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Road Safety Concerns Related to the Overtaking Side Distance of Cyclists – Examples of the Széchenyi Chain Bridge and Határ út in Budapest

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In Hungary, the issue of maintaining the overtaking lateral distance has been persistent among cyclists and law enforcement officers over the last 5 years. Opinions are also divided among road users as to the dangers of keeping or not keeping the lateral distance and, if the danger is real, what can be done to improve road safety. However, this issue can also be approached from the perspective of what factors might influence the ability of faster, motorised drivers to maintain this (perceived) safe lateral distance. In addition, it is legitimate to ask whether the degree of danger posed by different categories of vehicles and by different routes supports the importance of maintaining a lateral distance at different locations. In this study, I conducted an empirical data collection in downtown environment with scientific accuracy to gain insight into drivers' side distance keeping attitudes on Széchenyi Chain Bridge and Határ út in Budapest. As a result of the measurements, it has been shown that overtaking on the Chain Bridge at similar lane widths with a continuous line also occurs, while maintaining a smaller overtaking lateral distance. This result could be used as input for a possible traffic engineering revision in the future.

Keywords: bicycle, urban traffic, side distance, overtaking

Introduction

In Budapest, the resurgence of cycling has been observed in recent years, following a period of stagnation in the mid-2010s. This resurgence is attributed to the Covid–19 pandemic and the implementation of bicycle-friendly policies introduced in response. However, a longstanding debate persists within the cycling community and among advocates for the safety of vulnerable road users regarding the most effective cycle-friendly solutions. This debate encompasses both existing and hypothetical

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practices that could enhance the appeal of densely populated urban areas for cyclists.[2] The spread of cycling in urban transport can have a positive impact on road safety, which has already been studied in Hungary.[3] Giving the freedom of choice between transport modes is a strategic goal as well.[4]

Following a period of stagnation in cycling in Budapest during the 2010s, there was a notable resurgence during the Covid–19 pandemic.[5] The infrastructure modifications implemented to support cycling during the pandemic indicate progress toward Budapest's 2030 target for its modal share. However, the extent of this progress remains uncertain. Various approaches, including infrastructural adjustments, legislative measures, and initiatives aimed at raising social awareness and education, can influence the modal share, yielding both positive and negative outcomes. In addition, the Covid–19 pandemic had a significant impact on the increase in popularity of the Bubi public bicycle system in Budapest,[6] in parallel with the increase in private bicycle use.

The social and economic centre of gravity falls on downtown Budapest,[7] which is coupled with the tourist attraction, so it is important to humanise the traffic on the bridge, as a main transport corridor on the one hand, and to ensure its patency on the other. The latter was previously not provided for public transport and micromobility due to constant congestion.

One of the primary factors directly influencing the expansion of cycling is users' subjective perception of safety, a concern that extends to all types of vehicles. Generally, as in most human activities, individuals tend to favour actions they perceive as safe or where the perceived risk is not excessively high relative to the potential benefits. This type of risk assessment is also applied in the field of transportation, both by users and researchers.[8] This risk assessment inherently includes the cyclist's concern for their own health and safety. Consequently, the perception of safety – rather than the actual level of safety – plays a significant role in the context of cycling.

A common objection in public discourse to cycling in densely built-up or high-traffic urban areas is the perception that it is excessively dangerous. However, each road user has a unique perception of risk and varying levels of tolerance for perceived danger. As a result, it is insufficient to label a phenomenon as dangerous in general terms; instead, a thorough analysis supported by objective accident investigation data is required to determine whether a perceived danger is indeed real. Nevertheless, even if accident data indicate that the phenomenon in question contributes to only a small number of incidents, suggesting it is not a significant source of danger, this does not negate the fact that road users may still perceive it as hazardous. Such

2 Elvik–Bjørnskau 2017.
3 Felföldi 2023a; Glász 2017.
4 Balázs Mór-terv 2014.
5 Felföldi 2021.
6 Berezvai 2022.
7 Tóth et al. 2024.
8 Gutiérrez et al. 2020; Branion-Calles et al. 2020.

perceptions can directly influence the prevalence of cycling or electric scooter use in urban environments.

