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Implementation of Sustainable Mobility in Education

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1 Introductory thoughts

The development of transportation and with it mobility in the last century became an essential factor in the globalisation of modern civilization. Today we are more mobile than we have ever been, the success of a particular society is also reflected in its mobility. The more mobile it is, the more a society is economically developed and prosperous. Although the development of mobility has also had its dark side. Humans in the 20th century changed the world's ecosystem more than ever, and the consequences are global. Virtually all economic and other activities have had an impact on the environment and nature, though mobility has been particularly significant since it is embedded in practically all human activities. Today transport produces around a third of emissions which cause an increase in the greenhouse effect. One of the major challenges of the 21st century is thus how to make global transport systems sustainable. The development of technology is an important element of this transition, though we believe that education on the importance of sustainable mobility is no less an important element, since it bolsters demand for the development of sustainable (unfortunately sometimes still referred to as alternative) forms of transport. The authors of this book are aware that only long-term and systematic education about the benefits of sustainable mobility compared to conventional transportation can lead to a shift in people's mindset that will cause a shift in behaviour, understanding and actions. We hope that this book supports the efforts in Slovenia to shift the pattern of mobility towards greater sustainability.

Figure 1:

Sustainable mobility in Västerås, Sweden.

(photo: T. Resnik Planinc)

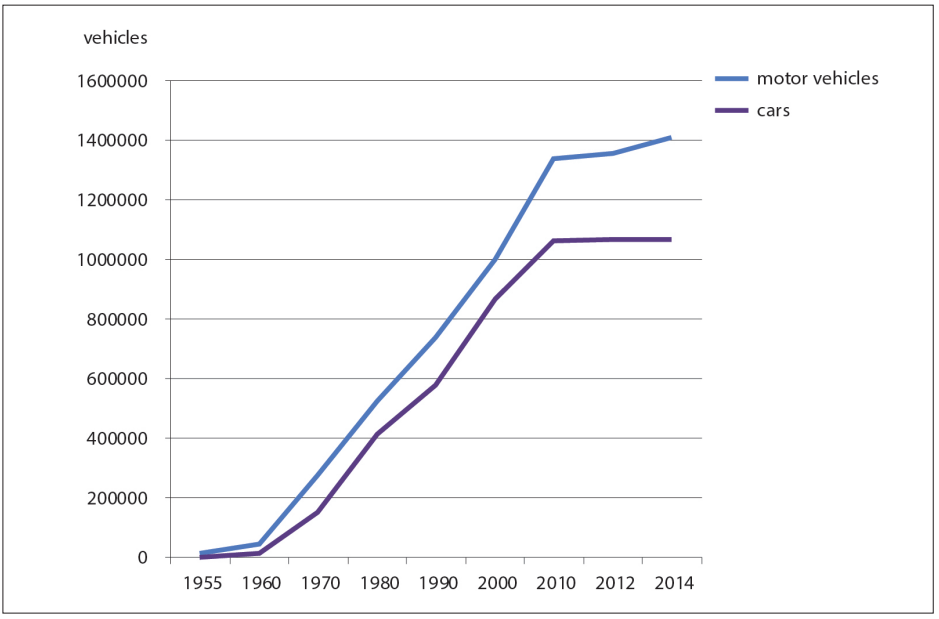
2 Transport and sustainable mobility

Slovenian transport systems have a long and rich history. Some of the main connections were outlined as early as in pre-Roman times and have been preserved until today. Even in the Middle Ages, transport routes in Slovenia roughly resembled today's transit corridors. The territory of Slovenia at many times has been positioned between major political formations emerging from the north (northeast) or southwest of present-day Slovenia. In the middle of the 19th century the railway quickly spread across the country, leaving a profound mark on the landscape (Urbanc, 2002) with villages along lines experiencing economic prosperity and others on cargo routes saw a gradual decline. Railways were also the result of a political decision from one of the centres of power – Vienna and the Austrian court; designed to reinforce connections between the then monarchy and the Adriatic as well as to establish the Austrian Empire as a maritime power. Thus, also at nowadays Slovenia had a bridging role as a link between the Alps and the Adriatic, and consequently the country early on, around the middle of the 19th century, got a railway line. Running from Vienna via Maribor, Celje (1846), Ljubljana (1849) and on to Trieste (1857) the line also served as the backbone of further development of the railways. Still today the Slovenian railway system is based on this line. Motorisation in Slovenia occurred at a slower pace. Officially, the first documented car in Slovenia was in 1898 but it was another half century until the onset of intensive motorisation, indeed the phenomena did not really emerge before World War II ended.

While motorisation occurred relatively late in Slovenia, in the decades after World War II it left a remarkable impression on the country's transport system and gradually overtook the railways as the most used form of transport. Motorisation in the initial decades after the war still centred on public transport (buses), though later on it was increasingly typified by private transportation (personal vehicles), which has become not only a symbol of prosperity and free movement, but also a status symbol.

Data from the Statistical Office of the Republic of Slovenia on population and registered motor vehicle numbers in Slovenia (Število prebivalcev …, 2017; Cestna vozila …, 2017) allow for the degree of motorisation in the country to be calculated. Going back to 1955 in Slovenia there was still only one and a half cars per 1,000 inhabitants, by 1970 motorisation amounted to 88 cars per 1,000 inhabitants, in 1980 this figure was 220, in 1990 290, in 2000 436 and by 2010 we had already reached a value of 519; the same rate recorded in 2014 which indicates a slowdown in motorisation, as it has approached an optimum level, given the conditions.

Figure 2: Motorisation in Slovenia.



Source: Število prebivalcev …, 2017; Cestna vozila …, 2017.

Other indicators also show that the car has become the undisputed leader of Slovenian mobility (Bole, 2004). Slovenia is not alone in this regard; it is the case throughout the developed world. In recent decades, we can also see that motorisation and rapid growth in private car ownership has spread quickly also to those places where it hitherto had not. Particularly, parts of Asia, such as China, Southeast Asia and India. That said, Slovenes seem to have taken motorisation further than most. In 2013, we Slovenes used cars for 86.3% of all on-land travel, ranking Slovenes third in the European Union, while 16% of household incomes go towards transportation (EU transport ..., 2015), ranking us second in the European Union; a symptom of the car's predominance over other, cheaper forms of transport. From an economic, environmental and social point of view, this causes a lot of issues. Economic costs are incurred in response to the accelerated construction of motorways as well as their intensive wear and high maintenance costs. Construction of new motorways has resulted in the strengthening of the transit corridor, in particular along the northeast to southwest axis, i.e. linking Eastern and Central Europe with the Adriatic Basin and Mediterranean in general. The first motorway in Slovenia was opened at the end of 1972, a 30 kilometre section between Vrhnika and Postojna (Zgrajene AC, HC …, 2016).

Thus, Slovenia has transformed from a nation that had no motorways 40 years ago into a country which is among the countries the most motorway (kilometres) per 1,000 inhabitants in Europe. By 1994 Slovenia had built 139 km of four-lane motorway and expressway as well as 59 km of two-lane motorway, while today the nation's network consists of 680 km of motorway, which equates to 334 km of motorway per million inhabitants. Apart from the motorways, the Slovenian road system also comprises main roads along with regional and local roads. There are 820 km of 1st and

2nd order main roads, 5,149 km of regional roads, 13,451 km of local roads as well as 18,796 public streets and roads within the road network which altogether cover 38,958 km (Cestno omrežje, 2013).

Statistics of completed trips on Slovenian roads paint a stark picture; in 2014 as many as 49% of trips took place on Slovenian motorways, which account for just 9.3% of public roads, 17% of journeys used main roads (12.4% of the network). The remaining public roads (78% of the network) saw 34% of trips. According to the state motorway company, average daily traffic numbers on Slovenian motorways amount to 29,495 vehicles (Prometne obremenitve, 2014). Thus, it is evident that motorways have become a critical piece of infrastructure within the Slovenian transport system and it is now inconceivable to travel around the country, or indeed traverse Slovenia, without using them. Confirmation of this can be seen when there are unexpected traffic incidents that result in partial or complete closure of parts of the motorways, subsequently causing traffic to back up for several kilometres and extending people's journeys by a few hours, while bypass roads become heavily congested and blocked. Of course, the construction of motorways comes at a cost and the financial burden of their rapid development is still being shouldered today by Slovenia and its citizens. In this regard the national motorway company (Družba za avtoceste Republike Slovenije – DARS), which is responsible for the management of motorways, their maintenance and financing, as of 2016 still had EUR 2.8 billion to payoff for past motorway construction works and annual repayment obligations of EUR 243 million in 2017; annual repayments will increase up until 2020, when they will amount to EUR 269 million (Stergar, 2016). These obligations are financed through collection of road tolls and vignette sales, however it is clear that they were sizable budget initiatives, which will long be relatively large financial burdens. It is thus reasonable to ask, whether it makes sense to continue building motorways at such a pace and whether or not the time has come to establish a more balanced transport system in Slovenia. It is true that certain Slovenian regions are poorly connected to the motorway network, while in many instances road links in these areas are inadequate and also dangerous. For example, this is the case in Posočje, Koroška, Bela Krajina, Posavje, Idrija–Cerkno. However, this does not mean that these areas need motorways but rather they simply require existing roads be renewed and made safer, while more efficient transport solutions are needed in specific areas, such as Gorjanci, Huda Luknja, Vršič, Kladje as well as in other places. Most importantly, we must not forget that in many places there is still an alternative to road transport – namely, the railways, which have been continually neglected in Slovenia in recent decades.

Looking briefly at the development and state of rail transport in Slovenia, as we already mentioned, the backbone of the railway network also includes the oldest line and connects Maribor, Celje, Ljubljana and Koper. Differing from the original route in the days of the Austro-Hungarian Empire, in 1967 the line was redirected to Koper; the site of a new port on the northern Adriatic. Today's rail network has changed little since, with most of today's operating lines having been built long ago. Most of the rail network in use today had been developed by the 1920. Looking at current operating rail network, there are only two lines that were built after the Second World War, specifically a section of line between Prešnica–Koper, built in 1967 and serving Luka Koper (the port of Koper, which financed it themselves!) as well as a

section of line between Puconci–Hodoš, built in 2002 (Mohorič 1968; Bogić, 1998; Jurković et al., 2011).

The length of railway infrastructure today is very similar to that of a decade ago. In 2013 there was 1,209 km, out of which there are only 330 km of double track lines and 500 km of electrified lines (Dolžina železniških …, 2013). Though even more illuminating are the comparisons with previous decades, which show that investments in railway infrastructure in the past half century have focused entirely on maintaining and modernization the existing network. In 1970 Slovenia had 1,056 km of railways, including 325 km of double-track lines and 337 km of electrified lines (Statistični letopis …, 1990). Twenty years later, the situation was not much different; there were 1,196 km of railway lines, of which 332 km were double tracks and 526 km were electrified (Statistični letopis …, 1993). Rail passenger numbers also match the trends we outlined regarding the state of the network. In 1970, the Slovenian railways carried 22.8 million passengers, 29.1 million in 1985, 21 million in 1990, 13.3 million in 1995, 16.2 million in 2010 and 15.5 million passengers in 2012 (Statistični letopis …, 1990; Statistični letopis …, 1993; Statopis, 2015). Thus, it is not surprising that Slovenes use trains for just 2.3% of all their land-based trips (EU transport in ..., 2015). Bus services during this period also declined, leaving cars to dominate the roads. We do not have accurate and comparable data for different time periods, though it is estimated that Slovenes presently use buses for 11.4% of land-based transportation (EU transport ..., 2015).

Transportation also has a negative effect on the environment. The environmental impact of transport can be separated into its effects on air, water and soil, as well as its impact on space generally. While when we talk about the social impact of transport systems we can find both positive and negative effects, from an ecosystemic perspective the impacts of transport on nature and the environment or else on environmental components are almost always negative. We will start by examining the spatial impacts of transportation.

2.1 Spatial impact of transportation

2.1.1 Land use

Transport infrastructure takes up a great deal of space, since the majority of transportation still occurs on land. Regardless of the type of transportation (land, air or water) all of them use vast amount of space for terminals, particularly for freight terminals, where cargo might also be stored for long periods in large quantities. This applies especially to ports, with it less of a feature at airports and railway stations. In terms of land-based transport, space is also taken up by railway infrastructure and roads. Bole (2015) states that, according to the land register in 2009 there was 465 km^2 of land used for the purposes of transportation, which is 2.3% of Slovenia. It is often the case that space set aside for modern motorised transport infrastructure is lost for a very long time, since the infrastructure remains in place for several decades or even centuries, as is the case for major roads and railways, tunnels, bridges and the like. What is more, these areas very often experience severe

land degradation and soil contamination. In such cases, the damage is more long-term and far outlasts human generations. Modern land-based infrastructure such as railways, motorways, expressways and other higher order roads can actually be considered corridors of degraded land in the landscape, which in terms of size and the scale of degradation simply cannot be compared to any infrastructure from before the times of motorisation and railways.

Another significant problem is the fact that personal vehicles, although the dominant means of transport, are for the most part (usually more than 23 hours a day) stationary or parked somewhere. In cities stationary vehicles pose significant pressures on space, taking up a considerable amount of space that is unusable for other purposes, which might otherwise be used by people and their interaction. In natural environments parked vehicles often have a negative impact on soil and vegetation and reduce the quality of how people experience the natural environment, while such situations also lead to conflicts between vehicle owners and landowners or the people managing these areas.

2.1.2 Fragmentation of space

Transportation, specifically transport infrastructure, frequently breaks up space. The infrastructure often represents an insurmountable obstacle to the movements of many animals and sometimes has the effect of reducing populations as a result of animals being run over on roads and railway lines. Thus, between 2011 and 2015 as many as 26,468 roe deer, 706 red deer, 499 wild boars and 42 bears died on Slovenian roads (Predanič, 2016). Annually between 4,900 and 6,800 wild ungulates are run over (Predanič, 2016).

Breaking up space also has negative consequences for ecosystems, since large infrastructure can fragment connected ecosystems, increase border zones and shrink core areas, thereby increasing the potential for disruption of these ecosystems and putting them at risk.

2.1.3 Greenhouse gas emissions

Motorised traffic is almost entirely powered by fossil fuels; using or actually burning fossil fuels causes an increase in the greenhouse effect and global warming. As such the contributions of transportation to total greenhouse gas emissions on a global scale are by no means insignificant. For the EU transport emissions are estimated to be 23% of all its greenhouse gas emissions (Greenhouse gas …, 2016), whereas in the US the equivalent figure is 26%.

Out of all the modes of transport in the EU road traffic releases by far the largest amount of greenhouse gas emissions; 73% of emissions in 2014. This year civil aviation has released 13% of the transport induced greenhouse gas emissions and railways contributed just 0.6% (Reducing emissions …, 2017).

In Slovenia transportation itself produced 10% of greenhouse gas emissions in 1986, 20% in 1995, 22% in 2005, and 32% in 2014. Meanwhile, total greenhouse

gas emissions in terms of their carbon dioxide equivalent increased from 2,028,000 tonnes in 1986 to 5,384,000 tonnes in 2014 (Mekinda Majaron, Kovač, 2016).

2.1.4 Air pollution

Another negative effect is the impact on the atmosphere due to the release of exhaust emissions, caused by fuel combustion in engines. Through this process so-called primary pollutants are released directly into the air, including hydrocarbons, nitrogen oxides, larger and smaller particles. What is more, these pollutants and others can react with each other and form new pollutants, called secondary pollutants. When there was relatively little traffic, total emissions were also insignificant, though as the number of transport services and vehicles on Earth have greatly increased, transportation has become a significant contributor to air pollution. Thus, in Slovenia transport activities caused about 63% of all nitrogen oxides emissions in 2014, 52% of which was from road traffic (Logar, 2016b), as well as approximately 12% of all PM 2.5 and PM 10 emissions, which is comparable to the EU average (Mekinda Majaron, Kovač, 2016), and 41% of all ozone precursors emissions, with road traffic alone causing 33% of these emissions (Logar, 2016a).

2.1.5 Impact of transportation on the quality of ground water

Substances which are waste materials of transport seep from the transport infrastructure into the ground and through the soil into the groundwater or surface water. These could be lubricant or fuel leaking from vehicles, or it could be as a result of a cargo spill, which can also cause sudden large-scale contamination. It is important to also remember the substances that are applied to the roadway, for example salt against icy road, paint residue from road markings, herbicides used to control weeds along railway lines and to a lesser extent beside roads. Transport activities can also have an impact on water quality via air pollution. Up until it was prohibited for fuels to contain lead or tetraethyl lead, which increased octane numbers, lead was released via fuel combustion into the air. From the air it would rapidly be deposited through sedimentation into the ground, and from there into water as well as food systems (Zupančič, 1997). Water contamination also occurs as a result of acid precipitation, with transport activities producing emissions that cause acidification and eutrophication. The main pollutants in this category include nitrogen oxides (NO_x), sulphur oxides (SO_x) and ammonia (NH_3). In 2014 transportation in Slovenia collectively produced 25% of all emissions, which cause acidification and eutrophication, of which road transport was responsible for more than 20% (Logar, 2016b).

2.2 The characteristics of sustainable mobility

It is very important that mobility planning takes into consideration, to the greatest extent possible, the spatial boundaries of ecosystems and introduce new, innovative and environmentally friendly modes of operation for society. Such planning requires

a great deal of coordination in order to obtain a broad consensus, and of course competent managers who are willing to replace existing practices, many of which are based on an unsustainable development model, with sustainable approaches.

Though even before people began talking about sustainable development, the terms environmentally friendly development (also environmentally sustainable) had emerged. Environment-friendly marked the transition of human society to increasingly effective protection of the planet, but is only the beginning of civilizations' conceptual leap. The Slovenian terminological dictionary of geography defines the concept of environmentally friendly development as "development of human society, in particular economic, that is harmonious with nature, landscapes, their capacity" (Geografski terminološki ..., 2005, p. 364).

Thus, environmentally friendly development is based on the use of environmental resources without exceeding their carrying capacity. The carrying capacity of an environment is determined by its regeneration and neutralisation capacities (Špes et al., 2002). Going further than the idea of environment-friendly or environmentally sustainable development is the broader concept of sustainability.

Sustainable development does not just consist of environmental sustainability, but also economic and social sustainability (Plut, 2007). Therefore, sustainable development seeks to meet the essential needs of human society, maintaining economic and social prosperity while making sure pressures on ecosystems stay below the limits of their carrying capacity. If we look at this in the context of the transport sector, then sustainable mobility can be distinguished from environmentally-friendly mobility, with the former also being concerned with economic (for example, a satisfactory income that allows adequate standard of living) and social (e.g. guaranteed jobs, equality in terms of incorporating all social groups, gender equality) sustainability, whereas the latter only considers environmental sustainability.

2.2.1 The inverted hierarchy of transport modes

A sustainable approach to transport demands a different hierarchy of road users than we see today. Typically, cars have been seen as the most important element, while pedestrian have had the least influence. The concept of sustainable mobility places most importance on pedestrians and non-motorised forms of transport, followed by public transport services and commercial vehicles, then passenger vehicles carrying several passengers, with single occupant cars coming later. In places where non-motorised modes of travel are not feasible or inefficient public transportation becomes the main focus. In terms of technology, the concept calls for innovative, environmentally friendly technologies with lower energy consumption and less negative environmental impacts compared to conventional technologies, for instance gas vehicles, electric vehicles, hybrid vehicles and similar. Such an approach leads to more harmonious planning and construction of infrastructure for sustainable forms of mobility such as walking paths, pedestrian zones, bicycle lanes, sidewalks and other similar measures. At the same time it reduces the supremacy of cars and their dominance in many places, where cars previously had a complete monopoly and subordinated other modes of transport. It does so not

only with infrastructure measures, such as erecting physical barriers (speed bumps or retractable bollards), but also through imposing speed limits, creating one-way streets, prohibiting parking, implementing traffic regimes in shared spaces, along with similar initiatives.

2.2.2 Reducing energy dependence on fossil fuels

We have already described the negative impacts of fossil fuels on the greenhouse effect. Though from an energy perspective there are also other important dimensions to the classical patterns of mobility. Currently, the transport system almost exclusively relies on fossil fuels. Oil reserves around the world are very unevenly distributed, which increases the power of oil-producing countries as well as corporations that sell and manage these resources. Meanwhile, the vast majority of countries that do not have these resources are at a competitive disadvantage and as such also have little geopolitical power. Switching to sustainable mobility systems will reduce the amount of oil used for transportation, while the introduction of electric powered transport means that the energy needed for running such services and vehicles can be obtained from a number of alternative renewable energy sources (hydroelectric, wind energy, solar energy ...). In addition to reducing dependence on oil producers this also ensures energy supplies are more diversified, while it often leads to job growth in the green economy and reduces the outflow of funds abroad – which were previously earmarked for the purchase of oil and its derivatives. It is also important to acknowledge that the amount of oil on Earth is finite and that the days of oil being readily available and cheap are drawing to a close. This is demonstrated by the new form of producing oil – so-called fracking, where oil is extracted from shale deposits. Until recently such practices had not been economically viable, however over the last decade because of the rising price of oil from conventional oil platforms before the global financial crisis there was a significant amount of investment in new technology for such extraction methods and today oil produced in this way is obtained from many new deposits, including in North America and parts of Europe. This highly controversial method of oil extraction, particularly from an environmental perspective, has definitely unearthed new possibilities for the exploitation of oil and pushed the tipping point when oil shortages might occur a few decades into the future. Though in all honesty this technology is actually just a hindrance to humanity. The negative consequences of dependence on fossil fuels will only continue to increase, while the transition to other sources will not be any less painful. Accordingly, it is necessary to design and develop sustainable mobility systems straight away.

2.2.3 Satisfying the mobility needs of all social groups

A transport system, which is dominated by individual automobile mobility is expensive and socially unjust. People often forget that a large part of the population are not allowed to or cannot drive a car. These include children and young people not old enough to legally drive, the elderly, people with various disabilities that prevent them from driving as well as people who cannot afford the cost of owning

and maintaining a personal vehicle. Even though many of these people pay taxes, public investments in roads do not help them much since they do not drive. In classical transport systems this group of people are marginalised, they do not see the opportunities and benefits that are experienced at higher levels of mobility, which in addition to personal distress and problems also causes economic damage to the country because people are thus less employable, in turn earning less and paying less tax. Therefore, it is also necessary to ensure these groups have quality transportation, in many places it may be sufficient to provide public transport and certain alternative forms of transport.

2.2.4 Changing the use of road surfaces

In the classical concept of transport planning, which has prevailed since the onset of motorisation, it is a well-established principle that congestion on transport infrastructure is most easily solved by building new infrastructure or by increasing the capacity of existing infrastructure. But on the other hand, it is oblivious to the fact that new infrastructure increases traffic demand and thus we quickly find ourselves in a spiral, where a new road causes even more traffic, more traffic leads to congestion, and then congestion necessitates new construction.

Apart from being spatially wasteful such an approach of managing traffic demand sooner or later also becomes financially unsustainable. An alternative concept can be seen in countries where transportation is developed in a more sustainable way, where they draw on the principle that existing transport infrastructure can be used more optimally. This means traffic flows are managed with the view to increase and make mobility easier for people (not vehicles) and greater occupancy in vehicles is encouraged, as is the use of public transport to avoid traffic jams, since a bus can replace more than 50 cars and a train more than a few hundred. In places where non-motorised transportation and public transport play an important role, there are fewer spatial conflicts associated with transportation compared to in places that are dominated by cars.

2.2.5 Returning to the original function of the city

Cities have always been places where people interact. The multiplicity of connections, interactions and forms of cooperation create synergies and a better quality of life. An abundance of activities attracts ever more activities, more contacts also means there is a greater flow of information, capital, as well as people. Cities are the engines of development, powered by a multitude of interactions. Following the Second World War, or even sooner in certain cities in parts of the Western world, especially in the United States, cities began to see the car emerge as a symbol of mass consumption, it was also seen as a symbol of freedom of movement. But in cities there is little free space and many of them, with town plans and architectural structures in place long before motorisation occurred, were not able to handle the mass of vehicles. It should be stressed that many people come into the city daily-migrants from surrounding areas, including: students, employees of businesses,

bureaucrats, people visiting public institutions such as hospitals, health centres, offices, etc. These daily flows of migrants have gradually come to rely more and more on cars, with public transport becoming a symbol of backwardness, whereas the car is seen as a symbol of modernity. The transport needs of the urban populations and migrants soon exceeded transport services and the capacity of the transport infrastructure in cities. Parking spaces and lots filled up and there were far too few of them, while on the roads traffic jams occurred on a daily basis. Cities saw a fall in road safety, more and more urban land was set aside for stationary vehicles and in the space of a few decades in the second half of the 20th century many cities of Western Europe were completed flooded with cars. You could say that cars took over the cities and began to crowd out city life from urban space. Thankfully, people soon noticed these trends in many places and began to gradually calm traffic in cities and return urban space for urban interactions and city life. One of the best known concepts of traffic calming in cities and giving cities back to the people is the concept develop by the Danish architect Jan Gehl (Gehl, 2017). To date also in Slovenia in many places we have already recognised that urban space can be functionally much better utilised if it is returned to the people and if cars are gradually discouraged from venturing into the city centre.

In Slovenia the most progress in this regard has been made in Ljubljana, which since 2006 (Ravbar, 2015) has steadily closed off the city centre to traffic, while in 2013 it also closed Slovenska cesta, the main thoroughfare through the centre of Ljubljana. Since this time only public transportation and delivery vehicles have been permitted to use the road, where there are actually shared space traffic regulations in place. In cities where it has already been accepted that the city should be given back to residents, initially there was scepticism of these measures and people feared a traffic meltdown (London, Stockholm, Ljubljana), though this has not happened anywhere. In general, if measures are well thought out and comprehensive and if there is a strategy to inform and effectively communicate with the public, then the benefits derived from the new traffic arrangements quickly outweigh the fears and public opinion swiftly turns in favour of the new arrangements.

2.2.6 Introduction of new technologies

Technology plays an important role in the transition to a sustainable approach to mobility. With the aim of increasing energy efficiency and a desire to reduce traffic induced air pollution as well as lower dependence on fossil fuels, we are slowly starting to see the emergence of electric and hybrid engines vehicles. The transition to the Euro emission standards substantially reduced road traffic emissions, which cumulatively are no longer increasing in Slovenia, even though traffic is still growing. It is true that electric vehicles also require energy, which is still produced unsustainably, though the process of electricity production in power plants is significantly easier to regulate when it comes to emissions and other environmental legislation. Today, modern thermal power stations already have filters for particulate matter and sulphur emissions, as well as for nitrogen oxides and thus they emit much less and are more closely controlled than what can be achieved when it comes to individual passenger vehicles. Meanwhile the technology of electricity production is also progressing

rapidly and there is real attention being paid to unconventional, renewable energy sources such as photovoltaic, wind energy and others.

2.2.7 Spatial and transport planning and the policy framework

Spatial planning plays an important role in promoting sustainable mobility. Transport systems meet mobility needs and such needs are very dependent on the spatial distribution of facilities and activities that people visit daily or occasionally. Transport planning should be an integral part of spatial planning and should follow the objectives of sustainable development, with one such goal being optimal energy and spatial efficiency. In transport planning we need to ensure that sustainable modes of transport are prioritised, such as public transport, cycling, walking, multi-occupancy cars, cars that run on alternative energy sources and similar means. For dealing with larger traffic generators we need measures in place at all levels to facilitate sustainable transport planning. Thus, it is essential that mobility plans are introduced for companies and public institutions, compelling them to follow the principles of sustainable transport and organise daily mobility in these institutions with the goal of achieving the most sustainable outcomes as possible. For larger areas, transport planning utilises sustainable urban mobility plans (municipalities, cities, larger towns; also smaller spatial units such as city districts), while at an even higher scale, sustainable mobility is included in transport policies of municipalities, regions or countries. Transport policies are typically embedded in a transport strategy, which in turn should be a key element of a country's broader spatial development strategy. Similarly, it is very important that national strategies are linked with each other and synchronised, especially when it comes to transport policy documents; after all, transportation is an important element in practically all human activities.

3 Sustainable mobility in Slovenian policy documents and certain programmes

Let us look now at how sustainable mobility is included in key policy documents concerning Slovenian transport policy.

3.1 Resolution on traffic and policies of the Republic of Slovenia (REPPRS): intermodality – time for synergy

In Slovenia, an umbrella document for transport policy titled the Resolution on Traffic and Policies of the Republic of Slovenia: Intermodality – Time for Synergy (Resolucija ..., 2006) has been in effect since May 2006.

The document outlines an agenda for the development of Slovenian transport policy and already as part of its vision acknowledges the importance of public transport, also emphasising intermodality, i.e. the integration of public transport with other modes of transport, which increases the competitiveness of public transport services. It also raises the issue of public transport integration and encourages the development of intermodal passenger terminals. Furthermore, when it comes to sustainable transport policy it acknowledges the importance of cycling and puts forth the principle of charging for transportation's external costs. Other identified goals include improving energy efficiency, ensuring a clean environment, increasing the use of public transport, as well as educating and informing the population about sustainable mobility. In terms of its policy platform, goals and actions, we can see that the document touches on sustainable mobility. That said, it does not outline an integrated approach to sustainable transport planning, which would recognise sustainability as the only way to enact transport policy. This suggests a lack of understanding about the paradigm of sustainable development, i.e. that everything mankind does on Earth needs to be in accordance with the principle of sustainable development. Sustainable development is not just another way of supplementing the conventional development paradigm.

3.2 Theses for Slovenian sustainable transport policy

In response to the Resolution, in 2006 "Theses for Slovenian sustainable transport policy" was released, which was prepared by the Coalition for Sustainable Transport Policy, a consortium of NGOs and sections of the professional classes. It was the result

of people's dissatisfaction with the formal resolution and proposed several recommendations, which the Coalition thought a transport resolution that focuses on sustainable transport policy should contain. Aside from the fact that the procedures for adopting the important regulation were not transparent and lacked wide-ranging debate involving the general public, the authors of the working paper were also upset because of the substance of the regulation and specifically its lack of ambition when it came to forcefully promoting sustainability. As such they released a working paper that included the following recommendations (Teze za ..., 2006):

1. Since a vision and strategy for transport policy is not defined in Slovenia's development strategy (SRS), it must be defined in the Resolution.
2. The price of transportation must include all external costs.

   Goal: Establish a system for determining external costs by 2008 and start to correctly price transportation, ensuring it includes at least 90% of external costs.
3. It is necessary to continually improve the safety and quality of transport infrastructure taking into account all transport users.

   Goal 1: To make it a legal requirement by 2007 that sidewalks and bike lanes along local roads in towns be installed during the next reconstruction.

   Goal 2: To remove international freight and passenger transit vehicles from local roads in urban centres by 2008, and to do the same for all other local and regional roads by 2012.

   Goal 3: To radically reduce the number of traffic accidents, by at least 30% before 2008 and by at least 50% before 2012. To adopt the "no fatal accidents" strategy by 2007.
4. New construction of roads must comply with the principles of the Alpine Convention's Transport Protocols.

   Goal: The immediate introduction of non-selective adherence to the guiding principles in the Alpine Convention's Transport Protocol concerning new road construction. Slovenia is a signatory to the Alpine Convention, so this goal is already essentially an obligation for Slovenia.
5. Public transport must be thoroughly modernized.

   Goal 1: To reach a 30:70 "modal split" in passenger transportation by 2012 (at least 30% of passenger kilometres travelled by using public transport) and to ensure that public transport prevails over private transport by 2020.

   Goal 2: By 2020 all the regional (provincial) centres need to be connected to Ljubljana with quality public transport (preferably by rail) running at regular hourly intervals, while travel times should be at least close to the same as those for personal vehicles. All settlements with 500 or more residents must be linked to regional centres by public transport, running at least at hourly intervals, and with travel times comparable to cars.

   Goal 3: To ensure by 2007 that there is effective integration of timetables of the various forms of public transport.

Goal 4: To ensure that by 2008 primary and secondary school students receive a subsidy of at least 80% of the cost of monthly public transport tickets or even that they would travel completely free of charge.

Goal 5: To mandate by 2007 that accessibility by public transport be made a prerequisite for public cultural institutions and protected areas to operate.

6. Transport of goods – especially international freight transit – must be encouraged to shift onto the railways.

   Goal 1: To obtain by 2007 from Brussels the right to protect the environment, health and infrastructure from international freight transit.

   Goal 2: To successfully redirect all international freight transit onto rail by 2020 via fair stimulation of freight operators.

   Goal 3: During the transitional period it is necessary to charge international freight transit a tax which would at least partially cover external costs. Similarly, in the transitional period before effective rail freight transportation is established, it is necessary to steer international freight traffic exclusively along motorways, thereby sparing many neighbouring local and regional roads, which were not built for and not dimensioned for international freight traffic.

7. We need to determine whether the construction of high-speed rail links is in Slovenia's national interest.

   Goal: To launch a debate in 2006 on the national interest regarding high-speed railways and to adopt a national strategy on the development of high-speed rail connections by the end of 2007.

8. Traffic flows need to be managed in an environmentally friendly and socially responsible way.

   Goal 1: To increase the rate of working from home by 20% by 2012.

   Goal 2: To legislate by 2008 that employees' travel expenses only be reimbursed when incurred for monthly travel passes for public transport services.

   Goal 3: To implement by 2010 the request in the EU that the full travel costs (including external costs) be factored into the price of goods. To prepare by 2008 a comprehensive programme to inform consumers about the product miles of the goods they purchase.

   Goal 4: To stabilise traffic flows in town centres by 2008 and to reduce them by 30% by 2012. To reduce the amount of stationary traffic by 20% by 2008 and by 50% by 2012.

   Goal 5: To establish by 2007 a link between the construction of housing (housing policy) and transport policy through the integration of transport policy priorities into housing policy and vice versa.

   Goal 6: To adopt by 2009 a system for charging tolls on local as well as all higher order roads and to simultaneously abolish lump-sum payment of road taxes through vehicle registration.

   Goal 7: That leisure-related transport be immediately incorporated into transport policy; on an equal policy footing to transport for work and schooling.

9. Slovenian transport policy should actively intervene in urban transport problems.

   Goal: To require all municipalities in Slovenia to have a sustainable urban mobility plans in place by 2008.

10. Increasing the efficiency of vehicles and driving along with increasing the use of alternative fuels can help to reduce emissions of hazardous gases.

    Goal: Compliance with EU requirements regarding standards for vehicles and the use of alternative fuels. Preparation of awareness-raising materials for drivers and incorporation of education about efficient driving into driving schools' programmes by 2007.

11. Raising awareness and educating the public are critical tools in the implementation of sustainable transport policy.

    Goal: To develop in collaboration with non-governmental organisations a comprehensive programme to raise public awareness about sustainable mobility by 2007.

12. Environmental monitoring must be introduced along major roads.

    Goal: The establishment of a network of monitoring stations by 2010.

13. Transport policy must define the hierarchy of further documents.

3.3 White paper on transport

The White Paper 2011: Roadmap to a Single European Transport Area – Towards a competitive and resource efficient transport system (also known simply as the White Paper on Transport) is recognised as an important document for transport policy (Bela knjiga, 2011). It was adopted by the European Commission and is in fact the third, updated version of the 1996 White Paper on Transport (Strategija razvoja prometa ..., 2015). The document was supposed to outline the guidelines of European transport policy based on recommendations from the European Commission, though it failed to gain the backing of the Council of the EU, such that member states are not bound by the document and are allowed to comply with it entirely based on their own interests (Strategija razvoja prometa ..., 2015).

The document's essential features include: preparations for an integrated European transport system; aims to reduce the dependence of European transport on oil; drastically reduce carbon dioxide emissions from transport, i.e. cut emissions by 60% by 2050 compared to 1990 levels; internalise the external costs of transport, though while doing so mobility must not be curtailed and the transport system must still develop and grow, which can be achieved through innovation and introduction of new technologies. The Paper inscribes special importance to urban transport as a prominent part of the transport system – it should be updated in a way that facilitates the transition to sustainable mobility with increasing emphasis on public transport and other forms of sustainable mobility (Bela knjiga, 2011).

