DEFINING CORRELATION BETWEEN THE MODAL SPLIT OF INHABITANTS AND STUDENTS AND THE LOCATION OF HOUSING AREAS AND SCHOOLS, WITH THE ANALYSIS OF TRAVEL PLANS

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Introduction

- Nowadays, **sustainable development and managing car traffic is often in the center of attention.**
- **In order to ensure sustainable development of a city it is important to reduce car traffic and the caused problems**, e.g. congestion, local air pollution, community severance, greenhouse gas emissions; degraded residential and urban areas.
- In the recent years the **authors participated in two Intelligent Energy Europe projects** (Pro.motion and Travel Plan Plus project) **which aim was to deliver transport-sector energy savings by creating travel plans.**
- **During the development of the projects two local travel plans were worked out, one for the residential area Ménfőcsanak**, in the city of Győr, Hungary **and one for the elementary educational institutions of Győr.**
- **The main objective of all these studies were, to reduce the problems caused by private car users and more over to promote sustainable mobility choices for target groups.**
- **The results of the two projects showed us, that travel plans are effective tools in order to solve mobility challenges in a sustainable way and that land-use methods have strong effect on the success of travel plans.**

Urban mobility

- **Today the largest proportion of travel related to work, services, free time activities** or tourism.
- According to a British National Travel Survey, in 2008, of **all miles traveled as a car driver** in Britain, **38% were for commuting or business purposes**.
- According to an other British survey, **20 % of trips made by car are inevitable, 60 % might be impressionable** (depend on the situation of the public-transport, working hours and the location of services) **and 20 % is replaceable with other travel modes.**
- **Urban transport is a complex system which is closely related to land-use and therefore requires coordinated development** with that.
- **The distribution of land use such as residential areas, industrial and commercial areas, determine human activities** e.g.: home, work, shopping, education or recreation.

Defining travel plans

- **A travel plan is a package of measures tailored to the needs of a target group and aimed to promoting greener, cleaner travel choices and reducing reliance on the car.** Unlike the traditional approach to addressing transport problems of providing more capacity, travel plans can be quick, cheap, effective and popular.

- There is no standard format or content for travel plans, and they may have a variety of names (such as green transport plans, company travel plans and school travel plans).

- However, **their relevance to planning lies in the delivery of sustainable transport objectives, including**:
  - **reductions in car usage** (particularly single occupancy journeys) and **increased use of public transport, walking and cycling**;
  - **reduced traffic speeds and improved road safety** and personal security particularly **for pedestrians and cyclists**;
  - more environmentally friendly delivery and freight movements, including home delivery services.

Travel plans in Győr, HUNGARY

- **The concept of travel plans in Hungary has became known after the accession to the EU** (2004), when the **Hungarian legal organisations could have participated in international travel planning projects, supported by the "Intelligent Energy – Europe" Programme** of the European Community (IEE,2006).

- **The Municipality of Győr**, in the last six years, **participated in two international projects,** one called **Pro.motion** & the other one called **Travel Plan plus**, supported by the "Intelligent Energy – Europe" Programme of the European Community (IEE, 2009), **which aim was to provide transport-sector energy savings by creating travel plans for the residential area of Ménfőcsanak and for primary schools in Győr.** The projects started in **2007 and ended in 2010.**

