

The Transport Challenges in one of the Most Beautiful Micro Regions of Hungary

László Jóna

(Dr László Jóna, Széchenyi István University, Faculty of Architecture, Civil Engineering and Transport Sciences, Department of Transport, Hungary, 9026 Győr, Egyetem tér 1., jona.laszlo@sze.hu; Centre for Economic and Regional Studies Institute for Regional Studies West-Hungarian Research Department, Hungary 9022 Győr, Liszt Ferenc utca 10., jona.laszlo@rtk.hu)

1 ABSTRACT

The Szigetköz is one of the most beautiful areas in Hungary, which is located in Western Transdanubia. However, in recent years more and more people have moved out of the region, mainly from the City of Győr, which due to their traffic has increased significantly. All this is the result of Győr's growing industry and economy, which has had a major impact on the growth of real estate prices. Therefore besides with the people of higher income also the people with lower income has been settled in one of the settlements of the Szigetköz. However, in the typical way of suburbanisation, people living in the area still go to work and study in the city, so there are serious congestions, especially in the morning and afternoon rush hours. These congestions not only affect the city of Győr, but can already be felt in several settlements of the Szigetköz. Therefore, in my study I present how the traffic of the Szigetköz has increased in recent years, how its green space has changed, and what transport-related development is planned in each settlement. At the end of the study, I suggest what kind of development could be used to make liveable the traffic of the area.

Keywords: sustainability, Szigetköz, microregion, Hungary, traffic

2 INTRODUCTION

The history of the Szigetköz started in that age when the place of the dried up Pannon see began to fill the ancestors of the river Danube, Moravian, and Nitra with sediment. In the beginning, this area was a large island, which was marked on old maps as "Insula Magna". However, in the 16th century, the flow of the main Danube branch changed and cut this large island in two. From then on, the southern part was called Szigetköz, and the northern part Csallóköz. The Szigetköz which is located between the Mosoni-Danube and the Great-Danube, has a northwest-southeast axis of approximately 52.5 km and a width of 6-8 km. (Alexay, 2018)

In our country, suburbanization started in the second half of the 80s, but the process accelerated from the 2000s. In the case of the city of Győr, most people have moved to the agglomeration in recent years, and in high rate to the more distant settlements which are located in the Szigetköz. The reason for this is primarily due to the fact that Győr's growing industry and economy had a significant effect on the increase in real estate prices. Therefore beside of the richer stratum a significant number of those has moved to the Szigetköz who cannot afford the family house in the city area. (Hardi – Nárai, 2005)