The White Paper also presents ten goals for competitive and, from a resource management perspective, efficient transport system, which it was envisaged would also

serve as benchmarks for achieving the set goal of reducing greenhouse gas emissions by 60% (Bela knjiga, 2011). Here we present those which explicitly refer to sustainable mobility:

Development and use of new and sustainable fuels as well as propulsion systems

(1) Halve the use of "conventionally fuelled" cars in urban traffic by 2030, gradually remove them entirely from cities by 2050; establish city logistics systems in large urban centres by 2030, which will be almost free of CO_2.

(2) Reach the point by 2050 that sustainable fuels with low carbon content will account for 40% of fuels used in air transport and similarly that there will be a 40% (or if possible a 50%) reduction in CO_2 emissions in the EU resulting from maritime bunker fuels.

Optimising the performance of multimodal logistic chains, including greater use of more energy-efficient modes of transport

(3) By 2030 30% of road freight over 300 km should be transported using other modes such as rail or waterborne transport, and this figure should exceed 50% of freight by 2050, which would enable efficient and green corridors for freight haulage. It will be necessary to develop an appropriate infrastructure in order to achieve this goal.

(4) Complete the Trans-European high-speed rail network by 2050. Triple the length of the existing high-speed rail network by 2030 and maintain a dense rail network in all member states. By 2050 the majority of passenger transport over medium distances should take place using rail.

(5) Ensure there is a fully functional and multimodal TEN-T "core network" at the EU level by 2030, with a high quality and capacity network by 2050 as well as an appropriate range of information services.

(6) By 2050, connect all core network airports to the rail network, preferably with high-speed rail, to ensure that all key ports are sufficiently connected to the rail freight and, where possible, inland waterways system.

Increasing the efficiency of transport and use of infrastructure through information systems and marketing initiatives

(9) By 2050, reduce the number of fatal accidents in road transport to almost zero. In line with this goal, the EU aims to halve by 2020 the number of road accident casualties. Make sure that the EU is a world leader when it comes to transport safety for all modes of transport.

(10) Move towards full application of the "user pays" and "polluter pays" principle and get the private sector to participate in removing distortions, including harmful subsidies, generation of revenues and guaranteeing of financing for future transport investments.

It is encouraging that the document contains clear and measurable goals and that they are positioned so highly; this represents concrete progress. Unfortunately, the document is not binding, but merely highlights the direction of developments in transport policies for the European Union, so too for Slovenia.

3.4 Transport development strategy of the Republic of Slovenia

In 2015, Slovenia adopted the Transport Development Strategy of the Republic of Slovenia. Alongside the previously discussed resolution, it is an umbrella document on Slovenian transport policy, which we have been waiting on for 25 years. A relatively comprehensive document, it contains an extensive review of the existing policy framework surrounding Slovenian transport policy and puts Slovenian transport policy in perspective as it relates to existing EU documents. It also presents the current status of transportation and outlines a vision for transport in Slovenia as well as performing a SWOT analysis of the transport sub-systems and infrastructure systems (Strategija razvoja prometa ..., 2015).

The main problem with this comprehensive document is that it describes and analyses many transport issues only generally, while not conducting sufficiently detailed analysis. Similarly, the goals are very general and offer no specific timelines or different threshold limits, which would be absolutely essential for quality implementation and verification. Again, even just looking at the goals that define the general thematic areas, not in terms of dynamics and intensity, we cannot see a clear course of action which the strategy should have laid out. In terms of the development of sustainable mobility, the document deals with numerous aspects and identifies them as being important, but at the same time throws everything in the same basket including unsustainable practices that have already been in use up to now. Since there is no defined timetable, nor a list of priorities, it is difficult to escape the impression that crucial parts of the document (goals, actions) are more a statement of everything that the authors wanted and needed to insert into the document, rather than a serious strategy, which should serve as the basis for subsequent documents dealing with transport issues. Recommendations of the White Paper are not really taken seriously in the document, though the Paper is mentioned in the chapter on the policy framework for transport documents. We can conclude that the umbrella document of Slovenian transport policy mentions and recognises sustainable development and stemming from it also sustainable mobility, but nonetheless does not consider it as the main substantive component of the development of the Slovenian transport system.

In September 2016 the Government of the Republic of Slovenia adopted the Resolution on the National Programme for the Development of Transport of the Republic of Slovenia until 2030; a document that provides more detailed guidance for transport strategy. The document serves to formalise the measures in the Strategy (Nacionalni program ..., 2016). The document covers the entire transport sector and includes a specific chapter on sustainable mobility (two pages), which in addition to a timetable of investments also provides an estimate of the amount to be invested.

The concerning aspect of this document is that it is based on the previously mentioned horizontal approach, i.e. separating transport policy from sustainable transport policy and treating sustainable mobility as a subsection of mobility, instead of it being dominated by an integrated approach that would integrate sustainable practices to the highest degree possible in all areas that it covers.

3.5 The 2030 agenda for sustainable development

An important document on the international level that transcends the borders of Slovenia and the European Union that should be mentioned is the document "Transforming our world – the 2030 Agenda for Sustainable Development", which was unanimously adopted at the UN Sustainable Development Summit in September 2015. An announcement released on the website of the Ministry of Foreign Affairs of the Republic of Slovenia to coincide with the release of the document reads: "… this represents a historic agreement by the international community to eradicate poverty, reduce inequality, to ensure progress and protection of the environment for present and future generations. At the core of the new development agenda are also respect for human rights and gender equality, along with ensuring prosperity, peace and security for all people and communities. The 2030 Agenda for Sustainable Development in a balanced way connects the three dimensions of sustainable development – economic, social and environmental – and weaves them together through 17 sustainable development goals that need to be achieved by 2030. An important feature of the new agenda is universality: taking into account national circumstances, all countries of the world will meet its goals, both developing countries and developed countries" (Cilji trajnostnega …, 2015).

The Agenda consists of 17 sustainable development goals, with content related to sustainable mobility directly and indirectly touched on in several parts. Already in the vision in point 9 it is stated that the vision also includes sustainable use of natural resources, such as air (Spremenimo svet …, 2015, p. 4): "We envisage a world in which every country enjoys sustained, inclusive and sustainable economic growth and decent work for all. A world in which consumption and production patterns and use of all natural resources – from air to land, from rivers, lakes and aquifers to oceans and seas – are sustainable. One in which democracy, good governance and the rule of law as well as an enabling environment at national and international levels, are essential for sustainable development, including sustained and inclusive economic growth, social development, environmental protection and the eradication of poverty and hunger. One in which development and the application of technology are climate-sensitive, respect biodiversity and are resilient. One in which humanity lives in harmony with nature and in which wildlife and other living species are protected."

The Agenda also addresses air quality in Goal 3: Ensure healthy lives and promote well-being for all at all ages; and specifically in the ninth indent which reads: By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination.

And in Goal 12, titled: Ensure sustainable consumption and production patterns (Spremenimo svet …, 2015, p. 12) Subtitle 12.4 "By 2020, achieve the environmentally sound management of chemicals and all wastes throughout their lifecycle, in accordance with agreed international frameworks, and significantly reduce their release to air, water and soil in order to minimize their adverse impacts on human health and the environment" (Spremenimo svet …, 2015, p. 19).

Even more concretely, the Agenda addresses sustainable mobility in goal number 11, entitled: Make cities and human settlements inclusive, safe, resilient and sustainable.

Stating in its second indent: "By 2030, provide access to safe, affordable, accessible and sustainable transport systems for all, improving road safety, notably by expanding public transport, with special attention to the needs of those in vulnerable situations, women, children, persons with disabilities and older persons" (Spremenimo svet …, 2015, p.18).

While in the sixth indent of the same goal the Agenda again pays attention to air quality: "By 2030, reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management" (Spremenimo svet …, 2015, p. 18).

3.6 Between reality and strategic orientations

In the Slovenian territory there was very early and rapid development of modern transport systems, because of the country's location between Vienna and the Adriatic Sea, such that already in the middle of the 19th century the railways were in place, serving as the backbone of modern mobility in Slovenia, with their role growing stronger until the collapse of the Austro-Hungarian Empire. Motorisation has had a profound effect on the lives of Slovenes, though the phenomena emerged relatively late, only after the Second World War. Today, the Slovenian transport system is highly reliant on the motorway network and is anything but sustainable. On the 9.3% of motorways within the national road network as much as 49% of traffic flows, whereas only 17% of traffic uses main roads, which amount to 12.4% of the national road network (Prometne obremenitve, 2014). In Slovenia, problems posed by the rapid growth of traffic flows have led to attempts to improve transport infrastructure, but these have not been very successful, because traffic flows are increasing at a greater pace, while at the same time new infrastructure creates additional traffic demand, such that we end up further away from sustainable transport practices. How to improve accessibility for certain regions, which are not close to or on the motorway, remains an open question. The plans covering transport links and accessibility are markedly dominated by road transport, with other (more sustainable) modes of transport again being neglected. In summary, the Slovenian transport system developed in an unsystematic and unsustainable way, in strong subordination to road and particularly motorway plans. The same can also be said for Slovenian transport policy. Before we had new transport policy, the young state of Slovenia had introduced the National Motorway Construction Programme. Transport policy in effect today, the Resolution on the Transport Policy of the Republic of Slovenia, was only adopted in 2006. This document, as well as all that followed it, mention sustainable mobility, however they do not integrate it as a component of all transport plans, rather it is treated as just another element of transport policy. These days, modern sustainably designed transport systems integrate sustainable approaches in transport policy when it comes to all forms of transport and at all levels of transport planning.

4 Sustainable mobility in the educational process

4.1 Sustainable mobility in selected curricula

As part of the *Educating, Informing and Raising Public Awareness about the Importance of Public Transport* project we sought to figure out to what extent sustainable mobility is included in the educational process. We reviewed preschool curriculum as well as curricula of selected primary school subjects – Geography (compulsory and elective subjects), Learning about the Environment (compulsory subject), Social Sciences (compulsory subject), Civics and Ethics (compulsory subject), Environmental Education (elective subject) – and secondary school subjects – Geography (compulsory subject and additional content for graduate exam), Environmental Education for Sustainable Development (interdisciplinary subject), Environmental Studies (elective subject), Sociology (compulsory and elective subjects as well as additional content for graduate exam). We focused mainly on educational and learning goals, which are one of the main guides for educators and teachers in their work. The review showed that dedicated education about sustainable mobility is inadequate or otherwise completely lacking.

4.1.1 Preschool

The curriculum for preschool (Kurikulum za vrtce, 2011) includes activities that are divided into the following subjects: physical education, language, art, social studies, nature studies, mathematics.

The inscribed objectives for each subject's activities constitute the framework within which professionally developed materials and activities are conveyed to educators as options or templates for their work. When it comes to implementing the curriculum, preschool teachers connect, supplement and build upon the recommended learning materials and activities in a variety of ways (Kurikulum za vrtce, 2011).

Except in physical education, which incorporates cycling, there are no subjects with prescribed activities to develop sustainable mobility habits included in current curricula. For this reason and based on lessons learned from several past projects addressing sustainable development and also sustainable mobility, we prepared a number of proposals for integrating sustainable mobility in preschools' daily activities.

So as to develop motor skills and healthy travel habits, it is recommended that from a very early age children be encouraged to take up cycling. Most children really enjoy cycling, be it in games or in everyday life. On the one hand, a bicycle is a toy, while on the other, it is a tool enabling independence and development of psychomotor and

physical abilities. We can also make smart use of transport examples in the learning of languages. Children can learn languages and at the same time pick up information about transportation as they are listening to everyday conversations, storytelling of literary texts and adults reading aloud together, or while they are telling a story/describing something themselves, as well as by using language in made up games, jokes, rhymes, riddles etc. Through varied art projects and using different activities it is possible to bolster the popularity of sustainable forms of mobility among children (e.g. examining photos depicting trains, buses, stations, bikes; creating a story out of collage; conceiving and producing an animation with a variety of puppets and objects that illustrate transport situations; singing bus, train or bike themed children's songs; drawing imagined scenes; going for a ride on a historic train). Because nature studies is a special subject, within which we develop children's capacities for active involvement in the surrounding physical and social environment as well as teaching them about healthy and safe living environments and habits, it should also educate children about sustainable mobility. In addressing these topics, norms which children adopt as "their own", play an important role. Therefore, as much as possible parents should take children to preschool on foot, by bike or by bus; alternatively, they could park their car at least 200 m away and then walk their child to preschool. Similarly, teachers or parents could take children on excursions by using public transport, while games and fairy tales could also be utilised to create a positive image of sustainable travel habits. In the social studies subject children should be encouraged to think critically and value their individuality (e.g. discussions about clothing, toys, music, commercials ...) and in terms of sustainable mobility also presented with the social connections that people (may) develop with fellow passengers in public traffic. And last but not least, within the subject of mathematics we can very easily use everyday examples from public transport and introduce a variety of games with toys, such as trains and buses, in order to get across basic maths concepts (Otrin et al., 2013b).

4.1.2 Primary School

At the level of primary schools, we conducted a detailed review of curricula in those subjects which we assume might include content related to sustainable mobility. During the reviews, we focused on the learning objectives outlined in the current curricula for elementary education in the following subjects: Geography (compulsory subject), Geography (elective subject), Learning about the Environment (compulsory subject), Social Studies (compulsory subject), Civics and Ethics (compulsory subject), Environmental Education (elective subject) (Ogrin et al., 2013).

By gathering together the individual primary school subjects' learning objectives associated with the studied topic, we wanted to highlight the possibilities for interconnecting content related to sustainable development and sustainable mobility as well as for connecting it with learning objectives inscribed in the curricula and to encourage teachers to integrate such material into their yearly lesson plans.

Geography (compulsory subject)

The curriculum (Učni načrt. Program osnovna šola. Geografija, 2011) for grades six, seven, eight and nine does not include content that directly relates to sustainable

mobility. Transport is considered primarily in terms of traffic and strategic location of areas and to a lesser extent from the perspective of sustainability.

In the general subject objectives five goals are outlined (Učni načrt. Program osnovna šola. Geografija, 2011, p. 6–7) which indirectly relate to the issue of sustainable transport and individual responsibility. Specifically, the goals state students in geography classes should:

- develop skills to evaluate the contradictions in the environment (local, regional, global) of the modern world, while they should also be equipped to recognise the urgent need for sustainable development and to take responsibility for preserving the physical and biological living conditions for future generations;
- develop values that raise their interest in social needs and solving common sustainable spatial planning issues at the local, national, regional and global scale;
- develop values that contribute to ensuring quality environment, planning for harmonious use of the environment, as well as to fostering consideration for the lives of future generations (sustainable development);
- develop values that contribute to caring about the preservation of the environment and their own health;
- develop values that contribute to solving local, regional and global issues following the principles of sustainable development and the principles inscribed in the Universal Declaration of Human Rights.

Environmental problems are considered mostly as they relate to industry and agriculture, with very little reference to transportation. In terms of sustainable development and sustainable mobility we identified the following operational material and goals from individual grades:

- in grade six it is inscribed that students should be able to differentiate between responsible and irresponsible spatial arrangements and gain experience in taking responsibility for commitments they take on (ibid., p. 8);
- in grade seven students should use a thematic map and relevant scientific literature to evaluate the importance of transportation and transport connections, past and present, across the Mediterranean; show on a map the typical landscape units and explain the transitivity of Central Europe from a relief and transport perspective as well as the significance of this transitivity for human life; describe what passes and tunnels mean for transport accessibility in Alpine landscapes and also understand the principles of sustainable development and responsible environmental management (ibid., p. 11–12);
- in grade eight students should determine the economic importance of Oceania along with its importance when it comes to transportation, and evaluate the importance of transport routes between the East and West of the continent (North America) (ibid., p. 15);
- in grade nine (where such goals are most numerous) students should understand the importance of preserving the environment for the sustainable development

of society in the present and the future; evaluate the importance of being located at the crossroads of Europe's natural units, the importance of language groups as well as the enlargement of the EU when it comes to the economy and trade; use the Karavanke tunnel as a case study to analyse the importance of transport links between two countries; evaluate the impact of the Adriatic Sea on climate, vegetation, transport, tourism, fisheries and agriculture; describe modes of transport, their strengths and weaknesses in terms of capacity and pollution; show on a map the major transport routes in Slovenia and evaluate their importance in terms of connecting the country with the rest of Europe and the world, and also analyse the correlations between traffic, traffic safety and the economy as well as the impact of geographical factors (ibid., p. 16–19);

- The curriculum (ibid., p. 21) also states that alongside civic skills students should be informed how every citizen can influence planning and development in their own living environment.

Geography (elective subject)

Among the general objectives in the curriculum for Geography as an elective subject (Učni načrt. Izbirni predmet: program osnovnošolskega izobraževanja. Geografija ..., 2004, p. 6) it states that:

- students learn about different types of environmental pollution in selected areas as well as about the ways and means the natural environment is protected for future generations;
- students learn about the characteristics, habits and way of life people have in selected parts of the world and Slovenia, while they also overcome prejudices and stereotypes.

The general objectives in the curriculum for the Geography elective subject (Učni načrt. Izbirni predmet: program osnovnošolskega izobraževanja. Geografija ..., 2004) open the door to addressing sustainable mobility, however the topic is not embedded in the operational goals of the course, which encompass more concretely outlined activities and educational goals of the elective subject. In terms of subject operational goals and knowledge standards that at least partially touch on the issue we are discussing, particularly those that represent a possible basis for educating and informing about sustainable mobility, we can highlight the following: students explain the ways in which mountainous landscapes are polluted along with the consequences and they propose responses; they study the transport functions of an area, locality and individual district in a settlement; they investigate landscape changes caused by human activities in the past as well as due to more recent activities; they determine the scale and type of threats facing the environment and identify measures for protecting the natural environment; they study landfills; document natural and cultural heritage and comment on their importance (Učni načrt. Izbirni predmet: program osnovnošolskega izobraževanja. Geografija ..., 2004, p. 8–13).

In this curriculum, proposed learning materials represent a framework within which teachers can select those topics or units that students are either most interested in or else are currently the most topical or they are the easiest to gather information

about. Thus, a teacher could easily work in among these activities a focus on sustainable mobility.

Learning about the Environment (elective subject)

The two most important general objectives outlined in the curriculum for Learning about the Environment (Učni načrt. Program osnovna šola. Spoznavanje okolja, 2011) are understanding the environment and cognitive development. They are put into practice through active learning about the environment.

Among the objectives of the subject there are also learning objectives that indirectly relate to the principle of sustainable mobility (Učni načrt. Program osnovna šola. Spoznavanje okolja, 2011, p. 7–17):

- learning about the existence of and perceiving the importance of social norms, human rights and responsibilities;
- realising that we are part of history, which we also shape and leave behind for future generations;
- forming a positive attitude towards living creatures and nature as a whole;
- developing a responsible attitude towards the environment and encouraging interest in the protection of nature;
- learning about the importance of health and the ways to maintain health;
- discovering and learning about the characteristics of the local landscape and human life in this region, as well as developing knowledge about human induced changes in the environment;
- training for correct and safe behaviour in traffic.

The subject Learning about the Environment is part of the syllabus for grades one, two and three, within which knowledge is built up as part of succinct units. Much of the learning content relates to the development of individual responsibility both for their own health as well as for the physical and social environment. Education of students in sustainable mobility means just that – education and training that raises awareness of the impact that individuals have through everyday decisions, including when they are deciding how to "move".

Specific activities that directly relate to education on sustainable mobility are limited and are only outlined in the operational programme for the third grade, as part of the "I look around" unit.

In the operational programmes several objectives and activities are listed, within which content related to sustainable mobility could also be addressed, such that there might be continuity in the education of sustainable transport. In this regard, we highlight the following eight learning objectives from the first grade: students learn how they themselves and other people have an impact on nature, how they can actively contribute to the protection and preservation of the natural environment, so too how they can contribute to managing the environment in which they live; they observe and learn the traffic routes around the school; they learn the important road signs for pedestrians and cyclists around the school; they learn about safe walking (in

a group, accompanied by adults, on the sidewalk, where there is no sidewalk, crossing the road, etc.); they understand the importance of visibility in traffic, a factor in a vehicle's stopping distance, and the importance of wearing a reflective vest and reflectors; they learn how to behave as a passenger on various modes of transport; they learn that traffic users under the influence of alcohol, drugs and medicines endanger all road users; they are able to build a model of the school surroundings and simulate transport and traffic situation on it. For grade two we would highlight eight relevant learning objectives: students learn how people affect the natural world and how they can actively contribute to protecting and preserving the natural environment and managing the environment in which they live; they learn that people feel better if they exercise regularly; they acquire knowledge, skills and attitudes that enable them to care for their own health and the health of others; they know the rules of behaviour for various means of transport; they know the road signs, they encounter on their way to school, including those relevant to the behaviour of pedestrians and cyclists; they learn about the dangers of traffic in different weather situations; they know that traffic users under the influence of alcohol, drugs and medicines endanger all road users; they reaffirm their knowledge about safe routes to school. In grade three there are seven such learning objectives: students know that people produce goods that are necessary for life; they know that the production also generates waste; they are aware of the necessity and importance of caring for the environment; they learn about some of the pitfalls of consumerism; they learn how people impact on nature and how they can contribute to the protection and preservation of the natural environment; they learn about the most significant environmental problems and ways of solving certain environmental problems; they can describe what appropriate waste management is, so too how to protect and preserve the environment; they know the main pollutants and the effects of pollution on water, air and soil, they also know that production systems and everyday activities produce waste (Učni načrt. Program osnovna šola. Spoznavanje okolja, 2011, p. 7–17).

Social Studies (compulsory subject)

Transportation also comes up in the Social Studies subject (Učni načrt. Program osnovna šola. Družba, 2011), though with an emphasis on appropriate behaviour and conduct in traffic and the role of transport in today's increasingly interconnected world. Education on the topic of sustainable mobility is not outlined in the operational plan, but we did find two learning objectives which are connected to it: students explore and learn about safe and less safe routes to school for pedestrians and cyclists as well as the impact of external factors on road safety (weather, road surfaces).

Civics and Ethics (compulsory subject)

The curriculum for Civics and Ethics (Učni načrt. Program osnovna šola. Državljanska in domovinska vzgoja ter etika, 2011) does not include objectives and activities that are directly related to sustainable mobility, though it does outline four educational objectives aimed at developing students' sensitivity to environmental problems and awareness about the interdependence of interwoven factors when it comes to environmental and social problems: students learn about the interdependence and interconnectedness of factors (social, economic, political ...) affecting problems in the environment and society; they become concerned with environmental issues, the

plight of others and social problems; they learn about the links between local, national and global problems, they develop the capacity to make ethical judgments; and learn about alternative economic and social development that supports sustainable development.

Environmental Education (elective subject)

Among the operational objectives of the Environmental Education elective subject (Učni načrt. Izbirni predmet: program osnovnošolskega izobraževanja. Okoljska vzgoja, 2004) there are three learning objectives to educate students about the environmental impacts of transportation along with objectives which focus on educating students about how our mobility habits are impacting on the environment and what this means: students learns to evaluate the implications of lifestyle habits on air pollution; they come to understand how our lifestyle and habits (transport, diet, hygiene, consumption ...) impact on the environment and they know the main air pollutants in their home environment and in Slovenia (Ogrin et al., 2013).

4.1.3 Secondary school

At the level of secondary schools, curricula for gymnasium programmes (general, classical, economic, professional gymnasium) were reviewed for selected subjects (Otrin et al., 2013a): Geography (compulsory subject and additional content for graduate exam); Environmental Education for Sustainable Development (interdisciplinary subject); Environmental Studies (elective subject); Sociology (compulsory and elective subjects as well as additional content for graduate exam).

Geography

In the curriculum for Geography (Učni načrt. Program gimnazija: splošna, klasična, ekonomska gimnazija. Geografija ..., 2008) there are no learning objectives (or associated content) which would educate students about sustainable mobility or that would otherwise directly tie into promoting sustainable travel habits among students, although it does include references to the concept of sustainable development. It deals with transport in a general manner, mainly considering the importance of transport networks, modes of transport, transport conditions in selected areas and the impact of certain forms of transport on the region. From an environmental protection standpoint students evaluate transport in the Alps and learn about the various measures in place in Alpine countries to reduce pollution. Out of the learning objectives that are linked to sustainable mobility or which could be supplemented with content about it, five fall within the unit on weather and climate, six in the unit on transport and telecommunications networks, six in the unit on settlements, and three in the unit on sustainable development. In the set of learning objectives relating to Europe, eight are suitable for being upgraded with content addressing sustainable mobility; and there are as many as sixteen such adaptable learning objectives among those focusing on Slovenia. Among the additional content for the graduate exam there are four topics which could be linked to sustainable mobility (the issue of Ljubljana's expansion in association with suburbanisation; the importance of a new Alpine transversal railway and base tunnel; transportation in Slovenia – a driver for

development; evaluation of transportation through the Alps with consideration to environmental protection and listing the measures taken in Alpine countries to reduce pollution) (Otrin et al., 2013a).

Environmental Education for Sustainable Development

Environmental Education for Sustainable Development (Učni načrt. Program gimnazija: splošna, klasična, strokovna gimnazija. Okoljska vzgoja kot vzgoja in izobraževanje za trajnostni razvoj ..., 2008) teaches students to monitor, analyse and critically evaluate the consequences brought about by scientific and technological development, so too it encourages students to search for alternative solutions that take into account the needs of future generations. The purpose of the subject is to educate individuals such that they will be capable of critically judging and discussing the impacts and consequences of current practices, habits and lifestyles on the future. At the same time students should be able to compare and evaluate different more or less environmentally friendly ways of satisfying personal and common needs and should form a vision of desired development for the future (Otrin et al., 2013a).

Environmental Studies

As part of the learning objectives for the Environmental Studies subject (Učni načrt. Program gimnazija: splošna, klasična, strokovna gimnazija. Študij okolja ..., 2012), which focuses on protection of the environment in one's own home, the emphasis is placed on the importance of changing living habits, values and attitudes. Travel habits could also be considered part of these, although they are not actually mentioned in the curriculum (Otrin et al., 2013a).

Sociology

Among the educational objectives for Sociology (Učni načrt. Program gimnazija: splošna, klasična, strokovna gimnazija. Sociologija ..., 2008) which align with the concept of sustainable mobility – though itself not specifically mentioned – are activities such as analysing the consequences of the status quo development model in light of the growing ecological crisis, as well as examining problems surrounding the concept of sustainable development and the issue of new ecological ethics (Otrin et al., 2013a).

4.2 Didactic recommendations

The didactic recommendations that we present are based on the curricula for Geography (Učni načrt. Program osnovna šola. Geografija, 2011; Učni načrt. Program gimnazija: splošna, klasična, ekonomska gimnazija. Geografija ..., 2008), since these go furthest in terms of including objectives linked to sustainable development and sustainable mobility. We suggest that teachers addressing themes related to sustainable mobility start by talking about the role of sustainable mobility in our daily lives. Following this they should make sure to continually motivate students and foster a positive attitude towards sustainable development and sustainable mobility among them. To this end, teachers can find assistance in the recommended activities which

facilitate students to reach or else make it easier to reach goals relating to the development of positive attitudes towards sustainable mobility. Teachers are encouraged to individualise and differentiate approaches based on the specific characteristics of individual students. When introducing certain social topics social sensitivity on the part of teachers can be important. Students should gather information about sustainable mobility using all their senses, while teachers should take into account their different cognitive abilities. They should be given the opportunity to participate in various projects, research activities etc. We recommend that teachers forge interdisciplinary or cross-curricular links and use information and communication technologies to facilitate the work of both students and teachers.

It is advisable to focus on personal experience and take into account experiences and ideas that students have encountered and developed in and away from school. Their ideas and experiences could be a starting point in lesson planning. Lessons should be organised so that students can discover new knowledge and skills through concrete activities and in a way which they can relate to. Teachers should also encourage them to reflect on how they learned something. Students should develop attitudes and values, learn effective problem solving strategies, communications capabilities as well as how to critically gather and assess information. Teachers should put great emphasis on interconnectedness and interaction between the individual elements.

Teachers should devote special attention to the following (Učni načrt. Program osnovna šola. Geografija, 2011; Učni načrt. Program gimnazija: splošna, klasična, ekonomska gimnazija. Geografija ..., 2008):

- making sure students obtain and master social skills and abilities, for example: taking responsibility, teamwork, understanding and respect for diversity, care for oneself and others, developing habits that help individuals live in a community, development of decision-making capacity and ability to express opinions, emotional self-control;
- helping students develop core values and critical thinking, for example: by posing questions, engaging them in research, defining concepts and problems, investigating the evidence for a specific thesis, analysing assumptions and attitudes about individual conclusions, allowing for different interpretations, facilitating openness etc. It is essential to avoid emotional closure and excessive simplification.

Students should learn that people through their everyday decisions and behaviours influence the natural and social environment. A deeper understanding of our relationship with the environment and having more detailed knowledge about the effects our actions have on the environment are essential for students' futures and for the future of society. Evaluations of everyday practices and decisions of people within the school community, hometown, home municipality, Slovenia and elsewhere should also include an evaluation from the perspective of sustainable development and sustainable mobility.

5 Research on sustainable mobility in preschools, primary and secondary schools in Slovenia

5.1 Survey among preschool and school teachers

The fundamental purpose of the research, the results of which are presented in this monograph, was to determine the extent to which education for sustainable mobility is already present in Slovenian preschools and schools, along with teachers' attitudes towards it. The research was conducted within the *Educating, Informing and Raising Public Awareness about the Importance of Public Transport* project.

Goals of the research were:

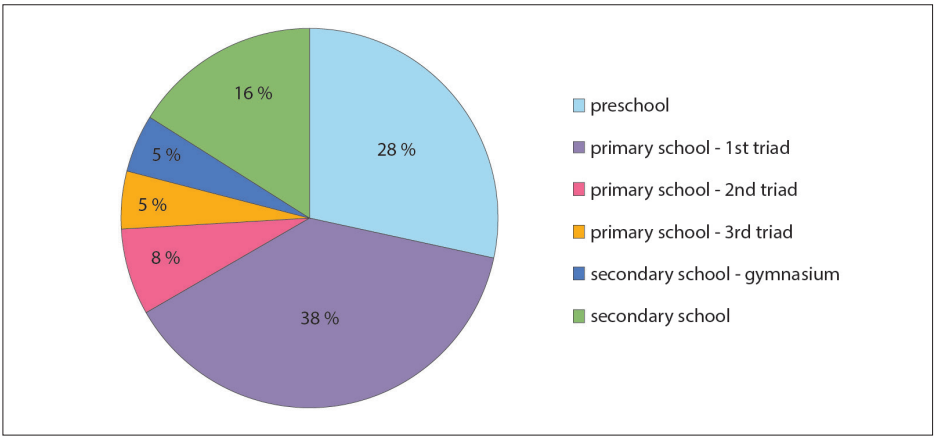
- to identify, based on teachers' opinions, in which school subjects students gain the most knowledge about sustainable development and sustainable mobility;
- to explore how teachers assess their own knowledge of the topic of sustainable development and sustainable mobility, which definitions of sustainable development and sustainable mobility do teachers think are the most appropriate as well as how teachers define sustainable development and sustainable mobility;
- to learn how teachers get to work, what are their reasons for their chosen method of getting to work and is there a possibility that they might change their mode of travel to work in the future;
- to determine how children and students get to preschool and school, and what are the reasons according to teachers for these modes of travelling to school;
- to find out how well school neighbourhoods and smaller towns are provided for in terms of transport infrastructure and road safety, what access arrangements are in place for important institutions (library, shops, health clinic, etc.) in school districts, what should be improved in the school neighbourhood when it comes to transport arrangements and how well organised is public transport in the school district;
- to explore what according to teachers could preschools/schools do to promote sustainable mobility and the use of public transport as well as walking, according to teachers, how could parents be persuaded to travel with children between preschool or school and home using sustainable modes of transport;
- to find out to what extent, according to teachers, education influences the mobility habits of children and adolescents;
- to determine whether the topic of sustainable mobility is recognised by school administrators as important, and what kind of attitude do educational

institutions and staff have to projects seeking to raise awareness and change (ingrained) habits;

- to take note of the opinions of teachers on how to persuade children and adolescents that sustainable mobility is important.

The survey involved 81 teachers from Slovenian preschools, primary and secondary schools; 96% of respondents were female. In terms of the age of respondents, 45% were aged 40–49 years, 28% were 30-39 years, 22% were over 50 years, and only 5% were younger than 30 years. Figure 3 shows the distribution of respondents by educational institutions: most respondents (51%) worked in primary schools, and more specifically 38% taught the first triad; 28% of respondents worked in preschools; and 21% were from secondary schools. The uneven distribution of the sample reflects the uneven interest in training and education for sustainable mobility among Slovenian teachers, which is clearly the highest among primary school teachers (most of them being from the first triad), whereas the proportion of respondents from secondary schools was worryingly low.

Figure 3: Proportion of respondents by educational institution.



In terms of schools represented in the survey, urban schools dominated with 62% of respondents, while looking at the distribution by statistical regions, 51% were from the Central Slovenian [Osrednjeslovenska] Statistical Region. There were also quite a few respondents from the Gorizia [Goriška] (12%), Littoral-Inner Carniola [Primorsko-notranjska] (9%) and Drava [Podravska] (9%) Statistical Regions; there were no respondents from either the Coastal-Karst [Obalno-kraška] or Central Sava [Zasavska] Statistical Regions.

In addition to preschool and class teachers, respondents were also primary and secondary school teachers covering most school subjects (with the exception of Physics, Mathematics, Chemistry).

The survey was conducted in the first half of 2013 via an online questionnaire prepared by using SurveyMonkey. All teachers who participated in the *Educating,*

Informing and Raising Public Awareness about the Importance of Public Transport project were invited to complete the questionnaire. All 81 teachers participating in the project responded.

The research methodology was based on three working methods: descriptive method, causal-nonexperimental method and quantitative method. We used the techniques of surveying and quantitative analysis of survey results. In terms of data analysis, we verified data collected from surveys of teachers, entered it into a database in the SPSS program, which we used to statistically analyse the data.

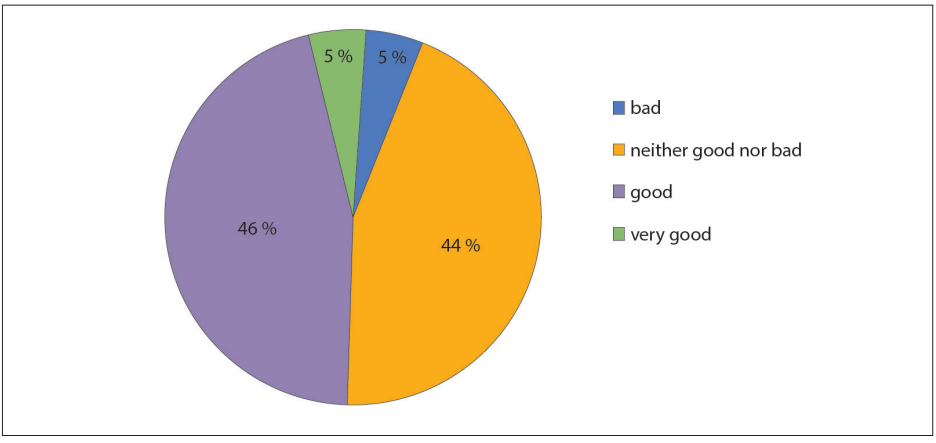
Inclusion of sustainable development and sustainable mobility in individual school subjects

According to respondents, students gain the most knowledge on sustainable development and sustainable mobility during the subjects Learning about the Environment, Social Studies, Geography and Physical Education. A smaller number of respondents also mentioned other subjects, including History, Sociology, Civics and Ethics, Natural and Technical Sciences, Fine Arts, Biology, Chemistry, Physics, Design and Technology, Slovenian language and even Music. One respondent commented that it is very much dependent on the teacher in charge of the subject, since learning content is developed such that teachers can opt to introduce specific and more topical subjects or else skip over it.