Győr, HUNGARY

In-depth analyses of the case studies made in Győr

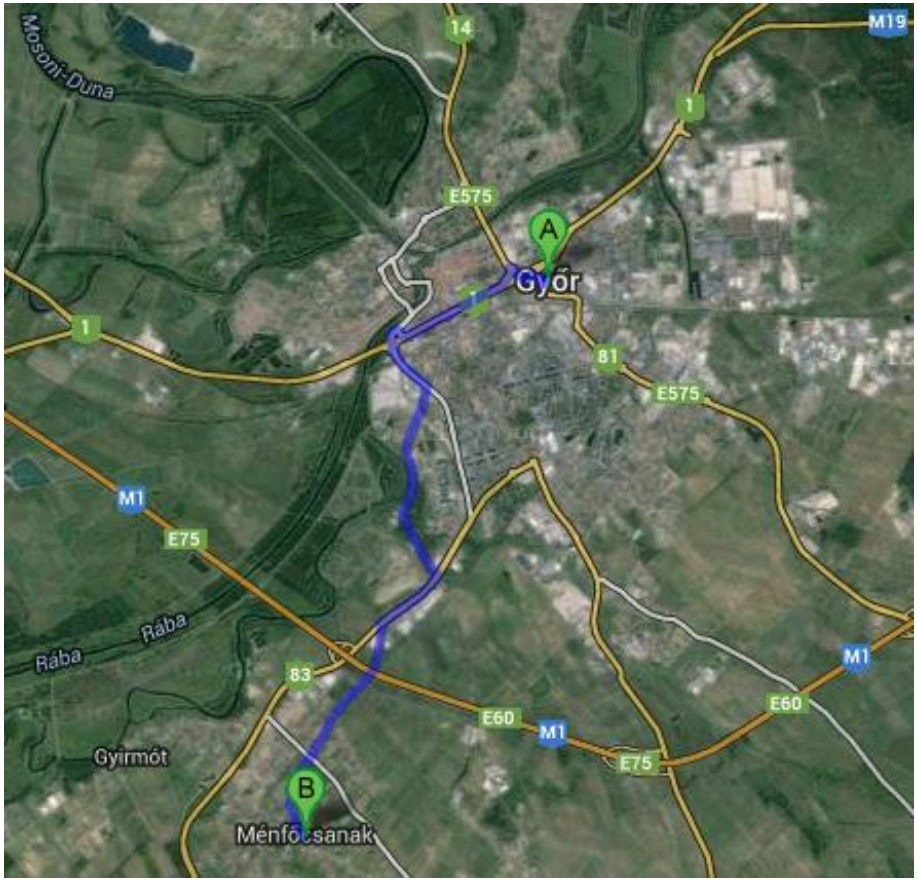
- **The agglomeration of Győr** contains 47 municipality with 75 649 inhabitants, **together with the city itself the number of inhabitants** reaches **200 000.**

- **The transportation system is composed of public transport (bus and train), contracted bus lines and private cars.**
  The overall modal share of the city is the following:
  - public transport: 66,5%
  - train 5,5%
  - bus 61,0%
  - private cars 31,3%
  - contracted bus lines 2,2%

- **The number of inhabitants is rapidly growing in the city especially in the suburbs.**
- Furthermore **the share of young inhabitants under the age of 14 is much higher in the suburbs than is the city**.
- **These are huge problems, since the covering of the suburbs by work places, primary schools, kindergartens and nursery schools is very incomplete**.
- **The organized commuting of neither workers nor children is generally solved**; therefore **it generates a huge amount of individual mobility**.