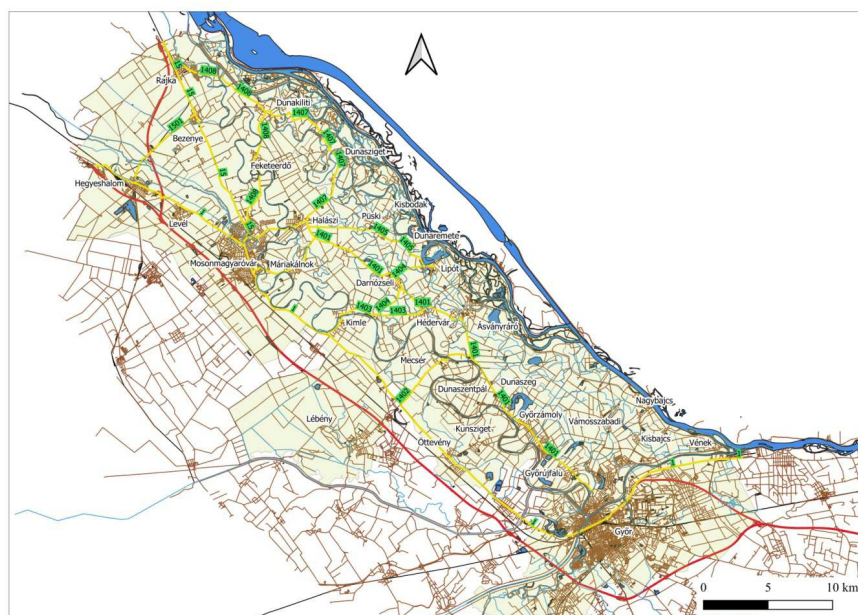


Fig. 1: The road network of the Szigetköz

One of the negative effects of suburbanization, which can also be observed in the case of those living in Szigetköz and in Győr, is the change in transportation needs and the significant increase of passenger car traffic. Especially during the morning and afternoon peak periods, significant congestion occurs along the main roads leading to Győr (main roads 1, 14, 81, 82, 83). All of this is also true for the "Szigetköz" connecting road number 1401, which through people coming from Szigetköz want to reach the Industrial Park and the city center on highway 14. Such a large increase in passenger car traffic is clearly one of the negative consequences of suburbanization, which is due to several factors. The most people works in such a position or workplaces which don't allow them to adapt to the public transport schedule, so they commute by car on a daily basis. A significant part of the services (e.g. shopping centers, post office, various customer service offices, clinics, etc.) are still located in the city, which would take much more time to reach by public transport, and in cases such as shopping, packing and transport would causes difficulty. And the children of those who moved out still go to school and kindergarten in the city, so in many cases before reaching the workplaces these institutions also have to be dropped, which also contribute to the formation of morning congestion. (Hardi – Nárai, 2005)

At the same time, the increased traffic causes problems not only in the city, but also in the settlements along the connecting road No. 1401, in which the fact that the agglomeration of Győr practically covers the entire Szigetköz plays a significant role, because there are some people who goes all the way from Rajka to work and learn in the city. (Hardi, 2008)

Therefore in my study on one hand I'm looking for the answer how has been the volume of the traffic changed in the Szigetköz between 2010 and 2019. On the other hand, what traffic problems exist and how traffic could be improved locally and how could be reduced the vehicle traffic into the direction of the city. In the current study, my investigations concern the following 32 Szigetköz settlements: Ásványráró, Bezenye, Darnózseli, Dunakiliti, Dunaremete, Dunaszeg, Dunaszentpál, Dunasziget, Feketeerdő, Győr, Győrladamér, Győrújfalú, Győrzámoly, Halászi, Hegyeshalom, Hédervár, Kimle, Kisbajcs, Kisbodak, Kunsziget, Lébény, Levél, Lipót, Máriakálnok, Mecsér, Mosonmagyaróvár, Nagybajcs, Öttevény, Püski, Rajka, Vámoszabadi, Vének.

3 THE CURRENT TRAFFIC SITUATION OF THE SZIGETKÖZ

3.1 The change of private transport

Looking at the traffic of the Szigetköz its busiest routes are its main traffic axis the 1401 road, the Mosonmagyaróvár and the 1401 road connecting 1406 road, and the Mosonmagyaróvár and Rajka connecting 1408 road. (Fig. 1.)

Examining the traffic of the routes, it can be said each of them that the vehicle traffic exceeds 2,000 vehicles/day. The traffic of the road 1401 increased by 24% between 2011 and 2018, and the chart shows that further growth is expected in the future. (Fig. 2.)

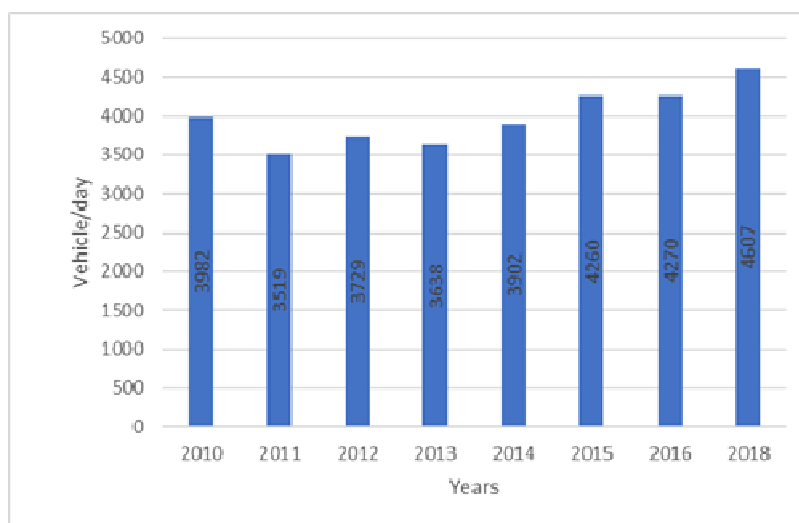


Fig. 2: Traffic increase on the 1401 road

The Mosonmagyaróvár and Máriakálnok connecting Road No. 1406 is almost 7 km long. The traffic of this road in 9 years has increased even more spectacularly than of the 1401 road. Because until 2012 it didn't even reach 2000 vehicles/day until in 2013 it jumped over 3500 vehicles/day which represented a 45% increase. Between 2013 and 2018 with 19% has increased the vehicle traffic on road 1406. (Fig. 3.)