In this paper, I examine a specific aspect of the perceived dangers of urban cycling: the issue of maintaining lateral distance while cycling and its associated risks, both objectively and subjectively. The concept of a safe lateral distance, along with its quantification or potential legislative standardisation, has been a recurrent topic in Hungarian transport and policy discussions concerning the safety of vulnerable road users for many years. There is substantial international literature on this subject, with studies measuring actual overtaking lateral distances.[9] Research has also been conducted on driver assistance systems for motorised vehicles, which can aid drivers in maintaining the correct safety lateral distance.[10] The distribution of overtaking by time of day was examined and it was found that overtaking lateral distances are smaller during peak traffic periods.[11] They also studied the phenomenon that overtaking cyclists by not crossing the continuous line, i.e. by keeping a smaller lateral distance, definitely increases the cyclist's physiological stress level.[12] Studies have also been carried out on the extent of overtaking lateral distance in relation to the visibility of different cyclist safety devices (helmet, visibility vest).[13] When combined with the wearing of a helmet, there is also a significant reduction in overtaking lateral distance.[14] In Hungary, there has been only one study on overtaking lateral distance in the literature, which found a mean of 134.2 cm and a median of 130.5 cm, lower than the values measured by Beck et al. in 435 overtaking manoeuvres on the Határ út in Budapest.[15] The results of this measurement will also be used for comparison with the results of the present data collection, since, as in the case of the Chain Bridge, a two-lane design with similar intensities of motorized traffic is seen at both locations. However, there is a difference in the way the roadway of the Chain Bridge is bordered by steel truss, which results in a narrower feel. Határ út is also not typical of connecting roads, with a total of two on the section of the measurement there. There was no turning traffic at all, so it is possible to compare the traffic flow to the traffic flow on a bridge. The difference between the two locations is the way the oncoming lanes are separated, as this is typically a broken line on the Határ út and a continuous line on the Chain Bridge. This difference does appear and can also be observed in the attitude of overtaking vehicles in terms of lateral distance, as shown in the presentation of the results.

In 2018, the social debate on the issue of maintaining a lateral distance from cyclists in Hungary was reopened. The 'One and a Half Meter' campaign of the governmental development agency Aktív Magyarország was launched in mid-August

[9] Beck et al. 2019.
[10] Brijs et al. 2022.
[11] Bahmankhah et al. 2020.
[12] Venkatachalapathy et al. 2022.
[13] Black et al. 2020.
[14] Walker–Robinson 2019.
[15] Felföldi 2023b.

2018 to benefit from the publicity of the Tour de Hongrie cycling competition, but no changes in legislation have followed in the years since. Despite the lack of clarity in the legislation, both Magyar Közút NZrt. (Hungarian Public Roads NZrt), the operator of the Hungarian state road network, and the National Accident Prevention Committee of the Hungarian Police Headquarters (ORFK-OBB) have been actively participating in the campaign until today.

Figure 1: Signs on the national road network recommending that the passing distance should be maintained

Source: photographed by Bálint Litkei

However, the legislative background in Hungary is still uncertain, even though in several countries there are already legislative regulations to solve the problem of the lateral distance keeping. Although, according to the plans, the Hungarian joint decree 1/1975 (II. 5.) KPM-BM on the rules of road traffic (hereinafter: KRESZ, also known as the Hungarian highway code) would include the numerical definition of the overtaking side distance, one meter in urban areas, one and a half meter outside of inhabited areas. Since then, the proposals made by the organisations involved have been raised in the public debate but have not been included in the legislation yet.

The problem of overtaking vehicles from different perspectives

Mutual lateral distancing

From time to time, various criticisms of overtaking by cyclists, based on lateral distance, also appear in the public discourse. The primary and most well-founded criticism is that the one meter prescribed in some countries, or 'expected' in Hungary in a residential area, or one and a half meters outside a residential area is not practicable and cannot be enforced. Another criticism is the subjective nature of the current obligation to maintain a lateral distance, as laid down in the Hungarian KRESZ, which, because it is undefined, also leaves room for various interpretations and application in practice.

At the same time, the issue of overtaking lateral distances has been present in the Hungarian public discourse for many years, and there are also opinions that if motorised road users have to keep a lateral distance of one or one and a half meters from cyclists, or possibly other micromobility devices that will be defined in the future in the highway code, or even pedestrians when overtaking, then the reverse should also be obligatory. Therefore, in the case of cyclists passing a stopped queue of vehicles, they should also be maintained at this distance.

The order of the factors influencing the probability of being disturbed or hit shows that from cyclists to other micromobility devices, and especially pedestrians, neither their surface size nor their speed can be such that they are even in the magnitudes of the air mass moved by motorised transport vehicles. This moving air mass is a fundamental source of the risk of fall and injury on the micromobility side. It also clearly follows that the risk of being swept away by a motorised vehicle is asymmetric in dependence on the physical appearance and speed of the road user. This, together with the stability of a two-track vehicle, makes the risk of overturning practically meaningless in relation to a non-motorised vehicle. However, it is not recommended that cyclists pass stationary vehicles at high speeds to allow themselves more time to react to pedestrians who may be stepping out of stationary vehicles or to a car door that has been opened in front of them. Nevertheless, there is no physical justification for requiring this kind of back-and-forth lateral distance.