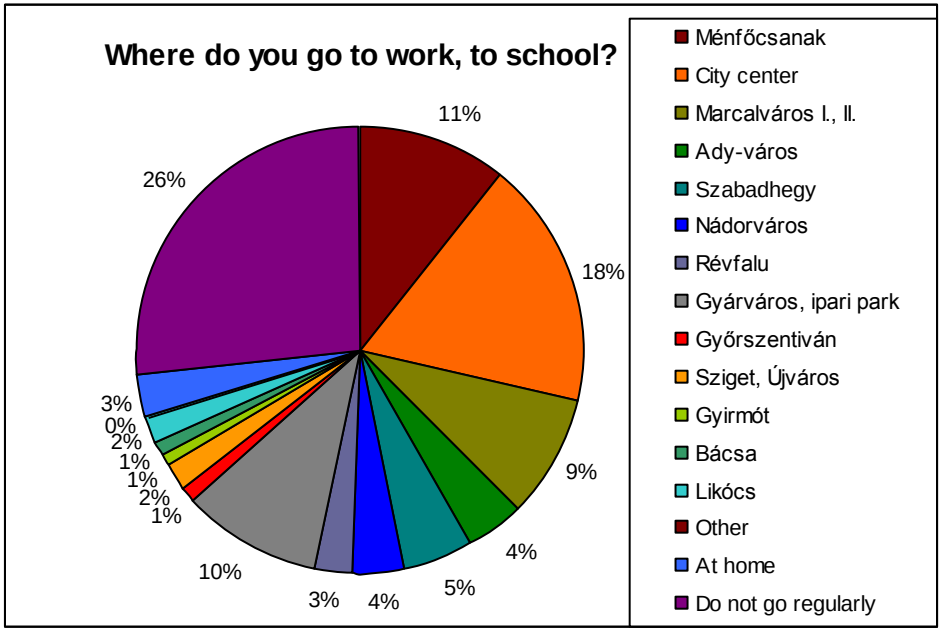
Pro.motion project

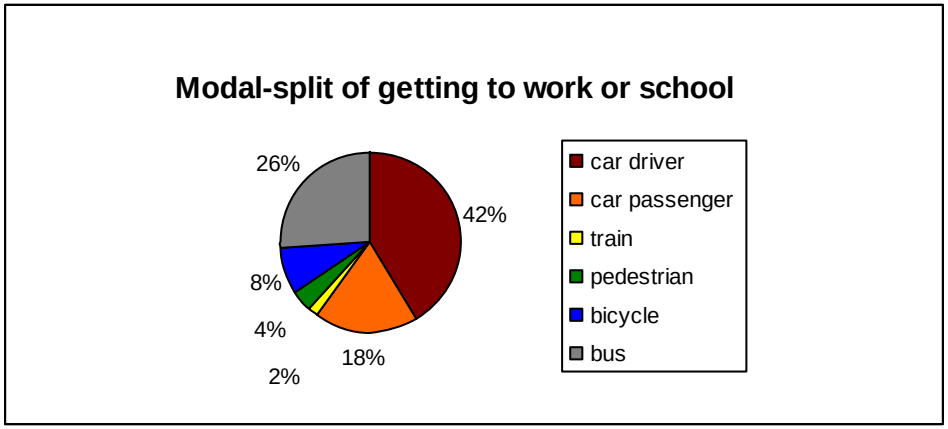
- **The aim of the project, was to promote sustainable mobility choices for the residents of the Ménfőcsanak suburb area.**
- **Ménfőcsanak is a part of the city of Győr**, however as a former independent **village** constitutes a distinct territorial entity.
- The **distance** from the city centre is between **6 km and 10 km**.
- **During the last decades a number of new families have moved here from the city centre** and from other places.
- It is like a **garden city mostly with middle-class families**, mostly in **single family houses.**
- The housing density is lower than in the city general.



Modal-split of inhabitants (getting to work or school)

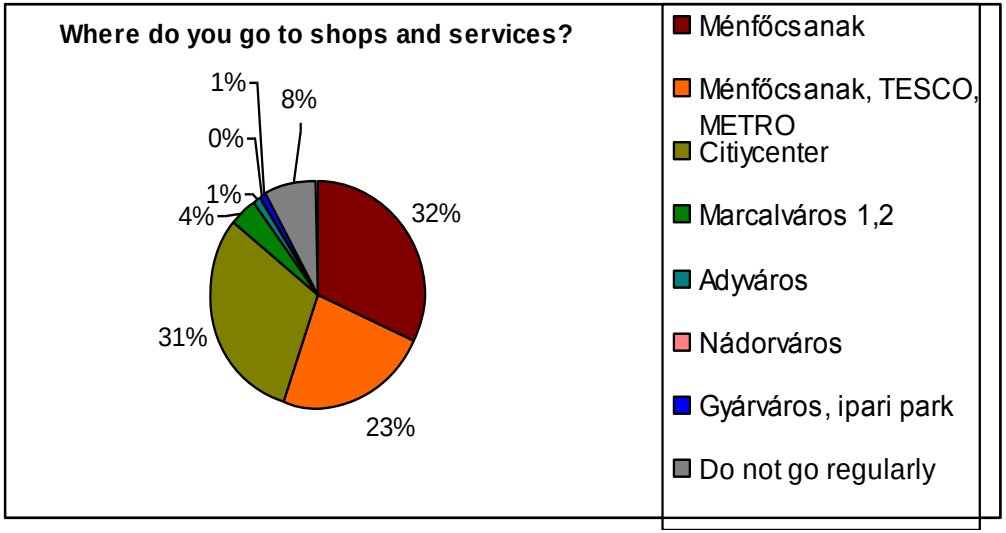
- **In order to get information about the different transportation modes** a **questionnaire was prepared** at the beginning at the project, which **has been filled out by ~600 inhabitants.**
- **The questionnaire was designed to collect data about travel patterns** and to relate them to personal characteristics as well as accessibility of the houses by public transport.
- **According to the survey, 74% of the inhabitants are traveling to work on a daily basis and 60% by car.** From all of these people **only 11% working in the Ménfőcsanak city quarter because of the lack of working places**.
- **10 % of the people travel to Gyárváros district, where most of the former industries as well as the new industrial park of the city is located** and **18% of the people work at the city center, where most of the municipal and other offices, banks and commercial services are** located.