Knowledge about sustainable development and sustainable mobility among preschool and school teachers

As many as 46% of teachers rate their own knowledge of the topic of sustainable development as good, 44% assessed it as neither good nor bad, while only 5% of respondents considered their knowledge as very good or bad, respectively. And no one believed that their knowledge of the topics was very bad (Figure 4).

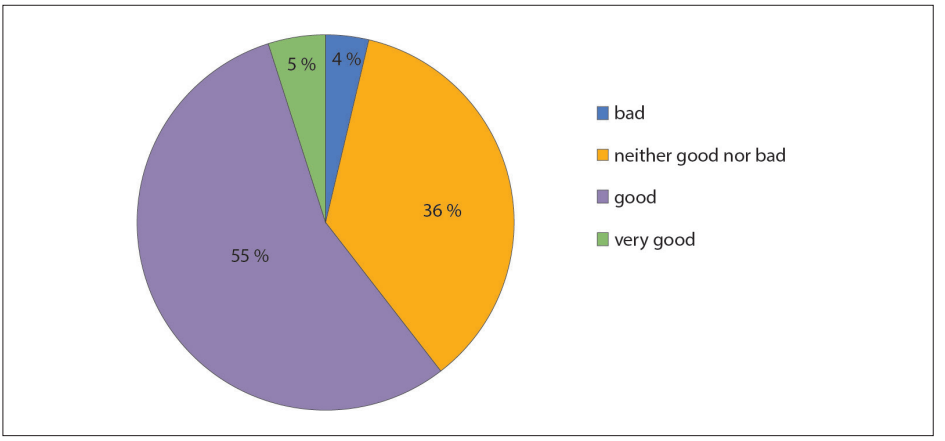
Figure 4: Teachers' knowledge of the topic of sustainable development based on self-assessments.



Interestingly, as many as 55% of the teachers considered their knowledge of the topic of sustainable mobility to be good, 36% that it was neither good nor bad. While,

4% of them assessed their knowledge to be bad and 5% rated their knowledge of the topic very good. So too when it came to sustainable mobility nobody assessed their knowledge to be very bad (Figure 5). We acknowledge that these results are questionable, given that they represent too small a sample of teachers at the national level. Likewise, respondents were teachers who were already interested in the issue of sustainable mobility and consequently, we can conclude that they were also more familiar with this issue.

Figure 5: Teachers' knowledge of the topics of sustainable mobility based on self-assessments.



If we combine the answers "good" and "very good", then looking at the results we can see that around half of the respondents assessed their own knowledge of the topics of sustainable development (51%) and sustainable mobility (60%) as good. It is interesting that a larger proportion of teachers were confident in their knowledge of the topic of sustainable mobility.

The value of the chi-square test of equal probability ($\chi 2 = 97.457$; $g = 4$; $\alpha = 0.000$) was statistically significant, hence we rejected the null hypothesis (H0) of equal probability with a risk value of less than 0.000%. In this regard, we accept the alternative hypothesis (H1), which assumes that the answers of the test group for this question are not equally distributed. The frequency distribution also demonstrates that the most responses (56% of all responses) are rated "good" (4 on the Likert scale of 1 to 5).

Out of the presented definitions of sustainable development, 85% of respondents selected as the most technically appropriate definition the one that states: "Sustainable development means environmental sustainability, supported by the economic and social pillars. This means that in addition to making sure that natural resources are exploited up to their regeneration capacity, sustainable development also sees to it that society develops in a socially just and economically viable way." 12% opted for the definition: "Sustainable development is the same as environmentally sustainable development, which means that it rest on the use of natural resources up to their regeneration capacity", while the other three definitions presented were chosen to a negligible degree or not at all.

Among the presented definitions of sustainable mobility, 99% decided to use the most appropriate professional definition, which says: "Sustainable mobility is an integral part of a sustainable lifestyle. This means that through it we do not exploit natural resources beyond their ability to regenerate and, in this way, it will not inhibit future generations. Sustainable mobility can take many forms, for instance, using public transport, riding of bicycles, walking, introducing cleaner technologies in road traffic, though at the same time it is also important that there are appropriate spatial and transport planning as well as ways of living that offer the same quality of life while reducing the need for daily trips." Just one respondent (1%) opted for the definition of "Sustainable mobility means moving all transport users around as cheaply as possible", while nobody selected the other three available definitions.

Getting to work

In the main respondents (70%) got to work by car, 15% of them arrived on foot, 9% by bike, 4% by bus and 1% by bus or train. Among the reasons for the chosen mode of getting to work, respondents cited unsuitable or lacking bus connections, (too) large distances between home and school (which holds true for catching the bus or train as well as for cycling and walking), public transport that is too time-consuming, and unregulated cycling routes. The vast majority of respondents would be willing to change how they get to school, at least occasionally, if the mentioned circumstances and factors would be different. Unfortunately, their responses indicate that they do not expect this to happen anytime soon, if ever.

How children and students get to preschool and school

The survey results show that children generally travel to preschool accompanied by parents, on foot or by car. Students in the first three grades in large part are escorted to school by parents who drive them, while parents also walk them to school or else they go by school bus. Students in the second triad mainly get to school on foot, by their parents driving them or else they ride a bike or take the school bus. In the third triad students travel to school on foot, in their parents' car, by bike or else on the school bus, while a greater proportion already use public transport, specifically buses (nobody arrived by train). Secondary school students to a much greater degree rely on public transport (both bus and train), while a greater number ride and walk to school and some are also driven by their parents.

The main factors behind the chosen methods of getting to school, according to teachers, were the distance to preschool or school, what options were available (organised school transport, proximity to bus or train station, etc.), the requirement that children in the first triad be escorted to school, the fact that parents with a longer commute often drive, dropping off their child on the way to work, inadequate public transport, while some also linked car usage with convenience for parents.

Transport infrastructure and traffic safety

According to survey respondents, most (62%) found that school surroundings were pedestrian and cyclist friendly, whereas 38% considered the surroundings unfriendly. Furthermore, 73% thought that there were sufficient sidewalks and safe pedestrian crossings in the vicinity of their school, 68% commented there were no bike paths,

while as many as 84% stated their school had car parking arrangements in place. Additionally, 58% of schools had safe and secure storage facilities for bicycles. A large proportion also stated there were safe and maintained bus (85%) and rail (72%) stations. Apparently, there are still many places that are not equipped for people with disabilities, indeed, 48% of respondents asked whether the school surroundings are well-set up for people with disabilities replied in the negative.

A large proportion of the respondents thought that access to important institutions (library, shops, health clinic, etc.) in their school district was adequately arranged, though standing out among these responses was the provision of car parking lots. Respondents frequently mentioned there being a lack of organised bike paths and sidewalks. While others noted that in some areas there are inadequate parking arrangements due to a lack of parking spaces, which also makes the situation more dangerous for pedestrians and cyclists. It also seems that access to various institutions is properly taken care of to varying degrees.

Looking at the regulation of traffic in the vicinity of preschools and schools, respondents thought that in many cases it would be necessary to renovate bicycle lanes, sidewalks, covered bus stops, provide appropriate parking facilities, upgrade roads around preschools and schools, improve the interurban transport services (bus, train), increase control of drivers of passenger cars together with restricting speeding, put in place routes for the disabled and provide facilities for bicycles and motorised bicycles.

In terms of passenger transport arrangements in the towns where preschools and schools are located, respondents expressed fairly similar opinions. Though in large part they stated that public transport services are adequate (especially in the case of Ljubljana), many also mentioned problems including irregular frequency of public transport services in various places, great distances between stops and schools, insufficient number of buses and trains during off-peak, i.e. outside of regular school and work commuter periods, as well as during work-free days, lack of coverage by public transport services in certain places, etc.

Promoting sustainable mobility and the use of public transport and walking

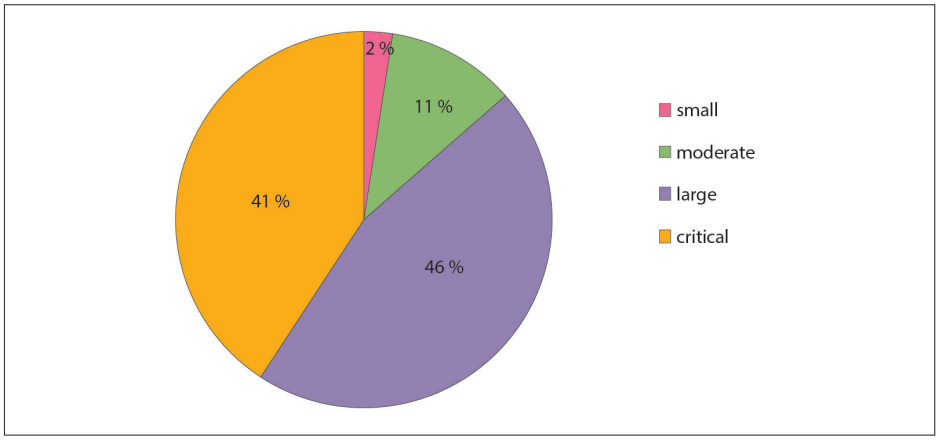
According to teachers, preschools and schools can promote sustainable mobility and the use of public transport as well as walking by: informing children, students and their parents about the importance of sustainable mobility; erecting barriers regulating entry to the schoolyard; collaborating with bus operators so as to provide adequate bus services for students; having teachers, educators and other individuals educate by example (the issue should be written about and reported on, cycling should be incorporated into school activities, persons who walk should receive awards, bus services should be updated and made more affordable ...); raising awareness on the need for children to be active; running recurring campaigns with the help of experts so that parents and grandparents also come to understand the importance of using public transport, riding and walking; providing and updating, in cooperation with the relevant authorities/institutions, bike paths and more generally improving transport infrastructure around the school/preschool; raising awareness about healthy lifestyles; carrying out various campaigns; participating in competitions, contests and projects; organising sports days, school excursions, visits

to events and performances utilising public transport; working with the municipality; offering parents and their children appropriate programmes – group activities such as walking groups, mountaineering clubs, cycling courses, etc.; organising a walking week; introducing the Traffic Snake Game; introducing Car-free Weeks, etc.

Respondents commented that a large number of parents drive their children to school because they then continue their journey to work by car, while many children walk home since parents have more time in the afternoon. They believed that in many places improving transport infrastructure would make it easier to convince parents about sustainable mobility and inspire them to take it up. They also pointed to the big impact children and adolescents can have on their parents, specifically when it comes to their compliance with recommendations, and furthermore, changing ingrained habits. They suggested that parents could collaborate in various projects, campaigns, etc., and they could be invited to training courses and workshops, they also suggested informing them about the results of campaigns and projects. Above all they believe that it requires a lot of time and effort, though even then positive results are not necessarily guaranteed.

The impact of education on the behaviour of children and adolescents in traffic
As many as 46% of respondents estimated that the impact of education on the behaviour of children and adolescents in traffic is large, while 41% considered it to be critical. Only 11% rated the impact as being moderate and only 2% of respondents believed that the impact of education in this regard is small. Based on the results, we can confirm the hypothesis, that teachers think education has a significant impact on the behaviour of children and adolescents in traffic.

Figure 6: Impact of education on the behaviour of children and adolescents in traffic.



The value of the chi-square test of independence ($\chi 2 = 6.757$; $g = 3$; $\alpha = 0.08$) was not statistically significant. The hypothesis of independence was not rejected. In terms of whether different educational staff (preschool teachers/school teachers) have different opinions regarding the impact of education on the behaviour of children and adolescents in traffic, we did not reach any conclusions. The chi-square test was statistically significant at $\alpha = 0.08$ and with the risk of 8% we did not reject the hypothesis

of independence, since the risk of rejection of the hypothesis of independence was too great (8.0%). Thus, we cannot say that within the statistical population the type of personnel has an effect on the held opinion nor that it does not have it.

Recognition of the importance of sustainable mobility

The teachers were of the opinion that the issue of sustainable mobility was recognised as important by school administrators (some more so than others). In fact, only five of the respondents answered negatively.

Respondents were very positive in their assessments of how sensible and valuable projects seeking to raise awareness and change (ingrained) habits are; 54% considered them to be very sensible and valuable, 22% saw them as extremely valuable and 20% as moderately so. Only 4% of respondents believed that they are not sensible and offer little value. In recent years, 40% of educational institutions have taken part in at least one project that addresses sustainable mobility, 28% had been part of two projects, 7% in three, 2% in four, while 6% had been involved in five or more. Only 15% of educational institutions had not yet participated in a project related to sustainable mobility. Unfortunately, 85% of respondents did not know of any successful examples of sustainable mobility projects at other institutions. As many as 69% of respondents would like to participate in sustainable mobility projects in the future. According to 63% of respondents, sustainable mobility initiatives in their school or preschool could become an important recognised symbol for their institutions, while 33% of respondents did not know or were unwilling to say what it would mean for their institution and only 4% did not see sustainable mobility as a potential symbol.

How to convince children and adolescents that sustainable mobility is important?

The teachers shared a number of suggestions on how to convince children and adolescents that sustainable mobility is important. Foremost, they believe it is necessary to talk with students about what our future will be and that of our children if we do not change some very important habits that affect our quality of life, and also they emphasise the importance of adults (both parents and teachers) setting an example for children and adolescents to follow. They suggest that the topic could be made attractive to students by utilising interesting and varied activities, concrete actions, outreach, workshops, involvement in projects. They also pointed to the significant influence that peers' attitudes to certain issues on one hand and attitudes of parents and extended family on the other have on behaviour of individuals. In this matter, they expressed particular concern about parents' attitudes, who are often unwilling to adopt changes that alter their usual way of life.

Preschool and school teachers' suggestions

At the end of the survey teachers shared a number of recommendations related to both project work and education for sustainable mobility. They stated that:

- the *Educating, Informing and Raising Public Awareness about the Importance of Public Transport* project should be continued in the coming years, given that it is a topic or actually an initiative that needs to be implemented in the long term, building on itself in order that we can achieve the desired outcomes;

- it is essential to build upon the existing situation and alert those responsible;
- sustainable mobility themed content needs to be included in technical days, sports days, etc.;
- because the topic of sustainable mobility in today's world and in Slovenia is becoming increasingly important, as much attention as possible should be given to this issue, thus projects like these are very welcome;
- the use of public transport has increased sharply since the introduction of state subsidies; if in addition to this public transport would be modernised and travel times reduced, particularly for rail services, then passenger numbers would certainly rise;
- shows on this topic, animated films, participation in projects which also actively involve parents;
- it is important to raise awareness among children and all citizens (e.g. via the local newspaper);
- the adequate provision of transport infrastructure is a prerequisite for effective change;
- the media needs to be involved;
- students should be rewarded if they travel to school for the whole year by walking, riding or taking the school bus;
- as many examples of best practice as possible should be shared and presented;
- any possible solutions suggested by children and adolescents should also be pursued, since in this way, their voices are heard, they feel important and their work takes on meaning;
- there should be interesting stories and issues for children to explore, a group visit to the police and a tour of a police station organised also for children from rural areas;
- content related to sustainable mobility should be incorporated into school curricula at all levels and in every which way possible;
- public gatherings and round tables should be organised, where local residents can get information about the negative effects of traffic, as well as community meetings; civic initiatives should also be organised.

5.2 Preschool and school teachers' reflections

Building on the results of the survey of teachers, in 2014 we also incorporated reflections of a different group of teachers who participated in the aforementioned project. Reflections on the situation, practices and needs were given by eight preschool teachers, seven primary school teachers and five secondary school teachers from different parts of Slovenia (Ajdovščina, Bled, Borovnica, Grosuplje, Hajdina, Kranjska Gora, Ljubljana, Nova Gorica, Rateče, Sevnica).

5.2.1 Preschools

In all eight preschools, irrespective of their location, be it in the city or in a rural area, teachers noticed that in most cases children escorted by adults got to and from preschool by car. However, there was an exception to this for children who lived very close to preschool, in which case they tended to walk or else there were rare instances of adults riding children to preschool (and even then, only in favourable weather conditions). They commented that nobody used public transport to get to preschool. Teachers from rural preschools thought the main reason for this was that public transport was either inadequate or non-existent. Similarly, the vast majority of employees got to and from work by car. While some preschools had adequate parking and arrangements in place for children's safe movement in traffic, in others the situation was said to be largely unsatisfactory (e.g. unregulated parking; inappropriate, inadequate or even non-existent traffic signs; problems with drop-offs due to inadequate access) and respondents particularly stressed the lack of interest on the part of responsible authorities to provide solutions for ensuring children's safety in potentially dangerous situations.

Teachers in all eight preschools endeavoured to set a positive example and raise awareness among children and parents. What is more, some of the teachers regularly encouraged other staff to actively campaign for sustainable mobility themselves. In the preschools, a very popular activity that children were happy to participate in was the White Bunny game. Teachers also organised trips by train, bus (urban, suburban) or walking, as well as a car-free week, when children with their guardians get to preschool, or at least part of the way, on foot. One of the preschools in Ljubljana organised a visit to the airport, a boat ride along the Ljubljanica River and they caught the Urban train to Ljubljana Castle – all in the desire to show both children and parents different forms of mobility. At the same time, they took care to draw attention to the problems associated with transport arrangements in the preschool neighbourhood and called for them to be rapidly addressed.

In all preschools teachers emphasised the importance of raising public awareness and cooperating with responsible authorities, including the police. First and foremost, they raised the issue of child safety in traffic and their efforts to find appropriate solutions, such as traffic calming using obstacles, maintained pedestrian crossings, appropriate and visible road markings and signs, maintained sidewalks and bicycle paths, as well as organised bicycle storage and car parking facilities. They evaluated participation in various projects to be desirable and necessary. Although they did not mention provision of adequate public transport, which probably reflects the complexity of the situation.

5.2.2 Primary schools

Similar to the preschools, in all primary schools teachers, particularly in the first triad, noted that in most cases adults drove children to and from school. They also commented that regardless of whether there was or was not a parking lot, the adults tried to park their cars as close as possible to the entrance of the school. The situation was

said to be worst where a preschool and school are located next to each other. Most employees got to work by car, although they mentioned that it is becoming more and more common for school staff to carpool. With the exception of a small number of primary school teachers in Ljubljana, none of the teachers relied on public transport. Older students who lived near the school tended to get to school on foot, bicycle, roller blades and scooter. Those living further away travelled between home and school using the school bus or minibus, with almost no one taking public transport. Around most schools road safety was seen to be fairly well taken care of, though unfortunately there were also schools where the road traffic situation posed potential dangers to everyone (no sidewalks, no bike lanes, either lacking or unregulated parking facilities, inadequate road signs and markings, etc.).

In all seven primary schools they were trying to raise awareness among students, parents and staff about the importance of sustainable mobility and all the benefits that go with it. For instance, they had participated in projects addressing sustainable mobility and traffic safety (e.g. the Traffic Snake, Project Armadillo [promoting correct use of child safety seats and safety belts], Be Careful and Visible), grade five children were taught how to ride a bike, they organised technical days focusing on sustainable mobility and whenever possible organised transportation using public transport services. They regularly cooperated with the police and provided responsible authorities with suggestions on how to manage traffic in the school neighbourhood. At teacher conferences, parent-teacher meetings and during classes they stressed the importance of road safety and sought to draw attention to problems such as inappropriate behaviour of some older students in traffic (riding bicycles and motorcycles without helmets) and certain parent's dangerous behaviour (disregarding speed limits, failing to use a child seat or seat belt).

So too in primary schools children's safety in traffic came first and they sought appropriate solutions, participation in various projects was seen as desirable and necessary. Exactly as preschool teachers they did not mention provision of adequate public transport.

5.2.3 Secondary schools

In five secondary schools teachers noted quite different situations in relation to transport arrangement around schools, which in turn affected road safety. While some schools could boast of adequate transport arrangements, which ensure the safety of students and employees in traffic, in other cases the situation was just the opposite (e.g. poorly maintained paths for pedestrians and cyclists, excessive distance to bus and train stations, poor public transport services). Whatever the situation, the vast majority of students practised sustainable mobility – they used public transport, bicycles, motorised bicycles or else they walked, though this was more a reflection of behaviour in a given situation rather than the conscious selection of sustainable mobility. Some also noticed that students lacked awareness or knowledge and had difficulties understanding the very concept of "sustainability", for instance it was often misunderstood as something that is related to the distant future when "they will not be around anymore".

In secondary school the influence of parents is no longer as great compared to what it is in lower levels of education, though it is true that young people's behaviour and decisions often mirror default patterns from home. Therefore, teachers seek to get students more actively involved in various projects and activities associated with sustainable mobility. Thus, for example, a secondary school in Ajdovščina conducted a survey among students and found that 50% of students were willing to set an example for younger people, peers as well as people older than them by using public transport, walking and cycling, whereas 35% were undecided. A similar survey was also conducted in one of Ljubljana's secondary schools, though they also surveyed parents and school staff. At that school, staff had largely changed their travel habits and now got to work by bike, on foot or by carpooling. Together with the students they also wrote a letter and sent it to the Municipality of Ljubljana. In Ajdovščina, as part of a module in the open curriculum for the Youth Entrepreneurship course a group of students put in place route signs for walking and cycling paths to school, proposed a design for new bike parking facilities and renovated existing ones. Other schools took action in the form of presenting examples of best practice, alerting those responsible in municipal authorities about problems, dangers and needs, and organising parent meetings focusing on the relevant topics.

They emphasised the importance of participating in various projects and campaigns, as well as of pro-active cooperation between the school and municipality. They devoted somewhat less attention to traffic safety than the primary school and preschool teachers.

5.3 Selected examples of sustainable mobility initiatives

As part of the project *Sustainable mobility in practice* in 2016 and 2017 two seminars for teachers were organised on the topic of sustainable mobility in primary schools. After the seminars, teachers shared their reflections and also concrete examples of sustainable mobility activities in their schools. A few selected examples are presented below, in order to show some specific examples of what we have been discussing above. We should also mention that their views on the situation, activities and needs when it comes to sustainable mobility do not differ from those of teachers mentioned in the previous chapter.

Figure 7: A letter to parents.

A letter to parents!

"Ever since I was a very young child I told my parents: I want to do it myself. Just help me to do it myself, do not do it for me. Every day, driven by the desire for autonomy I express my resistance, but often because of the rapid pace of life, unaware of my needs and motive, my parents urge me to hurry and often do things for me even though I know that I could do

them myself. Therefore, I would like to clearly and loudly tell my parents again: Never help me with things, which you know that I can do myself!"

In accordance with our educational plans and goals that we try to follow, we are asking parents to allow their children in the new calendar year 2017 to travel independently to school premises from 9.1.2017 onwards.

Your children *will, in accordance with accepted school rules, take care of their clothes, shoes and school bags themselves. In this way children can become more independent, build up confidence in themselves and their capacities, such that they will be able to provide for themselves and their needs. This feeling will stay with them throughout their lives, especially in moments when they are faced with everyday challenges and problems, which occur all too often. In this way, we are giving them a guide for a fuller and happier life. Is this not something we want for our children?*

Independence *is something we would like to build up in the new year through the Traffic Snake Game project and we also want to change mobility practices such that they will contribute to a cleaner environment, socialisation between adults and children as well as children themselves, physical activity promoting health. The Traffic Snake Game is a project that will reward students in the first triad: if they get to school on foot they will get a green sticker, if their parents drive other children to school besides them (i.e. carpool) they will get a red sticker, while at the end of the project all the best will also be rewarded.*

More about the Traffic Snake Game project can be found on the website; type Traffic Snake into your search engine or go to the site directly: http://www.trafficsnakegame.eu/slovenia/.

Stand alongside us, practitioners, and support children's independence! Together, by participating in the Traffic Snake Game project mobility activities we are making a small but meaningful difference for the planet and our health.

I am also writing to announce that we will supplement the Traffic Snake with two mobility novelties, The Walking Bus and Bike Train in May and June 2017.

Thank you for your cooperation and kind regards!

Barbka Drobnič, Principal – Dob Primary School, in collaboration with expert colleagues

Source: Archive of Department of Geography, Faculty of Arts, University of Ljubljana.

Figure 8: A proposal for the promotion of sustainable mobility.

A proposal for the promotion of sustainable mobility

We are organising a bike ride from Lower (Spodnja) Idrija to Idrija to attend the Health Day event, which will take place in May. Participating in the bike ride will be ninth grade students who attend ŠZS- sport for relaxation. We will invite parents to the bike ride, including those who work in jobs that are related to traffic as well as those who use this stretch of road:

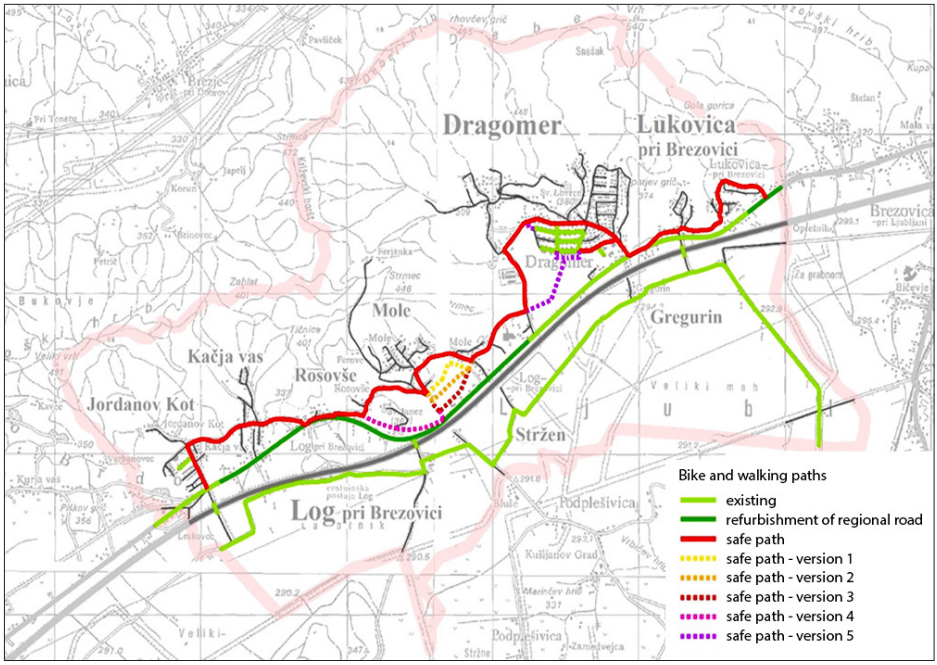
- *truck drivers (Brus transport, forestry sector),*
- *bus drivers (Avrigo bus company),*
- *motor vehicle drivers (parents of students who drive their own car to work every day),*
- *pedestrians who use bus services,*
- *cyclists,*
- *motorbike riders,*
- *disabled persons,*
- *police,*
- *first responder health workers with an emergency vehicle,*
- *firefighters,*
- *the cycling club,*
- *the best rally drivers in Slovenia: Aleks Humar (1. place), Rok Turk (2.) and Darko Peljhan (3.), all three are from Idrija,*
- *the mayor and colleagues.*

We will organise a round table where everyone will participate, particularly different road users who travel between Idrija and Lower Idrija. We will try to present the problems, reflections, reactions, seek out ways of "living together", solutions, etc. Before the bike ride takes place parents will be invited, via their children, to present their views about other road users (in the form of a report).

Prepared by: Marko Fink, Lower Idrija Primary School (OŠ Spodnja Idrija)

Source: Archive of Department of Geography, Faculty of Arts, University of Ljubljana.

Figure 9: Map of existing and planned paths in the school neighbourhood of the Log–Dragomer Primary School, Dragomer 2016.



Source: Archive of Department of Geography, Faculty of Arts, University of Ljubljana.

6 Sustainable mobility behaviour among youth

6. 1 Current mobility behaviour among youth and the need to shift to sustainable mobility behaviour

In recent years, most countries of the European Union (EU), have seen a decline in the proportion of children aged up to 15 years; on average they account for between 13-22% of the population. So is the case in Slovenia, where in the last two decades, the number of children decreased significantly; in 1995 children in Slovenia accounted for 19.1% of the population, but only 14.6% in 2014 (Delež otrok …, 2015). Nevertheless, we can still say that children are a relatively large and at the same time an important subset of the population in the context of mobility. Young people, at least until they turn 18 when they can take their driving test in Slovenia and are thus allowed to drive a car themselves, are dependent on walking, cycling and public transport for their daily mobility, or else they rely on parents with cars to drive them. It can also be said that young people are actually one of the most mobile population groups, because in addition to daily journeys to and from school, alone or accompanied by their parents, every afternoon they also undertake a variety of activities, attend groups and clubs or otherwise simply visit friends. The fact is, habits acquired in childhood are transferred into adulthood. So it is when it comes to transmission of patterns of mobility behaviour. If a child in its earliest stages of growing up learns, that in order to overcome short distances the car is the best and most appropriate means, then this pattern carries over into adulthood and the car is seen as something taken for granted in overcoming distances (even those that could otherwise be travelled on foot or by bike). Hence, the car can become an instrument that helps shape our space and defines our mobility habits (Otroci v gibanju, 2004). But do we want this? Do we want to be dependent on cars on a daily basis? Do we wish to teach our children from an early age that cars are the only means to accomplish daily trips, even the shortest ones, because we do not have the time or the willingness to walk or cycle? There is evidence that teenagers find it much easier to change their habits than adults. Research has shown that an individual's mobility habits develop by age 16 (Stark, Beyer Bartana, Fritz, 2015). In light of these findings, from the perspective of sustainable mobility, it is important that we pay special attention to the education of young people, as effective education on sustainable mobility has the potential to change young people's mobility patterns or else their dependence on cars, which they might have already picked up from their parents. In this way, it could be possible to change their mobility habits to be more in line with sustainable development.

Many international studies have also found that in the last decade children and adolescents are much less physically active than youth of previous decades. For instance,

they are much less engaged in sports and physical activities, which of course also includes walking and cycling, two modes of sustainable mobility. Consequences of young people's physical inactivity are reflected in increased adolescent morbidity rates, with health problems being compounded in adulthood with the onset of various chronic diseases, such as increased body mass index (obesity is seen as a serious problem even in childhood (Pooley et al., 2013), type-2 diabetes, cardiovascular diseases, etc. (Napier et al., 2011). Research shows that even mildly physically active modes of getting to school, such as walking and cycling, contribute significantly to young people's health (Mammen et al., 2014), moreover, it has been scientifically proven that doing so increases their concentration and reduces stress, which certainly contributes to improving a person's physical and mental health.

Despite the above listed advantages that physically active modes of travelling to school provide, studies have shown that in the last decade the proportion of children who reach school by car on a daily basis has increased significantly (Mitra, Buliung, 2014). In this sense, data from Canada is especially revealing, where research has indicated that between 2000 and 2010 the proportion of children who travel to school by car has increased from 51% to 62% (Mammen et al., 2013). They propose that such an increase in "driving adolescents" is mostly on account of society becoming a lot more car-centric compared to how it was at the start of the new millennium, and consequently greater concern of parents for their children's safety. Today, many parents believe that, due to excessive motorisation, cities are no longer safe for their children, even after they have completed elementary school (Leden et al., 2014). Furthermore, other authors maintain that additional factors in parents' decisions to drive their children to school rather than letting them go by themselves, either on foot or by bicycle, are that safe pedestrian crossings have not been installed everywhere and that in many areas there are insufficient traffic lights, which would allow for safe crossing of busy roads, while they also raise concerns that the air is too polluted due to heavy traffic and therefore hazardous to health (Su et al., 2013). The reality is that in the past few decades the number of cars in use daily has doubled in many places, which has probably reduced the safety of pedestrians and cyclists given that pedestrian and bicycle paths are often lacking, poorly maintained or otherwise unsuitable. This is one of the reasons why the number of children who walk or cycle to school has decreased from 42% to only 16% between 1969 and 2001 (Su et al., 2013). The issues mentioned above have led to public transport, cycling and walking becoming much less attractive modes of transport in recent decades, while on the other hand, car use has significantly increased (Banister, 2008). In line with the European Commission's "Reclaiming City Streets For People" initiative and in order to successfully achieve the goals of the United Nations' 2030 Agenda for Sustainable Development, cities need to work towards adopting certain measures also when it comes to mobility. It is important we start acknowledging that sustainable urban policies can significantly contribute to improving people's quality of life (within the EU approximately 70% of the population reside in cities), not just in cities but also on a global scale. Educational institutions certainly play an important role when it comes to initiatives focused on sustainable mobility, as they can affect and change current mobility habits of young people and thus contribute to the next generations being much less car-centric and much greater users of sustainable transport modes.

Su and colleagues (2013) conducted a survey which aimed to determine relationships between sustainable modes of youth getting to school, gender and family income. They found that, compared to girls, boys are much happier walking or cycling to school and do so more often (Su et al., 2013; Pojani, Boussauw, 2014). Furthermore, after school boys much more frequently engage in sports and physical activities than girls. The study also showed that children who come from high-income families most often travel to school accompanied by their parents who drive them by car, while conversely, children from middle and low-income families most often get to school on foot or by bicycle, i.e. using sustainable means of transport (Su et al., 2013). Other research has also revealed a close link between the condition of the environment and percentage of pedestrians. They showed that in well-maintained and attractive neighbourhoods where houses appear neat and tidy with nice gardens, more people walk compared to neighbourhoods whose external appearance is not visually attractive or well-kept (Foster, Giles-Corti, Knuiman, 2010). In light of the mentioned study results, we must once again highlight the vital role of educational institutions. By including content addressing sustainable mobility into the syllabus in a clear and straightforward fashion, schools could educate young people about the importance of sustainable development together with sustainable mobility. Through teaching and workshops we could change the present mindset of young people who feel that sustainable modes of transport are inferior, reserved for poorer people and have a more or less negative connotation. During the educational process, the teaching of sustainable mobility should not focus merely on presenting the benefits of sustainable mobility for the environment, but also what it means for the individual. When addressing young people, we should thus highlight the positive things they can get from practicing sustainable mobility habits: health, better physical and mental fitness, developing social skills, learning and getting to know new routes etc.

In the context of mobility, primary school children present a special group, mainly because most of their daily trips are made within the municipalities of schools they attend. In Slovenia, every municipality is obliged to provide transportation for children who live more than four kilometres from the primary school they attend. In some cases, schools must provide organised transportation even if the distance is shorter, especially if the route to school is deemed unsafe. On the other hand, in the first grade of primary school parents are obliged to accompany children to school or else ensure they are escorted by either another adult or a juvenile companion older than 10 years. The problem with escorting children, as already mentioned in the fifth chapter, is that many parents, despite living very close to schools, opt to drive their children to school by car. Particularly during the morning rush hour, this creates a complete traffic chaos around many schools (Kelly, Fu, 2014), and in certain situations also a less safe environment for those students who walk or ride to school. While studying mobility habits of students in primary schools, Gabrovec and Bole (2009) carried out a survey in the municipality of Maribor. They found that in 2002, in the Municipality of Maribor, 14% of primary school children travelled to school daily accompanied by their parents by car. In 2009, this proportion had increased significantly to 48.1% (Raziskava o načinu ..., 2010). These figures are certainly troubling and demand serious consideration. Questions that arise include: In all these cases, is being driven in a car really the most appropriate mode of getting to school? Is it also

the safest? Have measures been taken in school neighbourhoods to ensure the safety of children, such that they can safely get to school on foot or by bicycle?