Legislative interpretation of lateral distance

At the time of writing of this paper, the current road legislation, and particularly the Highway Code, does not contain any quantified value for overtaking for road vehicles and pedestrians. There is also no provision in this respect for micromobility devices, the main reason being that micromobility devices themselves are not defined in the Hungarian legislation. Therefore, the behaviour required of them cannot be defined either.

This does not mean, however, that the issue of lateral distance is not addressed at all in the legislation. The basic requirement is laid down in the Hungarian Act I of 1988 on Road Traffic, which states that a vehicle must be driven on the right-hand side of the road in Hungary, as far as possible to the right side of the road in the direction of travel, according to road and traffic conditions. Consequently, the spatial separation of vehicles travelling towards each other can be the greatest possible, which is beneficial to traffic safety. It is in this context that the concept of lateral distance is used for the first time in the Highway Code: "Vehicles travelling in opposite directions (on opposite sides) must maintain an adequate lateral distance between each other; to this end, vehicles must, where necessary, pull to the right side of the carriageway."[16] However, the rules on overtaking state that "overtaking is permitted if […] it is possible to maintain a sufficient lateral distance from the vehicle to be overtaken".[17] Such (logical) requirements for right-hand drive, however, condition drivers in the opposite direction to the side clearance required when overtaking.

They tend to keep a greater distance from the oncoming vehicle in opposing traffic, while the vehicle they are overtaking does not seem to be as much of a danger, either because of the smaller speed difference or because of the greater distance from the driver (not from the car).

In this type of situation, a more reasonable scenario for the overtaking driver seems to be to move towards the vehicle being overtaken (with whom the relative speed difference is also much smaller) in the event of oncoming traffic. This smaller lateral distance is considered to be less risky. As a contrast to the small lateral distance relative to the vehicle in the opposite direction, which is closer to him (and with a significantly greater speed difference), he will go back to the right, which he considers safer, even if this means increasing the risk of drifting away the micromobility user, which he has generated. In the empirical measurements for this paper, this type of driver behaviour was observed on numerous occasions. Previous research in Hungary has also shown that overtaking and lateral distance compliance were problems between cyclists and motorised road users, and that motorised road users were nearly 22 times more likely to cause this problem to cyclists than vice versa.[18]

However, in addition to the above wording, there are no vehicle-specific or distance-specific requirements in the KRESZ. This definition does not even refer the overtaking of pedestrians and other micromobility devices, as they are not vehicles, and Article 34 (1) d) of the KRESZ only requires an 'appropriate' lateral distance from the overtaking vehicle.

[16] Joint Decree 1/1975 (II. 5.) KPM–BM Paragraph 32 (1).
[17] Joint Decree 1/1975 (II. 5.) KPM–BM Paragraph 34 (1) d).
[18] Glász–Juhász 2017.

Lateral distance measurement on the Chain Bridge, Budapest

Methods

The measured lateral distance values were collected by instrumental measures while moving in traffic. The method consisted of physically implementing the data collection, systematising this data, and then evaluating and visualising the systematised information using Excel software. I was supported in the evaluation by full-time traffic police officer students of the Faculty of Law Enforcement of the Ludovika University of Public Service. The data were entered in a self-made Excel spreadsheet in order to allow for the evaluation of the data in case of further expansion. The present series of measurements were taken on the Chain Bridge in Budapest. The measurements were carried out on 9 June 2023, 21 June 2023, 8 September 2023, 10 May 2024, 13 May 2024, 25 July 2024 and 26 July 2024, recording a total of 238 vehicle passings. All measurements were made during daytime and under good visibility conditions. The data obtained here are compared with the previous results of a series of measurements on the Határ út in Budapest.

The one-way paved lane width of Határ út without pavement markings varies between 3.2 and 3.3 meters based on own field measurements, while the total roadway width between the edges of Chain Bridge is 6.45 meters,[19] with a standard[20] 0.12 m wide painted continuous line in the centre line. Thus, the available width per direction is 3.165 m, so there is no substantial difference in the width of the two routes studied.

Devices for the measurement

The measurement device, similar to the one previously mentioned on Határ út, is the Physics Package C3FT V3.1.1 measurement device manufactured by Codaxus LLC.[21] The instrument emits 42 kHz ultrasound, this reflection is detected from the objects between 20 and 250 cm distance, and then displays the distance value calculated from the reflection of the sound wave numerically on a LED display. The sensitivity of the device varies between +3 and 0 cm, so that if a vehicle passes within 100 cm of the point of installation in real life, it will not read out a value less than 100 cm, but may read out a value of 103 cm. The theoretical setup is shown in Figure 2 and the real setup in Figure 3.