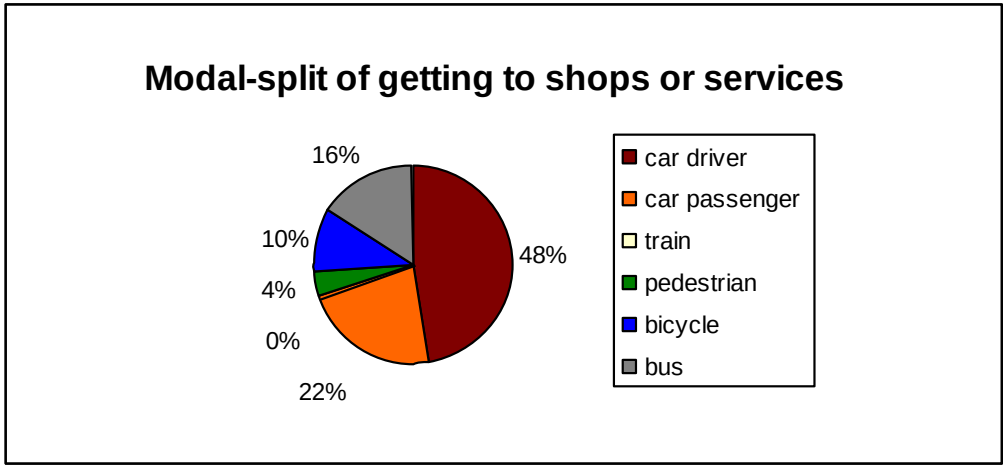




Modal-split of inhabitants (getting to shops or services)

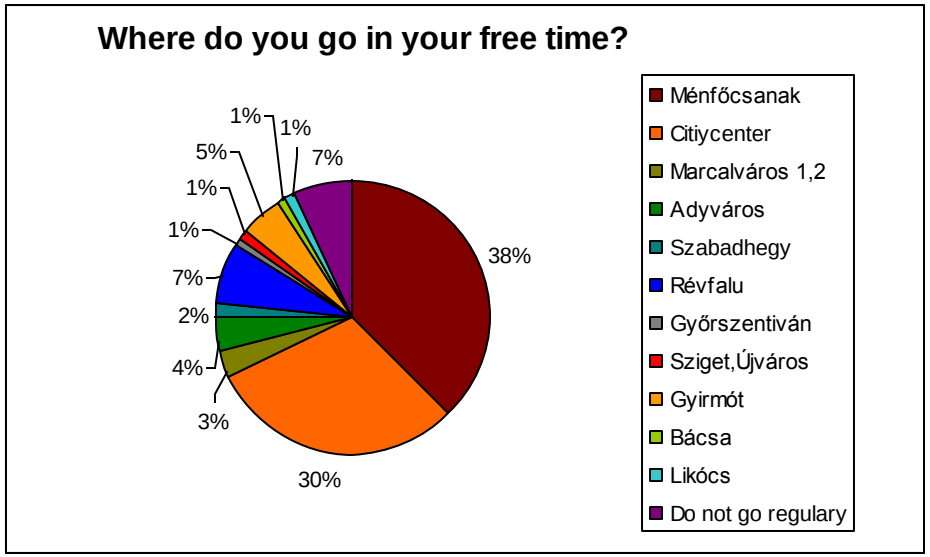
- **Between the border of Ménfőcsanak and the city of Győr, two large shopping centers are located,**
- **These two shopping centers** (TESCO and METRO) **have the highest proportion among the destinations** right after Ménfőcsanak itself and the city centre.
- **The modal split of this kind of destinations is** something **similar to the work, 70% of the inhabitants traveling by car.**
- **There are some percent more bicycling** (10%) and less traveling by bus though.