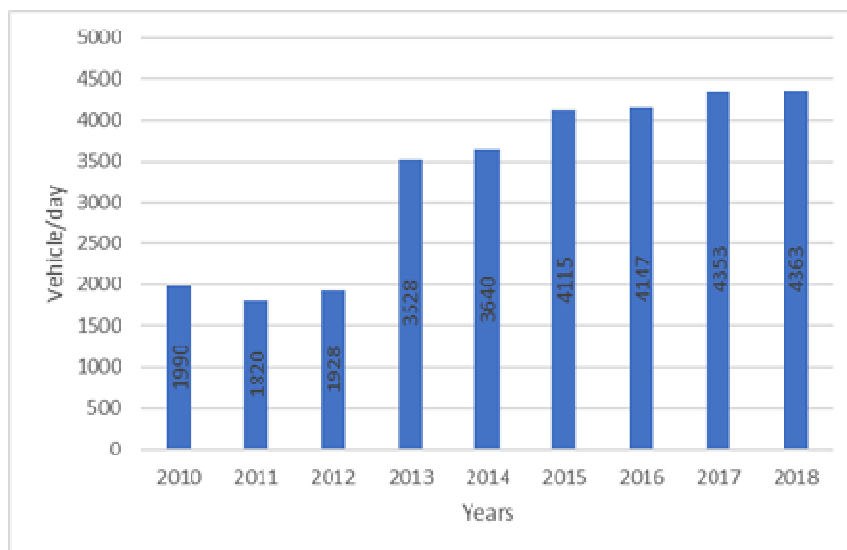


Fig. 3: Traffic increase on the 1406 road

The Mosonmagyaróvár-Dunakiliti-Rajka connecting Road No. 1408 is almost 18 km long. The highest increase in traffic was between 2013 and 2014 when the traffic of the route increased by 23%. Similar to the roads 1401 and 1406 the traffic of the 1408 road is also constantly increasing which between 2014 and 2018 has grown by 10%. (Fig. 4.)

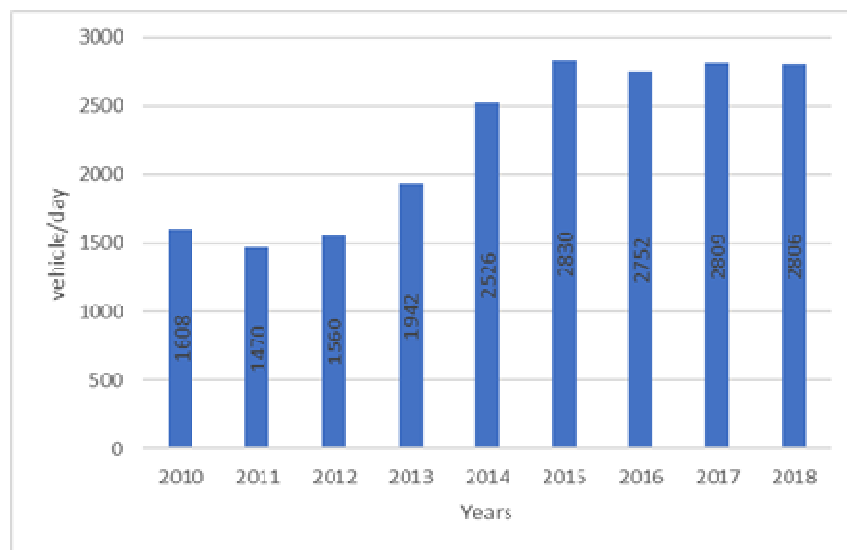


Fig. 4: Traffic increase on the 1408 road

Overall, it can be said that the traffic of the studied roads showed a significant increase in 9 years. All of this is true not only for the three busiest roads which were presented in the study, but also for all the routes located in the Szigetköz.

3.2 The change of public transport

Within the vehicle traffic of the Szigetköz it is important to study how the public transport has been changed between 2010 and 2018. As it can be clearly seen in Table 1. the number of buses increases every year on all in the paper studied roads which from the road 1406 is highlighted where the bus traffic has more than doubled. The traffic on the road 1401 increased by 59% and on the road 1408 by 42%. As it can be seen next to the private transport the role of public transport has also increased significantly in the Szigetköz in recent years, therefore its further development will definitely be necessary in the future.