[19] See: https://bkk.hu/fejlesztesek/kiemelt-fejlesztesek/archivum/fovarosi-fejlesztesek/kozteruleti-fejlesztesek/-a-szechenyi-lanchid-rekonstrukcioja.5786/

[20] e-UT 04.03.12:2022.

[21] See: https://codaxus.com/c3ft/c3ft-v3/

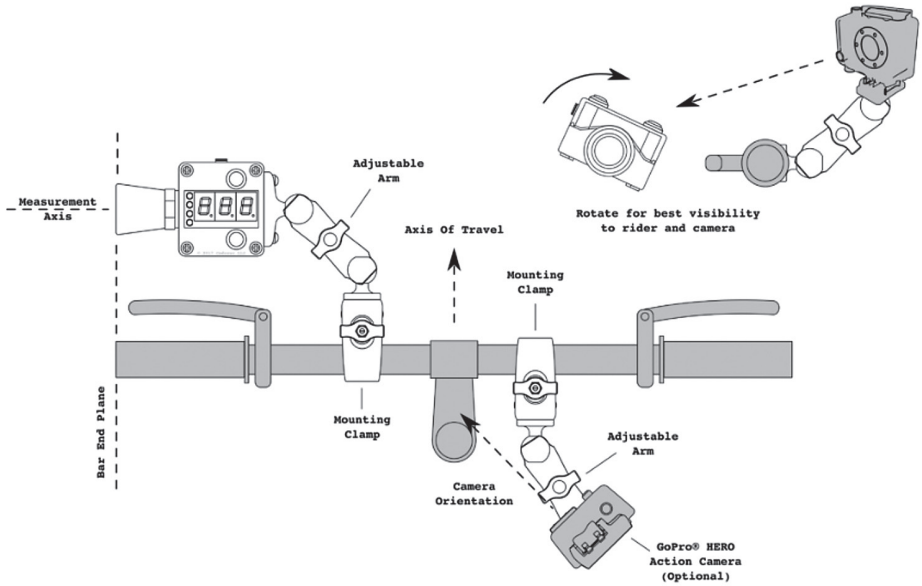


Figure 2: Recommended installation and layout for the C3FT v3.1.1 rangefinder
Source: https://codaxus.com/wp/wp-content/uploads/2017/06/c3ft-v3-mounting-diagram-768x497.png

As shown in Figure 3, the video which I recorded was made with a GoPro Hero 9 action camera. This differs from the proposed measurement setup. The camera records the values shown by the instrument while facing backwards. This speeds up the post-processing of the videos as it makes the oncoming vehicles visible. This makes it possible to identify vehicle types more easily. The disadvantage is that the measured distance values are displayed upside down on the video.

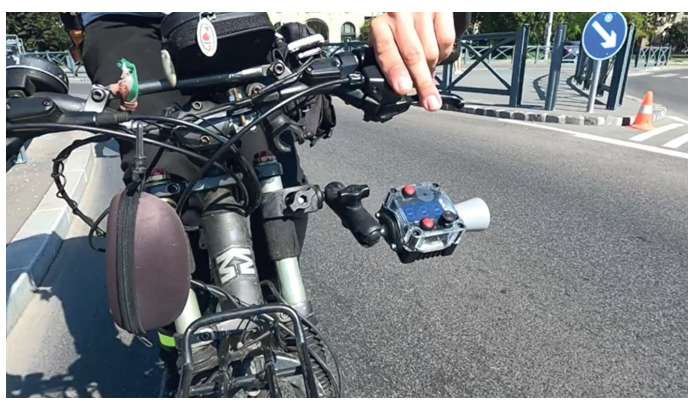


Figure 3: The measuring assembly, Budapest, Széchenyi Chain Bridge
Source: photographed by the author

The bike was a conventional drive MTB-style grey Mongoose Otero Comp with a 26-inch wheel diameter. It was used with the same setup for all measurement sessions, with the rear lights constantly on for safety reasons. Clothing was dark toned on all occasions, with no visibility vest.