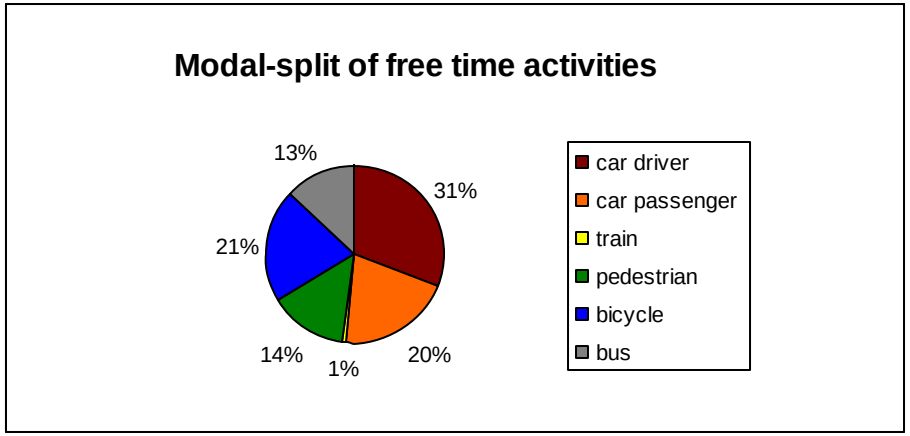




Modal-split of inhabitants (getting to free-time activities)

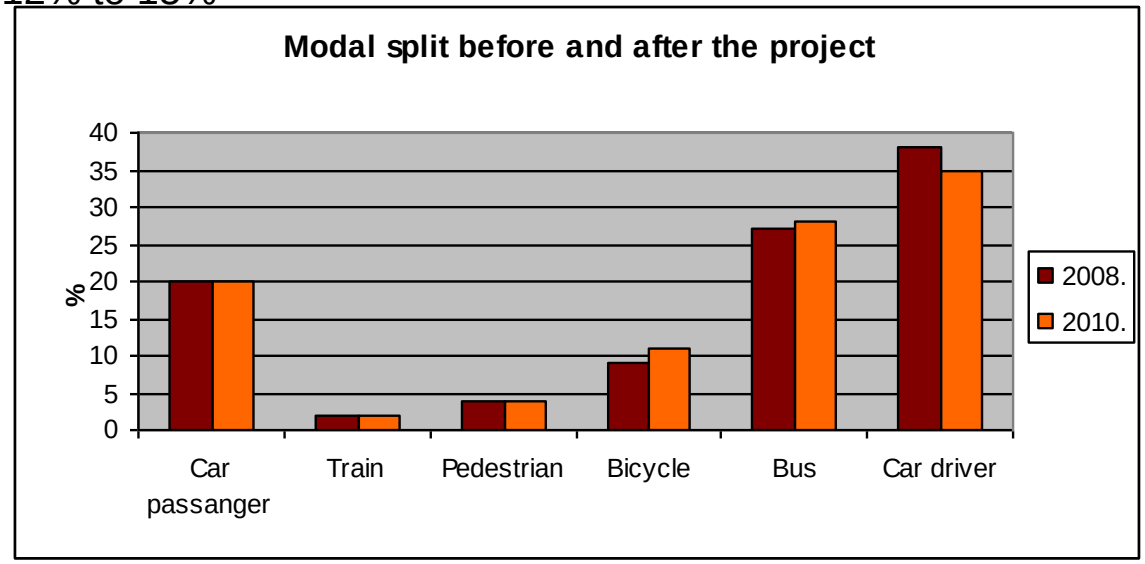
- **The highest percentage of the free time destinations is Ménfőcsanak,** higher than in the case of the other two destination group.
- **The city centre has the second biggest sector with 30%.**
- Remarkably **Révfalu and Gyirmót city districts have also quite high proportion owing to their good location and possibilities of free time activities**.
- The **car still stands first on the list**, but with lower proportion than at the other two activities. The bus has lower percentage than at the other kind of destinations **but the cycling has a bit more proportion and the walking have remarkably bigger sector than above with 14%.**