Bus traffic			
Year	Road number		
	1401 (vehicle/day)	1406 (vehicle/day)	1408 (vehicle/day)
2010	41	7	33
2011	34	6	28
2012	35	6	28
2013	51	20	23
2014	60	25	46
2015	61	25	47
2016	52	20	38
2017	63	25	47
2018	65	25	47
Change 2010-2018 (%)	58,54	257,14	42,42

Table 1: The rate of change in bus traffic between 2010 and 2018 (%)

3.3 Bicycle traffic

During the study of the Szigetköz traffic it can't be leave out the bicycle traffic because the Szigetköz is a popular tourist destination that many people visit by bicycle. All of this is not coincidence, because the EuroVelo 6 international bicycle route, which connects the Atlantic Ocean with the Black Sea, passes through the region. The Hungarian section of the route starts at Rajka and leaves Szigetköz in the direction of Győr.

In the case of the three busiest roads in the Szigetköz from 2013 a clear increase can be observed in the annual average bicycle traffic. (Fig. 5.) Among them, the road 1406 is highlighted where most people cycle, and between 2013 and 2018, the rate of cyclists increased by nearly 60%. In the same period on road the 1401 with 65% and on the road 1408 with 61% .

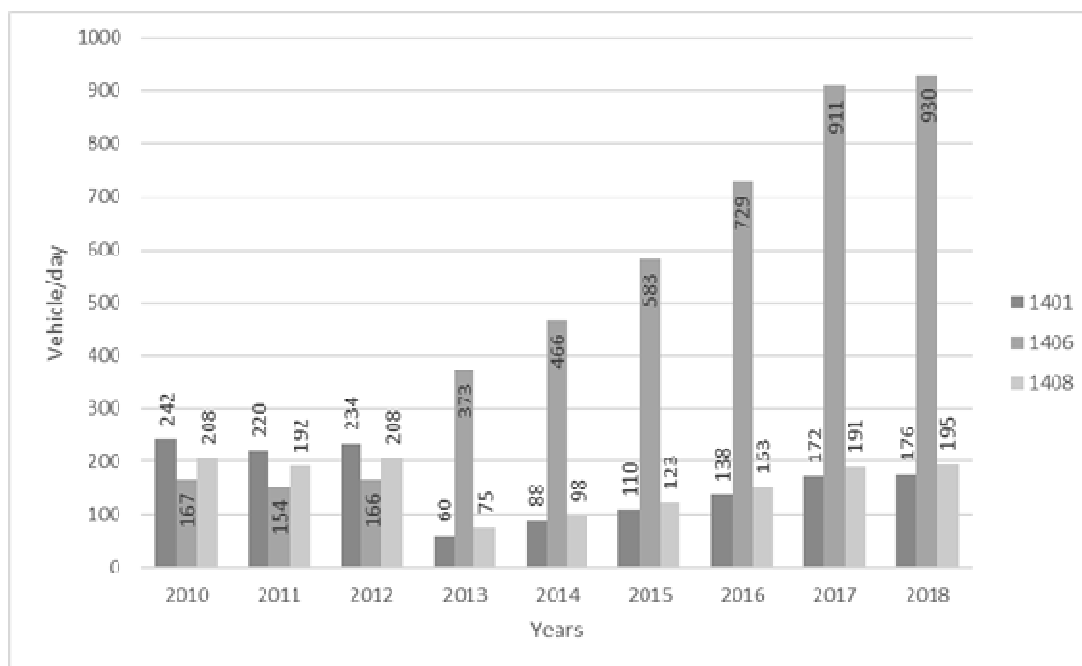


Fig. 5: The change of rate in bicycle traffic between 2010 and 2018 (%)

From the traffic data it clearly turns out, that cycling plays an important role in the area, and its year-on-year growth also predicts that its development will be necessary. All of this will be important not only from a traffic point of view, but also from an environmental point of view. Therefore it is also necessary to study how the green areas of the Szigetköz settlements changed between 2010 and 2018. Because, as it can be seen vehicle traffic has increased significantly in 9 years, and it is expected that it will only increase in the future.