Statistical data for Slovenia show that during the school year 2013/2014 there were 163,229 primary school students and 76,714 secondary school students (Statopis, 2015). By adding these two figures, we see that in Slovenia around 240,000 young people travel from home to school and back every day by one means or another. How they will make this trip on a daily basis, students decide either themselves or else are guided by their parents. It is precisely parents, who through their own habits and decisions greatly impact the mobility patterns and habits of their children. If every day children see their parents commuting to work and running afternoon errands by means of public transport or else observe them using a bicycle or walking for short trips, they will adopt these patterns and habits themselves. Conversely, if they see their parents travelling even the shortest distances exclusively by car, they will take on this mobility behaviour and see the car as a natural means in overcoming even the shortest distances. Hence, it is important that we do not teach only young people about sustainable mobility, but that will also involve adults and the elderly in this process. Indeed, they play an important role in bringing up their children and transferring mobility habits (Canters et al., 2015). How non-sensical using a car seems in certain cases is made clear by the facts that approximately half of all car trips are shorter than three kilometres and that parents, on average, spend 42 minutes every day driving their children to different activities (Canters et al., 2015). It would certainly be feasible to undertake some of these trips, shorter than three kilometers, on foot or by bicycle and parents could doubtless take their children to some of the afternoon activities by cycling or escort them on foot. It is also worth considering, that by accompanying them to after-school activities on foot or by bicycle, parents can use this time to talk and socialise with their children, teach them about road safety, show them their neighbourhood etc. Sustainable modes of transport therefore provide an important social and educational component. Finally, we have to emphasise that from a sustainability perspective, it is necessary to significantly reduce motorised means of travel (Augenstein, 2014).

6.2 Proposed practices for developing sustainable mobility behaviour among youth

In the last decade, which saw the importance of sustainable development come to the fore, there has been much debate on educational institutions integrating sustainable development content into their practices. In countries around the world, different approaches have been introduced to tackle this task: in many, schools have implemented various projects through which they aim to bring young people's habits (including mobility habits) in line with sustainable development; some teachers have, through their own initiative, included content dealing with sustainable development and sustainable mobility into their subject's curriculum; while in other countries, sustainable development (including mobility) content has been successfully embedded in learning objectives of individual subjects through renewal of curricular documents.

In Slovenia, curriculum renewal coincided with a period when numerous sustainable development themed projects were underway. Thus, between 2008–2010, during the curriculum renewal process, sustainable development content was successfully incorporated into some of the subject curricula. In this respect, geography curricula for primary schools as well as general, classic and professional gymnasiums stand out, referring either directly or indirectly to the concept of sustainable development in both general and operational learning objectives and competences. Yet, a survey of geography curricula carried out in 2016 (Ilc Klun, 2016a; Ilc Klun, 2016b) found that, when it comes to sustainable development, both primary and secondary level geography curricula place too much emphasis on the environmental pillar (environmental protection), while the social and economic pillars of sustainable development are neglected. Therefore, it is recommended that when curricula is being renewed, content on social and economic elements should also be incorporated into learning objectives. Additionally, we recommend that sustainable mobility is featured and highlighted in curricula as well, given the need for changes in societal mobility behaviour. This is because we know that if learning material is not present or rather inscribed in the curriculum, which is the only statutory document that guides the educational process, then teachers are not required to deliver it. It is also noteworthy, that increasing demands for sustainable development to be covered in the educational process have resulted in a growing need for educational seminars for teachers, who will then in turn transfer their knowledge on sustainable development to their students, also teaching them by example. Namely, teachers should be shown examples of how to effectively teach their students about sustainable development (including sustainable mobility). Below, we list a few examples of sustainable mobility best practices that are being/have been implemented in Slovenia and abroad as part of the educational process. At the end of this chapter, we also propose a few practices, which we have developed and believe teachers would be able to successfully adopt in their lessons.

6.2.1 Practices particularly suitable for primary school children

Since previous studies show that mobility patterns develop in adolescents by age 16, special consideration should be given to teaching primary school children about sustainable mobility (in Slovenia, students are aged 14 when they complete primary school). Given that children learn best and better retain long-term knowledge through experiential learning and actively participating in the learning process themselves, it is imperative that teachers use active teaching methods when delivering content on sustainable development. Looking at examples of best practices, it turns out that a very successful method of teaching sustainable mobility is project work, in which students are involved over a longer period (at least one week); with longer-running activities we can expect better results and ultimately also changes in existing (mobility) habits of students.

6.2.1.1 *The CONNECT project*

CONNECT project was one of the most successful European projects dealing with sustainable mobility. While it was running, between 2007 and 2010, 85,000 primary

and secondary school students and 5,000 teachers were engaged, across a network of more than 350 primary and secondary schools from nine European countries – Austria, Belgium, Bulgaria, Greece, Hungary, Italy, the Netherlands, Slovenia and the United Kingdom (UK). The aim of the project was to inform both young people and their parents about the advantages of using sustainable transport modes for journeys to and from school, which may also help change prevailing mobility habits more generally. Within the project, three main objectives were set: educate young people, parents and teachers about the benefits of using sustainable transport; teach school children about safe travel to school whilst equipping them with the necessary knowledge and skills; and encourage as many children, young people, parents and teachers as possible to use sustainable modes of mobility for their daily commute to school (Canters et al., 2015). Several practices developed as part of the project were very well-accepted: one of them was more suitable for promoting sustainable mobility in primary schools (the Traffic Snake Game), while two were more suitable for high school students (the ECO-TRIPPER and the ECO-TRIP week). These practices aimed to reduce car use in everyday life and promote sustainable forms of mobility, such as walking, cycling and public transport.

The ***Traffic Snake Game*** was extremely well-received among primary school students and, in light of what it teaches, is also very effective in promoting the use of sustainable mobility, which is why we wish to describe it in more detail at this point, as well as list several important results and observations arising from the implementation of this game in Slovenia as part of the project *Educating, informing and raising public awareness about the importance of public transport*, which was commissioned by the Ministry of Infrastructure and Spatial Planning of the Republic of Slovenia. The Traffic Snake Game was launched as a small project in Flanders, Belgium, but after a few years it grew into a mass campaign, still ongoing in several European countries, and all the while engaging more and more schools. It has been proven that the game effectively increases the use of sustainable modes of getting to and from school and therefore reduces CO_2 emissions. With the rapid spread of the campaign and calls for better coordination, the Traffic Snake Game Network has been established and the game is currently being implemented by national focal points in eighteen countries across Europe (Traffic Snake, 2015).

The Traffic Snake Game takes place over a two week period during the school year, which the schools choose themselves (while it is recommended that the game is played during European Mobility Week, which further reinforces the importance of sustainable modes of transport). The main purpose of the game is to inspire as many students and parents as possible to use sustainable modes of getting to school, so as to at least somewhat change their unsustainable patterns of everyday mobility. And how is the game played? Each student receives a dot sticker every time they use a sustainable transport mode to get to school (walking, riding a bike or scooter, taking a bus; or else carpooling, if the aforementioned modes are not feasible). Thus, every day children earn a sticker only if their travel to and from school is environmentally friendly, which they then affix to the bigger, class sticker, and if the target goal the class had set at the start of the project is reached (e.g. to increase sustainable modes of travelling to school by 20%) the then full class sticker is affixed to the school's Traffic Snake Game banner. The aim of the game is to collect as many full class stickers

as possible and place them on the Traffic Snake Game banner. In addition to the Traffic Snake, there are five other drawings on the banner, which represent daily goals, meaning that students strive to reach the set goal every day of the week. Each day the daily goals thus encourage students and their parents to reach or, if possible, even exceed set goals, for which they are duly rewarded. Schools themselves decide how they will reward their students; though it is encouraged that rewards are non-material, such as extra time for play, relaxation, no homework, etc. When school children reach the head of the Traffic Snake, they receive an even bigger reward, for instance a bike tour, cycling/walking excursion etc. Three weeks after the completion of the game, data gathered before, during and after the game are compiled and analysed. The analysis provides insights into the following: how many students travelled to school in an environmentally friendly way before the start of the game; to what extent were unsustainable mobility patterns successfully altered during the game; what were the effects of the game on mobility habits of students after its completion.

Of course, during the game students should be continually encouraged to use environmentally friendly ways to get to school, while on the other hand, their safety must also be ensured when travelling to and from school. Therefore, for students who live far from school or else for those whose safety would be compromised if they walked or cycled to school, it is allowed that they are driven to school by parents, provided they park the car at least 100 metres away from the school and let the children reach it on foot, either alone or escorted. In this case, we are talking about so-called combined transport, which can also aid in reducing motorised traffic in the vicinity of schools. Schools can further encourage this "combined" mode of travel by situating parking areas at least 100 metres away from the school. Parents may also organise amongst themselves to drive several children to school in one car (i.e. carpool), another means of reducing motorised traffic around schools.

In the 2011/2012 school year, with the assistance of teachers the Traffic Snake Game was carried out in ten Slovenian schools as part of the project *Educating, informing and raising public awareness about the importance of public transport*. Between 2014 and 2017, the game has been implemented as part of the *Traffic Snake Game Network*, cofinanced by the *Intelligent Energy Europe Programme*, and coordinated by the Sinergija Development Agency at the national level. In the 2014/2015 school year, 29 Slovenian primary schools participated. During the two weeks the game was played, schools recorded that, on average, 77% of school travel was achieved using sustainable modes. In just two weeks they were able to save 14 tonnes of CO_2 emissions and 339 trees by travelling to school on foot, by bike or by public transport. 65 Slovenian primary schools participated in the game in the 2015/2016 school year (Karba, 2015).

To serve as examples of best practice, we present Traffic Snake Game results from the Dr. Ivan Korošec Primary School in Borovnica, where the game was coordinated by the teacher Edita Gradišar and supervised by teachers Tanja Plohl, Martina Kogovšek and Dajana Jovanovič, and from the Prof. Dr. Josip Plemelj Primary School in Bled, where it was carried out under the supervision of teachers Meta Sebanc, Bernardka Bernard and Irena Burja.

Before the game, a majority of participating students from the Dr. Ivan Korošec Primary School in Borovnica walked to and from school (40%), while 22% used the

school van and 20% were driven every day by parents in a car. The remaining children travelled to school either by combined transport, carpooling, riding or public transport – the latter was the least frequently used mode of transport, used by only one student who during the 2011/12 school year lived outside of the school municipality.

During the Traffic Snake Game the percentage of pedestrians remained more or less the same, while the percentage of riders increased markedly. Carpooling also substantially increased, thanks largely to parents, who enthusiastically supported the project. The school was most proud of the drastic decline in car use, which dropped by more than 50%, meaning that, during the week the game was played, they successfully raised awareness among both students and parents on the importance of sustainable mobility. The reassessment three weeks after the game's completion showed it had a significant impact on the mobility habits of students and indirectly also their parents. They were especially proud of having been successful in reducing the use of cars as a school travel mode from 20% to "only" 11%.

Figure 10: An example of the traffic snake at the Dr. Ivan Korošec primary school in Borovnica.

The traffic snake at the dr. Ivan Korošec primary school in Borovnica

At our school, I and three other employees applied to be part of the project as we wanted to lower the increased use of cars and consequently the potential traffic hazards around the school. At the school, [we] the participating instigators, otherwise cover various areas from ecology and environmental protection to the traffic club along with cycling exams, so we saw great potential in this game for children to gain traffic experience, adopt safe and responsible behaviour, while reducing carbon dioxide emissions into the environment.

After a preliminary seminar in January 2012, where we learned more about the content and course of the game, in March 2012 we began informing the public that we were planning to start the game. We informed the teachers, students and parents. Since ensuring adequate traffic safety of school routes in the immediate vicinity of the school is necessary for successfully playing the game, we also informed the Borovnica Municipality, the Borovnica Council for Accident Prevention and Road Safety Education, and the Vrhnika Police Station. With their help, increased control at pedestrian crossings was ensured during the game, having members of the Council for Accident Prevention and Road Safety Education stationed there.

A few days before the game, participating teachers obtained information on school travel modes in all classes; the form was designed by the national coordinator. Based on the gathered data, we set a target goal we would try to reach during the game. We decided to set different target goals for individual classes. According to the Model 2, we calculated the required number of dot stickers each class would need in order to achieve their set goal. We chose this model because there were major differences between certain classes.

This was followed by installing the game banner in a prominent and accessible location, namely in the school multipurpose area, otherwise intended for exhibitions and events. We distributed stickers to classes and every day during the selected week (from

16 to 20 April 2012) we entered data on school travel modes into pre-prepared forms. If the class target goal was reached, the class sticker was affixed to the game banner.

Symbolic rewards for achieving target goals were to be awarded at the end of the game. The Borovnica Municipality and the Borovnica Council for Accident Prevention and Road Safety Education were asked to help us in this regard. They responded positively to our requests, and prepared Participation Awards for participating classes along with traffic safety equipment (reflective objects).

The last day of the game was scheduled to coincide with the school eco day. Participating teachers agreed that, after having completed all activities, this day would be a great opportunity to have a closing ceremony for both the Eco Day and the Traffic snake Game and that they can be merged into a whole that is compatible both in content and from the organisational aspect. The event was organised by teachers and students of the participating classes. All school students and school staff members were present, as well as visiting guests: Mayor of the Borovnica Municipality, Mr. Andrej Ocepek, a representative from the Borovnica Council for Accident Prevention and Road Safety Education, Mr. Nikolaj Bogdan Stražišar, and a police representative, Mr. Viljem Jereb. Local media (Naš časopis; Radio Orion) were also informed.

Edita Gradišar, coordinator, teacher

Source: Archive of Department of Geography, Faculty of Arts, University of Ljubljana.

The Prof. Dr. Josip Plemelj Primary School in Bled recorded similar results in terms of reducing car use for school travel during the Traffic Snake Game. In the week from 2 to 6 April 2012, as many as 126 students were engaged in the game under the mentorship of teachers Meta Sebanc, Bernardka Bernard and Irena Burja. These teachers decided that, in order to ensure the safety of children walking to school, they would assign a meeting point where every morning they would wait for students who opted for walking as their school transport mode and escort them to school themselves. Every morning between 25 and 30 children gathered at the meeting point, who then walked to school together with their teachers. The game with its sustainable mobility activities was extremely well-received at the school and among students; besides reducing car use, 4th grade students set an additional goal – to come to school riding scooters on one of the days during the game week and have a scooter trip to lake Bled. To conclude the game the school organised an event, during which a representative from the Bled Police Station addressed students in a speech about the importance of road safety. The success of the school in playing the Traffic Snake Game was also presented to the general public through an article covered by the Bled local news.

The Traffic Snake Game encourages students, teachers and other employees at the school as well as parents of students to use sustainable modes of transport. It is important to emphasise that the game is particularly effective because it is motivational: students compete with each other (between classes) to collect as many stickers as possible, indirectly also involving their parents in the game, who then start using sustainable mobility modes themselves. More information about the project is

Figure 11:

4th graders on scooters.

Figure 12:

The Traffic Snake Game banner.

Source 11 & 12: Archive of Department of Geography, Faculty of Arts, University of Ljubljana.

available on the website http://www.trafficsnakegame.eu, where teachers can also get teaching aids and game manuals (in 19 different languages, including Slovenian).

6.2.1.2 *Living Streets – Walk once a Week*

Walking is one of the most reliable, simple and at the same time healthy modes of transport. Nevertheless, in the last decade many places around the world have experienced a large decline in numbers of students who take short trips on foot. In the UK, a survey found that about 70% of parents today walked to school when they were students themselves, while today the percentage of children who walk to school is much lower, about 50%. On the other hand, between 1997 and 2012 the proportion of students who are driven to school by parents increased from 16% to 23% (Living Streets 1, 2015). The consequences of this situation are reflected not only in traffic congestion around schools, but also in air pollution and overweight students (in the UK, a third of students completing primary school are overweight). In response to the state of affairs in the UK, a few years ago the "Living Streets – Walk once a Week (WoW)" campaign was launched, which aims to encourage students to walk to school at least once a week, improving their physical fitness, contributing to their

health and at the same time reducing daily traffic congestion around schools while improving air quality. Studies have shown that children who walk to school are generally more physically active than those who go to school by car. Likewise, children who are physically active, achieve better grades in school and are more alert and attentive when learning. Each year the campaign successfully inspires hundreds of thousands of students to walk to school at least once a week. It has been shown that in just five weeks of participation schools can increase the number of students who walk to school by 26% (Living Streets 1, 2015). Students are also encouraged and motivated to walk by teachers. At the end of the month, every student who came to school on foot at least once a week receives a badge. Within the project, an interactive application has been developed, allowing teachers and students to enter data on school travel modes into an assembler on a daily basis, and they are thus able to observe and analyse their travel habits throughout the year.

In the context of this campaign, an example of best practice was the Holy Trinity Rosenhill Primary School, Stockton, UK, which joined the WoW campaign in September 2010. Prior to joining the campaign, 50% of their students walked to school every day, whereas after joining the proportion increased significantly; now as many as 96% of their students walk to school at least once a week. A special meeting point was designated for students unable to walk to school because of unsafe routes or the distance being too great, where parents could drop them by car and from where they were escorted to school on foot. Positive outcomes they observed were not only the increased proportion of children who walk to school and reduced traffic congestion around the school, but above all significantly improved social interaction among students. During their walk to school children socialised and chatted, while new friendships were formed between them, as well as between parents and students, parents and teachers, and teachers and students. Thus, walking became an everyday activity for students and staff of this school; they have included it in the educational process (Living Streets 2, 2015). More information about the campaign and the project is available on the website http://www.livingstreets.org.uk/, where all materials needed for schools to enter this campaign are also provided (posters, badges, a link to the interactive application etc.).

6.2.1.3 *Walk or Bike to School*

The Walk or Bike to School initiative was first started in the United States by the Partnership for a Walkable America in 1997. They wanted to draw attention to the advantages offered by walking and cycling on the one hand and the excessive use of cars on the other. At the start, students were encouraged to walk to school on a designated day which they named "Walk to School Day"; the event continues, taking place every year in October (Buckley et al., 2013). Initially nationally based, it became an international project in 2000 when schools from Great Britain and Canada joined in. Today, it includes several thousand schools in over 40 countries around the world, while October was chosen as International Walk to School Month. Because of the great success they had with encouraging walking to school, in 2012 they set a new goal, namely to inspire as many children as possible to cycle to school. Thus, May was proclaimed National Bike Month and May 9 became Bike to School Day (Buckley et al., 2013).

Below, we list some snippets and reflections from coordinators at participating schools in the United States, who organised the "Walk to School Day" in the 2014/2015 school year. All statements were sourced from the website http://walkbiketoschool.org.

"This was the first time our school participated in Walk to School Day and we got started only a few days before the event. We received lots of positive feedback from all the families that participated and are encouraged about doing it again next year." – Illinois

"Parents were so energized by the event that they asked us to organize a monthly walk/bike to school day. We had our first one last week." – Florida

"I kept waiting for the normal rush of cars in front of the school and they never came! I've never seen the bike rack so full." – California

"It was a lot easier than I thought it would be. So many families showed up and just walked. It was fun." – Colorado

Both activities, Walk to School Day as well as Bike to School Day, encourage students to use sustainable and environmentally friendly modes of school travel. Further information about the project and its activities is available for teachers and other interested parties on the website http://www.walkbiketoschool.org.

6.2.1.4 *Car-Free School Days*

Car-Free School Days is a programme from Canada. It aims to remind students and parents throughout the year about the advantages of sustainable modes of transport. Its design is simple. Every first Wednesday of the month, schools encourage students to get to school in an environmentally friendly way, either on foot, by bike or by public transport instead of by car. During the first class of the day, teachers carry out a short survey: students who had come to school by one of these means are asked to raise their hand. In this way, teachers learn how many students came to school using sustainable means, either on foot, by bicycle or bus, and how many travelled in a car. Survey results are communicated to the school coordinator, who makes them public via a web application and a poster that is hung in the school in a prominent position. The class with the most students having come to school in a sustainable way on this day, are commended for it, and at the end of the year the winner receives the "Golden Shoe Award" (Car Free School Days, 2015). The programme lasts all year round and provides "healthy competition" between classes of the same school on one side and several schools on the other.

More information about the programme along with other examples of best practice is available on the website http://peterboroughmoves.com/.

6.2.1.5 *Walking buses*

The concept of "a walking bus" is already well known in many countries around the world. The first bus of this kind dates from 1995 and was conceived of in the UK. Since then it has been embraced in many other countries as an example of best practice in

healthy, active and enjoyable school travel. It has been proven that "walking buses" reduce congestion around schools, while also save parents' time, who would otherwise drive their children to school by car. The practice is overseen by an adult, either a parent of a student, a volunteer, retiree or teacher. Every day an adult chaperones a group of children who live nearby on their way to school on foot; together they form a line that is symbolically called "a walking bus". Besides reduced traffic loads around schools, advantages of this mode of school travel also include before school recreation for children and social interaction between peers and adults, while it can also have an educational role, as students can learn from the adult about road safety while walking.

For example, one student who had been coming to school by the "walking bus" for more than nine months said that the advantage of walking to school in this way was hanging out with and talking to friends; the journey to school passed quickly and during the trip he also learned about road safety rules (Walking Bus, 2015).

6.2.1.6 *We meet at the station*

Educating, informing and raising public awareness about the importance of public transport was a project which ran between 2010 and 2013 under the Ministry of Infrastructure and Spatial Planning of the Republic of Slovenia as part of its efforts for integration of public transport. Within the project, project partners (Urban Planning Institute of the Republic of Slovenia, Department of Geography, Faculty of Arts, University of Ljubljana, FOCUS (Association for sustainable development), CIPRA Slovenia (Commission for the Protection of the Alps), Atelje POMLAD (architecture and consultancy studio), Mayer McCann (marketing and communications agency) and VALICON (marketing consulting agency)) were engaged in awareness-raising, educating and informing the public about the importance of public transport as well as promoting the use of public transport and sustainable travel modes among children, kindergarten teachers, primary, secondary and post-secondary students and teachers along with car users.

Three manuals were issued as part of the project: one of each for kindergarten teachers, primary school teachers and secondary school teachers. In the manuals, authors presented the benefits that public transport and other means of sustainable mobility have over car use. With regard to current curricula, they also made proposals in terms of learning objectives and lesson design, in order to instruct teachers how to educate young people that they will adopt the use of public transport as well as understand the need for sustainable mobility. Manuals were issued as stand-alone publications and were sent to a number of kindergartens and schools in Slovenia. All manuals are also available on the website http://www.na-postaji.si/sl-si/.

Authors of this publication were partners in the project, educating, informing and raising awareness among primary school students and their teachers about the benefits of public transport. To this end we conducted training seminars for teachers in schools across Slovenia, while also including students from the entire primary education spectre in various activities. Children in the first triad were thus encouraged to think about the prudence of using public transport through drawing, students in

the second triad through writing stories and poems, and students in the third triad through making short films. Below we show some of the outcomes of students' work.

First triad students from 24 primary schools participated in the sustainable mobility themed drawing contest, namely: Hajdina Primary School; Ivanjkovci Primary School; Kuteževo Primary School; Ludvik Pliberšek Primary School, Maribor; Maksim Gaspari Primary School, Begunje; Milan Šušteršič Primary School, Ljubljana; Podgorje pri Slovenj Gradcu Primary School; Renče Primary School, the Bukovica subsidiary; Šmartno Primary School; Spodnja Šiška Primary School; II Murska Sobota Primary School, the Krog subsidiary; Dobravlje Primary School, the Vipavski Križ subsidiary; Prof. Dr. Josip Plemelj Primary School, Bled; Danila Kumar Primary School, Ljubljana; Dr. Ivan Korošec Primary School, Borovnica; Spodnji Duplek Primary School; Dornberk Primary School; Ivan Rob Primary School, Šempeter pri Gorici; Dobravlje Primary School, the Škrilje subsidiary; Dobravlje Primary School, the Čirniče subsidiary; Tone Okrogar Primary School, Zagorje ob Savi; France Prešeren Primary School, Maribor; Šempas Primary School; and Zadobrova Primary School.

From the aforementioned schools we received nearly 400 drawings by first triad students; out of these we present drawings which were awarded by organisers of the drawing contest and the *Educating, informing and raising public awareness about the importance of public transport* project. These drawings are examples of best practice, illustrating how teachers can encourage even the youngest, first triad students to think about the advantages of public transport.

Figure 13: Train (1).

Author: Nik Drašler, 3rd grade, Dr. Ivan Korošec Primary School, Borovnica.

Student Niko Drašler's drawing received an award because it followed the rules of perspective drawing and spatial keys.

Figure 14:

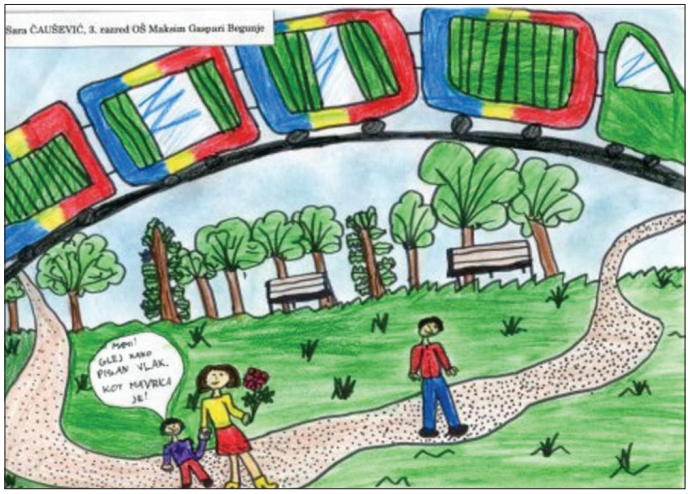
By bus to work, on a trip.

Authors: Loti Medved and Anastasia Šebes, 3rd grade, Danila Kumar Primary School, Ljubljana.

The drawing by Loti Medved and Anastasia Šebes was awarded because it was outstanding in its category in terms of technique as well as art design.

Figure 15:

Rainbow Train.



Author: Sara Čauševič, 3rd grade, Maksim Gaspari Primary School, Begunje.

Sara Čauševič's drawing was awarded for her placement of the train above other elements in the drawing and for following basic rules of perspective drawing.

Figure 16: The train (2).

Author: Lila Jernovoi, 3rd grade, Prof. Dr. Josip Plemelj Primary School, Bled.

Lila Jernovoi's drawing was awarded for its motif and the use of an appropriate technique (scratch painting) for creating a line drawing.

Second triad students from 14 primary schools participated in the sustainable mobility themed essay and poem writing contest, namely: Maksim Gaspari Primary School, Begunje; Dušan Munih Primary School, Most na Soči; Danila Kumar Primary School, Ljubljana; Dornberk Primary School; Tone Okrogar Primary School, Zagorje ob Savi; Brinje Primary School, Grosuplje; Savsko naselje Primary School, Ljubljana; Šempas Primary School; II Murska Sobota Primary School, the Krog subsidiary; Dr. Ivan Korošec Primary School, Borovnica; Ludvik Pliberšek Primary School, Maribor; and Spodnja Šiška Primary School.

From these schools, we received 186 essays and poems written by 4th to 6th grade students. Below, we present some of the student work as examples of best practice.

Figure 17: Example of an essay.

Why is it necessary to travel in an environmentally friendly way?

In the evening I go to bed. I fall into deep sleep and deep dreams.

The alarm began to ring. I quickly got up out of bed and hurried to the bathroom. There I do all the necessaries, rush back to the room and grab my school bag. At that moment my mother came into the room and opened the shudders. She stopped at the window, then came to me, hugged me around my shoulders and took me to the window.

I look out the window and see the sky, hazy from the smoke, withered flowers, dry and bent trees, gray earth. There birds that used to chirp each morning were gone. I was afraid and I was sad. Mother helped me put on a jacket and she placed a protection mask over my face. I waved to her and went to school. The mist was obstructing me on

my way and everything was quiet. From the mist a classmate appeared and together we went down the path that led to the school. Every day was like that. Outside it was gray, no colours, no heat from the Sun, no grass was visible, the water from springs was dirty and poisoned by chemicals. In school we discussed why it is so. The teacher told us the planet on which we live is sick and that people are to blame. She explained to us that we do not know how to take care of the planet, because we drive vehicles emitting too much exhausts, factories are toxic and full of chemicals, while they release these toxins into air or rivers. We also dispose of trash everywhere around us. Several years later, the Earth has become like this.

I started to toss and turn in bed. I realised it was only a horrible dream. I quickly jumped out of bed, looked out the window and was relieved. I was happy to be warmly welcomed by sunshine, birds were chirping, the grass was green and flowers were full of colours.

When I told my mom about my dream she warned me that, if we do not take care of the planet ourselves, my dream will come true.

Živa Gajič, 4th grade
Dr. Ivan Korošec Primary School, Borovnica

Source: Archive of Department of Geography, Faculty of Arts, University of Ljubljana.

Teachers can encourage cross-curricular links when teaching sustainable mobility. In this way, students can learn about sustainable mobility in several subjects simultaneously, a result of which are for example student essays and poems. Through such activities students not only acquire knowledge and learn about the prudence of sustainable mobility, but also develop their literary and writing skills.

Figure 18: Example of a poem.

Why is it necessary to travel in an environmentally friendly way?

Today I truly have decided,
to everyone this message be provided:
I no longer ride the van to my school campus,
since protecting the environment is making such a rumpus.

Every day I will be waking up an hour sooner,
be putting on my shoes and wear my trousers.
Will travel in an eco-friendly manner.
How, you ask?
On foot, of course! There is no other way, you rousers!

Along I'll hear birds' singing not the engine shouting.
I will protect the nature in this way,
while also staying healthy and O.K.

Žan Vrabec, 4th grade
Dr. Ivan Korošec Primary School, Borovnica

Source: Archive of Department of Geography, Faculty of Arts, University of Ljubljana.

6.2.1.7 *Eco-school – sustainable mobility thematic module*

Eco-School is an internationally recognised programme of environmental education. It is aimed at promoting and raising awareness about the need for sustainable development among youth (children, primary and secondary school students) during the educational process as well as through active participation in the local community and beyond. Each year, the best performing schools receive an international award, which is the only public and international award given to Slovenian schools for environmental protection efforts that is in accordance with the international FEE (Foundation for Environment Education) criteria. In Slovenia, the following institutions can participate in the Eco-Schools programme: kindergartens, primary and secondary schools, Centres for School and Outdoor Education, and student dormitories.

For the 2016/2017 school year sustainable mobility thematic modules have been developed for primary and secondary schools and faculties, whereby for each age group of young people they proposed different activities. For primary school students they envisaged two activities, one for the 1st to 3rd grade age group (I count steps, I protect the environment!) and another for the 4th to 9th grade age group (Green Route to a Friend?).

The "I count steps, I protect the environment!" thematic module stipulates that schools or organisations who choose to adopt it, dedicate at least two weeks to sustainable mobility (one in autumn and one in spring). Through awareness-raising and educational work, guided by mentors, students explore which modes of transport are the most environmentally friendly, how they themselves travel to school and what modes of transport their families use. They then choose the most common route to school, which could be traversed by car, and count steps while walking it (if the route does not allow for walking, they choose another that does, or else the safest route) – they walk with parents who also count their steps. The purpose of this activity is to encourage observation of the route to school and consideration of how they could get to school on foot. The module also offers an additional activity, where students have to count during selected weeks how many times they came to the school on foot or by bicycle, and determine how often and where they travelled by bus or train. As part of the award contest a group of students create art projects (drawings, models, posters, drawing with chalk on the floor) focusing on environmentally friendly modes of transport and illustrating their own role in it (there can be several students in one drawing or model).

The thematic module "Green Route to a Friend?" also takes place over two weeks (one in autumn and one in spring). A group of students choose a location they want to visit (it is desirable that the location is not within their hometown or town of the school). Students identify how to get to these locations in the most sustainable way. In doing so they determine whether the route is safe or otherwise what should be done to make it safe, is there a safer alternative. They plot the route to the location on a map and mark the mode of transport. As part of the award contest students prepare an especially interesting and useful plot or display of the selected route (model, map, application) and arrange a presentation or exhibition at the school or in their hometown (Trajnostna mobilnost …, 2016).

6.2.2 Practices particularly suitable for secondary school students

Relatively few examples of good practices are suitable for secondary schools. The reasons for this can be found in the following: 1. secondary schools do not have their own school districts and hence secondary school students may come from various distant environments. Therefore secondary schools are not required to provide transportation for students; 2. the age of students (at least in the Slovenian education system) exceeds 14 years, such that students can travel home to school and back by themselves and do not rely on being escorted/driven by parents; 3. only at the end of their secondary education students can take the driving test (at least in the Slovenian education system), so in cases where the distance between home and school is large students are dependent on public means of transport (i.e. means of sustainable mobility). Nevertheless, greater attention should be paid to educating secondary school students on sustainable mobility, including through various projects, since many high schoolers can hardly wait for when they will pass the driving test and be able to switch from public transport to driving a car.

6.2.2.1 *Project CONNECT – the ECO-TRIPPER and the ECO-TRIP week*

As part of the *Connect* project two interesting initiatives were developed for secondary school students: "ECO-TRIPPER" is dedicated to an individual student, while the "ECO-TRIP week" campaign is for a group of students, class or else an entire secondary school.

The ECO-TRIPPER campaign aims to motivate secondary school students to use environmentally friendly travel modes on a daily basis, especially on their way to and from school. Thus, high school students are encouraged to make a short film of their ECO-TRIP and share it on social networks with other young people such that they might inspire young people around them to travel in a sustainable way, while in their group of friends initiate and expand thinking on sustainable transport. In this sense it is a way that young people can increase awareness of sustainable mobility in their social lives via social networks (EKO-popotnik, 2015).

The ECO-TRIP week campaign on the other hand aims to encourage groups of students, whole classes, or even whole schools to travel in an environmentally friendly way during the week of their choice. As the campaign lasts several days, students are first presented with the ECO-TRIP campaign concept and a short survey on everyday travel behaviour to and from school is carried out. In the week that follows, measuring of environment-friendly trips to and from school takes place: every day students communicate to their class teacher how they got to and from school. In this way, it is possible to determine whether during the ECO-TRIP week the number of environmentally friendly trips has changed compared to the situation before the campaign. In addition to taking measurements during the week of the campaign, two further activities are conducted, namely students compete among themselves to come up with the best slogan for the school's week of sustainable mobility, while they are also asked to collaboratively film a short film addressing environmentally friendly and sustainable mobility. The films produced are entered into awards contests, organised

at various levels: school (students at the same school compete among themselves), country (they compete against the best short films from various secondary schools across the country) or Europe (competition of films made by students in different schools in different European countries) (Teden EKO-Potovanj, 2015).

6.2.2.2 *Eco-school – sustainable mobility thematic module*

This international programme, presented in greater detail in the section Practices suitable for primary school children, also outlines one activity within the sustainable mobility thematic module targeting secondary school students. The thematic module *My sustainable vehicle* involves more individual work, in which an individual (or a group of students) designs or builds a sustainable vehicle (bicycle, scooter, skateboard, etc.), made out of waste materials, or rather developed using as many environmentally friendly elements as possible. The most innovative approach to building a sustainable vehicle receives an award as part of the award competition (Trajnostna mobilnost …, 2016).

6.2.2.3 *Competition for the most sustainably mobile secondary school*

Every year during Mobility Week the Ministry of Infrastructure of the Republic of Slovenia publishes an invitation for municipalities to participate in a competition to identify the most sustainably mobile secondary school. The theme of the competition is sustainable mobility with an emphasis on public transport, and specifically its promotion and school efforts to figure out how it could become a more popular mode of transport for secondary school employees, students and their families. The purpose of the competition is: to prompt students and staff to find sustainable solutions for getting to and from school; to encourage them in connecting with local and national authorities, as well as generating changes in the school area in line with sustainable mobility; and to spur original ideas in sustainable mobility. Projects submitted by secondary schools are assessed according to the following criteria: innovation, change in travel habits, effort, participation and media response (Evropski teden …, 2015).

6.2.3 Practices suitable for students in higher education

In Slovenia there are currently 90 higher education bodies (members of the University of Ljubljana, University of Maribor, University of Primorska, University of Nova Gorica and Euro-Mediterranean University) (Seznam visokošolskih zavodov, 2016) and 67 vocational schools (Seznam višjih …, 2016), which together form the so-called tertiary education pillar. Given the location of their chosen higher education institution, during the academic year students seek out the most suitable living arrangements for themselves. Regarding their mobility during studying, students can be divided into two groups. The first is comprised of those who live in the immediate vicinity of the faculty, where they are studying. They most often travel the distance from home to the faculty and back on foot or by bike. The second group includes students who live so far from their university that they have to adopt other travel means, as walking

or cycling is not feasible. Therefore, they are dependent on public transport and cars. Regarding promotion of sustainable mobility, it is vital to pay special attention to the second group, who daily travel greater distances, and work towards making them adopt sustainable modes of transport as their first choice for overcoming such distances. In recent years, there have been several successful projects for promotion of sustainable mobility among students, which should be continued or else promoted going forward.