Conclusion on the Pro.motion project (1)

- **After the first phase of the project a new transportation strategy has been created** in accordance with the promotion principles.
- **In order to change people's behavior public transport services has been improved** in the area.
- **Aside from the budget a new P+R and B+R parking scheme was planed** and **outside the project budget, from national funding a new bicycle lane was built** between the new living areas and the city of Győr.
- **As the result of the organized media campaigns, educational programs and the improvement of service standards, the inhabitant's behavior get better after than before the project.**
- **The proportion of individual car drivers gets reduced, and the number of people who use the public transport or bike get decreased** (% of public transport users from 20% to 23%, % of bicycling from 12% to 15%



Conclusion on the Pro.motion project (2)

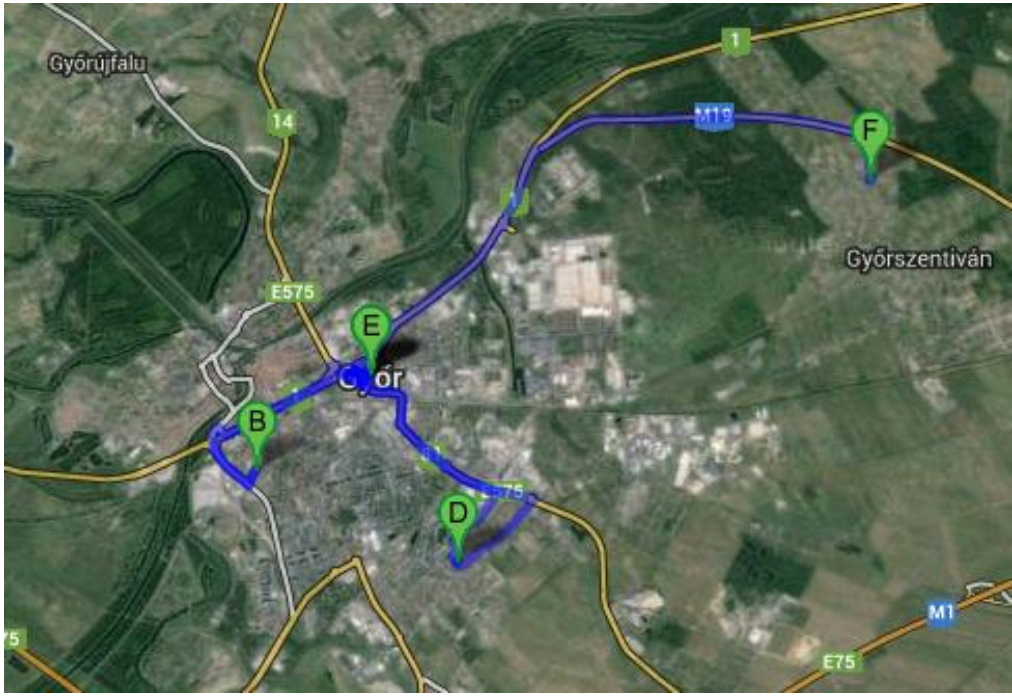
- **The Győr-Ménfőcsanak area, because of the low housing density has higher ecological impact on mobility than other housing areas of the city of Győr.**
- **In order to reduce the ecological impact of mobility** the **population density** of the Győr-Ménfőcsanak **should be increased and the further sprawl** of the are **must be stopped.**
- **Higher density patterns could reduce average distances between home and place of work**.High densities might be **ensure better** amenable **public transport supply.**
- According to our study, the **location of the residence and it is distance from the city centre area, has the strongest influence on modal split** between car and non-motorized transport, and energy use for transport.
- **The distance from the residence to the downtown area is seemed to be a key factor affecting the accessibility to a number of facility types** e.g.: public offices, cultural facilities, restaurants, entertainment and specialized stores.
- **Even if there are couple of stores and hypermarkets close to the housing area** in Győr-Ménfőcsanak, **specialized stores and offices are missing** from the area, **just like the wide variety of jobs** and the lack of these things all force mobility of residence.
- **Higher density patterns would also help to spread specialized stores and offices in the area,** which **could reduce** the number and the distances of **motorized transport.**

Travel Plan plus project

- In the TRAVEL PLAN PLUS project there has been worked out a **Local Travel Plan for three primary schools** in the city, Győr.

