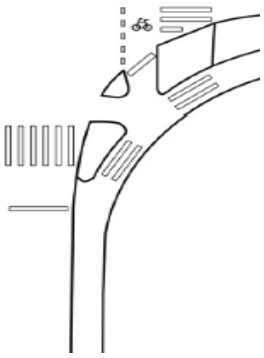
3. Vad brukar du göra när du uppfattar att fordonet på din vänstra sida kommer att svänga höger och du bedömer att ni anländer samtidigt till den punkt där era körbanor korsar varandra?
   - Jag gör inget särskilt, jag cyklar på som vanligt.
   - Det fordonet har visserligen väjningsplikt mot mig, men jag tar det säkra före det osäkra, även om det innebär att jag behöver bromsa och möjligen stanna för att låta bilen passera före mig.
   - Det fordonet har visserligen väjningsplikt mot mig, men man vet aldrig vad den kommer att göra. Därför håller jag noga koll på bilen under min framfärd och bromsar om det behövs.
   - Eftersom det fordonet har väjningsplikt mot mig, cyklar jag på och signalerar genom mitt agerande att jag har för avsikt att passera korsningspunkten först. Jag bromsar bara om det verkligen blir nödvändigt och kan då känna en viss irritation.
   - Annat……

4. Om du anländer till en sådan här korsning strax efter ett motorfordon (bil, buss eller lastbil) brukar du passera det på dess högra sida?
   - Ja, (om …….
     därför att ……..
   - nej, därför att …….

5. Vilken typ av utformning av tillfarten till en korsning föredrar du som cyklist?

A	B	C
Ingen separat cykelfacilitet	Cykelfält	Cykelbana





6. Har du någon kommentar i övrigt vad gäller denna typ av situation på tillfarten till i en korsning?

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.....

.....

Bakgrundsinfo

7. Kön: ◯ Kvinna ◯ man

8. Ålder: ◯ < 18 ◯ 18-44 ◯ 45-64 ◯ >64

9. Typ av cykel:

○ Komfortcykel (dam/herr), ofta fotbroms, styret högre än sadeln 	○ Racer-/landsvägscykel, smala däck, bockstyre, sadeln högre än styret 
○ Mountainbike oavsett typ 	○ ”Stadscykel”/trekking-cykel, sadel och styre ungefär i samma höjd, ofta fler än 7 växlar 
○ Elcykel oavsett typ 	
○ Lådcykel	
○ Liggcykel	
○ Annat:	

Appendix 3. Respondents' comments (in Swedish)

Respondents' comments at type A sites.

2: Kör oftast
4: Därför att cykelfältet är där
4: Därför att det ej känns säkert
4: Därför att jag väntar tills bilen kör
4: Om ej buss, 6: Cykelfält är bättre än ingen separat cykelfacilitet
4: Om fordonet ej ska svänga till höger
4: Om hen ser mig därför att det känns tryggt
4: Om man står bra därför att det känns säkert
4: Söker ögonkontakt
6: För fråga 5 så är B värre än A
6: Generellt sätt ganska osäker korsningssituation
6: Har koll
6: Ibland promenerar
6: Man är rätt van, bilister oftast rätt vana vid andra cyklister
6: Svänga vänster är jobbigt
6: Tycker inte om att svänga vänster
6: Vem har rätt när två cyklister möts på en och samma sida på en cykelväg
6: Väljer hellre övergångsställe till höger om korsningen

Respondents' comments at type B sites.

2: Kollar inte
3: Är det rött men slagit om till grönt på övergångsstället vid korsningen till höger cyklar jag
4: Ja men avvaktar lite
4: Ja om cykelbana
4: Ja om nära
4: Nej avvaktar
4: Nej avvaktar
4: Nej bromsar
4: Nej bromsar in
4: Nej litar ej på bil
4: Nej väntar
4: Nej, avvaktar
4: Nej, avvaktar
4: Nej, avvaktar
4: Nej, döda vinkeln
4: Nej, fordonet kan ändra riktning
4: Nej, kanske kör om på vänster
4: Nej, stannar
6: B känns ganska otryggt
6: Bilister har alldeles för hög hastighet
6: Bra sikt, bra med enkelriktade cykelbanor
6: Högt trafikflöde, otryggt med cykelfält + box
6: Irriterande när cyklister ej förstår att det är enkelriktat
6: Minska trafik
6: Obehaglig korsning
6: Otrygg vänstersväng för cyklister
6: Andra cyklister är det som är största orosmomentet, alla följer inte regler
6: C är bättre
6: Det är inte säkert, mer uppdelat mellan bilar och cyklister
6: Funkar ok
6: Föredrar cykelbanor
6: Lite rörigt
6: Smidig om folk gör som de ska
6: Stökig

Respondents' comments at type C sites.

2: Litar på rödljus
2: Litar på trafiksignalen
2: Tittar bara på rödljus
4: För att komma före
4: Avvaktar
4: För att synas
4: Långsamt
4: Stannar bredvid
6: Korsande cykelfält dåligt, blir påkörd när man väntar på att köra över
6: Enkelriktning följs ej, för smal gång/cykelväg, cementplatta väljer asfalt cykelbana
6: Enkelriktning som inte följs
6: Långsamma ljus vilket gör att man får stå länge
6: Andra cyklister som ej följer regler för enkelriktat, liten yta för alla trafikanter att dela, smal cykel/gångväg
6: Bilister visar mer hänsyn
6: Bilisternas agerande vid grönt gör att cykel alltid borde väja
6: Bra korsning med breda cykelbanor
6: Bättre väghållning på vintern
6: Cykel är osäker med alla fotgängare
6: Cykelbanan har endast ett körfält: Kan ibland bli trångt samt konflikter med förare som passerar i andra riktningen
6: Cykelbanan har endast ett körfält: Men inte ett jättestort problem eftersom många rör sig i samma riktning
6: Cyklar kommer fort från LTH
6: Cyklister: mer synligt att de får grönt
6: Dålig sikt i hörnen
6: Enkelriktat som ej följs, svårt att se om det är enkelriktat
6: Folk är galna
6: Föredrar holländska modellen
6: Gående i cykelbana med hörlurar
6: Känns osäker
6: Man måste ibland trycka för att det ska bli grönt
6: Man måste vara vaken
6: Mycket bilar i korsningen. Ser gärna att CG får grönt ljus samtidigt för att bilarna har oftast mer uppsikt när gångtrafikanter får grönt och cyklisternas säkerhet kan då öka
6: Mycket olika riktningar för cyklister så lätt att krocka med andra cyklar
6: Mycket trafik, osäker
6: Många kör på fel sida cykelbanan
6: Måste trycka för att få grönt ljus
6: Otrygg med mycket bilar
6: Ser inte, smalt i hörnen av cykelbana, svårt när gående och cyklister har samma yta
6: Stor väg, mycket bilar
6: Tycker man borde tänka på mötet med cyklister då man korsar andra cykelbanor
6: Upplever att korsningen är högt trafikerad av MF vilket kan kännas otryggt
6: Upplever att man MF tror att cyklister kör mot rött när de har grönt: Blir en konflikt mellan cyklister och motorfordon samt innebär en större säkerhetsrisk för cyklister