6.2.3.1 *Top 50 reasons for car-free study*

The award competition *Top 50 reasons for car-free study* was carried out under the *Educating, informing and raising public awareness about the importance of public transport* project in the 2013 academic year and was aimed at all students who at the time had student status and were enrolled in any post-secondary or higher educational institution. The purpose of the competition was to encourage sustainable mobility among students and to collect ideas and proposals for a mobility guide, which was released in 2014 and given to all Slovenian students who were then enrolled in a post-secondary programme for the first time. According to the organisers, the response was very good; they received more than 80 contributions and the best was rewarded with two InterRail tickets.

6.2.3.2 *Promotion of cycling*

As part of the University of Ljubljana Student Organisation and *the Educating, informing and raising public awareness about the importance of public transport* project promotion of cycling among University of Ljubljana students was also undertaken. Together, they organised a bicycle tour of the city in association with the so-called May Games and a discussion for students on the use of bicycles and exchange of best practices with other countries, while they also renovated and enlarged secure bicycle storage facilities at three University of Ljubljana faculties (Izobraževanje, informiranje …, 2013).

6.2.3.3 *Sustainable Adventure Race*

In the 2016/2017 academic year second year masters (2nd level) students in a dual-discipline Geography study programme at the Department of Geography, Faculty of Arts, University of Ljubljana conducted a speed-orienteering race in the Fiesa–Piran area, where participants were tested on overcoming speed-orienteering obstacles using sustainable transport means. Through this race, participants hone their orienteering skills, while thinking about sustainable mobility modes and becoming a tightly-connected group, since the whole race is designed as a "team building" exercise. In the following we provide detailed instructions that can serve as a conceptual basis for organisation of team building activities (not tied exclusively to the student population).

Figure 19: An example of speed-orienteering race in the Fiesa–Piran area.

Sustainable "Adventure Race Team Building"

Hello!

In this year's high-speed orienteering race, you will have the opportunity to forge even stronger bonds within your group, learn about each other's strengths, skills and knowledge, while on the other hand, you will have the opportunity to compete against other teams and prove that you are better than them in overcoming obstacles that await you on the trail. By participating in the "Adventure Race" you can prove that with good group cooperation and orienteering skills you can beat your opponents.

As the Adventure Race will be held outdoors, wear weather appropriate clothing and footwear. We will be getting home in the evening, when it is already dark, so perhaps bring a flashlight.

Tasks and instructions:

1. *Choose a name for your group and write it on the list in the classroom. Also, decide who will be the group leader.*
2. *It is obligatory that the whole group participate in the Adventure Race. This means that the full trail has to be covered by all team members as a group – so no dividing into subgroups.*
3. *Equipment that you will need to take: suitable footwear and clothing, a smartphone (camera and phone), local maps, pens, a compass and a positive attitude.*
4. *On the map you receive there are marked locations. Each location on the list, marked with a letter (A, B, C ...), also has a corresponding score written on the side of the list. This is the number of points each location is worth and therefore the number of points that your team gets, if you reach this location.*

Example: *Location A is worth 2 points. When all group members reach this location they take a group "selfie", showing all members and demonstrating that they actually are in the location marked on the map. When a "selfie" is taken, 2 points can be marked down on the provided sheet.*

Additional points (x2) can be obtained if the location is reached by any means of sustainable travel (except on foot).

Example: *Location A is worth 2 points. When on the way to point A, part of the route was travelled by bike (in this instance it may involve only one group member; a photo proving the use of sustainable mobility means is required). Because a sustainable mobility mode was used, the number of points is multiplied by 2. So for reaching point A, 4 points are awarded (instead of just 2 if it was reached only on foot).*

5. *Your goal is to gain as many points as you can. The winning group will be the group who gained the most points.*

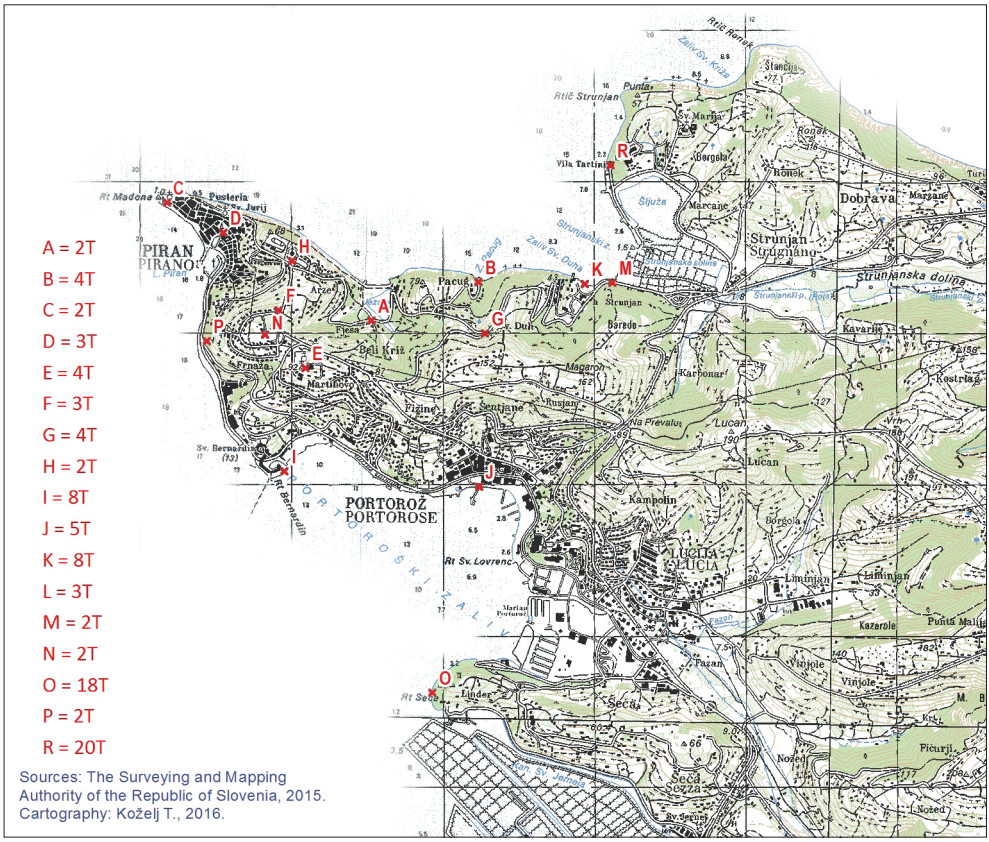
The "Adventure Race" finishes at exactly 18.00 at the following address: Prešernovo nabrežje 4, 6330 Piran. *If the group reaches this address by 18:00 then they get an additional 10 points. If they arrive between 18:00 to 18:10 they lose 10 points, while arrivals after 18:11 cost the group 20 points.*

How groups plan for the race, which locations they will visit and which sustainable transport modes they will employ in order to gain as many points as possible, is decided by all group members. Of course, speed and ingenuity are necessary, likewise groups need to be punctual in reaching the finishing destination.

USING A CAR IS STRICTLY FORBIDDEN!

Author: M. Ilc Klun.

Figure 20: The map of the area with locations and points.



The race was very well-received among students. It is a good example of how we can encourage young people through play to be physically active, while also constantly thinking about using sustainable mobility modes to overcome distances.

(photo: K. Jurkošek)

Figure 21:

A group of students participating in the "Sustainable Adventure Race".

6.3 What else can be done to promote sustainable mobility behaviour among youth in Slovenia?

In this section, we want to present some useful suggestions that can be adopted by schools for teaching and educating children and young people about the advantages and benefits of sustainable mobility, and above all in order to encourage youth to use sustainable travel modes, especially walking and cycling, as two effective active and healthy modes of getting to school. Practices are listed in order, starting with those which are primarily tailored for primary school children, followed by practices targeting both primary and secondary school students, and concluding with practices that teachers can use to instruct secondary school students about sustainable mobility, along with approaches suitable for educating parents and raising awareness among employees.

6.3.1 Sustainable mobility mascot

It is well-known that a mascot significantly contributes to the success of an initiative, promoting the activity and bolstering the visibility of the project. Therefore, it is advisable to introduce a mascot into initiatives for sustainable mobility which aim to engage a greater share of the population. An identifiable mascot would support and promote sustainable mobility activities. For example, a school that has set itself the goal of promoting sustainable mobility among young people might invite their students to participate in designing and creating a sustainable mobility school mascot, which through its visibility could eventually become a distinctive symbol, associated with sustainable mobility principles.

6.3.2 Elective course – Sustainable mobility

One of the options that schools can offer students in the context of sustainable mobility is a course in "Sustainable Mobility – environmentally friendly travel." The subject could be taught by a geography teacher who has learnt about sustainable mobility while studying geography (Avram, 2014), or else by a teacher from a related discipline with competencies and knowledge related to sustainable mobility. Through a variety of teaching approaches and methods students could learn about sustainable mobility, thus in class they could develop sustainable mobility guidelines for the school and suggest improvements to road safety around schools. Educating primary school students about sustainable mobility, which is part of the sustainable development module, it is also important in light of so-called lifelong education, because it is through it that pupils acquire and hone knowledge, skills, abilities and the capacity to be sustainable (Azeitero et al., 2014).

6.3.3 Map of safe routes to school

Most schools in Slovenia already have a cartographic representation of safe routes to school. It is important that this map is not only on display on the school website, but is hung in a prominent place in the school hall, where students can see it and learn from it about safe routes in their school district. We also suggest that class teachers in the first triad present the map in the classroom during a *Learning about Environment* lesson, in order for children to familiarise themselves with it. In this manner, children not only learn safe routes from their home to school and back, but also safe traffic routes in general throughout the school neighbourhood, safe routes to homes of schoolmates, as well as the overall spatial configuration around the school. It is important that teachers draw particular attention to less safe, dangerous sections of routes to school, and address these by helping students find or propose better alternatives in terms of road safety and school district configuration.

6.3.4 Walking bus

Even though positive reports from abroad on the use of walking buses for school travel started pouring in several years ago, this project has not yet been introduced

in Slovenia. Schools could act as initiators of such activities, inviting teachers, parents, senior citizens or other adults to participate in escorting a group of children from the meeting point to the school. One of the benefits this project provides is interaction of different social groups, such as pensioners, unemployed persons, secondary school students, etc. As initiators, schools could also present the project as an example of effective, safe, healthy and enjoyable mode of school transport, as well as engage students and parents through online or school radio announcements and student opinions. Initially, a school could organise a pilot walking bus project led by a designated teacher in an area where most of their students reside. The news of the walking bus would then no doubt spread quickly and we are confident that students from other areas would soon want to get to school this way too.

6.3.5 Making public transport more attractive

Making public transport more attractive, including buses and trains, would definitely promote the use of public transport. One of the possibilities is a project where students could transform the external appearance of a bus. The public transport company could establish a competition for schools, aimed at encouraging young people to make greater use of public transport and as part of which children could decorate a bus with their pictures (these would be displayed as stickers on the outside of the bus instead of advertising, which in large part currently "decorates" public buses). Thematic buses are another example; their exterior and interior would captivate road users and prompt them to use this means of public transport. One option is also the "Name the bus" game – an individual who took the bus most frequently in a week could choose the name of the bus, which would be visibly displayed on the bus. Competition would ensue among youth over who will name and what they will call the bus for that week.

6.3.6 Encouraging students to walk and cycle to school

Schools can motivate primary and secondary school students to walk or cycle to school by inscribing walking and cycling in the school curriculum as preferred travel modes. Of course, here it should be stressed that the safety of school children comes first and these travel modes should only be promoted if it is feasible that children can safely get to school in this way. Primary and secondary schools can encourage their students to use bicycles or walk by adopting any of the best practice examples we presented in the previous section (certificates, recognitions, awards, badges, stickers, etc.).

6.3.7 Promoting car sharing

Where for security reasons it is not possible for students to get to school on foot or by bicycle, schools should encourage parents to embrace carpooling (also known as car sharing in the UK). The advantages of this mode of school travel can be presented at the beginning of the school year; schools invite parents to get to know each other and create a network of parents or families living in the same neighbourhood or street, and encourage them to share the task of transporting children, through

which they could help prevent congestion at the school and make the immediate environment around the school safer. By networking, parents and students from the same neighbourhood not only drive together every day, but also develop important mutual social bonds.

6.3.8 Children or student parliament for sustainable mobility at the school

Schools can organise a group of primary or secondary school students (or these organise on their own initiative), which is responsible for promoting sustainable mobility, educates about advantages of sustainable mobility through its activities, by setting examples and issuing announcements, organises sustainable mobility themed student meetings, and helps change travel habits of students who would otherwise come to school by car. The student group can be tasked with carrying out a survey of mobility habits of students at their school, which they also publicly present to all fellow students (either at an event, in the school newspaper, on the school radio); they can be responsible for the implementation of selected projects promoting sustainable mobility among students, etc. If more schools decided on a children or student parliament, primary/secondary school students form different schools could connect and exchange experience or participate in joint (competitive) projects.

6.3.9 Service stations for bicycles

At city petrol stations, bicycle service stations could be placed, where cyclists could pump up tires, buy puncture repair kits, safety gear, etc. These stations would thus be reserved exclusively for cyclists, while at the same time encouraging other road users to cycle via a range of initiatives.

6.3.10 Converting a few car parking spaces in front of the school

At every school there are areas reserved for employee car parking. School administrators could also involve employees in promoting sustainable mobility at their school by converting some parking spaces for other uses, taking into consideration good suggestions of students, such that they might install a bicycle stand, benches or plant trees etc. In this way, the school administrators would show through their own actions that the employees themselves promote sustainable mobility habits, while students could be actively involved in transforming school spaces. Thus they would not only appreciate that sustainable mobility habits are important, but also that they themselves can be active participants in spatial changes, that their opinion counts and that their suggestions and wishes are considered. This activity would also promote active citizenship among students.

6.3.11 Organising public transport based school trips

During the school year, school administrators and school excursion organisers can choose for one school excursion to take place using combined means of public

transport (particularly train). Organising such an excursion is more time demanding and also somewhat restricted by space and time (dependent on the public transport network and connections), nevertheless, it may contribute to students learning about public transport, its network and connections, and recognising the potential for using public transport when travelling long distances.

6.3.12 Organising sustainable mobility themed team-building activities

Management can organise sustainable mobility themed team-building activities for teachers at the school (or company employees). For example, management can propose that employees, divided into random groups, meet at a designated point (located at least 30 km from the schools), where they have to arrive using as many sustainable travel modes as possible. When all participating groups gather at the selected location, they each present their travel network, how many metres or kilometres they travelled by individual travel modes, how long it took etc. (groups can decide to film clips with mobile phones and use them as graphic presentations for fellow participants). The group that uses the most sustainable travel modes wins the game. Through such activities, employees get to know each other better, connect, have fun, while also think about how they could incorporate sustainable travel into their daily lives.

6.3.13 Educating parents

Before a school launches into sustainable mobility initiatives, it is recommended that they invite students' parents to a group meeting. Namely, best practice examples reveal that the effects of sustainable mobility activities or any activities, which schools carry out, are greater if parents are notified about the goals, objectives, advantages and benefits of the activities. Thus, at a joint meeting (this may be at the beginning of parent meetings for individual classes or at group meetings, such as the parents' council) parents should be informed about what sustainable mobility is, why in today's society it is necessary and how it can positively affect both traffic conditions around the school as well as their children's health and ultimately the quality of the air. During the meeting it would be prudent to inform parents about existing road safety problems around schools; research shows that a large proportion of parents drive their children to school in the morning, causing congestion around schools and, due to haste and parking on sidewalks, reducing the safety of children who come to school on foot, by bicycle, scooter, etc. Children find it difficult to judge the speed and distance of cars, so school management should also make sure to warn parents who drive their children to school to slow down in the vicinity of schools, as speeding can lead to accidents (Kattan, Tay, Acharjee, 2011). As the meeting progresses the school should present concrete proposals or activities addressing sustainable mobility, which will take place either periodically or throughout the school year. It is therefore important that before commencing activities the school first notifies parents and only then begins to implement them with students. Notices and descriptions of activities in the school newspaper or newsletter or notices on the bulletin board in the lobby of the school can also have a positive impact on the success of activities. To

highlight the advantages and benefits of sustainable mobility, schools can engage higher grade students (e.g. 9th grade) to distribute leaflets in front of the school to parents, drawing their attention by making them reflect on the prudence and necessity of sustainable mobility.

7 Perceptions of sustainable mobility among geography students

Sustainability is not a new idea in Slovenia, though it is also true that it is only in the past few years that it has been actively included in the educational process. Given that curriculum documents are the only binding documents for those in charge of and carrying out the educational process, it is essential that sustainable development as well as sustainable mobility subject matter are present in curricula throughout the entire vertical system of the educational process, from pre-school, primary and secondary schools to post-secondary and tertiary education. This is also import in the context of implementing the 2030 Agenda for Sustainable Development. In the fourth chapter of this monograph we briefly present elements of primary and secondary school curricula that relate to sustainable mobility; this highlight the possibilities within learning topics and course units where teachers in primary and secondary schools can deliver content about sustainable development and sustainable mobility. Curricula for primary and secondary schools are clearly defined; for each learning topic or course unit there are specific prescribed operational learning objectives, which a student should meet over the course of individual subjects. It is also worth pointing up that curricula at post-secondary and tertiary institutions are somewhat more vague, for instance objectives are less specific because of the nature of the study. After completing secondary school, students can enroll in one of the ninety higher education bodies (University of Ljubljana, University of Maribor, University of Primorska, University of Nova Gorica, Emuni University, Private higher education institutions) or else at one of the forty-eight post-secondary education institutions. Each of the higher education and post-secondary institutions have their own faculties and programmes through which material about sustainable development could be taught. Given the current relevance of the topic we can observe that as post-secondary and higher education curricula and lesson plans are updated, content dealing with sustainable development is increasingly included also within post-secondary and tertiary education. So it is at the Department of Geography, Faculty of Arts, University of Ljubljana, where during the transition to the Bologna academic system and as course curricula have been renewed, some existing courses have incorporated content relating to sustainable development and sustainable mobility more specifically. Likewise, some new material addressing sustainable mobility has also been added to course programmes in all study streams. Thus, within the first-level university study programme in Geography, students encounter the topic of sustainable development, so too sustainable mobility, within the courses: Human Geography 1, Geography of Population and Settlements, Geography of Tourism and Transport, Environmental Geography, Geography of Sustainable Development; and within the first-level dual-discipline university study programme in Geography during Social Geography 1 as well as Environmental Geography, and also in Geography of Sustainable Development, if it is selected as an elective subject. In the second-level

master's study programme in Geography students are able to deepen their understanding of sustainable development as well as sustainable mobility while taking the study modules: Environmental and Physical Geography and Geography of Tourism and Leisure. While as part of second-level dual-discipline master's study programmes in Geography students address the topic of sustainable development and sustainable mobility in the subjects, Didactics of Geography 1 and Didactics of Geography 2. A brief review also revealed that students quite often engage with the topic of sustainable development and sustainable mobility over the course of their studies at the Department of Geography, University of Ljubljana. In this chapter we focus on the first year student population, since an aim of the study was to determine how much former high schoolers actually knew about sustainable mobility.

The aim of the study, carried out in December 2016 among students in the first year of a first-level (undergraduate) university study programme in Geography and students in first-level dual-discipline university study programmes in Geography at the Faculty of Arts, University of Ljubljana, was to find out what students identified as being connected to the concept of sustainable mobility, how they perceived sustainable mobility and how the concept of sustainable mobility fit into their daily lives. In this study, among other things, we also wanted to check how much of the knowledge and skills that students theoretically should have attained during their primary and secondary education had actually been adopted in students' lives and how this knowledge affects their daily mobility.

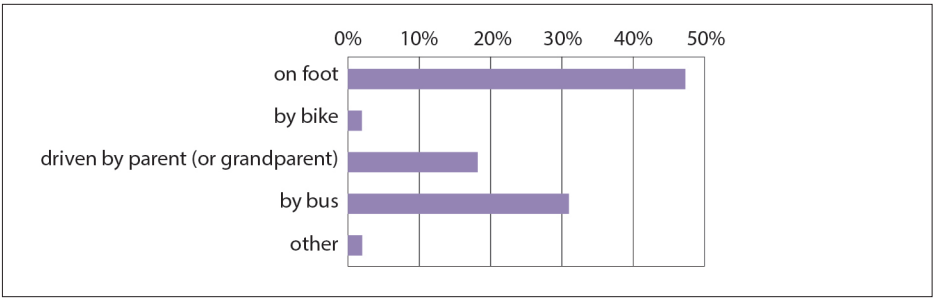
Fifty-four students participated in the study; 59% male and 41% female. Of all the respondents surveyed, more than 31% came from the Osrednjeslovenska Statistical Region, 19% were from Gorenjska, 13% from Savinjska, 7% each from the Primorsko-notranjska, Jugovzhodna and Posavska, 6% from Obalno-kraška and Zasavska, while 2% were from Podravska and Goriška Statistical Regions. Information about participants reveals that the study excluded two statistical regions: Pomurska and Koroška, since none of the participants in the survey were from these regions. Out of all surveyed students, 54% lived with their parents, 33% in a rented apartment and 13% in a student dorm.

Given that in the first part of this monograph we outlined the theoretical foundations of sustainable mobility and in the introductory chapters we also detailed the presence of the topic of sustainable development and mobility in primary and secondary education, in the survey of students we wanted to determine how familiar they are with the issue of sustainable mobility. Most, 56% of the students surveyed had heard about the concept of sustainable mobility in secondary school, while 6% had already encountered it in primary school. A sizable 37% of respondents had heard about sustainable mobility for the first time at a higher education institution, and one student had never heard of the concept. Respondents were asked to complete the following sentence "Sustainable mobility is …". Based on this exercise we assessed that from a theoretical perspective respondents had a fairly good grasp of the concept of sustainable mobility. For instance they noted, inter alia, that sustainable mobility is "a mode of transport that reduces the amount of traffic, pollution, congestion and energy usage", "mobility that is less polluting", "transportation which does not use a lot of fossil fuels", "a mode of transport which minimises pressures on the environment", "mobility

utilising environmentally friendly means of transport". Likewise, sustainable mobility was seen as "trying to maximise usage of environmentally friendly resources when taking trips", "maximising trips using environmentally friendly transport modes", and "substituting car usage with public transportation, bicycles, …". Moreover, quite a few respondents finished the sentence by stating that sustainable mobility is important and crucial for protecting the environment. Mirroring these definitions of sustainable mobility, when asked to complete the sentence, "If more people in the world used sustainable modes of transport, then …", a majority of respondents emphasised the environmental pillar of the concept. Most respondents completed the sentence suggesting that it would significantly reduce environmental pollution. For instance, inter alia, they stated: "(there would be) reductions in pollution and concentrations of harmful gases"; "the world would be much less polluted and the air would be much cleaner, the quality of the living environment would improve"; "there would not be problems with CO_2 emissions"; "we would live in a cleaner environment"; "the volume of emissions and energy consumption would be greatly reduced"; "there would be less pollution". Some also highlighted problems relating to spatial issues, for example completing the sentence, that "there would be less congestion", "the city centre would be less polluted and the roads less crowded", and "travel times would be shorter for most travellers and there would be more social interaction". Thus, when defining and further articulating the concept of sustainable mobility most people mentioned the environmental pillar of sustainability (protection/pollution of the environment), a few also thought about the economic pillar, while only one sentence elaborated on the social pillar (increased social interaction between people).

Numerous international studies have revealed that mobility habits of youth change as young people grow up. While it has also been shown that mobility habits acquired in childhood carry through to adulthood. Hence, there are a number of projects promoting sustainable mobility that pay particular attention to schoolchildren. The research we conducted among students, aimed to assess, inter alia, what type of mobility habits primary and secondary school students had as well as what type of mobility habits they have for getting to and from school. Specifically, we wanted to know whether students everyday mobility habits and perceptions of transportation changed at all as they got older. Moreover, we wanted to check if people generally become increasingly car-centric as they grow up, as most international research suggests.

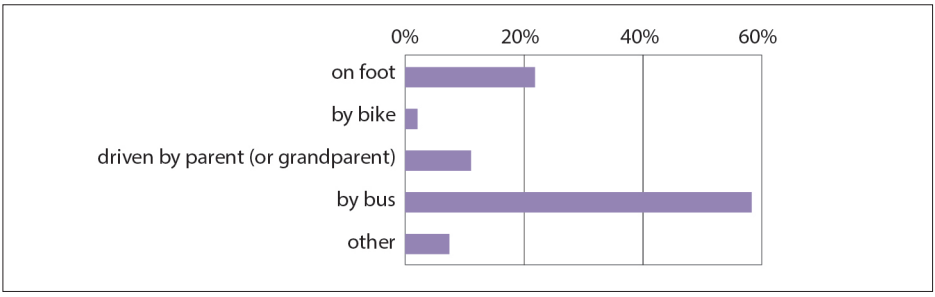
Figure 22: Daily mode of transport to primary school.



In terms of how respondents' travelled to primary school, 47% walked, 33% went by bus, 18% were driven, while only one respondent (2%) rode a bike to school. Based on these figures, we can conclude that the mobility habits of respondents during their primary schooling were predominantly sustainable; indeed, less than a quarter of respondents travelled to primary school by car, while the rest relied on sustainable modes of transport.

The pattern of respondents' mobility habits during secondary education are quite different, because the location of secondary schools means that the proportion of those in secondary school travelling by bus increases and the proportion of those walking to school declines. While high schoolers also utilised another mode of transport, trains. Thus, to get to high school respondents mostly, 58%, travelled by bus, 22% walked, 11% arrived by car (driven by parents), while 7% travelled by train and there was one cyclist. The data reveals that almost 90% of respondents travelled to high school in a sustainable way. In Slovenia, high school students generally have no regular income and car expenses are very high, though according to certain figures around 1,600 Slovene secondary school students have their own car (Nakup avtomobila …, 2014).

Figure 23: Daily mode of transport to secondary school.



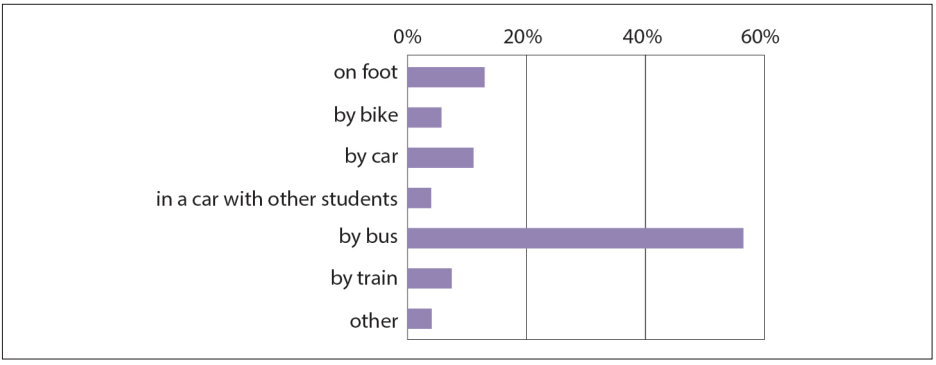
Studies in the USA, one of the most motorised countries, have also shown that in recent years the proportion of secondary school students who have completed their driving test and could therefore possibly drive a car themselves has been declining. From the 1960s right up to the 1980s the number of young people in America who, from as early as 16 years of age, already had a driving license was increasing. Indeed, in 1983 as many as 72% of young people aged between 16 and 19 had already passed their driving test, while 92.2% of those aged 20 to 24 had passed. By 2011, these figure had declined substantially, to "only" 50.9% of people aged 16 to 19 and 79.7% of those in the 20 to 24 age group. The reasons for such a decline in the proportion of young people with driving licenses was the focus of a study at the University of Michigan (University of Michigan's transportation research institute), which found the following (Lavelle, 2013):

1. Increased virtual accessibility reduces the reliance on physical accessibility (by car). Similar findings, that online access to information generally serves to decrease the proportion of young people taking the driving exam, were also discovered in some other countries – eg. Canada, South Korea, Germany and Japan.

2. The costs associated with driving and having a car are quite large, which means that many young people (teenagers) cannot afford a driver's license and their own car (fuel costs and insurance), especially if they have no regular income. On the other hand, many warn that the downward trend in the proportion of young people who have their own car, may just reflect the current poor economic conditions, given the recent crisis, and that we may see the proportion of young car owners rise again, once the economic situation improves.
3. Many young people, even those that could buy a car and get their driver's license, seem to consciously decide not to do so; preferring instead to travel by other modes of transport (eg. public transport, car/ride sharing, bicycle sharing, etc.).
4. Only 9% of young people stated that they had decided not to get a driver's license and become a car owner for environmental reasons.

Our study showed that daily mobility habits do not change much as people move into higher education; there was not much difference between groups of respondents. For instance, only 11% of respondents travel daily to their faculty/college by car, whereas the majority, 56%, of higher education students travelled by bus, 13% walked, 7% took trains, 5% cycled and 4% used so-called ridesharing (carsharing).

Figure 24: Daily mode of transport to higher education institutions.



Respondents' reliance on sustainable means of mobility for travelling between home-faculty is also linked to the fact that tickets for urban and suburban public transport are subsidised. Thus, most students use public transport primarily because it is cheaper than driving to university or college everyday. Information about students mobility habits, when they are undertaking daily errands (shopping, meeting friends, etc.), reveals that students are in fact much more car-centric than their travel patterns between home-faculty would suggest. For instance, 44% of all respondents use a car for daily errand trips, a much larger figure compared to commuter car usage. While 33% of respondents perform daily errands on foot, 13% by bicycle and 11% by bus.

The rate of car usage is at its greatest, by far, when it comes to going on summer holidays. A whopping 95% of respondents go on summer vacation with a car, 4% go by plane and 1% by train.

Figure 25: Mode of transport for carrying out daily errands.

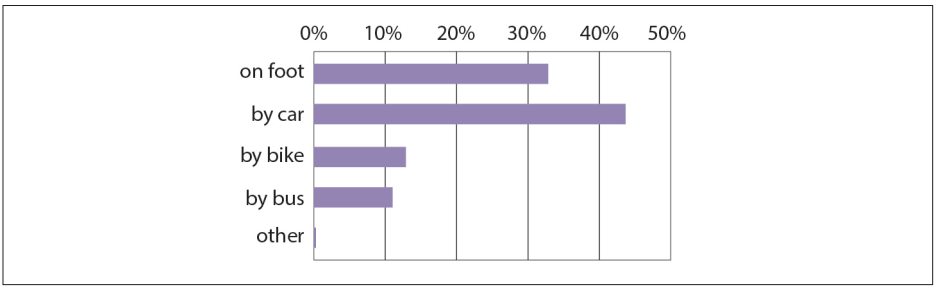
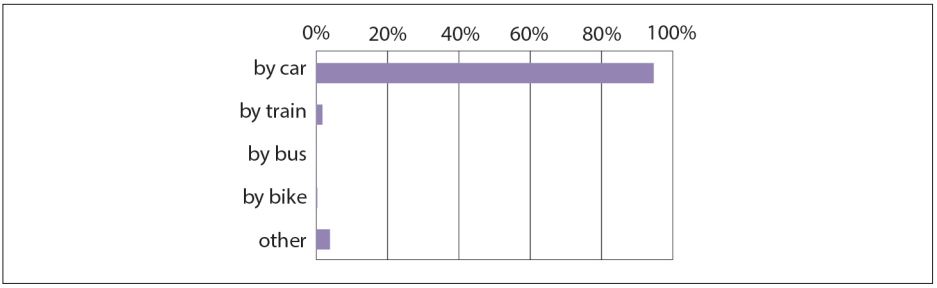
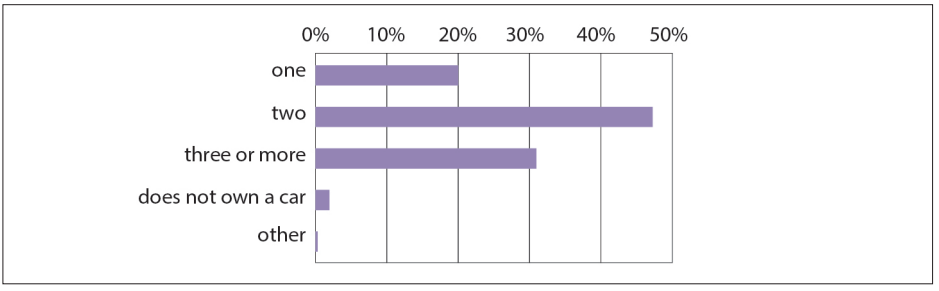


Figure 26: Mode of transport most often used when going on summer vacation.



In the study we also wanted to know how many cars were owned by each respondent's family. In Slovenia, there are about 1.07 million registered personal vehicles, which means that on average every second person in Slovenia has a car; on average each household has 1.3 cars (Registrirana cestna motorna vozila, 2016). Our study found that families of geography students are much more motorised than the national average. As many as 47% of respondents' families had two cars and 31% had three, while 20% said their family had one car. Only one student, noted that their family did not have a personal vehicle. On average, the families of surveyed students had 2.07 cars, which is considerably more than the Slovenian average.

Figure 27: Number of cars owned by respondents' families.

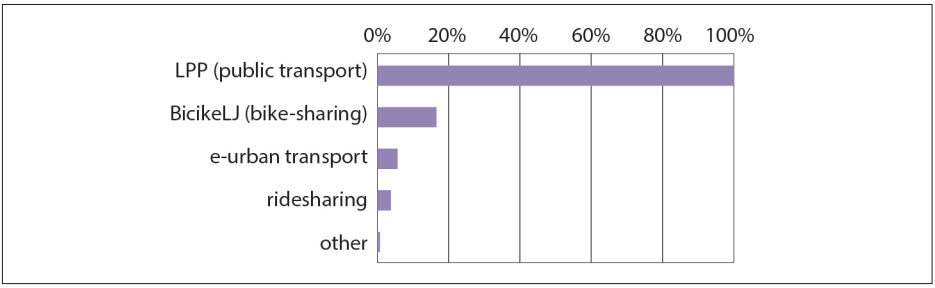


Given that all people surveyed were geography students at the Faculty of Arts, University of Ljubljana, we were also interested in their opinions about the state of

sustainable mobility in Ljubljana. Based on a number of metrics Ljubljana could be considered as an example of best practice when it comes to sustainable transportation; which we break up into three categories. The first category consists of cycling; in this regard Ljubljana introduced a bike sharing system (BicikeLJ), as part of which there are 38 bike stations, spaced at intervals of 300 m to 500 m. Thus, the BicikeLJ system is suitable for making short trips within the city (Postajališča …, 2017). Ljubljana's BicikeLJ system is very popular, with subscribers using the system, on average, more than 700,000 times a year. Respondents were also asked whether they had ever used the BicikeLJ system themselves; 17% of respondents confirmed they had. The second best practice category is based on the introduction of pedestrian zones. Indeed, the most striking example of this, not just in Slovenia but also in a European context, has been the closure of Slovenska cesta to personal vehicles. With the same approach planners also rearranged the city centre, increasing and improving pedestrian areas. They also built four new footbridges across the Ljubljanica River, intended exclusively for pedestrians. The third category of best practices focuses on the organisation of the public transport system, within which the biggest achievement has been the introduction of a modern electronic ticketing system – Urbana, an integrated ticket. Other, improvements within the public transport system include the extension of certain urban bus lines so that some even connect with surrounding municipalities, while in order to better inform passengers about bus arrivals and departures, electronic displays have been installed at bus stops.