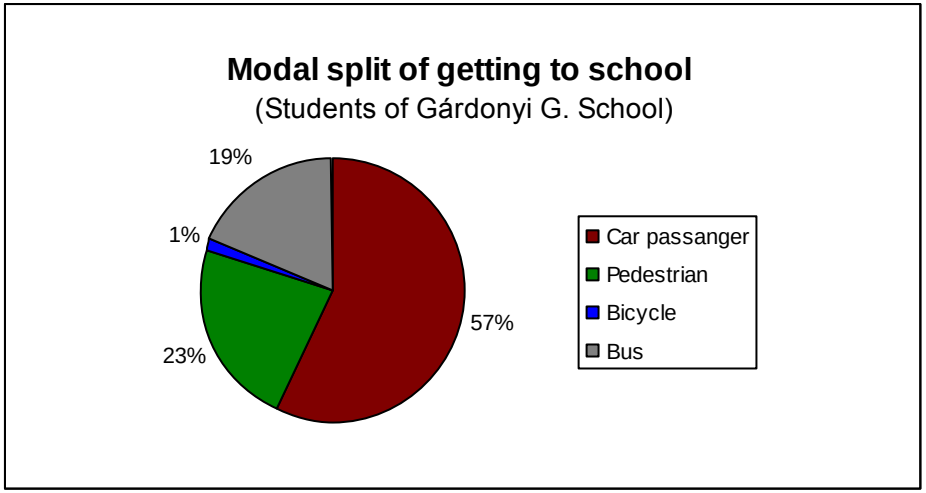
- **The aim of the study, was to promote sustainable mobility choices for primary school's students.**

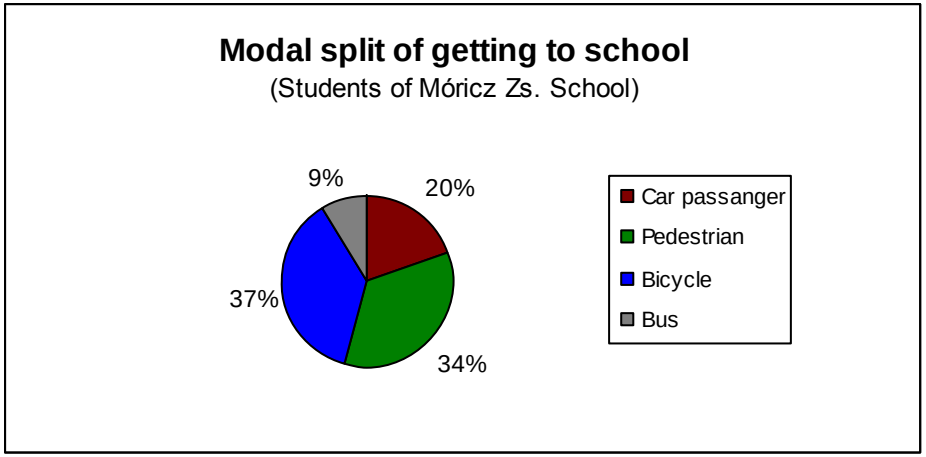
- **The schools located in different parts of the city.** One is in the **city centre,** the very reputed **Gárdonyi G. School (B), which has students from all around the city. Therefore it creates a big mobility demand** among the parents. The **second primary school, Kölcsey F.(D), is also close to the city centre, but it has more students from its neighbourhood.** The third primary school, called **Móricz Zs.(F), is located in the suburb, in Győrszentiván, where all the students live close to the school.**



Modal-split of getting to school

- **The modal share of the Gárdonyi students** is shown in the first picture.
- **One quarter of the students walk to get to the school** and only **a small proportion ride a bike**. **19% of the students get to school by bus** and **57% by car**. When getting home some part of the students who arrive by car go on walk or use a bus.
- **The modal split of the Kölcsey school is very similar to the Gárdonyi School**, but the share of car users is even higher and the share of bus users is even lower.
- **Walking and riding a bike is much more popular in the Móricz School** than in the inner city schools. **The higher share of the sustainable modes is due to the location of the school.** Győrszentiván is one of the suburbs of Győr, **almost all the students come from this district**.