Collection of data

The data collection was carried out in the centre of Budapest, on the Széchenyi Chain Bridge, which connects the banks of the Danube between Pest and Buda. During the five measurement sessions I cycled back and forth along the entire length of the bridge. A continuous line was painted on the road axis of the bridge. The width of the lanes is insufficient to allow a car or bus to safely overtake a cyclist in the lane. At the same time, the bridge has a vertical radius of 3,500 meters, which means a relatively steep uphill gradient to the bridge from both directions. The result is that cyclists cannot travel at high speeds until the halfway point of the bridge, from where they can roll to the bridge ends without the need to pedal. For this reason, I have chosen a speed of around 15 km/h up to the halfway point, and around 25 km/h on the downhill section, both roughly in the outer third of the traffic lane. The speed limit is 30 km/h for the entire section. This speed limit is widely used in several downtown areas due to the positive effects of road safety, air quality and noise reduction.[22] Since the distribution of bicycle traffic within the season, week and time of day shows great unevenness,[23] as well as the composition of the micromobility users is also very variable, special attention must be paid to the safety of such a bottleneck infrastructure as a Danube bridge.

Organising the data

During the post-analysis of the video recordings, the data taken from the instrument were recorded in a dedicated Excel spreadsheet. The minimum distance of the overtaking vehicle, as recorded by the instrument, was recorded according to the category of vehicle shown on the camera image, and even whether the vehicle was a taxi or not. This was necessary because the motorised traffic on the Chain Bridge, since the 2022 renovation, is mainly consisting of taxis. Therefore, in this measurement, and in future data collections at other locations using the same methodology, it will be possible to show whether there is a difference between the overtaking attitudes of taxi drivers and, for example, non-professional car drivers. Overtaking values are recorded for the corresponding vehicle type.

[22] Yannis–Michelaraki 2024.
[23] Bakó et al. 2022.

Authorised or emergency cars or lorries can also use the Chain Bridge. In the measurement presented here, only vehicles under 3.5 tonnes were included among overtaking lorries.

Mopeds and motorcycles can also use the Chain Bridge. They are also subject to the minimum value indicated by the instrument, but even for this type of vehicle the problem of lateral distance is not significant because of the width of the traffic lane available to motorcyclists. They also have a relatively small amount of moved air. Overtaking bicycles and electric scooters were also recorded separately. These kind of single-track vehicles could overtake within the lane.

A solo bus category can also be included when recording overtaking distance data. All bus categories that can no more be driven with a category B driving licence are recorded as belonging to this category. However, articulated buses can also be recorded separately in the table, but articulated buses are not operated on the Chain Bridge. There is no need to distinguish other types of vehicles, since the traffic regime on the Chain Bridge only allows the categories of vehicles discussed above to cross the bridge.

Results

Since the method designed and implemented as described in the Collection of data subsection was based on the same principles as the measurement that was carried out earlier on the Határ út in Budapest, it is possible to determine statistical indicators of the overtaking lateral distance values obtained and compare them with the results of the earlier measurement. The results can be seen separately in Figure 4, with the overtaking lateral distances measured on the Chain Bridge in red and on the Határ út in green. The diagrams, differentiated according to the measurement settings, show that there are no particularly high numbers of cases. Overtaking is shown in centimeter intervals. In principle, this cannot be otherwise, given the values displayed by the measuring instrument, but if we consider the nature of an overtaking, below certain values it is a matter of coincidence how many centimeters apart it occurs. This uncertainty is due to the movement of the overtaken bicycle, the movement of the overtaking vehicle and also to environmental influences. Thus, it is worth analysing the resulting data set further.

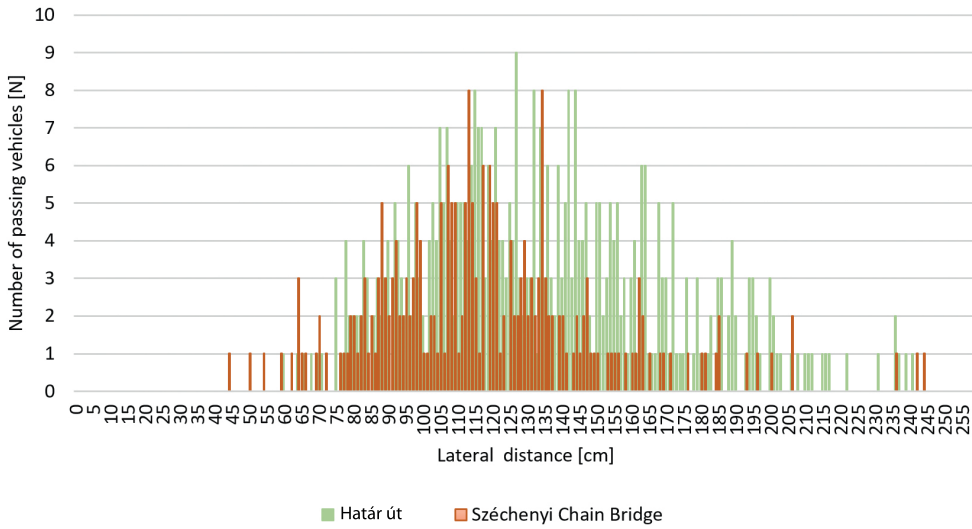
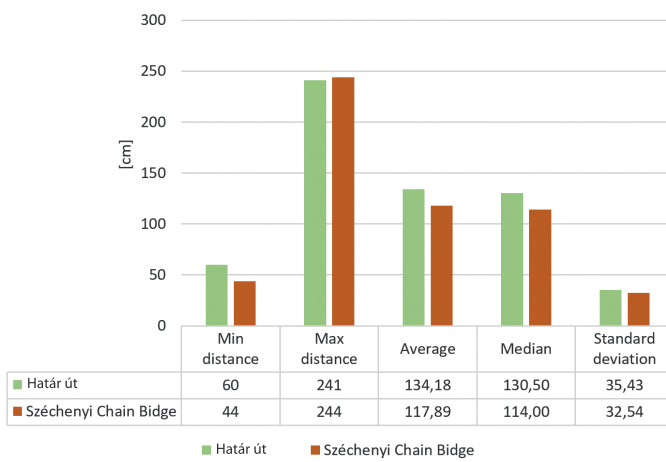