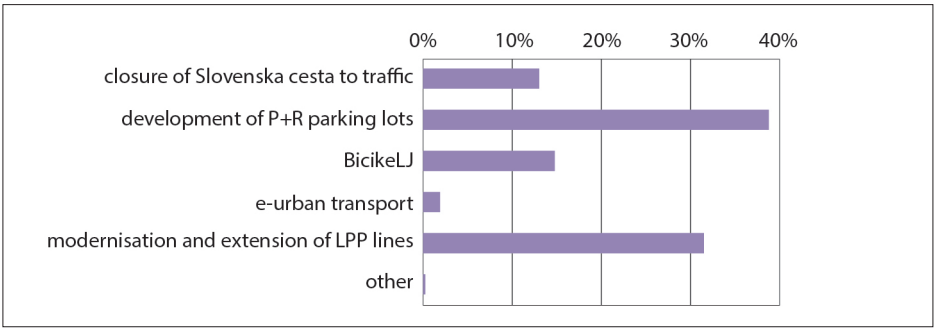
In the survey, students were not just questioned about usage of the BicikeLJ system, moreover, we were interested if they had ever used any other sustainable transport systems in Ljubljana, such as ridesharing/carpooling, carsharing, e-urban transport (an on-demand public transport service) or the Ljubljana public transport system (LPP). As expected, all respondents had already used the LPP, 6% had previously used e-urban transport, while two students had used a ridesharing system.

Figure 28: Sustainable transport systems that respondents have previously used in Ljubljana.



When ranking which sustainable mobility measure implemented in Ljubljana was the best in terms of promoting sustainable mobility: 39% of respondents considered the construction of park and ride (P+R) parking lots as the best step; 31% pointed to the modernisation and expansion of LPP lines; 15% listed the introduction of the system BicikeLJ; and 13% cited the closure of Slovenska cesta.

Figure 29: Best measures implemented in Ljubljana for promoting sustainable mobility.



In general, students noted in the survey that their mobility needs are well taken care of in Ljubljana, in particular, respondents highlighted the advantages, good connections and affordability of Ljubljana's public transport. In terms of improving sustainable mobility in Ljubljana they proposed: introducing new LPP lines, which would provide faster and more frequent services; operating more LPP services at night; increasing the number of BicikeLJ stations and providing more bicycles to rent; and, closing more roads to personal vehicles. Additionally, some stressed that there needs to be more advertising, which would encourage the city's residents to use the LPP and sustainable means of transport.

Based on our research, we can conclude that first-year geography students at the Department of Geography, Faculty of Arts, University of Ljubljana know a lot about the concept of sustainable mobility from a theoretical perspective, while they also successfully use sustainable modes of transport for their daily mobility between home-faculty-home. However, when carrying out other daily errands and during leisure time they are much more car-centric. Most surveyed students, 75%, commented that they would like to use sustainable forms of mobility to a greater extent. In our opinion there is certainly a lot of potential to increase the use of sustainable transport for carrying out daily errands. Such trips generally cover short distances and people could certainly take these trips in an environmentally friendly and healthy way (walking, cycling, by public transport, etc.). The research revealed that young people, specifically first year geography students, are very familiar with the concept of sustainable mobility in a theoretical sense, whereas their theoretical knowledge and awareness of the benefits of sustainable mobility did not reflect fully in their everyday lives. It is this issue, i.e. the transfer of theoretical knowledge into everyday life, that opens up opportunities and possibilities particularly when dealing with young people, some of whom will eventually become spatial planners in the future, since we can influence them and encourage them to adopt environmentally friendly and healthy transport means in their daily mobility, thereby teaching them to live more sustainably. Only in this way, when theoretical knowledge about sustainable development is actually embedded in people's everyday lives, can we achieve the objectives that are set out in the 2030 Agenda for Sustainable Development.

8 Best practice examples

In order for a transport system to be characterised as sustainable it must take into account all three dimensions of sustainability – environmental, economic and social aspects. Around the world, so too in Europe and Slovenia, we have seen a large number of practices, showcasing various attempts to reduce the impact of transportation on the environment, make transport more user-friendly and accessible to people, as well as increase its economic efficiency.

In selecting best practice examples we took the following factors into consideration:

- An integrated systematic approach.
- Reductions in environmental impacts.
- Collaboration of diverse stakeholders. Horizontal and vertical as well as interdisciplinary and interregional cooperation (users, local residents, public transport providers, administrators, policy makers, experts, etc.).
- Planning for people.
- Prior analysis of the situation, shortcomings.
- Monitoring and active participation.
- Priority on environmentally friendly modes of transport.
- Good information and education.
- Organisational manager.
- Social and economic justice.
- Protecting the health and safety of residents.

8.1 Cycling games

Denmark is a country that we can scarcely imagine without bikes. Cycling is part of their culture. The Danes say that the reason they ride so much and so often is because they start cycling at a very early age. In Denmark, riding a bike is treated as a basic skill, just like walking and talking. Most children learn to ride before they go to school (Ruby, Liv Andersen, 2016).

Despite the fact that in Denmark as many as 44% of children ride to school (Bicycle Statistics from ..., 2015), in recent times there has been a decline in the proportion of school students cycling. In order to arrest this trend they decided to take action through improving the safety of cycling infrastructure and introducing other soft measures that promote cycling culture (Denmark – On Your Bike!, 2014). Particular

attention was paid to children. The Danish Cyclists' Federation carried out a detailed review of the regular training course teaching children how to ride a bike. They found that the training was not very amusing, nor particularly efficient. The courses often only superficially focused on learning bike riding skills with most of the time devoted to learning the traffic rules. Traffic rules are without a doubt very important, but children who do not master riding a bike will never become competent cyclists. If bike riding courses become annoying obligations there is also a risk that children will lose interest in cycling. On the other hand, a child who loves cycling will also be very motivated to learn traffic rules (Ruby, 2010).

In the review of bike training courses it was determined that the following elements are necessary (Ruby, 2010):

- Training should focus on teaching children to ride.
- Training should boost children's interest in cycling.
- Training should start when children are young so that by the time they become traffic users themselves they will have fully mastered riding a bike and know the road rules.

As an outcome of the review, in 2008 Denmark's cyclists' federation, together with child development experts, came up with the concept of cycling games, which offer a fun alternative to traditional bike riding courses. The purpose of the games is to share the joy of cycling to the next generation and reduce the decline in the number of children who cycle. The aim is to teach children how to ride a bicycle primarily through playing a game. While playing a game children do not focus on learning to ride a bike, but step by step they become proficient cyclists (Ruby, 2010). At the core of the concept is a list of cycling games, which are mostly traditional games, adjusted and modified to be played on a bike. Denmark's cyclists' federation published a booklet of cycling games (6 cycling games …, 2010) intended as inspiration for teachers, educators and parents. Every preschool received a package of ideas and aids to kick-start the cycling games. They also offered educators inspiring workshops in cycling games. Learning materials were tested by teachers and children, meaning that there is a greater likelihood that these tools will be completely integrated and consequently more used (Schiøtt Stenbæk Madsen, 2015).

The concept is very flexible; it can be easily carried out in different environments and is adaptable to different sized groups, children's ages and maturity as well as their abilities/skills. Experience shows that users generally develop new games or adapt them to suit their needs and interests. The simplest games can be played by children aged from two to three years. Playing cycling games can be continued as part of learning how to ride courses at school. If the games are slightly adjusted, they can also be used in riding courses for adults. Cycling games are complemented with tips on road safety, giving the next generation of cyclists a good grounding in bike safety and ensuring they will happily embrace cycling (Ruby, 2010).

The target group are pre-schoolers. The reason for this is that personal travel habits are developed during childhood. Children who learn to ride before they go to school find it easier to learn road rules and later on are more likely to safely and

independently ride to school. The long-term goal is for the cycling games to become a permanent part of a child's development (Kristensen, 2015).

Figure 30: An example of one of the cycling games in the booklet issued by the Danish Cyclists' Federation.

CANNON BALLS FOR THE GUNNER

Number of children: Four or more.

Number of adults: At least one.

What you need: Approximately 100 small, light and different coloured balls.

Where to play: A playground or a tarmac or gravel playing area.

The game: An adult plays the gunner. The adult throws the balls all over the playing area. The children then cycle out to collect the "cannon balls". The children carry the balls by hand, under their tops, in their pockets or some other way. They have to return the balls to the cannon king. The gunner can get the children to do various things. For example, the girls can collect the yellow balls, and the boys can collect the red ones. Or you can make all the children find three balls which each have a different colour, etc.

Source: 6 cycling games …, 2010.

Through the games, children learn to stay balanced on a bike, judge distances and speed; they develop a sense of position in space and direction as well as practice various types of skills on a bike (starting, stopping, turning, etc.). They learn to ride very well, so too they learn road rules and become more attentive to what is happening around them. Through the games players also learn how to work together to solve problems (Ruby, 2010). So far results out of Denmark suggest that learning to cycle using games has a strong stimulative effect. Interest among preschools in the campaign "We can bike!", which brings the concept of cycling games into the curriculum, is very large and growing every year. In 2015 the number of children involved in the project doubled compared to 2014 (from 2,000 to 4,000 children), while in 2016 the figure doubled again (to 8,000 children). Thus, in preschools across Denmark you can see children who are playing on their bicycles and learning to ride. As they ride they chase bubbles, collect coloured balls or try to evade the Tickle monster (Ravn Faber, 2015).

According to the campaign manager, Mai-Britt Aagaard Kristensen, preschool teachers are recognising the breadth of learning that children pick up through integrated lessons on bikes. Likewise, he noted that parents of children involved are very proud and surprised at how much their child learned after just a couple of hours playing the cycling games. Many have also decided to cycle with children (Ravn Faber, 2015).

The idea of cycling games has successfully spread elsewhere in the world. In 2015 cycling games were carried out in Colombia, while following a presentation at the World Cycling Forum in Chile in 2016 the games successfully spread elsewhere in South America (Bech, 2015; Monberg Dalhof, 2015; Bech, 2016; Cramer, 2016b). In

autumn of 2016 cycling games were also presented in Japan, where they were very well received by both administrators and teachers as well as by children (Cramer, 2016a).

The experience from Denmark shows that through carefully selected games it is possible to properly teach and excite even preschool children about riding, who are still developing their habits, and as such there is great potential to instil in them lasting sustainable transport habits. When it comes to bike riding, the Danish approach of "A good start is an early start" and the introduction of learning through games are shown to be very important factors in the development of cycling culture in a society.

The fact that Danish children start to ride and are physical active from early ages also reflects in their good physical condition and health. Lang et al. (2016) tested the physical fitness of children and adolescents in 50 countries around the world and Danish children achieved top results. The study determined that Danish children's vitality was strongly influenced by their way of life, with walking and cycling a part of their everyday lives. Grøntved et al. (2016) found that for people who start cycling while still at school, the risk of developing cardiovascular disease is reduced by a factor of 43.

In addition to documented positive effects cycling to school has on health and the environment, in the COWI study (Evaluering af ABC …, 2013) it was also revealed that it has a strong positive impact on the economy. For instance, students who ride to school get sick less often and thus miss less school days. Furthermore, children who cycle encourage parents to ride bikes instead of driving a car. This leads to less road congestion, less pollution and better maintained roads (Britz Nicolaisen, Schiøtt Stenbæk Madsen, 2013).

8.2 The revitalisation of local railway lines and rail transport in Vinschgau Valley in South Tyrol (Vinschgaubahn)

The example of the Vinschgau Valley in South Tyrol shows that it is possible to revive public transport in areas where people mainly drive cars. The Merano-Malles local railway line was decommissioned by the Italian Railway Network in the 1990s because of rationalisation, though in 2005 it was reactivated (Von Rainer, 2009). Talks on reopening the railway lasted eight years, from 1991 to 1999, when a number of enthusiasts managed to convince local authorities to re-establish the connection and approve its funding (Otrin, 2016). The instigator and driving force in the project to revive the route was Helmut Moroder, a representative from an integrated local public transport company – SAD-trasporto locale. The first proposal was to invest 40 million in the line to bring it up to minimum standards, however this would not have resulted in shorter travel times and better services. Doubts emerged over the sense of such a restoration of the railway line. Namely, the reason the rail connection had been suspended in the past was the fact that the railroad was not appealing to people. Most people in the region got around using personal vehicles. The basic restoration would not have been able to convince people to use the train for their

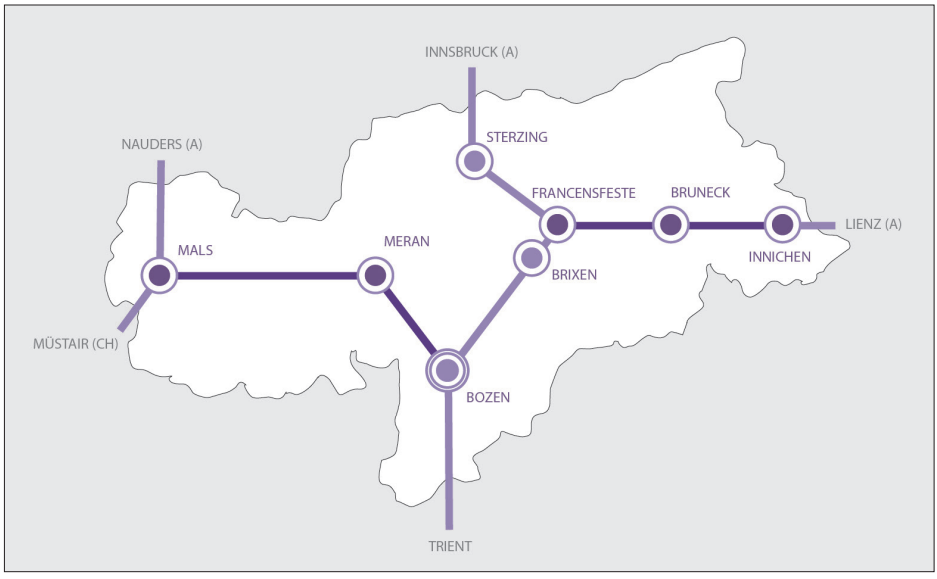
journeys, when it would have been more convenient for them to drive. They came to the conclusion that if they wanted to make rail transport attractive, they needed to find innovative solutions. In the end, experts managed to convince decision-makers that the track needs to be renovated such that it would be reliable, safe and high-quality, with low operating costs. The cost of such restorations would amount to EUR 130 million (Moroder, 2016).

Figure 31:

The renewed Merano-Malles railway line.

(photo: Š. Berlot)

Figure 32: Railway connections in South Tyrol.



Source: Stations. Südtirol Bahn, 2016.

Renewal steps (Götz, 2007; Moroder, 2016; Safety Equipment, 2016):

- First of all an analysis of the needs was conducted on the basis of which timetables and connections were designed.
- In the planning stage a lot of time was also devoted to safety, which represented one of the main focal points of the project. More than 50 level crossings were closed and in their place passages and collector roads were constructed.
- They constructed bridging facilities for crossings intersecting with road traffic.
- They renovated existing stations in the traditional architectural style and built new railway stations where they were needed. During construction they sought to fit stations with the environment by utilising natural materials (wood). The platforms at the stations are level with the ground, allowing easy access for all, including cyclists and physically handicapped persons.
- They purchased attractive new trains with large windows and space for wheelchairs and bicycles.
- They established good accessibility and connections (two stations in each village).
- They set up an electronic command centre in Merano with smaller centres elsewhere for the automatic management of trains and tracks, which ensures the greatest possible level of safety for rail traffic as well as the punctuality of trains. This type of monitoring is much more economical. The control system also includes a passenger information system that informs passengers about train arrival and departure times, as well as about train delays and any platform changes.

Some information about the functioning of the railway line (Best Practice …, 2013; General Concept …, 2016; Moroder, 2016; Trains from Merano ..., 2016):

- Trains run hourly or half-hourly, from 5:42 to 22:44. During peak hours trains run more frequently. Every two hours there is also a direct link with the regional express service (RegioExpress) which goes to Bolzano stopping only at major stations in the lower Venosta Valley.
- Train and bus timetables are synchronised, especially in the upper part of the valley where buses run to and from railway stations.
- A town bus service in Malles, Lagundo and Silandro connects the towns with each other and stations with the surrounding area.
- In the upper part of the valley, timetables of trains are also aligned with Swiss buses and railways.
- Stations offer free parking for bicycles in secure storage facilities. This solved the problem of a large number of bicycles taking up space on trains, since now people ride their bikes to an entry station and leave the bike in the storage facilities, then at the exit station they continue on using a rented bicycle. Such rail trips are very popular among tourists – cyclists, who can get a daily ticket for a bike. Due to a lack of carrying capacity for bicycles on trains during the tourist season a new

service has recently been introduced, namely, tourists can leave their bike at a train station and it is then transported to their destination station in a van.

- They also offer a single integrated ticket Bikemobil Card, which allows full use of the South Tyrol integrated public transport network.

Figure 33:

Easy access for people with physical disabilities and cyclists.

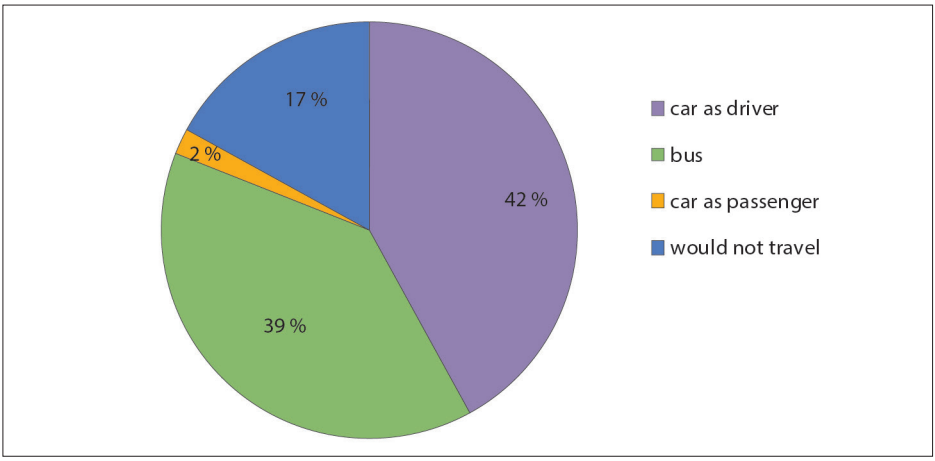
(photo: Autonomous Province of South Tyrol, Department of Transport, STA)

The railway line is owned by the Autonomous Province of Bolzano – South Tyrol, which funded all of the restoration work; while these days the province also cover its operating costs (Best Practice …, 2013). The single-line, non-electrified 60 km line between Merano-Mals has a difference in altitude along its route of 696 m, rising from 302 m in Merano to 998 m in Malles, with a maximum gradient of 28‰. Its maximum speed is 120 km/h, with a minimum of 70 km/h. There are eight main railway stations along the line, two of which serve only as railway hubs, and there are 11 smaller stations (Stations …, 2016).

Before the renewed line opened, buses in the valley carried one million passengers per year. After the line opened, most regional bus routes in the valley were terminated and for the first six months residents were allowed to travel on the new comfortable trains free of charge. A survey carried out among users of the railway line in 2008 revealed that if there were no railways 41% of residents would drive, 38% would go by bus, and 5% would carpool, while the rest would opt not to travel (Best Practice …, 2013).

The number of passengers recorded in the three years after opening exceeded all expectations. When the line opened in 2005 the goal was to reach 1.8 million passengers by 2010, though the railway had already carried 2.9 million passengers in 2009 (Best practice …, 2013). With approximately two million passengers per year, the capacity of the diesel trains, particularly during peak hours and the tourist season, is exceeded. In 2014, the government of South Tyrol therefore decided to electrify the line in the next few years, as that will enable an increase in the number of seats on trains by up to 276 and also the running of more frequent train services. Electrification of

Figure 34: Priorities of traveling if there were no railway line.



Source: Best Practice …, 2013.

the railway with all the necessary adaptations is expected to cost around EUR 56 million (Zwei Million Fahrgäste ..., 2014).

The strength of this example lies primarily in the highly effective services, effective integration with other means of transport and the awareness among users about alternatives to personal vehicles. One of the most important outcomes has been the reduction of car traffic on the main road connecting Merano with Malles. In the future, when the train services are fully developed, experts predict a 15% increase in rail transportation at the expense of road traffic (Best Practice …, 2013).

8.3 Subsidised tickets for students

Practice around the world shows that innovative approaches to financing public transport significantly increase its management efficiency (Mulley, Walters, 2014). Provision of public transport in areas with low population density, where it is generally not cost-effective, represents a major challenge in many countries around the world. A combination of an area's key components is essential to achieving success. It is necessary to take into account the interests of stakeholders and the particulars of the system (De Jong et al., 2011). Demand for public transport is relatively sensitive to financial changes, thus policy measures in terms of subsidisation play an important role in promoting or inhibiting the use of public transport (Bresson et al., 2003; Habjanič, 2015).

The previous system of subsidising transportation for pupils and students in the Republic of Slovenia, in place up until September 2012, destimulated public transport usage among young people (Habjanič, 2015). It offered them a financial allowance for accommodation and transportation as part of state or Zoisova scholarships, which beneficiaries were able to use as they wished. The subsidy amount was determined

on the basis of the beneficiary's material wealth, while operators claimed the subsidy for sold tickets on behalf of the beneficiaries (Spremembe dodatkov …, 2012; Habjanič, 2015).

The subsidy system needed to be harmonised and systematically standardised. In 2012, the National Assembly adopted amendments to the Road Transport Act (Slovene title: Zakon o prevozih v cestnem prometu; Zakon o prevozih …, 2013). The Ministry responsible for transport then designed a new model of subsidisation. In developing the model they took inspiration from the approach used in the Austrian province of Styria, where an integrated ticketing system has been in place since 1994. In terms of size, geographic characteristics (relief, settlement patterns, demographic structure) and economic characteristics Styria and Slovenia are quite comparable. In Austria, students and apprentices can obtain an annual school travel pass for 19.60 euros. For a minimal additional cost of 8.30 euros per month they may also use their passes for urban public transport services. Monthly student passes are also subsidised. A half-yearly travel pass cost a student 141 euros (Hočevar et al., 2011).

At the beginning of May 2013 the new Road Transport Act (Zakon o prevozih …, 2013) came into effect which introduced some new features concerning the subsidisation of transportation for pupils, students and adults engaged in formal education. From now on pupils, students and others engaged in formal education are entitled to a subsidised travel pass if they reside at least 2 km from their educational institution (previously the required distance was over 5 km). Subsidised travel passes are intended for beneficiaries who travel daily from home to their place of education. Beneficiaries are entitled either to: a subsidised monthly pass for daily travel to and from their place of permanent or temporary residence to their place of education; or a monthly ten-trip pass if they reside in the same place where their educational institution is located. Another new feature is the option of purchasing subsidised half-yearly and annual travel passes.

With the passing of the Act Amending the Road Transport Act (Slovene title: Zakon o spremembah in dopolnitvah zakona o prevozih v cestnem prometu; Zakon o spremembah ..., 2015) a new system for subsidising monthly travel passes for pupils and students came into effect, which subsidises beneficiaries regardless of their social status. In addition to the benefits for beneficiaries, the law also brought about changes for transport operators by establishing a new sales system and reporting procedures for subsidised monthly travel passes.

Table 1: Prices of subsidised travel passes for interurban public transport.

TRAVEL PASS TYPE	MONTHLY PASS (in €)	HALF-YEARLY PASS (in €)		ANNUAL PASS (in €)	
		4 MONTHS	5 MONTHS	STUDENTS – 9 MONTHS	SCHOOL STUDENTS – 10 MONTHS
Pass for **10 trips per month**	**20**	70	87.50	135	150
1 ZONE: up to 60 km	**25**	90	112.50	180	200
2 ZONE: from 60 km up to 90 km	**35**	130	162.50	270	300
3 ZONE: more than 90 km	**55**	210	262.50	450	500

Source: Subvencionirana vozovnica …, 2016.

Table 2: Supplements to subsidised travel passes for urban public transport.

URBAN TRANSPORT	MONTHLY PASS (in €)	HALF-YEARLY PASS (in €)		ANNUAL PASS (in €)	
		4 MONTHS	5 MONTHS	POST-SECONDARY STUDENTS – 9 MONTHS	SCHOOL STUDENTS – 10 MONTHS
Ljubljana	**10**	40	50	90	100
Maribor	**5**	20	25	45	50
Jesenice	**15**	60	75	135	150

Source: Subvencionirana vozovnica …, 2016.

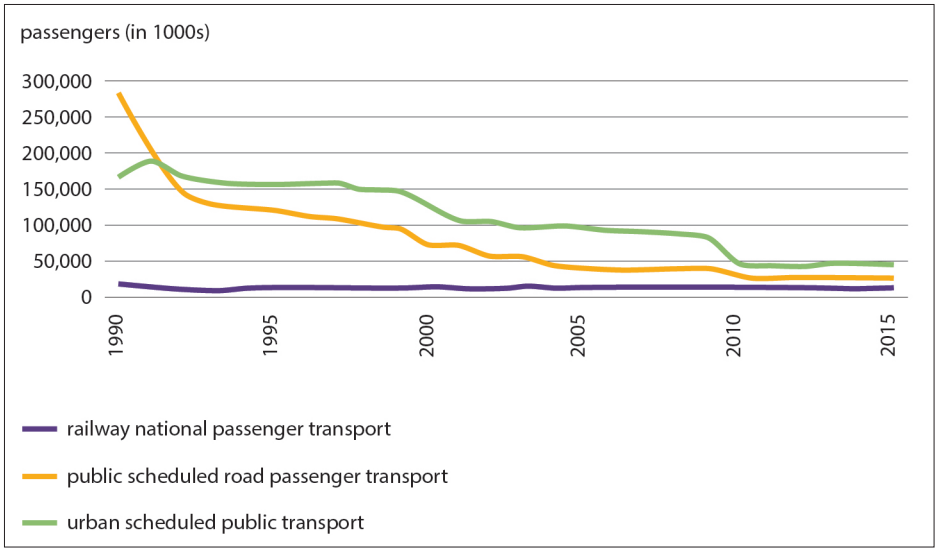
Since 2013 students can purchase a monthly travel pass to get to school or faculty with the price determined by the distance between a student's place of residence and education; passes for distances up to 60 km cost 25 EUR, from 60 to 90 km the price is 35 EUR, while those travelling more than 90 km are charged 55 EUR. The price of a ten-trip monthly pass now costs 20 EUR (Subvencionirana vozovnica …, 2016).

In 2015 new changes and additions to the Road Transport Act were adopted (Zakon o spremembah ..., 2015). The project of subsidising travel passes was updated in September 2016 with the introduction of an integrated ticketing system for public transport (IJPP), which seeks to enhance integrated services. Before the introduction of the new system subsidy recipients could travel with only one operator, whereas with an integrated travel pass for the same price they can choose between different transport operators and modes of public transport on their selected interurban route (Subvencionirana vozovnica …, 2016).

The IJPP is provided by a consortium, including Slovenian Railways, the Ljubljana (LPP) and Maribor (MARPROM) public transport companies, as well as technological subcontractors Imovation and Margento. Setting up the system cost about EUR four million, of which 85% came from European funds. Maintenance costs for the next five years will amount to just over a million euros (Rožman, 2016). It was designed as a pilot project, envisaging that it will provide a foundation for later on introducing an integrated ticketing system covering the whole of Slovenia and other users. The aim of the initiative to subsidise tickets is to stop the decline in public transport passenger numbers and reduce personal vehicle usage. The longer-term plan for the project is to also harmonise timetables and possibly establish new public transport routes through cooperation between the Ministry and local authorities (Projektna naloga za ..., 2013).

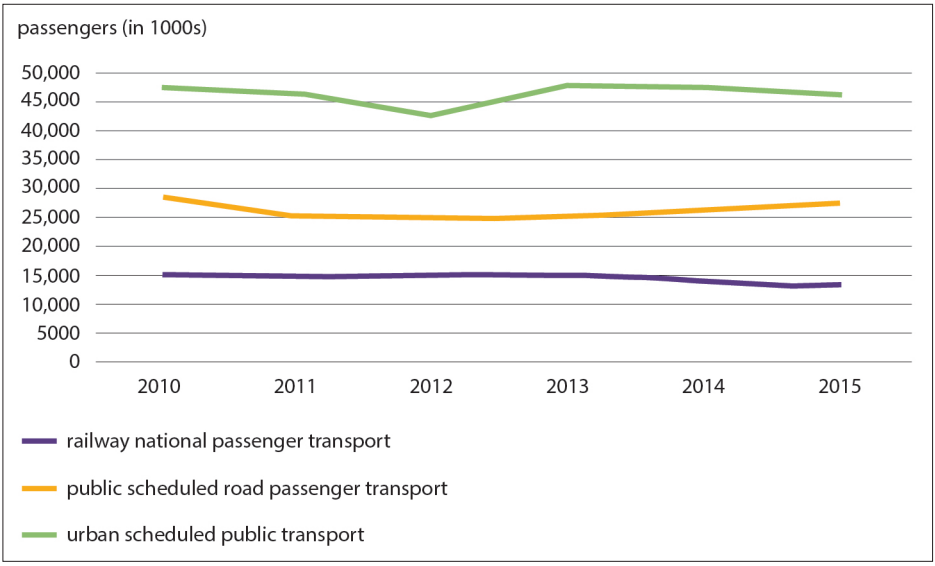
Implementing the project as a whole ensures students with equal opportunities and access to education. In this regard, the Act redirects all the financial resources previously devoted to supplements for transport and part of the living allowance supplements towards financing of subsidised transport services. Fare policy has reduced the price for concession holders by as much as 50% and thus contributed to a substantial drop in households' mobility expenses (Zakon o prevozih ..., 2013; Habjanič, 2015).

Figure 35: Number of passengers (in 1000s) by modes of public transport in Slovenia from 1990 to 2015.



Source: Cestni javni linijski …, 2016.

Figure 36: Number of passengers (in 1000s) by modes of public transport in Slovenia from 2010 to 2015.



Source: Cestni javni linijski …, 2016.

Use of public transportation, especially bus travel, significantly declined after Slovenia gained independence. While in the 1990s there was a very large decline in domestic rail traffic, in the last decade train passenger numbers have slowly increased. The steep decline in bus trips was evident right up until 2004, when passenger numbers more or less stabilised. Since 2012 we have seen numbers rising again. The rebound of bus passenger numbers is mostly due to the introduction of subsidised tickets for students. In 2012 the number of passengers on interurban bus services amounted to 24,793,000 and by 2015 this has increased by 2,943,000 (to 27,736,000). Meanwhile, domestic train passenger numbers have seen a slight decline since 2012 (from 14,622,000 in 2012 to 13,792,000 in 2015). The reduced passengers numbers may partly be explained by the fact that before 2016 and the introduction of the IJPP integrated ticket system, recipients of subsidised travel passes had to select a single transport operator and were thus prevented from using different types of public transport. Because public bus connections service a wider area, there was a larger proportion of students who opted to take buses. The impact of the introduced IJPP integrated ticketing system on domestic rail passenger numbers will be visible in a few years.

Data on public transport in Slovenia shows that even through appropriate financial measures alone it is possible to increase public transport usage. However, keeping this trend going requires an integrated approach, within which operators must take an active role in keeping and making public transport competitive and self-sustaining.

9 Concluding thoughts

Slovenia's location meant that it emerged as a transport junction even in pre-Roman times. Some of the main transport routes were outlined as early as in Roman times and have been preserved until today. While today's transport corridors in Slovenia roughly match those already in place in the Middle Ages. Railways came to Slovenia early on, whereas motorisation occurred at a much slower rate. Half a century passed from the first record of a car in Slovenia in 1898 to the onset of intensive motorisation, indeed the phenomena did not really emerge before the end of World War II. While in the decades after 1970 motorisation very rapidly progressed and in the new millennium Slovenia became one of the most motorised countries in the EU. The intensive growth of motorisation brought with it many problems and moved the Slovenian transport system away from sustainability. Since 1972, when the first stretch of motorway opened, until today Slovenia has become one of the most "motorway rich" countries in the EU. The motorway network carries about 49% of all traffic (Prometne obremenitve, 2014), even though it accounts for less than 10% of the entire road network. The situation for the railways is not even remotely similar to that of Slovenian motorways; in fact, the length of lines has not substantially changed in decades, while rail passenger numbers do not reach the levels seen in the days when the country was a part of Yugoslavia and in recent years have plateaued at levels below those of 1970. Although mobility and transportation have always been beneficial for society, undeniably it also leads to negative environmental impacts. These include, inter alia, taking up space, breaking up space, greenhouse gas emissions and air pollution. This has led to efforts to develop a different approach to mobility, one that takes into account environmental constraints, supports social justice and facilitates economic development. This is termed sustainable mobility and among other things it focuses on reducing excessive energy consumption in transport systems, inverting the hierarchy of transport modes (compared to the present model) and making sure that the mobility needs of all social groups are provided for. Another two very important aspects of sustainable mobility are that it reinterprets the city as an area of interactions and not as an area intended exclusively for cars, and it also introduces new technologies in vehicle propulsion systems. National transportation systems are determined by transport policies which consider international connectivity, while transport policy is also often decided on outside of national settings at the international level. If we want to redirect transport systems from the conventional towards being sustainable, we need to change transport policy, specifically the core transport documents. Current de jure Slovenian transport policy is based on documents such as the Resolution on the Transport Policy of the Republic of Slovenia and the Transport Development Strategy of the Republic of Slovenia. Unfortunately, de facto, these documents are not fully adhered to, since they were adopted very late (Resolution in 2006 and the Strategy in 2015), while the policy decisions at those times had not changed substantially compared to previous (largely unsustainable) practices. Although sustainable mobility is mentioned in these documents as well as others

and it generally holds that the more recent a political document the more they refer to issues of sustainability, in practice public investment and funding does not follow.

The Slovenian transport system is unsustainable and without being thoroughly reformed cannot guarantee a successful transition to a sustainable paradigm. Without sustainable mobility the paradigm will be incomplete, and in practice will be unable to fulfil its promises. The public transportation system in Slovenia is not keeping pace with the mobility needs of the population, especially when it comes to rail services and in certain areas also interurban bus services. If we want to successfully turn things around, in addition to making major investments in sustainable transport infrastructure and sustainable modes of transport, efforts will need to be stepped up in terms of education and work with young people, in whom we instil travel habits by addressing their patterns of daily mobility. It is necessary to start teaching the principles of sustainable mobility at all levels of education, although we should not forget that the actual practice of young people's (as well as everyone else's) mobility is at least as much influenced by in class learning as it is by everyday experiences, given that people undertake a huge range of different trips on a daily basis.

Proof that with the introduction of competitive, systematically arranged rail services it is possible to divert people from cars to using public transport is revealed in the example of the revitalisation of the railway line in the Vinschgau Valley in South Tyrol. In an area where people mostly drove cars, they were successful by innovatively and comprehensively revitalising railway infrastructure and services (high frequency and high speed trains, good local and regional connections, harmonised timetables with other public transport operators, integrated ticketing, easy access for the physically disabled and cyclists, attractive trains with large windows, restored train stations with up to date information systems, secure infrastructure, low operating costs) in making rail transport attractive to people and within three years after opening, having carried nearly three million passengers, exceed all expectations (Best Practice …, 2013; Moroder, 2016).