Enrolment obligations and trends

- **According to the compulsory school attendance of the Hungarian State children between the age of 6 and 18 are obliged to go to school.**

- **The municipality of Győr ensures its enrolment obligation by the determination of the enrolment districts. Those children have to be enrolled, who are possessed of inhabitancy in the city. It means the primary schools provide the obligatory duty within their enrolment districts.**

- **According to the results of a state wide survey, parents consider the following aspects when choosing a school for their children**:
- How big is the distance between the home and the school? Is the major aspect.
- Traffic safety, travelling time is also considered.
- The program of the school is also play an important role,
- The pedagogical program of the school, and what kind of sport and free time activities are offered is also very important.
- Many parents look for a school where schoolmates have similar social background.

- **Despite the legislation, parents have couple of rights choosing a school outside their district, which increase the distance between home and school and force motorized mobility**

What is the reason for the high rate of car usage in the inner city schools?

- According to the questionnaire **41% of the students come from more than 3km. High percentage of the parents go to work by car, therefore they take their children to school on the way**, especially in the two inner city schools students come from further distances.

- Personal safety was also among the most important aspects.

- **Even though, much more students would choose the bike, as they actually do, and only one third of the students would like to get to school by car.** Showed the answer of the children for the question of the survey, targeted the desired transport mode of the children, what kind of transport they would choose if they could. Unfortunately children in the primary schools have less influence to their own mode of transport than their parents.
- Nevertheless **57% of the parents said 'yes', for the question of the survey was: Would you consider changing the transport mode of your child, if the way was safer?**

Conclusion on the Travel Plan plus project (1)

- **So far numerous campaigns has been organised in Győr in the last decade,** especially in the framework of the Travel plan plus project, such as the European Mobility Week, the European Car Free Day, Bike to School or Bike to Work campaigns, etc.
- **As a result of campaigns, educational programs student's behaviour get better after than before the project.**
- All the **measures cost positive change about student's traffic preferences**. More students and parents used bicycle and public transport instead of car.
- **The % of pupils who were car passenger decreased from 35% to 32 %.**
- Further more 25 % of all students and parents have been affected by travel plan initiatives and there has been 17 activities organised which promoted the LTPN area.

Conclusion on the Travel Plan plus project (2)

- **Strict management of the enrolment districts would be useful in order to reduce the distance between schools and home** of the children, **because distance, has the strongest influence on modal split between car and non-motorized transport,** and energy use for transport. 90-95% of the students should be admitted from inside the enrolment district into the schools of the municipality.
- **The level of the public transport services is lower in the suburban villages than in the inner city.**
- **Low density patterns of the suburban villages increase average distances between home and place of work and school and low density obstruct the development of the public transport supply.**
- **The lack of mobility is consequently balanced by private cars, which leads to congestions.**
- **In order to improve the situation, on the main transport corridors of the city school bus lines should be applied.** These buses could collect students from several parts of the city. The bus lines could provide not only a single school, but rather a group of neighboring schools.
- Walking and riding a bike is much more popular and common in the suburban schools, because in suburban areas most students travel on safer roads and on shorter distances, than in the inner city schools.

Conclusion

- Travel plans are effective tools in order to solve mobility challenges in a sustainable way but urban structural characteristics have strong effect on the success of travel plans.

- The case studies confirm the hypothesis, that there is a tight relationship between urban form and travel behaviour. Further more the results of the case studies proved, that not only urban form, but settlement structure, distance from the city centre, housing density, diversity of jobs and services and the level of education have also huge effect on people mobility behaviour.

Thank you very much for your attention!