Figure 4: Number of overtaking vehicles as a function of lateral distances
Source: compiled by the author

The resulting data set contains differences between the two sites that can be identified at first glance. It is noticeable that, as can be proved from the theorem of the central limiting distribution for any result set that is as random as the present one, but with a sufficiently large number of random events, the result set approximates normal distribution. However, the data measured on Chain Bridge and Határ út show a different graph layout, and it is therefore also worth examining their statistical indicators.



	Min distance	Max distance	Average	Median	Standard deviation
Határ út	60	241	134,18	130,50	35,43
Széchenyi Chain Bidge	44	244	117,89	114,00	32,54

Figure 5: Statistical indicators
Source: compiled by the author

It can be seen that both the mean and the median are smaller on the Chain Bridge, while the range of overtaking is also smaller. The minimum value also shows that overtaking on the Chain Bridge is also carried out closer to the cyclist, while the maximum value shows that overtaking is physically possible even in a larger curve than the one measured on the Határ út. As there is currently a continuous line on the Chain Bridge, a cyclist cannot be overtaken by a car or bus in any circumstances without touching or crossing the continuous line, and the available lane width is not sufficient for that. Therefore, if overtaking, even if it were to commit an offence, this could be done in accordance with the characteristics of the Boundary Road.

Figure 6 illustrates the values obtained at the two measurement locations. This representation eliminates the aforementioned random effect on overtaking accuracy and allows trends to be observed. In this case, data sets have been split into 10 and 20 cm intervals, and the lateral distances for each measurement site have been represented according to these intervals. The values obtained are represented by shape curves, and as the intervals are increased, it becomes apparent that the two curves are similar in nature. The shape of each curve is similar, as the roughly twice larger number of elements on the Határ út can be eliminated by using two value axes.