A review of the inclusion of sustainable mobility in the educational process revealed that dedicated education on sustainable mobility is very patchy or else non-existent. As part of the Educating, Informing and Raising Public Awareness about the Importance of Public Transport project we sought to figure out to what extent sustainable mobility is included in the educational process, thus we reviewed the preschool curriculum as well as curricula of selected primary school subjects – Geography (compulsory and elective subjects), Learning about the Environment (compulsory subject), Social Sciences (compulsory subject), Civics and Ethics (compulsory subject), Environmental Education (elective subject) – and secondary school subjects – Geography (compulsory subject and additional content for graduate exam), Environmental Education for Sustainable Development (interdisciplinary subject), Environmental Studies (elective subject), Sociology (compulsory and elective subjects as well as additional content for graduate exam). We focused mainly on educational and learning objectives, which are one of the main guides for educators and teachers in their work. Looking at the curriculum for preschools, with the exception of physical education, which incorporates cycling, there are no subjects with prescribed activities to develop sustainable mobility habits. We therefore prepared, based on lessons learned

from several past projects addressing sustainable development and also sustainable mobility, a number of proposals for integrating sustainable mobility into preschools' daily activities (e.g. early promotion of cycling; using examples from transportation for learning languages; showing photos depicting trains, buses, stations, bikes; creating a story out of collage; creating and producing an animation with a variety of puppets and objects that illustrate situations in traffic; singing themed children's songs about buses, trains, bikes; drawing imagined scenes; going for a ride on a steam train ...) (Otrin et al., 2013). Looking at primary schools, we gathered together individual primary school subjects' learning objectives associated with the studied topic, as we wanted to highlight the possibilities for interconnecting content related to sustainable development and sustainable mobility as well as for connecting it with learning objectives inscribed in the curricula and to encourage teachers to integrate such material into their yearly lesson plans. In the reviewed curricula, with the exception of the curriculum for the Environmental Education subject (elective subject; in addition to the three learning objectives that are intended to educate students about the environmental impacts of transport, there are also objectives aiming to educate about the importance of the impact of people's mobility habits on the environment: students learns to evaluate the implications of lifestyle habits on air pollution; they learn about how our lifestyle and habits (transport, diet, hygiene, consumption ...) impact on the environment) there are no operational objectives outlined that are directly related to sustainable mobility. However, among the overall learning objectives there are some that indirectly relate to sustainable transport issues and individual responsibility. Among the reviewed secondary school curricula there are no learning objectives (or associated content) which would educate students about sustainable mobility or that would otherwise directly tie into promoting sustainable travel habits among students, although it does include references to the concept of sustainable development. It deals with transport in a general manner, mainly considering the importance of transport networks, modes of transport, transport conditions in selected areas and the impact of certain forms of transport on the region.

Furthermore, in order to determine the extent to which education on sustainable mobility is already incorporated into Slovenian preschools and schools, and what attitudes preschool and school teachers hold toward it, as part of the mentioned project we carried out a survey of preschool and school teachers that had participated in the project.

The survey involved 81 teachers from Slovenian preschools, primary and secondary schools; 96% of respondents were female. In terms of the age of respondents, 45% were aged 40–49 years, 28% were 30–39 years, 22% were over 50 years, and only 5% were younger than 30 years. Regarding the type of educational institution from which respondents were drawn, most (51%) worked in primary schools, and more specifically 38% taught in the first triad; 28% of respondents worked in preschools; and 21% were from secondary schools. Respondents were mainly (62%) from urban schools, while looking at the distribution by statistical regions, 51% were from the Central Slovenian [Osrednjeslovenska] Statistical Region. In addition to preschool and class teachers, respondents were also primary and secondary school teachers covering most school subjects (with the exception of Physics, Mathematics, Chemistry).

The survey was conducted in the first half of 2013 via an online questionnaire prepared by using SurveyMonkey. All teachers who participated in the Educating, Informing and Raising Public Awareness about the Importance of Public Transport project were invited to complete the questionnaire. All 81 of the teachers participating in the project responded. The research methodology was based on three working methods: descriptive methods, causal effects in nonexperimental methods and quantitative methods. We used the techniques of surveying and quantitative analysis of survey results. In terms of data analysis, we standardised the data collected from surveys of preschool and school teachers then entered it into a database in the SPSS program, which we used to statistically analyse the data.

According to respondents, students gain the most knowledge on sustainable development and sustainable mobility during the subjects Learning about the Environment, Social Studies, Geography and Physical Education. A smaller number of respondents also mentioned other subjects, including History, Sociology, Civics and Ethics, Natural and Technical Sciences, Fine Arts, Biology, Chemistry, Physics, Design and Technology, Slovenian language and even Music. One respondent commented that it is very much dependent on the teacher in charge of the subject, since learning content is developed such that teachers can opt to introduce specific and more topical subjects or else skip over it.

As many as 46% of teachers rated their own knowledge of the topic of sustainable development as good, 44% assessed it as neither good nor bad, while only 5% of respondents considered their knowledge as very good or bad, respectively. And no one believed that their knowledge of the topics was very bad. Interestingly, as many as 55% of the teachers considered their knowledge of the topic of sustainable mobility to be good, 36% that it was neither good nor bad. While, 4% of them assessed their knowledge to be bad and 5% rated their knowledge of the topic very good. So too when it came to sustainable mobility nobody assessed their knowledge to be very bad. If we combine the answers "good" and "very good", then looking at the results we can see that around half of the respondents assessed their own knowledge of the topics of sustainable development (51%) and sustainable mobility (60%) as good. It is interesting that a larger proportion of teachers were confident in their knowledge of the topic of sustainable mobility.

In the main respondents (70%) got to work by car, 15% of them arrived on foot, 9% by bike, 4% by bus and 1% by bus or train. Among the reasons for the chosen mode of getting to work, respondents cited unsuitable or lacking bus connections, (too) large distances between home and school (which holds true for catching the bus or train as well as for cycling and walking), public transport that is too time-consuming, and unregulated cycling routes. The vast majority of respondents would be willing to change how they get to school, at least occasionally, if the mentioned circumstances and factors would be different. Unfortunately, their responses indicate that they do not expect this to happen anytime soon, if ever.

The survey results show that children generally travel to preschool accompanied by parents, on foot or by car. Students in the first three grades in large part are escorted to school by parents who drive them, while parents also walk them to school or else they go by school bus. Students in the second triad mainly get to school on foot,

by their parents driving them or else they ride a bike or take the school bus. In the third triad students travel to school on foot, in their parents' car, by bike or else on the school bus, while a greater proportion already use public transport, specifically buses (nobody arrived by train). Secondary school students to a much greater degree rely on public transport (both bus and train), while a greater number ride rather than walk, and some are also driven by their parents.

The main factors behind the chosen methods of getting to school, according to teachers, were the distance to preschool or school, what options were available (organised school transport, proximity to bus or train station, etc.), the requirement that children in the first triad be escorted to school, the fact that parents with a longer commute often drive, dropping off their child on the way to work, inadequate public transport, while some also linked car usage with convenience for parents.

Most respondents (62%) thought that school surroundings were pedestrian and cyclist friendly, whereas 38% considered the surroundings unfriendly. Furthermore, 73% thought that there were sufficient sidewalks and safe pedestrian crossings in the vicinity of their school, 68% commented there were no bike paths, while as many as 84% stated their school had car parking arrangements in place. Additionally, 58% of schools had safe and secure storage facilities for bicycles. A large proportion also stated there were safe and maintained bus (85%) and rail (72%) stations. Apparently, there are still many places that are not equipped for people with disabilities, indeed, 48% of respondents asked whether the school surroundings are well-set up for people with disabilities replied in the negative.

Looking at the regulation of traffic in the vicinity of preschools and schools, respondents thought that in many cases it would be necessary to renovate bicycle lanes, sidewalks, covered bus stops, provide appropriate parking facilities, upgrade roads around preschools and schools, improve interurban transport services (bus, train), increase control of drivers of passenger cars together with restricting speeding, put in place routes for the disabled and provide facilities for bicycles and motorised bicycles. In terms of passenger transport arrangements in the towns where preschools and schools are located, respondents expressed fairly similar opinions. Though in large part they stated that public transport services are adequate (especially in the case of Ljubljana), many also mentioned problems including irregular frequency of public transport services in various places, great distances between stops and schools, insufficient number of buses and trains during off-peak, i.e. outside of regular school and work commuter periods, as well as during work-free days, lack of coverage by public transport services in certain places, etc.

As many as 46% of teachers estimated that the impact of education on the behaviour of children and adolescents in traffic is large, while 41% considered it to be critical. Only 11% rated the impact as being moderate and only 2% of respondents believed that the impact of education in this regard is small.

The teachers were of the opinion that the issue of sustainable mobility was recognised as important by school administrators (some more so than others). In fact, only five of the respondents answered negatively. Respondents were very positive in their assessments of how sensible and valuable projects seeking to raise awareness and

change (ingrained) habits are; 54% considered them to be very sensible and valuable, 22% saw them as extremely valuable and 20% as moderately so. Only 4% of respondents believed that they are not sensible and offer little value. In recent years, 40% of educational institutions have taken part in at least one project that addresses sustainable mobility, 28% had been part of two projects, 7% in three, 2% in four, while 6% had been involved in five or more. Only 15% of educational institutions had not yet participated in a project related to sustainable mobility. Unfortunately, 85% of respondents did not know of any successful examples of sustainable mobility projects at other institutions. As many as 69% of respondents would like to participate in sustainable mobility projects in the future.

The teachers shared a number of suggestions on how to convince children and adolescents that sustainable mobility is important. Foremost, they believe it is necessary to talk with students about what our future will be and that of our children if we do not change some very important habits that affect our quality of life, and also, they emphasise the importance of adults (both parents and teachers) setting an example for children and adolescents to follow. They suggest that the topic could be made attractive to students by utilising interesting and varied activities, concrete actions, outreach, workshops, involvement in projects. They also pointed to the significant influence that peers' attitudes to certain issues on one hand and attitudes of parents and extended family on the other have on behaviour of individuals. In this matter, they expressed particular concern about parents' attitudes, who are often unwilling to adopt changes that alter their usual way of life.

The results of the survey of teachers were built upon in 2014 by also incorporating reflections of a different group of teachers who participated in the aforementioned project. Reflections on the situation, practices and needs were given by eight preschool teachers, seven primary school teachers and five secondary school teachers from different parts of Slovenia (Ajdovščina, Bled, Borovnica, Grosuplje, Hajdina, Kranjska Gora, Ljubljana, Nova Gorica, Rateče, Sevnica).

In all eight preschools, irrespective of their location, be it in the city or in a rural area, teachers noticed that in most cases children escorted by adults got to and from preschool by car. However, there was an exception to this for children who lived very close to preschool, in which case they tended to walk or else there were rare instances of adults riding children to preschool (and even then, only in favourable weather conditions). They commented that nobody used public transport to get to preschool. Teachers from rural preschools thought the main reason for this was that public transport was either inadequate or non-existent. Similarly, the vast majority of employees got to and from the school/preschool by car. Similar to the preschools, in all primary schools teachers, particularly in the first triad, noted that in most cases adults drove children to and from school. They also commented that regardless of whether there was or was not a parking lot, the adults tried to park their cars as close as possible to the entrance of the school. The situation was said to be worst where a preschool and school are located next to each other. Most employees got to work by car, although they mentioned that it is becoming more and more common for school staff to carpool. With the exception of a small number of primary school teachers in Ljubljana, none of the teachers relied on public transport. Older students who lived

near the school tended to get to school on foot, by bicycle, roller blades and scooter. Those living further away travelled between home and school using the school bus or minibus, with almost no one taking public transport. In five secondary schools teachers noted quite different situations in relation to transport arrangement around schools, which in turn affected road safety. While some schools could boast of adequate transport arrangements, which ensure the safety of students and employees in traffic, in other cases the situation was just the opposite (e.g. poorly maintained paths for pedestrians and cyclists, excessive distance to bus and train stations, poor public transport services). Whatever the situation, the vast majority of students practised sustainable mobility – they used public transport, bicycles, motorised bicycles or else they walked, though this was more a reflection of behaviour in a given situation rather than the conscious selection of sustainable mobility.

In preschools as well as primary and secondary schools teachers are trying to set a positive example and raise awareness among both children and parents. They also stressed the importance of participating in various projects and initiatives as well as the need for pro-active cooperation between preschools/schools and municipalities.

Children and adolescents are a relatively large and at the same time, important subset of the population in the context of mobility, indeed for their daily mobility needs they frequently depend on walking, cycling and public transport, or else they rely on parents with cars to drive them. Many international studies have also found that in the last decade children and adolescents are much less physically active than youth of previous decades. Children becoming more and more physically inactive may be partly connected with modern mobility habits, which adults (especially parents) pass onto their children. In the last decade there has been a dramatic increase in the proportion of children who are driven by parents to and from school daily. The research we conducted among geography students at the Department of Geography, Faculty of Arts, University of Ljubljana, revealed that students know a lot about the concept of sustainable mobility from a theoretical perspective and they also successfully use sustainable modes of transport for their daily mobility between home-faculty-home. However, when carrying out other daily errands and during leisure time they are much more car-centric. With aims of making people change their mobility habits in daily life, to date several important projects and activities have taken place, that remind and teach children and young people and society as a whole about the advantages of sustainable mobility. Some examples of such successful projects include: Project Connect, Living Streets – Walk once a Week, Walk or Bike to School, Car-free days, Walking buses, Let's Meet at the Station. There are also further activities we could carry out with students to promote sustainable mobility among young people in Slovenia, such as introducing a special mascot in the first three years of primary school, developing a sustainable mobility elective subject for higher grades of primary school, integrating existing maps of safe routes to school in a variety of activities, with the assistance of teachers and adults starting up a walking bus to get to school, decorating thematic buses for public transport to make it more attractive, promoting walking and cycling within the school curriculum, encouraging parents to also drive others' children to and from school (carpool), changing a few parking spaces for cars in front of the school into a more attractive space, organising a school excursion that relies on public transport, setting up special bike service stations along major

roads, organising sustainable mobility themed team building sessions for students and staff, and informing parents of the goals, objectives, advantages and benefits of sustainable mobility. We are confident that with these activities all road users would be effectively motivated to use sustainable modes of transport for getting around.

If we want children and young people to develop sustainable mobility habits they must be educated and trained to this end in a way that is interesting and fun for children. In Denmark this is widely accepted, so for instance the Danish Cyclists' Federation, together with child development expert, developed the concept of Cycling Games, which offer a fun alternative to the traditional cycling training. The aim is to teach children how to ride a bicycle primarily through playing games. Learning through the Cycling Games begins before children go to school and then continues on as part of cycling training during schooling (Schiøtt Stenbæk Madsen, 2015). Mostly they are traditional games that have been adjusted and modified to be played on a bike and through playing children learn to ride a bike well, they learn the road rules and to be careful of what is happening on the road. The concept is very flexible; it can be easily carried out in different environments and is adaptable to different sized groups, children's ages and maturity as well as their abilities/skills. The results so far indicate that learning to ride using games has a strong stimulative effect – children learn quickly through games and every year more and more children are taking part in the project. The project is very well received by parents, teachers and children, and has also spread around the world (Ruby, 2010; Kristensen, 2015).

The survey, which we carried out among students of the Department of Geography, Faculty of Arts, University of Ljubljana, revealed that young people are very familiar with the concept of sustainable mobility in a theoretical sense, whereas their theoretical knowledge and awareness of the benefits of sustainable mobility did not reflect fully in their everyday lives. It is this issue, i.e. the transfer of theoretical knowledge into everyday life, that opens up opportunities and possibilities particularly when dealing with young people, some of whom will eventually become spatial planners in the future, since we can influence them and encourage them to adopt environmentally friendly and healthy transport means in their daily mobility, thereby teaching them to live more sustainably. Only in this way, when theoretical knowledge about sustainable development is actually embedded in people's everyday lives, can we achieve the goals that are set out in the 2030 Agenda for Sustainable Development.

Povzetek

Prometni sistemi na slovenskem ozemlju imajo dolgo in bogato zgodovino. Nekatere glavne smeri so bile začrtane že v predrimskih časih in so se ohranile vse do danes. Tudi v srednjem veku je prehodnost Slovenije v grobem že spominjala na današnje tranzitne koridorje. Ozemlje Slovenije je bilo pogosto na prehodu pomembnejših političnih tvorb, ki so se oblikovale jugozahodno od današnje Slovenije ter severno ali severovzhodno od nas. Na sredini 19. stoletja je bila v slovenskih deželah hitro izgrajena železnica, ki je pustila v prostoru velik pečat, spodbudila gospodarski razcvet naselij ob progi in postopen zaton tistih ob tovorniških poteh. Motorizacija je vstopila v Slovenijo razmeroma pozno, a je v povojnih desetletjih povsem zaznamovala prometni sistem Slovenije in postopno prevzela primat železnic. V prvih povojnih desetletjih še v obliki javnega potniškega prometa (avtobusi), nato pa vse bolj v obliki individualnega (avtomobilskega) prometa, ki je postajal ne le simbol blaginje in svobode gibanja, pač pa tudi statusni simbol. Še leta 1955 je na 1000 prebivalcev v Sloveniji prišlo le eno osebno vozilo in pol, leta 1970 je motorizacija znašala 88 osebnih vozil na 1000 prebivalcev, leta 2010 pa smo dosegli vrednost 519, ki velja tudi za leto 2014, kar nakazuje na umirjanje motorizacije, saj je se je približala optimumu v danih razmerah. Tudi ostali kazalci kažejo, da je avtomobil postal nesporen kralj slovenske mobilnosti. To ni izključno slovenska značilnost, saj je prisotna povsod v gospodarsko razvitem svetu. Lahko celo trdimo, da se v zadnjih desetletjih motorizacija in hitra rast lastništva osebnih avtomobilov pospešeno širi tudi tja, kjer do sedaj ni bilo tako. To so predvsem območja v Aziji, na primer Kitajska, Jugovzhodna Azija in Indija.

Podatki o opravljenem prometu na slovenskih cestah nam pokažejo zgovorno sliko. Na avtocestah, ki znašajo le 9,3 % dolžine državnih cest, je bilo v letu 2014 izvedenega kar 49 % prometa v Sloveniji, na glavnih cestah (12,4 %) pa 17 % prometa. Na ostalih državnih cestah (78 %) je bilo opravljenega 34 % vsega prometa. Po podatkih DARS je povprečni dnevni promet na slovenskih avtocestah znašal 29.495 vozil (Prometne obremenitve, 2014). Vidimo torej, da so avtoceste postale ključna infrastruktura slovenskega prometnega sistema, brez katere si prometa v Sloveniji in skozi njo več ne predstavljamo. Današnja dolžina železniške infrastrukture je zelo podobna tisti pred desetletji. Leta 2013 je znašala 1209 km, od tega le 330 km dvosmernih prog in 500 km elektrificiranih prog (Dolžina železniških prog …, 2013). A še bolj zgovorna je primerjava s preteklimi desetletji, ki nam pokaže, da so bila vlaganja v železniško infrastrukturo v drugi polovici 20. stoletja usmerjena zgolj v vzdrževanje in posodabljanje obstoječe mreže.

Promet povzroča tudi obremenjevanje okolja. Okoljske učinke prometa lahko delimo na učinke na zrak, vodo, tla in prostor v celoti. Če pri vplivih prometa na družbo lahko govorimo o pozitivnih in negativnih vplivih, so vplivi prometa na naravo in okolje oziroma okoljske sestavine z ekosistemskega vidika praviloma vedno negativni. Poglejmo najprej vplive prometa na prostor.

Promet je velik porabnik prostora, saj se večinoma še vedno odvija po kopnem. Ne glede na vrsto prometa (kopni, zračni ali vodni) so velik porabnik prostora terminali, pri čemer še posebej izstopajo tovorni terminali, kjer tovor lahko ostane tudi dlje časa v večjih količinah. To velja zlasti za luke, manj pa za letališča in železniške postaje.

Promet oziroma prometna infrastruktura marsikje deli prostor. Infrastruktura pogosto predstavlja nepremostljivo oviro za prehod številnih živali in ponekod vpliva na zmanjšanje populacij zaradi povoza na cestah in železniških progah. Motoriziran promet za vir energije skoraj v celoti uporablja fosilna goriva, uporaba oziroma izgorevanje fosilnih goriv pa povzroča povečan učinek tople grede in globalno segrevanje. Tako prometni prispevek k skupnim izpustom toplogrednih plinov na globalni ravni nikakor ni zanemarljiv. V EU je prometni delež izpustov ocenjen na 23 % vseh izpustov toplogrednih plinov (Greenhouse gas …, 2016), v ZDA pa njegov delež znaša 26 % (EPA, 2016). V procesu onesnaževanja ozračja se v zrak neposredno sproščajo ogljikovodiki, dušikovi oksidi, večji in manjši delci, ki jim pravimo primarna onesnaževala. Ta in druga onesnaževala pa lahko med seboj reagirajo in tvorijo nova onesnaževala, tako imenovana sekundarna onesnaževala. Dokler je bilo prometa malo, so bili tudi skupni izpusti nepomembni, ko pa se je število prometnih sredstev na Zemlji močno povečalo, je promet postal pomemben dejavnik onesnaževanja ozračja. S prometne infrastrukture se v tla, preko tal v podtalnico ali v površinske vode prenašajo snovi, ki so odpadne snovi prometa. To so lahko maziva ali goriva, ki uhajajo iz vozil, pa tudi razsuti ali razliti tovor, ki lahko povzroči nenadno onesnaženje večjih razsežnosti. Ne smemo pa pozabiti tudi na snovi, ki jih nanašamo na vozišče, na primer sol proti poledici, ostanki barv za prometno signalizacijo, herbicidi, s katerimi zatiramo plevel ob železniških progah in v manjši meri tudi na robu vozišč.

Trajnosten pogled na promet zahteva drugačno hierarhijo prometnih udeležencev od dandanes uveljavljene. V klasičnem pogledu je najpomembnejši člen avtomobil, najšibkejši pa pešec. Koncept trajnostne mobilnosti v središče postavi pešca in nemotorizirane oblike prometa, nato sledijo sredstva javnega potniškega prometa in gospodarska vozila, potem osebna vozila z več potniki, osebna vozila z le eno osebo pa pridejo šele kasneje. Danes prometni sistem temelji skoraj izključno na rabi fosilnih goriv. Zaloge nafte na Zemlji so razporejene zelo neenakomerno, s čimer se povečuje moč držav proizvajalk nafte oziroma korporacij, ki jo prodajajo in s temi viri upravljajo. Hkrati se velika večina držav, ki teh virov nimajo, nahaja v podrejenem položaju in s tem slabi tudi njihova geopolitična vloga. Z vpeljavo trajnostnih sistemov mobilnosti se potrošnja nafte na opravljeno prometno delo zmanjša, z vpeljavo elektro mobilnosti pa lahko energijo za delovanje teh sredstev pridobimo tudi iz številnih drugih, obnovljivih virov (hidroenergija, energija vetra, energija Sonca, …), kar poleg zmanjšane odvisnosti od proizvajalcev nafte pomeni tudi večjo diverzifikacijo energetske oskrbe, pogosto tudi rast zelenih delovnih mest in manjši odliv finančnih sredstev v tujino – tistih sredstev, ki smo jih dotlej namenjali za nakup nafte oziroma njenih derivatov.

Prometni sistem, v katerem prevladuje individualna avtomobilska mobilnost, je drag in socialno nepravičen. Pogosto pozabljamo, da velik del prebivalstva ne sme ali ne more voziti avtomobila. To so otroci in mladi pod starostno mejo za dodelitev vozniškega dovoljenja, starejši ljudje, ljudje z različnimi motnjami, ki jim onemogočajo

vožnjo, ter ljudje, ki si stroška osebnega avtomobila in njegovega vzdrževanja ne morejo privoščiti. Čeprav mnogi od njih plačujejo davke, jim javna vlaganja v ceste ne pomagajo veliko, saj ne vozijo. V klasičnih prometnih sistemih so te skupine ljudi odrinjene od priložnosti in koristi, ki bi jih bili deležni ob večji stopnji mobilnosti, kar poleg osebnih stisk in problemov povzroča tudi gospodarsko škodo državi, saj so ljudje tako tudi manj zaposljivi, torej manj zaslužijo in plačajo manj davkov. V klasičnem konceptu načrtovanja prometa, ki prevladuje od začetka motorizacije, je uveljavljeno načelo, da zastoje na prometni infrastrukturi najlažje rešimo z gradnjo nove infrastrukture ali s povečanjem zmogljivosti obstoječe. A po drugi strani se pozablja dejstvo, da nova infrastruktura poveča prometno povpraševanje in tako se hitro znajdemo v spirali, ko nova cesta povzroča še več prometa, več prometa pripelje do zastojev, zastoji pa narekujejo novo gradnjo. Poleg prostorske potratnosti je tak način urejanja prometnega povpraševanja prej ali slej tudi finančno nevzdržen. Namesto tega koncepta je v državah, kjer promet razvijajo bolj trajnostno, v veljavo stopilo načelo bolj optimalnega izkoriščanja obstoječe prometne infrastrukture. To pomeni, da upravljamo prometne tokove v smislu večje in lažje pretočnosti ljudi (ne vozil), spodbujamo večjo zasedenost vozil in v izogib zastojem spodbujamo uporabo javnega potniškega prometa, kjer lahko avtobus nadomesti več kot 50 vozil, vlak pa več kot nekaj sto. V 20. stoletju so tako avtomobili zavzeli mesta in z mestnih površin začeli izrivati mestno življenje. K sreči so te trende marsikje kmalu opazili in začeli s postopnim umirjanjem prometa in vrnitvijo mestnih površin mestnim interakcijam, mestnemu življenju. Med najbolj znanimi koncepti umirjanja prometa v mestih in vračanja mest ljudem je koncept danskega arhitekta Jana Gehla (Gehl, 2017), do danes pa smo tudi v Sloveniji marsikje že spoznali, da so mestne površine lahko funkcionalno precej bolje izkoriščene, če jih vrnemo ljudem in avtomobile postopno odvračamo od poti v središča mest. Največji preskok na tem področju v Sloveniji je naredila Ljubljana, ki že od leta 2006 (Ravbar, 2015) postopno za promet zapira mestno središče, leta 2013 pa je zaprla tudi Slovensko cesto, glavno prometno os središča Ljubljane, po kateri od tedaj vozi le javni promet in dostava – sicer pa na njej velja prometna ureditev deljenega prostora. Tehnologija igra pomembno vlogo v prehodu na trajnostni način mobilnosti. V težnji povečevanja energetske učinkovitosti, zmanjševanja prometnega onesnaževanja ozračja in odvisnosti od fosilnih goriv se počasi uveljavljajo motorji na električni pogon in hibridni motorji. Prehod na emisijske standarde EURO je bistveno zmanjšal izpuste iz prometa, ki v Sloveniji kumulativno ne naraščajo več, čeprav promet še vedno narašča. Res je, da tudi električna mobilnost potrebuje energijo, ki jo še vedno proizvajamo netrajnostno, a procese proizvodnje električne energije v elektrarnah je bistveno lažje nadzorovati glede izpustov in ostale okoljske zakonodaje.

Prostorsko načrtovanje ima pomembno vlogo pri uveljavljanju trajnostne mobilnosti. Prometno načrtovanje pa mora biti sestavni del prostorskega načrtovanja in slediti ciljem trajnostnega razvoja, med katere zagotovo sodi cilj optimalne energetske in prostorske učinkovitosti. V prometnem načrtovanju moramo zagotoviti prednost trajnostnim prometnim oblikam, kot so javni promet, kolesarjenje, hoja, avtomobili z več potniki, avtomobili na alternativne vire energije in podobno. Za večje generatorje prometa na vseh ravneh potrebujemo instrumente trajnostnega prometnega načrtovanja. Tako je nujno za podjetja in javne ustanove vpeljati mobilnostne načrte, ki

morajo slediti ciljem trajnostnega prometa in urejati dnevno mobilnost teh ustanov s ciljem doseganja čim večje trajnostnosti. Za večja območja promet načrtujemo s celostnimi prometnimi strategijami (občine, mesta, večja naselja, lahko pa tudi manjše prostorske enote kot so deli mest), na še višji ravni pa trajnostni promet vpeljemo s prometnimi politikami občin, regij ali države. Prometne politike so običajno ugnezdene v prometne strategije, te pa morajo biti sestavni del strategije prostorskega razvoja neke države.

Slovenija je krovne dokumente prometne politike sprejela pozno in pri tem ni upoštevala logične hierarhije nastajanja tovrstnih dokumentov. Kot krovni dokument prometne politike je od maja 2006 v veljavi Resolucija o prometni politiki RS (RePPRS) z naslovom Intermodalnost: čas za sinergijo (Resolucija …, 2006), od leta 2015 pa tudi Strategija o razvoju prometa v Republiki Sloveniji, katere izvajanje bolj podrobno določa Resolucija o nacionalnem programu razvoja prometa v Republiki Sloveniji za obdobje do leta 2030. Slovenska prometna politika oziroma njeni dokumenti vsaj v načelu omenjajo tudi Belo knjigo o prometu, na žalost pa ne omenjajo Agende za trajnostni razvoj do leta 2030. Prav tako v večjem delu niso bile upoštevane Teze za trajnostno prometno politiko. Strnemo lahko, da dokumenti slovenske prometne politike trajnostno mobilnost sicer omenjajo, a je ne integrirajo kot sestavino vseh prometnih sistemov in ukrepov, pač pa bolj kot eno od vsebin prometne politike. Moderen, trajnostno zasnovan prometni sistem danes trajnostni pristop integrira v prometno politiko pri vseh prometnih načinih in na vseh ravneh prometnega načrtovanja.

V okviru projekta *Izobraževanje, informiranje in ozaveščanje javnosti o pomenu javnega potniškega prometa* smo z vidika vključenosti trajnostne mobilnosti v vzgojno-izobraževalni proces pregledali kurikulum za vrtce ter učne načrte izbranih predmetov v osnovni in srednji šoli. Na ravni osnovne šole smo za natančen pregled izbrali učne načrte tistih predmetov, za katere smo predvidevali, da bi lahko vključevali vsebine, povezane s trajnostno mobilnostjo. Pri pregledu smo se osredotočili na učne cilje, zapisane v veljavnih učnih načrtih naslednjih predmetov osnovnošolskega izobraževanja: geografija (obvezni predmet), geografija (izbirni predmet), spoznavanje okolja (obvezni predmet), družba (obvezni predmet), državljanska in domovinska vzgoja ter etika (obvezni predmet), okoljska vzgoja (izbirni predmet) (Ogrin in sod., 2013). Na ravni srednje šole so bili pregledani učni načrti gimnazijskih programov (splošna, klasična, ekonomska, strokovna gimnazija) izbranih predmetov (Otrin in sod., 2013): geografija (obvezni predmet in dodatne vsebine za maturo), okoljska vzgoja kot vzgoja in izobraževanje za trajnostni razvoj (medpredmetno področje), študij okolja (izbirni predmet), sociologija (obvezni in izbirni predmet ter dodatne vsebine za maturo).

Temeljni namen raziskave v monografiji je bil ugotoviti, v kolikšni meri je izobraževanje za trajnostno mobilnost že prisotno v slovenskih vrtcih in šolah ter kakšen odnos imajo do njega vzgojitelji in učitelji. V raziskavi, ki je potekala v sklopu projekta *Izobraževanje, informiranje in ozaveščanje javnosti o pomenu javnega potniškega prometa*, je sodelovalo 81 vzgojiteljev ter učiteljev osnovnih in srednjih šol v Sloveniji, od tega je bilo 96 % anketiranih ženskega spola. Po mnenju anketirancev učenci največ znanja o trajnostnem razvoju in trajnostni mobilnosti pridobijo pri spoznavanju okolja, družbi, geografiji in športni vzgoji. Med ponujenimi definicijami trajnostnega

razvoja se je kar 85 % anketirancev odločilo za strokovno najbolj ustrezno definicijo, ki pravi: »Trajnostni razvoj pomeni sonaravnost, podkrepljeno z ekonomskim in socialnim stebrom. To pomeni, da poleg skrbi za izkoriščanje naravnih virov do stopnje njihove regeneracije trajnostni razvoj skrbi tudi za to, da se družba razvija socialno pravično ter ekonomsko uspešno.« Med ponujenimi definicijami trajnostne mobilnosti se je 99 % vprašanih odločilo za strokovno najbolj ustrezno definicijo, ki pravi: »Trajnostna mobilnost je sestavni del trajnostnega načina življenja. To pomeni, da z njo ne izkoriščamo naravnih virov preko njihove sposobnosti obnavljanja in bo kot taka omogočena tudi naslednjim generacijam. Med trajnostno mobilnost sodijo na primer vožnja z javnim prometom, uporaba koles, pešhoja, uvajanje čistejših tehnologij v avtomobilskem prometu, hkrati pa je pomembno tudi ustrezno prostorsko in prometno načrtovanje ter način življenja, ki za enako kakovost življenja zmanjšuje potrebe po dnevnih potovanjih.« Največji delež anketirancev (70 %) prihaja na delovno mesto z osebnim avtomobilom. 15 % jih prihaja peš, 9 % s kolesom, 4 % z avtobusom in 1 % z avtobusom ali vlakom. Med vzroki za izbrani način prihoda na delo navajajo neustrezne oz. pomanjkljive avtobusne povezave, (pre)veliko oddaljenost doma od šole (kar velja tako za uporabo avtobusa oz. vlaka kot za vožnjo s kolesom in pešhojo), preveliko porabo časa v primeru koriščenja javnega prevoza in neurejene kolesarske poti. Svoj način prihoda v šolo bi bila velika večina anketirancev pripravljena vsaj občasno spremeniti, če bi se spremenile že omenjene okoliščine oz. razlogi. Anketiranci ugotavljajo, da je okolica šol v večjem deležu pešcem in kolesarjem bolj prijazna (62 %) kot neprijazna (38 %); da so v okolici šol pločniki in varni prehodi za pešce (73 %); da nimajo urejene kolesarske steze (68 %), medtem ko jih ima kar 84 % urejeno parkirišče za avtomobile. 58 % šol ima urejen in varen prostor za kolesa. Kar 46 % anketirancev ocenjuje, da je vpliv vzgoje na obnašanje otroka in mladostnika v prometu velik, 41 % pa jih meni, da je odločilen. Podobno kot v vrtcih tudi v izbranih osnovnih šolah učitelji predvsem prve triade opažajo, da odrasli otroke največkrat pripeljejo in pridejo iskat z avtom, pri čemer se ne glede na (ne)obstoječa parkirišča skušajo z avtom čim bolj približati vhodu v šolsko poslopje. Situacija je najslabša tam, kjer se zraven šole nahaja tudi vrtec. Večina zaposlenih prihaja na delovno mesto z avtomobilom, pri čemer pa omenjajo, da se vedno več zaposlenih poslužuje skupne uporabe enega avtomobila. Javnega potniškega prometa se, z izjemo manjšega števila zaposlenih v ljubljanskih osnovnih šolah, ne poslužujejo. Starejši učenci, ki stanujejo v bližini šole, prihajajo v šolo peš, s kolesi, rolerji in tudi skiroji.

V zadnjem desetletju je bilo zaradi poudarjanja pomena trajnostnega razvoja veliko govora o vključitvi vsebin trajnostnega razvoja tudi v vzgojno-izobraževalne ustanove. Države po svetu so se tega lotile na različne načine – mnoge so v šolah začele izvajati različne projekte, s pomočjo katerih želijo spremeniti navade mladih (tudi mobilnostne) v smeri trajnostnega razvoja, nekateri učitelji so vsebine trajnostnega razvoja in trajnostne mobilnosti samoiniciativno vključili v vsebine svojih predmetov, v drugih državah pa so uspeli s prenovo kurikularnih dokumentov vsebine trajnostnega razvoja (tudi mobilnosti) vključiti tudi v učne cilje posameznih predmetov. V Sloveniji je prenova učnih načrtov sovpadla z obdobjem intenzivnejše prisotnosti projektov, vezanih na trajnostni razvoj, zato so v letih 2008–2010, ko je potekala prenova učnih načrtov, uspeli v nekatere učne načrte vključiti tudi vsebine trajnostnega razvoja. Poudariti pa velja tudi, da se zaradi vse večjega poudarjanja nujne prisotnosti

trajnostnega razvoja v vzgoji in izobraževanju, kaže velika potreba po izobraževalnih seminarjih za učitelje, ki s svojim znanjem in zgledom mlade poučujejo o trajnostnem razvoju. Učitelju je treba tako ponuditi primere, kako lahko svoje učence in dijake učinkovito poučuje o trajnostnem razvoju in tudi trajnostni mobilnosti.