4 THE CHANGES IN THE GREEN AREAS OF THE SZIGETKÖZ

The size of the green areas of the Szigetköz settlements between 2010 and 2018 shows a rather varied picture. (Fig.6.) The reason for this is that from the studied 32 settlements Ásványráró, Dunaremete, Feketeerő and Mecsér have never provided statistical data on the size of their green areas. And from 2011 Győrújfalú and from 2013 Bezenye and Győrzámoly settlements did the same. In addition, the data provided by individual settlements show significant differences in certain years, of which the two big cities Győr and Mosonmagyaróvár are highlighted, where the most green areas are located. Therefore, the jumps and declines shown in the diagram are due to these two cities. However it is important to note that the size of green areas in the majority of the Szigetköz villages is mostly stagnant or slightly increasing, while the decrease is mainly characteristic of Győr and Mosonmagyaróvár. However due to the increase in traffic and the number of vehicles, it can be seen that the protection and increase of green areas is not enough for the Szigetköz area to remain sustainable without significant transport development. Therefore in the next chapter it will be presented that the settlements of the studied area what kind of transport developments planning in the future.

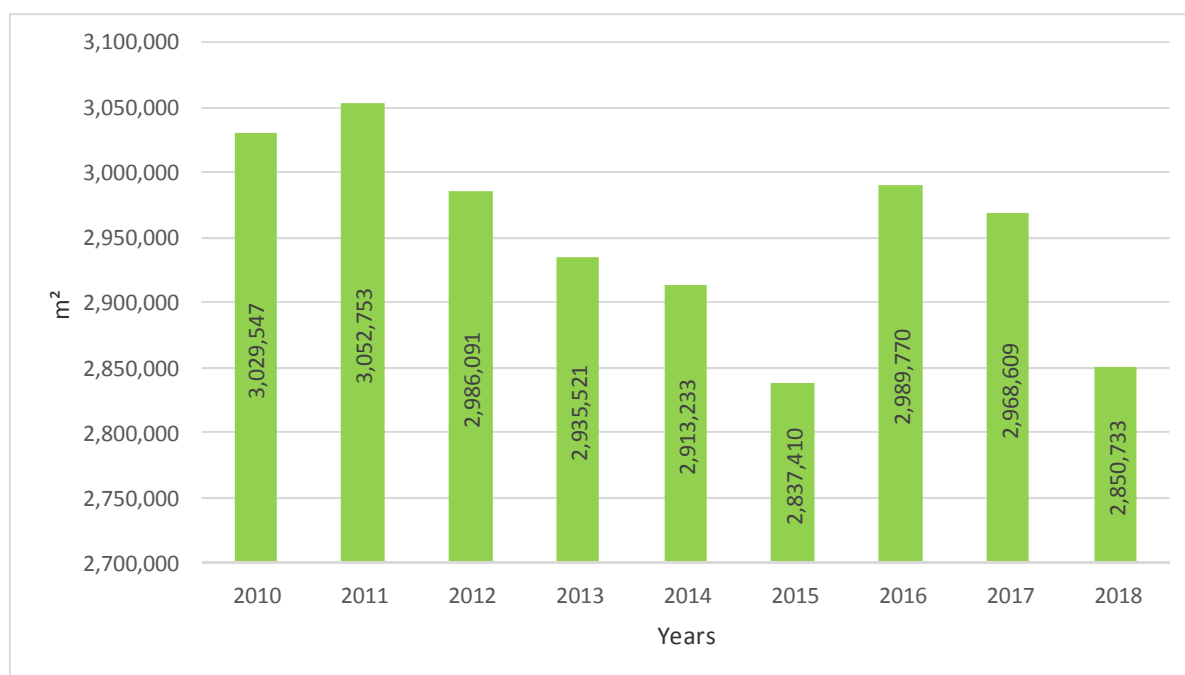


Fig. 6: The changing of the green areas in the settlements of the Szigetköz

5 THE TRANSPORT DEVELOPMENT PLANS OF THE SETTLEMENTS IN THE SZIGETKÖZ

To study what kind of transport related development are planning the individual settlements of the Szigetköz, 32 master plan of the Szigetköz settlements were reviewed where primarily I was looking for the answer what kind of transport development suggestions got each document. Therefore primarily within the master plan of each settlement I reviewed the structural plan, the transport supporting document and the technical description of the master plan where this was possible. From the studied settlements only in 15 cases were not reviewed the transport supporting document which is primarily due to the fact that it wasn't available either on the website of the settlement or at the office that prepared the master plan. I requested the missing data from Magyar Közút, and I asked all studied settlements to provide information about their planned future developments.