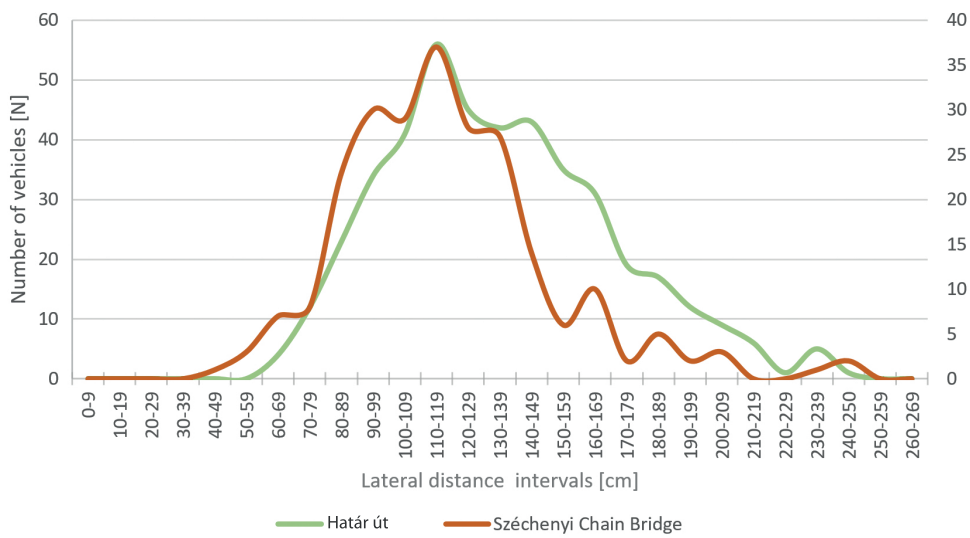


Figure 6: Lateral distances at 10 cm intervals

Source: compiled by the author

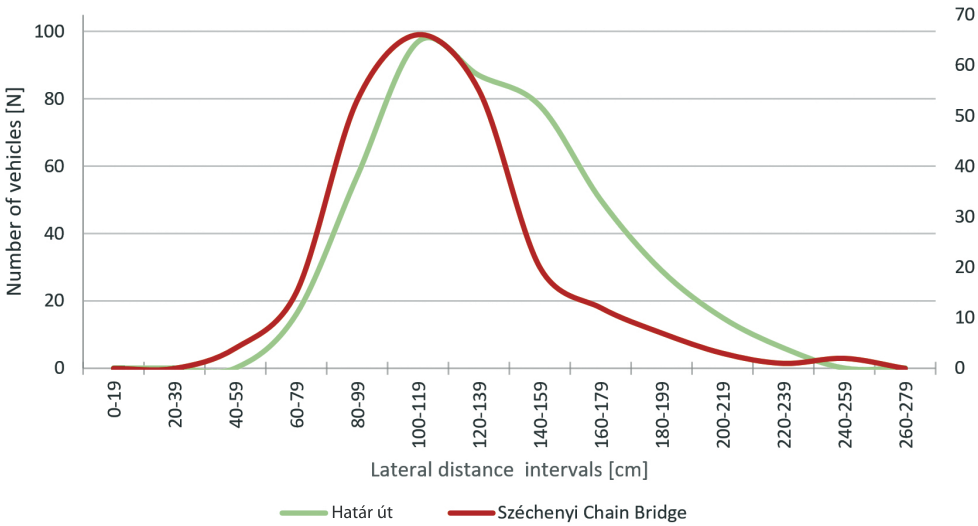


Figure 7: Lateral distances at 20 cm intervals

Source: compiled by the author

Figure 6 shows that on the two Budapest locations the maximum of the intervals of the overtaking side distances used by the overtaking vehicles in the 10 cm categories falls in the 110–119 cm category, practically regardless of whether there is a continuous line or a broken line on the middle of the road. However, it can also be seen from Figure 7 that the same data set, divided into 20 cm categories, already clearly show a result that supports the preliminary expectations. On the Chain Bridge with the continuous line, the overtaking lateral distances are modified by the pavement sign so that motorised vehicles pass closer to cyclists in the majority of cases. Supposedly in the hope that they can still do this legally, overtaking within the lane. However, this manoeuvre is equally illegal, overtaking within the lane is not possible. In these circumstances, cycling in the outer third of the lane, a two-tracking vehicle must in any case touch the continuous line, based on the average width of a car of 2 meters and the available lane width of 3.165 m. However, it is not safe for cyclists to ride on the Chain Bridge even further to the right due to its structural design. In addition, the measurement was taken on this same line at Határ út, too, therefore the two data series can be compared in this way.

The bridge is also used by Budapest public transport buses, of which the Karsan ATAK midi buses have a width of 2.436 m and the Mercedes Connecto 2 solo buses a width of 2.55 m.[24] There were also occasions when these buses overtook during the measurements, but possibly due to the lower acceleration, the larger width and the greater willingness of its professional drivers to obey the rules, there were far fewer (9 occasions in total) than in the case of the overtaking passenger cars, which were

[24] See: www.bkv.hu/hu/jarmuveink/autobusz

mainly taxis. Of the 159 overtaking passenger cars on the Chain Bridge, 152 were taxis, a rate of 95.598%. This is not unexpected, considering that the number of private cars using the bridge is limited. In practice there was no occasion when an arriving taxi did not overtake if there was physically enough space to do so.

Summary

As shown, the statistical indicators of the overtaking side distances maintained alongside cyclists on the two examined road sections with similar width parameters show a detectable and noticeable difference in reality. The speed limit is 30 km/h along the whole length of the Chain Bridge, where a continuous line is painted along the whole length, while on the Határ út the speed limit is 50 km/h and overtaking is limited by the traffic density of oncoming vehicles, not the continuous line. Nevertheless, overtaking is quite common on the bridge, especially on the uphill side of the bridge where cyclists are moving at slower speeds. The tempo of the traffic is not very different from the rest of the city and overtaking at speeds of the rider at 20–25 km/h was also common, even with a high-speed difference. At the same time, Hungarian legislation already allows for fully automated monitoring and sanctioning of speed limits and overtaking across the continuous line[25] called VÉDA System, but VÉDA devices are not in operation on the Chain Bridge.