From the received data, the master plans, and after the detailed study of the technical descriptions it turned out that in the Szigetköz the following three planned developments affecting the most settlements:

- Construction of the 1401 bypass road
- Construction of a bicycle road along the embankment of the Danube
- Construction of connecting road/roads with the neighboring settlement/settlements

Beside of the above mentioned developments the M14 motorway must be highlighted which doesn't directly affect the area of Szigetköz, but after its construction will have a significant impact on its future traffic. The planned transport developments of the studied settlements of the Szigetköz presents detailed the Table 2.

No.	Settlement	Planned development
1	Ásványráró	Settlement connecting road to Hédervár and Lipót Bicycle path along the Danube The 1401 bypass road
2	Bezenye	Bicycle road along the No. 1401 connecting road
3	Darnózseli	The section of the 1401 bypass road in two versions National side road in the direction of Dunaremete and Lipót Settlement road in the direction of Püski
4	Dunakiliti	Bicycle road along the connecting roads 1407 and 1408 connecting roads and the to Mosoni-Danube leading roads In the southern area of the settlement, inter-settlement roads have been designated
5	Dunaremete	Development of the junction between Fő utca and Arany János utca on connecting road no. 1405 Connecting road into the direction of Kisbodak and Darnózseli
6	Dunaszeg	The 1401 bypass road
7	Dunaszentpál	Bicycle road through the center of the settlement
8	Dunasziget	Bicycle road on road No. 1407, as well as along Szent István, Cikola, Dózsa György street, a bicycle path has been designated The extension of Nagysziget utca in the direction of Püski has been designated
9	Feketeerdő	The master plan of the settlement is not on the settlement's website, Magyar Közút hasn't give any information about future development in the settlement
10	Győr	M14 motorway Continuation of Ipar street Construction of a new entrance section of the main road No. 82. Construction of the western bypass road
11	Győrladamér	The 1401 bypass road
12	Győrújfalú	Western bypass road between the intersection of the 813 road and the main roads No. 1.-85.
13	Győrzámoly	The 1401 bypass road The renovation of road 1401
14	Halászi	The master plan of the settlement is not on the settlement's website, Magyar Közút hasn't give any information about future development in the settlement
15	Hédervár	Településközi összekötő út az 1401. útból kiindulva Ásványráró, és Mecsér irányába
16	Hegyeshalom	A település honlapja alapján a rendezési terv módosítása 2020.-ben kezdődött el. A Magyar Közút tájékoztatása alapján nincs tervezett fejlesztés a jövőben Hegyeshalomban.
17	Kimle	Settlement connecting road starting from road 1401 into the direction of Ásványráró and Mecsér
18	Kisbajcs	Bicycle road along the Danube
19	Kisbodak	There is no planned transport development in Kisbodak
20	Kunsziget	Kunsziget-Dunaszeg connecting road Börcs-Kunsziget connecting road
21	Lébény	Bicycle road along the main roads (from Ottómajor to Mosonszentmiklós) Settlement connecting road into the direction of Mosonszentmiklós Lébény-Károlyháza connecting road
22	Levél	Settlement connecting road has been designated in the continuation of Alsó Fő street into the direction of Mosonmagyaróvár
23	Lipót	Settlement connecting road has been designated through Ásványráró and the planned Lipót/Bösi harbor and Dunaremete into the direction of Darnózseli
24	Máriakálnok	The master plan of the settlement is not on the settlement's website, Magyar Közút hasn't give any information about future development in the settlement
25	Mecsér	Settlement connecting road into the direction of Dunaszentpál Bicycle road into the direction of Lébény The renovation of road 1402
26	Mosonmagyaróvár	A ring road has been designated touching the main roads No. 1 and 86. From Mátyás király street to the south, a bicycle path has been designated along the main road No. 86 and along Soproni street, as well as into the direction of Mosonudvar, touching Mosonszentjános street Móvár déli tehermentesítő út, valamint az M1 Moson-pihenő - 8505.j. út összekötése (csomópont kialakítás) Móvár southern relief road and the M1 Moson- resting place- 8505. road connection (junction formation)
27	Nagybajcs	Bicycle road along the Danube
28	Öttevény	There is no planned transport development in Öttevény
29	Püski	The master plan of the settlement is not on the settlement's website, Magyar Közút hasn't give any information about future development in the settlement
30	Rajka	The master plan of the settlement is not on the settlement's website, Magyar Közút hasn't give any information about future development in the settlement
31	Vámoszabadi	M14 motorway and the roads connected to it (Győrzámoly settlement connecting road), to the border Bicycle road between roads No. 14 and 1303 to the north of the inner area
32	Vének	Settlement connecting road into the direction of Gönyű (and Slovakia) New road into the direction of the Water feature

Table 2.: Planned transport developments in the master plan of the Szigetköz settlements

From the table it turns out clearly that the settlements connecting roads would primarily with the neighbouring settlements providing fast connection therefore cycling would be a good transport alternative on them. Therefore, with sustainability and environmental protection keeping in mind, it would be

recommended to limit passenger car traffic on these roads in such a way that, from spring to autumn, primarily cycling and public transport would be allowed on them. And by passenger cars could be used only in the autumn and winter seasons these roads which looking at their design would be single-lane.

6 SUMMARY

As it was presented in the study the traffic of each highlighted roads of the Szigetköz has significantly increased between 2010 and 2018. From these stands out the 1401 road which traffic exceeded 4,600 vehicles/day in 2018. Looking at the bus traffic also increase has been experienced on all roads of the Szigetköz. The highest increase in bus traffic was experienced on route 1406, which almost tripled in 9 years. Between 2010 and 2012 the bicycle traffic showed a rather varied picture, and then started to increase significantly from 2013. Since 2017 the road 1406 has exceeded 900 vehicles/day, until the roads 1401 and 1408 have over 150 vehicles/day.

A tanulmányban ahogy látható volt mindegyik kiemelt szigetközi út forgalma 2010 és 2018 között jelentős mértékben megnövekedett. Ezek közül kitűnik az 1401-es szigetközi út mely 2018-ban már meghaladta a 4600 jármű/nap forgalmat. Az autóbusz közlekedést tekintve szintén növekedés volt tapasztalható valamennyi szigetközi úton. A legnagyobb autóbusz forgalom növekedés az 1406-os úton volt tapasztalható, mely 9 év alatt majdnem megháromszorozódott. A kerékpáros forgalom 2010 és 2012 között meglehetősen változatos képet mutatott, majd 2013-tól jelentős növekedésnek indult. Az 1406-os úton 2017 óta meghaladja a 900 jármű/napot, míg az 1401-es, és 1408-as utakon 150 jármű/nap felett van.

After the review of the master plans of the settlements in the Szigetköz it was established that most of them want the construction of the 1401 bypass road, which is clearly due to the increasing proportion of people moving out to Szigetköz. Beside that as it was seen the development of bicycle transport is also a high priority in the plans, but primarily from a tourism point of view. Therefore, it is no coincidence that the settlements connecting roads were in the third place, which, primarily due to the increased traffic, can represent an alternative route for those living in the Szigetköz. However, the new road construction in the future will only generate additional vehicle traffic and reduce the green areas of the settlements. Therefore it would be recommended to create these settlement connecting roads in such a way that they are only single-lane, and from early spring to late autumn, only public transport or alternative means of transport would be allowed on them, such as the use of electric vehicles, cycling, etc. During the autumn and winter periods the passenger cars could only use to a limited extent these roads also, and in the morning and afternoon peak times due to the faster distribution of traffic, and in case of extreme weather (e.g. fog, intense rain, snow, etc.), taking traffic safety into account. In order to increase green areas, as far as the landscape and traffic safety conditions allow, vegetation must be planted along these roads, and where it is possible to protect the existing ones.

In the future, it is expected that even more people will move to Szigetköz, whose traffic will continue to increase. Therefore, it would definitely be recommended to implement the transport development presented in the study, as well as the increase of green space. With the help of this, Szigetköz can continue to be liveable and sustainable in the future.

7 REFERENCES

- Alexy Zoltán: A Szigetköz múltja és jelene. In: Honismeret, Vol. 46. Issue 3, pp. 50-61. Budapest, 2018
 Hardi Tamás, Nárai Márta: Szuburbanizációs és közlekedés a győri agglomerációban. In: Tér és Társadalom, Vol. 19. Issue 1, pp. 81-101. Győr, 2005
 Hardi Tamás: A határtérség térszerkezeti jellemzői. In: Tér és Társadalom, Vol. 22. Issue 3, pp.3-25. Győr, 2008