The examination of the WEB-BAL accident database operated by Hungarian Public Roads NZrt.[26] shows that after the reconstruction of the Chain Bridge is completed in December 2022, there will be no accident markers in its database. Makers shown in WEB-BAL required police action after an accident. There were no such markers on the bridge until March 2024, (the data is available in WEB-BAL until this time). This shows that even with this traffic regime and the presence of illegal overtaking, traffic can still flow without any severe accidents. However, this means that a considerable amount of motorised users experience the slower speed of cyclists as a frustration. At the same time, it also means that they want to manage this frustration by violating the overtaking rules by crossing the continuous line.

Pragmatically one could say that it doesn't matter whether there is a continuous or a broken line on the Chain Bridge or something else, or even no pavement signs, because as it currently exists, traffic uses the bridge as if there were no continuous line. This phenomenon will become a matter of concern if this continuous line alters the overtaking tendency of road users in such a way as to create more dangerous or frightening situations for cyclists. From the results obtained, this is exactly what we can see.

[25] Major–Mészáros 2016.
[26] Felföldi 2023c.

Looking at the maximum values for overtaking side distances, we see that there is physically enough available space to apply this larger side distance if there is no oncoming traffic, but it is not being applied by motorised road users. During the data collection, it was very rare that overtaking was not done with a larger curve, as measured on the Határ út, because the oncoming traffic did not allow it. Motorised road users may feel 'discomfort' crossing the continuous line because there is a learned mental block. However, the extent of this block can be influenced by a number of factors ranging from the age, gender, occupation of the driver to the number of passengers.[27] This has also resulted in a much more homogeneous group of overtakers on the Chain Bridge, which may have led to a homogenisation of drivers' risk-taking behaviour.[28]

Taking all this into account, the current traffic engineering solution of the Chain Bridge may cause greater frustration for cyclists due to the smaller lateral distances they have to deal with. Following also can be a frustration for cyclists. Meanwhile the lower, 10–15 km/h speeds and the prohibition of overtaking can be a frustration to motorised drivers. The solution to this could be to allow overtaking through traffic engineering, keeping in mind that the current speed limits for motorised vehicles should not be increased significantly. The vertical design of the bridge does not allow sufficient overtaking visibility at a speed limit of 30 km/h. For this reason, overtaking is currently still carried out at speeds above 30 km/h with a small lateral distance. If the speed limit on the bridge were 40 km/h, the overtaking visibility would be shortened, so broken line could be painted and motorised traffic would be able to overtake with a greater lateral distance.

Alternatively, asymmetric lane widths could be used on the uphill and downhill sections of the bridge, as the available width of 6.45–0.12 m is currently split equally between the two directions. Therefore, the width of the traffic lanes on both the uphill and downhill sides is 3.165 m, which could be divided in such a way that the uphill side lanes have a wider width and the downhill side a narrower width, with a transient aera with oblique parallel lines in the middle of the bridge. This is not expected to clearly eliminate the problem of overtaking across the continuous line, but it would provide some extra lateral distance for the more vulnerable cyclists travelling slowly uphill towards the centre of the bridge.

In addition to the problem of overtaking, greater attention to each other by road users can be increased by radically reducing traffic engineering and road signs. The Vienna Convention on Road Signs and Signals does not require pavement markings to separate lanes, and in Hungary there are many places where there are even wider two-way road sections than the Chain Bridge without pavement signs. In these places, it is up to the road users' decision to create safer traffic situations and to solve the problems that may arise by increasing the level of interaction between them.[29]

[27] Rosenbloom–Perlman 2016.
[28] Figueira–Larocca 2020.
[29] Luca et al. 2012.

Of course, this solution also requires the surveillance and enforcement of the speed limit prescribed for the section.

Whether the traffic regime on the Chain Bridge changes in the future or remains the same, with the current continuous line and 30 km/h speed limit, it is necessary to enforce the existing rules that are being or will be established. This must be a permanent, automated task, which requires, in particular, the use of cameras to monitor the entire road network and the automatic sanctioning for any unlawful manoeuvres. Both speeding, crossing the continuous line and inappropriate lateral distance can be clearly and automatically detected from camera images, and, as with systems already in operation in many parts of Hungary, the sanctions can be fully automated. Whatever the established traffic rules on an infrastructure, if violations of these rules are known to go unsanctioned, the willingness to comply with the rules will decrease over time.[30]

Evidence of this is clearly visible on the Széchenyi Chain Bridge, where the lack of sanctions leads to a complete lack of compliance with traffic rules. This is not good for road safety, and not good for the traffic morale in the long term.

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