Delo se posveča tudi odnosu študentov do trajnostne mobilnosti. V raziskavi, ki je bila izvedena decembra 2016 med študenti prvega letnika prvostopenjskega univerzitetnega študijskega programa geografija in prvostopenjskega univerzitetnega dvodisciplinarnega študijskega programa geografija na Filozofski fakulteti Univerze v Ljubljani, je bil cilj ugotoviti, kaj si študenti predstavljajo pod pojmom trajnostna mobilnost, kako dojemajo trajnostno mobilnost in kako koncept trajnostne mobilnosti prenašajo v svoje vsakodnevno življenje. Večina anketiranih študentov (56 %) je za pojem trajnostna mobilnost slišala v srednji šoli, 6 % pa že v osnovni šoli. Kar 37 % vprašanih je za trajnostno mobilnost prvič slišalo na fakulteti. Raziskava je pokazala, da se vsakodnevne mobilnostne navade anketirancev tudi v času visokošolskega izobraževanja niso kaj dosti spremenile. Le 11 % anketirancev namreč vsakodnevno na fakulteto prihaja z osebnim avtomobilom, medtem ko večina (56 %) prihaja z avtobusom, 13 % peš, 7 % z vlakom, 5 % s kolesom, 4 % pa s souporabo avtomobila. Izbor trajnostnih sredstev mobilnosti pri premagovanju razdalje dom–fakulteta lahko povežemo tudi s subvencioniranimi vozovnicami mestnega in primestnega potniškega prometa, saj se večina študentov odloči za tovrstni način prevoza predvsem zaradi nižjih stroškov v primerjavi z vsakodnevno vožnjo z avtomobilom. Na splošno so študenti v anketi izpostavili, da je za njihove mobilnostne potrebe v Ljubljani dobro poskrbljeno, še posebej so izpostavili prednosti, dobre povezave in cenovno ugodne prevoze ljubljanskega javnega potniškega prometa (LPP). Za izboljšanje trajnostne mobilnosti v Ljubljani so predlagali vzpostavitev novih prog LPP, ki bi zagotavljale hitrejši in pogostejši prevoz, uvedbo več prog javnega prometa v nočnem času, več postajališč za BicikeLJ, več koles za izposojo in več zaprtih cest za osebna vozila, nekateri pa so poudarili tudi večji pomen oglaševanja, s katerim bi občina prebivalce spodbujala k uporabi javnega prometa oziroma sredstev trajnostne mobilnosti.

Glede na izvedeno raziskavo ugotavljamo, da študenti prvih letnikov Oddelka za geografijo Filozofske fakultete Univerze v Ljubljani v teoretičnem smislu dobro poznajo koncept trajnostne mobilnosti in sredstva trajnostne mobilnosti učinkovito uporabljajo tudi v vsakodnevni mobilnosti na relaciji dom–fakulteta–dom, medtem ko so pri opravljanju drugih vsakodnevnih obveznosti in pri preživljanju prostega časa veliko bolj vezani na prevoz z avtomobilom.

Da lahko prometni sistem označimo kot trajnostni, sonaravni, mora ta upoštevati vse tri dimenzije trajnosti – okoljski, ekonomski in družbeni vidik. V svetu, Evropi in Sloveniji smo priča mnogim primerom, ki na različne načine poskušajo zmanjšati vpliv prometa na okolje, narediti promet bolj prijazen in dostopen za ljudi ter povečati njegovo gospodarsko učinkovitost. Take primere pogosto imenujemo kar primeri dobre prakse. V prikazu primerov dobre prakse se knjiga osredotoči na tri primere. V prvem opiše uvajanje kolesarjenja oziroma kolesarskih iger v osnovne šole na Danskem. Danska je država, ki si jo brez kolesarjenja težko predstavljamo. Kolesarjenje je del njihove kulture. Danci zase pravijo, da je razlog, da toliko in tako pogosto kolesarijo v tem, da začnejo kolesariti že zelo zgodaj, a v zadnjem obdobju število kolesarjev med

šolarji upada. Da bi ustavili trend padanja števila kolesarjev, so se odločili ukrepati z izboljšanjem varne kolesarske infrastrukture in drugimi mehkimi ukrepi promocije kolesarke kulture (Denmark – on your bike!, 2014). V letu 2008 je Danska kolesarska federacija skupaj s strokovnjaki na področju razvoja otrok razvila koncept kolesarskih iger, ki predstavlja zabavno alternativo tradicionalnemu kolesarskemu usposabljanju. Namen iger je razširiti veselje nad kolesarjenjem na nove generacije in zmanjšati upad števila otrok, ki kolesarijo. Gre za usposabljanje za vožnjo s kolesom, katerega bistvo je igra. Otroci med igro ne razmišljajo o tem, da se učijo voziti kolo, ampak korak za korakom postajajo spretni kolesarji (Ruby, 2010). Učila in učne pripomočke učitelji skupaj z otroki preizkusijo tudi sami, zaradi česar je večja možnost, da bodo ti pripomočki popolnoma integrirani in posledično bolj uporabljeni (Schiøtt Stenbæk Madsen, 2015). Izkušnje kažejo, da uporabniki v splošnem razvijejo nove igre ali jih prilagodijo tako, da ustrezajo njihovim željam in potrebam. Dosedanji danski rezultati učenja kolesarjenja preko igre so zelo stimulativni. Interes vrtcev za kampanjo »We can bike!«, ki uvaja koncept kolesarskih iger v učni načrt, je zelo velik in se iz leta v leto povečuje. V letu 2015 se je število otrok, vključenih v projekt, v primerjavi z letom 2014 podvojilo (z 2.000 vključenih otrok na 4.000 otrok), v letu 2016 pa se je to število glede na leto 2015 še enkrat podvojilo (8.000 otrok).

Drugi primer dobre prakse opiše oživitev lokalne proge na Južnem Tirolskem. Lokalno železniško progo Merano–Malles so italijanske železnice v 90. letih 20. stoletja zaradi racionalizacije ukinile, leta 2005 pa je bila ponovno oživljena (Von Rainer, 2009). Prišli so do ugotovitve, da morajo za privlačnejši železniški promet poiskati inovativnejšo rešitev. Strokovnjakom je uspelo prepričati odločevalce, da je treba progo obnoviti tako, da bo zanesljiva, varna in kakovostna, z nizkimi obratovalnimi stroški. Pred otvoritvijo prenovljene proge so avtobusni prevozniki v dolini prepeljali milijon potnikov na leto. Po otvoritvi proge so večino regionalnih avtobusnih prog v dolini ukinili, prebivalcem pa prvih šest mesecev omogočili brezplačen prevoz z novimi udobnimi vlaki. Cilj ob odprtju proge leta 2005 je bil doseči 1,8 milijona potnikov do leta 2010, a so že leta 2009 na progi zabeležili 2,9 milijona potnikov. Eden najpomembnejših rezultatov je zmanjšanje avtomobilskega prometa na glavni cesti, ki povezuje Merano z Mallesom.

Tretji primer dobre prakse je doma v Sloveniji in govori o subvencionirani ceni vozovnic za dijake in študente. Pretekli sistem subvencioniranja prevozov dijakov in študentov v Republiki Sloveniji, ki je bil v veljavi do septembra 2012, je mlade odvračal od uporabe javnega prevoza (Habjanič, 2015). Nudil jim je finančni dodatek za bivanje in prevoz v okviru državne ali Zoisove štipendije, s katerim pa so upravičenci lahko prostovoljno razpolagali. Na ministrstvu, zadolženem za promet, so tedaj oblikovali nov model subvencioniranja. Pri oblikovanju modela so se zgledovali po uporabljenem modelu avstrijske zvezne dežele Štajerske, ki je po velikosti, geografskih značilnostih (relief, poselitev, demografske značilnosti) in ekonomskih značilnostih vpeljave sistema enotne vozovnice leta 1994 primerljiva s Slovenijo (Hočevar in sod., 2011). V letu 2015 so bile sprejete nove spremembe in dopolnitve Zakona o prevozih v cestnem prometu (Uradni list RS, 92/15). Projekt subvencioniranih vozovnic so v septembru 2016 nadgradili z uveljavitvijo enotne integrirane vozovnice javnega potniškega prometa (IJPP), ki skuša urediti področje integriranih prevozov. Pred uvedbo vozovnice je lahko upravičenec izbiral le med enim prevoznikom, z enotno vozovnico

pa lahko za isto ceno izbira med različnimi prevozniki in vrstami javnega prometa na izbrani medkrajevni relaciji (Subvencionirana vozovnica …, 2016). Uvedba celotnega projekta je pomenila zagotovitev enakih možnosti in dostopa dijakov in študentov do izobraževanja. Zakon je tako vsa finančna sredstva, ki so bila prej namenjena dodatku za prevoz in deloma dodatku za bivanje, preusmeril v financiranje subvencioniranih prevozov. Cenovna politika je kar za 50 % znižala plačilo upravičencev in tako bistveno znižala stroške mobilnosti gospodinjstev. Število potnikov na medkrajevnem avtobusnem prevozu je v letu 2012 znašalo 24.793.000 in se je do leta 2015 povečalo za 2.943.000 (na 27.736.000). V železniškem notranjem potniškem prometu pa od leta 2012 beležimo celo rahel upad (s 14.622.000 v letu 2012 na 13.792.000 v letu 2015). Zmanjšanje števila potnikov je mogoče deloma razložiti tudi s tem, da so se upravičenci do subvencionirane vozovnice, preden je bila v letu 2016 uvedena enotna vozovnica IJPP, morali odločiti za vožnjo z enim izbranim prevoznikom in tako niso mogli uporabljati več vrst javnega prevoza. Zaradi večje pokritosti povezav s cestnim javnim potniškim prometom se je tako večji delež dijakov in študentov odločil za vožnjo z avtobusom. Kakšen bo vpliv uvedbe integrirane enotne vozovnice IJPP na obseg železniškega notranjega potniškega prometa bo vidno čez nekaj let. Podatki o javnem potniškem prometu v Sloveniji nam kažejo, da je že z ustreznimi finančnimi ukrepi mogoče povečati število uporabnikov javnega potniškega prometa. Nadaljevanje trenda pa terja celostni pristop, ki zahteva aktivno vlogo upravljavca, da ostane oz. postane javni potniški promet konkurenčen in samozadosten.

References

6 cycling games. Fun cycle training for all children. 2010. Copenhagen, The Cycling Embassy of Denmark. Retrieved from http://www.cycling-embassy.dk/wp-content/uploads/2010/06/Cykelleg_engelsk_endelig.pdf (24.12.2016).

Augenstein, K., 2014. Analysing the potential for sustainable e-mobility – The case of Germany. Environmental Innovation and Societal Transitions, 14, pp. 101–115.

Autonomous Province of South Tyrol. Department of Transport. STA. Retrived from http://www.suedtirolbahn.bz.it/ (24.12.2016).

Avram, S., 2014. Sustainable development – compromise all solution. What is the place of geography in this context? Procedia Economies and Finance, 15, pp. 595–602.

Azeiteiro, U. M., Bacelar-Nicolau, P., Caetano, F., Caeiro, S., 2014. Education for sustainable development through e-learning in higher education: experiences from Portugal. Journal of Cleaner Production, 106, pp. 308–319.

Banister, D., 2008. The sustainable mobility paradigm. Transport policy, 15, Oxford University Centre for the Environment, Oxford, pp. 73–80.

Bech, L., 2015. Colombian children learn to bike the Danish way. Danish bicycle games for Japanese children. Cycling Embassy of Denmark. Retrieved from http://www.cycling-embassy.dk/2015/05/22/colombian-children-learn-to-bike-the-danish-way/ (24.12.2016).

Bech, L., 2016. Santiago de Chile wins award with cycling games in kindergartens. Danish bicycle games for Japanese children. Cycling Embassy of Denmark. Retrieved from http://www.cycling-embassy.dk/2016/08/08/santiago-de-chile-wins-award-implements-cycling-games-kindergartens/ (24.12.2016).

Bela knjiga o prometu. Načrt za enotni evropski prometni prostor – na poti h konkurenčnemu in z viri gospodarnemu prometnemu sistemu. 2011. Bruselj, Evropska komisija, 31 p. Retrieved from http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2011:0144:FIN:SL:PDF (10.12.2016).

Best Practice Report with hubs benchmark. Joint concept for Rail hub integration and interconnection. 2013. Bologna, Province of Bologna, 43 p. Retrieved from http://rail4see.eu/wp-content/uploads/2012/10/6.1_Best-Practice-Report.pdf (24.12.2016).

Bicycle Statistics from Denmark. Cycling Embassy of Denmark. 2015. Retrieved from http://www.cycling-embassy.dk/wp-content/uploads/2009/03/Fact-sheet_English.pdf (24.12.2016).

Bogić, M., 1998. Tiri in čas. Pregled razvoja železniškega omrežja v Sloveniji in okolici. Ljubljana, Slovenske železnice – Železniški muzej, 36 p.

Bole, D., 2004. Daily mobility of workers in Slovenia. Acta geographica Slovenica, 44-1, pp. 25–45.

Bole, D., 2015. Spreminjanje prometne rabe zemljišč v Sloveniji. Ljubljana, Geografski inštitut Antona Melika ZRC – SAZU, 74 p.

Bresson, G., Dargayb, J., Madre, J., Pirotte, A., 2003. The main determinants of the demand for public transport: a comparative analysis of England and France using shrinking estimators. Transportation Research Part A: Policy and Practice, 37, 7, pp. 605–627. Retrieved from http://ac.els-cdn.com.nukweb.nuk.uni-lj.si/S0965856403000090/1-s2.0-S0965856403000090-main.pdf?_tid=c81aac86-0bb9-11e7-8d62-00000aacb35d&acdnat=1489828001_c694ab86224905fdb7b2d-fcf61069616 (24.12.2016).

Britz Nicolaisen, B. C., Schiøtt Stenbæk Madsen, J., 2013. It Pays Off to Bike to School. Cycling Embassy of Denmark. Retrieved from http://www.cycling-embassy.dk/2013/08/26/it-pays-off-to-bike-to-school/ (24.12.2016).

Buckley, A., Lowry, M. B., Brown, H., Barton, B., 2013. Evaluating safe routes to school events that designate days for walking and bicycling. Transport Policy, 30, pp. 294–300.

Canters, R., Lambert, L., Ishfag, S., Hardy, P., 2015. Connect project. Retrieved from http://www.schoolway.net/docs/CONNECT_booklet0.pdf (8.5.2015).

Car free school days. Retrieved from http://peterboroughmoves.com/ (7.11.2015).

Cestna vozila in prve registracija cestnih vozil glede na vrsto vozila, Slovenija, letno, 2017. Retrieved from http://pxweb.stat.si/pxweb/Dialog/varval.asp?ma=2222102S&ti=&path=../Database/Ekonomsko/22_transport/08_22221_reg_cestna_vozila/&lang=2 (20.3.2017)

Cestni javni linijski potniški prevoz (medkrajevni in mednarodni), Slovenija, letno, 2010–2015. Statistični urad Republike Slovenije. Retrieved from http://pxweb.stat.si/pxweb/Dialog/viewplus.asp?ma=H058S&ti=&path=../Database/Hitre_Repozitorij/&lang=2 (24.12.2016).

Cestno omrežje, 2013. Statistični letopis Slovenije 2013. Retrieved from http://www.stat.si/StatWeb/doc/letopis/2013/21_13/21-20-13.html (9.12. 2016).

Cilji trajnostnega razvoja. Ministrstvo za zunanje zadeve Republike Slovenije. 2015. Retrieved from http://www.mzz.gov.si/si/zunanja_politika_in_mednarodno_pravo/mednarodno_razvojno_sodelovanje_in_humanitarna_pomoc/politike_mrs/cilji_trajnostnega_razvoja/ (10.1.2017).

Cramer, K., 2016a. CED abroad: Danish Bicycle Games for Japanese children. Cycling Embassy of Denmark. Retrieved from http://www.cycling-embassy.dk/2016/10/06/bicycle-games-japanese-kids/ (24.12.2016).

Cramer, K., 2016b. CED abroad: Danish Bicycle Games in Rio de Janeiro. Cycling Embassy of Denmark. Retrieved from http://www.cycling-embassy.dk/2016/09/23/danish-bicycle-games-rio-de-janeiro/ (24.12.2016).

De Jong, W., Vogels, J., van Wijk, K., Cazemier, O., 2011. The key factors for providing successful public transport in lowdensity areas in The Netherlands. Business & Management, 2, pp. 65–73. Retrieved from http://www.sciencedirect.com/science/article/pii/S2210539511000216 (24.2.2016).

Delež otrok v EU-ju se povsod zmanjšuje, izjema le Danska. RTVO SLO. 2015. Retrieved from https://www.rtvslo.si/evropska-unija/delez-otrok-v-eu-ju-se-povsod-zmanjsuje-izjema-le-danska/363020 (3.11.2015).

Denmark – on your bike! The national bicycle strategy. 2014. Copenhagen, Ministry of Transport, 72 p.

Dolžina železniških prog. Statistični letopis Slovenije 2013. 2013. Ljubljana, Statistični urad Republike Slovenije. Retrieved from http://www.stat.si/StatWeb/doc/letopis/2013/21_13/21-02-13.html (9.11.2016).

EKO-Popotnik. Retrieved from http://www.schoolway.net/index.phtml?id=1204&ID1=1072&sprache=en (3.12.2015).

EPA. Greenhouse Gas Emissions. Retrieved from https://www.epa.gov/ghgemissions/sources-greenhouse-gas-emissions (5.12.2016).

EU transport in figures. Statistical pocket book 2015. 2015. Luxembourg, Publication office of European Union, 148 p. Retrieved from https://ec.europa.eu/transport/sites/transport/files/pocketbook2016.pdf (9.1.2017).

Evaluering af ABC med fokus på samfundsøkonomiske effekter. Cyklistforbundet og trygfonden. 2013. Kongens Lyngby, COWI A/S, 44 p. Retrieved from http://www.abc-abc.dk/Laerer/~/media/ABC2013/Cowi_rapport/Evaluering%20af%20ABC%20-%2031052013.ashx (7.11.2016).

Evropski teden mobilnosti. Razpis za "tekmovanje za najbolj trajnostno mobilno srednjo šolo." Ministrstvo za infrastrukturo Republike Slovenije. 2012. Retrieved from http://www.tedenmobilnosti.si/2015/files/srednje_sole/Tekmovanje_Razpis.pdf (7.12.2016).

Foster, S., Giles-Corti, B., Knuiman, M., 2011. Creating safe walkable streetscapes: Does house design and upkeep discourage incivilities in suburban neighbourhoods? Journal of Environmental Pshychology, 31, 1, pp. 79–88.

Gabrovec, M., Bole, D., 2009. Dnevna mobilnost v Sloveniji. Georitem 11. Ljubljana, Založba ZRC, 102 p.

Gehl. Making Cities for People. Gehl. 2017. Retrieved from http://gehlpeople.com/ (10.1.2017).

General Concept. Südtirol Bahn. Retrieved from http://www.vinschgauerbahn.it/en/betriebskonzept.asp (24.12.2016).

Geografski terminološki slovar. 2005. Kladnik, D., Lovrenčak, F., Orožen Adamič, M. (ed.). Ljubljana, Založba ZRC, ZRC SAZU, 451 p.

Götz, A., 2007. Mi, Alpe! Ljudje ustvarjamo prihodnost. 3. poročilo o Alpah. Šmarje-Sap, Buča, 301 p.

Greenhouse gas emission statistics. Eurostat Statistic Explained. 2016. Retrieved from http://ec.europa.eu/eurostat/statistics-explained/index.php/Greenhouse_gas_emission_statistics (9.1.2017).

Grøntved, A., W. Koivula, R., Johansson, I., Wennberg, P., Østergaard, L., Hallmans, G., Renström, F., W. Franks, P., 2016. Bicycling to Work and Primordial Prevention of Cardiovascular Risk: A Cohort Study Among Swedish Men and Women. Journal of the American Heart Association, 5, 11, pp. 1–12. Retrieved from http://jaha.ahajournals.org/content/5/11/e004413 (24.12.2016).

Habjanič, S., 2015. Učinek uskladitve Sistema javnega financiranja prevozov dijakov in študentov na povpraševanje po javnem prevozu. Magistrsko delo. Maribor, Fakulteta za gradbeništvo, 80 p.

Hočevar, M., Jaklič, M., Zorić, J., Pustovrh, A., Kotar, M., 2011. Izdelava ekonometričnega modela za določanje cen vozovnic v javnem potniškem prometu. Ljubljana, Agencija za promet, razvoj in raziskave d.o.o., 105 p. Retrieved from http://www.mzi.gov.si/fileadmin/mzi.gov.si/pageuploads/DPR/Integriran_javni_pot_promet/Koncno_porocilo_Ekonometricne_analize_povprasevanja_po_JPP.PDF (24.12.2016).

Ilc Klun, M., 2016a. Analiza učnega načrta geografija gimnazija (splošna, klasična in strokovna) z vidika vzgoje in izobraževanja za trajnostni razvoj. Ljubljana, Zavod Republike Slovenije za šolstvo, 77 p.

Ilc Klun, M., 2016b. Analiza učnega načrta za geografijo osnovna šola z vidika vzgoje in izobraževanja za trajnostni razvoj. Ljubljana, Zavod Republike Slovenije za šolstvo, 51 p.

Izobraževanje, informiranje in ozaveščanje javnosti o pomenu JPP. 2013. Zaključno poročilo projekta Dobimo se na postaji. Ljubljana, Urbanistični inštitut Republike Slovenije, 37 p. Retrieved from http://www.na-postaji.si/Portals/0/dokumenti/porocila/PROMOCIJA%20JPP_zakljucno%20porocilo_www.pdf (9.12.2016).

Jurkovič, D., Zemljič, F., Kosec, M., 2011. Predstavitev projekta Modernizacija železniške proge Pragersko–Hodoš, železniške povezave po vseh evropskih standardih. Retrieved from http://www.dcm-svs.si/posvetovanje/posvetovanje31/predstavitve/06_predstavitev_projekta_modernizacije_Pragersko_Hodos_JURKOVIC.pdf (4.12.2016)

Karba, K., 2015. Informacije o prometni kači. (Personal source. 11.12.2015). Ljubljana.

Kattan, L., Tay, R., Acharjee, S., 2011. Managing speed at school and playground zones. Accident Analysis and Prevention, 43, 5, pp. 1887–1891.

Kelly, J. A., Fu, M., 2014. Sustainable school commuting – understanding choices and identifying opportunities, A case study in Dublin, Ireland. Journal of Transport Geography, 34, pp. 221–230.

Kristensen, M., 2015. 10 Danish cities get bicycle playgrounds. Cycling Embassy of Denmark. Retrieved from http://www.cycling-embassy.dk/2015/01/30/10-danish-cities-get-bicycle-playgrounds/ (24.12.2016).

Kurikulum za vrtce. 2011. Ljubljana, Ministrstvo za šolstvo in šport, Zavod RS za šolstvo, 53 p.

Lang, J. J., Tremblay, M. S., Leger, L., Olds, T., Tomkinson, G. R., 2016. International variability in 20 m shuttle run performance in children and youth: Who are the fittest from a 50-country comparison? A systematic literature review with pooling of aggregate results. British Journal of Sports Medicine, pp. 1–12.

Lavelle, M., 2013. US Teenagers Are Driving Much Less: 4 Theories About Why. National Geographic. Retrieved from http://news.nationalgeographic.com/news/energy/2013/12/131217-four-theories-why-teens-drive-less-today/ (10.1.2017).

Leden, L., Garder, P., Schirokoff, A., Monterde-i-Bort, H., Johansson, C., Basbas, S., 2014. A sustainable city environment through child safety and mobility – A challenge based on ITS? Accident Analysis and Prevention, 62, pp. 406–414.

Living Streets 1. Retrieved from http://www.livingstreets.org.uk/walk-with-us/walk-to-school/primary-schools/walk-once-a-week (6.11.2015).

Living Streets 2. Retrieved from http://www.livingstreets.org.uk/walk-with-us/success-stories/95-walking-with-wow-in-stockton-on-tees (7.11.2015).

Logar, M., 2016a. Izpusti predhodnikov ozona. ARSO. Retrieved from http://kazalci.arso.gov.si/xml_table?data=graph_table&graph_id=15979&ind_id=743) (9.11.2016).

Logar, M., 2016b. Izpusti plinov, ki povzročajo zakisovanje in evtrofikacijo. ARSO. Retrieved from http://kazalci.arso.gov.si/xml_table?data=graph_table&graph_id=16073&ind_id=742) (9.1.2017).

Mammen, G., Stone, M., Faulkner, G., Ramanathan, S., Buliung, R., O'Brien, C., Kennedy, J., 2013. Active school travel: An evaluation of the Canadian school travel planning intervention. Preventive Medicine, 60, pp. 55–59.

Mammen, G., Stone, M. R., Buliung, R., Faulkner, G., 2014. School travel planning in Canada: Identifying child, family, and school-level characteristics associated with travel mode shift from driving to active school travel. Journal of Transport & Health, 1, 4, pp. 288–294.

Mekinda Majaron, T., Kovač, N., 2016. Izpusti toplogrednih plinov. ARSO. Retrieved from http://kazalci.arso.gov.si/xml_table?data=graph_table&graph_id=16573&ind_id=773 (9.11.2017).

Mitra, R., Buliung, R. N., 2014. The influence of neighbourhood environment and household travel interactions on school travel behaviour: an exploration using geographically-weighted models. Journal of Transport Geography, 36, pp. 69–78.

Mohorič, I., 1968. Zgodovina železnic na Slovenskem. Ljubljana, Slovenska matica, 597 p.

Monberg Dalhof, R., 2015. Danish Cycling Games gain popularity in South America. Danish bicycle games for Japanese children. Cycling Embassy of Denmark. Retrieved from http://www.cycling-embassy.dk/2015/11/20/danish-cycling-games-gain-popularity-in-south-america/ (24.12.2016).

Moroder, H., 2016. Vlak in kolo – alternativa osebnemu avtomobilu na vsakdanjih in turističnih poteh. Seminar in delavnica (11.5.2016). Borovnica.

Mulley, C., Walters, J., 2014. Innovative finance for innovative public transport. Research in Transport Economics, 48, pp. 389–392. Retrieved from http://ac.els-cdn.com.nukweb.nuk.uni-lj.si/S0739885914001127/1-s2.0-S0739885914001127-main.pdf?_tid=724a384a-ce0a-11e6-b830-00000aacb35d&acdnat=1483045674_af35234851f1b2eafa09bd256c5d2c89 (24.12.2016).

Nacionalni program razvoja prometa v RS. 2016. Ljubljana, Ministrstvo za infrastrukturo. Retrieved from http://www.mzi.gov.si/si/dogodki/nacionalni_program_razvoja_prometa_v_rs/ (10.12.2016).

Nakup avtomobila brez rednih prihodkov – ne splača se! 2014. Retrieved from http://blog.i-svetovanje.com/2014/03/11/nakup-avtomobila-brez-rednih-prihodkov-ne-splaca-se/ (5.12.2016).

Napier, M. A., Brown, B. B., Werner, C. M., Gallimore, J., 2011. Walking to school: Community design and child and parent barriers. Journal of Environmental Psychology, 31, 1, pp. 45–51.

Ogrin, M., Resnik Planinc, T., Ilc Klun, M., Plevnik, A., 2013. Trajnostna mobilnost. Priročnik za učitelje v osnovnih šolah. Ljubljana, Ministrstvo za infrastrukturo in prostor, 93 p.

Otrin, K., 2016. Železniška proga Merano-Malles v dolini Vinschgau na Južnem Tirolskem (Vinschgaubahn). V: Peterlin, M., Očkerl, P. (ur.). Trajnostna mobilnost v praksi. Ljubljana, Inštitut za politike prostora, 56 p.

Otrin, K., Benčina, M., Živčič, L., Resnik Planinc, T., Plevnik, A., 2013a. Trajnostna mobilnost. Priročnik za učitelje v srednjih šolah. Ljubljana, Ministrstvo za infrastrukturo in prostor, 85 p.

Otrin, K., Benčina, M., Živčič, L., Resnik Planinc, T., Plevnik, A., 2013b. Trajnostna mobilnost. Priročnik za vzgojitelje v vrtcih. Ljubljana, Ministrstvo za infrastrukturo in prostor, 74 p.

Otroci v gibanju. 2004. Ljubljana, Ministrstvo za okolje, prostor in energijo, 61 p.

Plut, D., 2007. Sonaravni razvoj (napredek) in geografija. Dela, 28, pp. 287–304.

Postajališča. BicikeLJ. Retrieved from http://www.bicikelj.si/Kako-deluje/Postajalisca (15.11.2016).

Pojani, D., Boussauw, K., 2014. Keep the children walking: active school travel in Tirana, Albania. Journal of Transport Geography, 38, pp. 55–65.

Pooley, C., Horton, D., Scheldeman, G., Mullen, C., Jones, T., Tight, M., Jopson, A., Chisholm, A., 2013. Policies for promoting walking and cycling in England: A view from the street. Transport Policy, 27, pp. 66–72.

Predanič, J. 2016. V petih letih Slovenci povozili več kot 26 000 srn. Delo, (13. december 2016). Retrieved from http://www.delo.si/novice/kronika/v-petih-letih-slovenci-povozili-vec-kot-26-000-srn.html (9.11.2016).

Projektna naloga za izvedbo projekta Uveda integriranega javnega potniškega prometa v RS, 2013. Ministrstvo za infrastrukturo, 52 p. Retrieved from http://www.mzi.gov.si/fileadmin/mzi.gov.si/pageuploads/javna_narocila/2013/PROJEKTNA_NALOGA_7.11.2013.pdf (24.12.2016).

Prometne obremenitve. DARS. 2014. Retrieved from https://www.dars.si/Dokumenti/O_avtocestah/Prometne_obremenitve_94.aspx (9.11.2016).

Ravbar, E., 2015. Spreminjanje prometne ureditve središča Ljubljane skozi 20. stoletje do danes. Zaključna seminarska naloga. Ljubljana, Filozofska fakulteta, Oddelek za geografijo, 57 p.

Ravn Faber, R., 2015. Cycling games are spreading across Denmark. The Cycling Embassy of Denmark. Retrieved from http://www.cycling-embassy.dk/2015/09/07/cycling-games-are-spreading-across-denmark/ (24.12.2016).

Raziskava o načinu potovanja osnovnošolcev v šolo v šolskem letu 2009/2010. Mestna občina Maribor, mestna uprava.

Reducing emissions from transport. A European Strategy for low- emission mobility. Climate action. European Commission. Retrieved from http://ec.europa.eu/clima/policies/transport_en (9.11. 2016).

Resolucija o prometni politiki Republike Slovenije (RePPRS) (Intermodalnost: čas za sinergijo). 2006. Uradni list RS, 58, pp. 4398–4459. Retrieved from http://www.uradni-list.si/1/objava.jsp?urlid=200658&stevilka=2426 (10.11.2016).

Rožman, A., 2016. Dijakom in študentom enotna vozovnica za vlak in avtobus. Dnevnik, (24. avgust 2016). Retrieved from https://www.dnevnik.si/1042748822/slovenija/integracija-potniskega-prometa-enotna-vozovnica-za-dijake-in-studente (24.12.2016).

Ruby, L., 2010. Making cycle training fun. Cycling Embassy of Denmark. Retrieved from http://www.cycling-embassy.dk/2010/12/13/making-cycle-training-fun/ (24.12.2016).

Ruby, L., Liv Andersen, C., 2016. Cycling to kindergarten. The official website of Denmark. Retrieved from http://denmark.dk/en/green-living/bicycle-culture/cycling-to-kindergarten (24.12.2016).

Safety equipment. No compromises when it comes to safety. Südtirol Bahn. Retrieved from http://www.vinschgauerbahn.it/en/sicherungsanlagen.asp (24.12.2016).

Schiøtt Stenbæk Madsen, J., 2015. Kindergarten kids cycle in Odense. The Cycling Embassy of Denmark. Retrieved from http://www.cycling-embassy.dk/2015/12/09/kindergarten-kids-cycle-in-odense/ (24.12.2016).

Seznam višjih strokovnih šol, Evidenca zavodov in programov 2016. Retrieved from https://krka1.mss.edus.si/registriweb/Seznam1.aspx?Seznam=5040-enote (8.12.2016).

Seznam visokošolskih zavodov. Visokošolski zavodi v Republiki Sloveniji. Ministrstvo za visoko šolstvo, znanost in tehnologijo. 2016. Retrieved from http://www.arhiv.mvzt.gov.si/si/delovna_podrocja/visoko_solstvo/dejavnost_visokega_solstva/seznam_visokosolskih_zavodov/ (8.12.2016).

Spremembe dodatkov k Zoisovi štipendiji. Javni Sklad Republike Slovenije za razvoj kadrov in štipendije. 2012. Retrieved from http://www.sklad-kadri.si/si/razpisi-in-objave/novica/n/sprememba-dodatkov-k-zoisovi-stipendiji/ (24.12.2016).

Spremenimo svet: Agenda za trajnostni razvoj do leta 2030. 2015. Slovenski prevod. New York, Organizacija Združenih narodov, 28 p. Retrieved from http://www.mzz.gov.si/fileadmin/pageuploads/Zunanja_politika/ZDH/Politike_MRS/SDG/Spremenimo_svet_-_Agenda_za_trajnostni_razvoj_2030.doc (9.11.2016).

Stark, J., Beyer Bartana, I., Fritz, A., 2015. Examing mobility behaviour among youth – a progress report. Transportation Research Procedea, 11, pp. 481–491. Retrieved from http://ac.els-cdn.com/S2352146515003312/1-s2.0-S2352146515003312-main.pdf?_tid=b22d7636-0bd4-11e7-94f1-00000aacb35d&acdnat=1489839560_7498034576511b846f94f0eb5f71871e (10.12.2016).

Stations. Südtirol Bahn. Retrieved from http://www.vinschgauerbahn.it/en/meranmals.asp (24.12.2016).

Statistični letopis Republike Slovenije 1990. 1990. Ljubljana, Zavod Republike Slovenije za statistiko. Retrieved from http://www.stat.si/StatWeb/doc/letopis/1990/1990_16.pdf (9.11. 2016).

Statistični letopis Republike Slovenije 1992. 1993. Ljubljana, Zavod Republike Slovenije za statistiko, 530 p. Retrieved from http://www.stat.si/StatWeb/doc/letopis/1992/1992_23.pdf (9.11.2016).

Statistični letopisi RS 1992–2010. Statistični urad Republike Slovenije. Retrieved from http://www.stat.si/StatWeb/glavnanavigacija/podatki/publikacije (24.12.2016).

Statopis. Statistični pregled Slovenije 2015. 2015. Ljubljana, Statistični urad Republike Slovenije, 94 p. Retrieved from http://www.stat.si/dokument/8732/statopis_2015.pdf (24.12.2016).

Stergar, A., 2016. Za tovornjake višje cestnine in nižji popusti. Delo, (2. december 2016). Retrieved from http://www.delo.si/gospodarstvo/infrastruktura/za-tovornjake-visje-cestnine-in-nizji-popusti.html?iskalnik=Sonja%20Merljak (9.11.2016).

Strategija razvoja prometa v Republiki Sloveniji. 2015. Ljubljana, Ministrstvo za infrastrukturo, 271 p. Retrieved from http://www.mzi.gov.si/fileadmin/mzi.gov.si/pageuploads/Dogodki/Strategija_razvoja_prometa_v_RS-koncna_razlicica-popr_tabela_okt2016.pdf (10.11.2016).

Subvencionirana vozovnica. V šolsko leto z novo subvencionirano vozovnico IJPP. 2016. Retrieved from http://www.mzi.gov.si/si/delovna_podrocja/promet/subvencionirana_vozovnica/ (24.12. 2016).

Südtirol Bahn. Südtirol Bahn – Treno Alto Adige. Südtirol Bahn. Retrieved from http://www.vinschgauerbahn.it/en/bahnhoefe.asp (24.12.2016).

Su, J., Jerrett, M., McConnell, R., Berhane, K., Dunton, G., Shankardass, K., Reynolds, K., Chang, R., Wolch, J., 2013. Factors influencing whether children walk to school. Health & Place, 22, pp. 153–161.

Špes, M., Cigale, D., Lampič, B., Natek, K., Plut, D., Smrekar, A., 2002. Študija ranljivosti okolja: (metodologija in aplikacija). Ljubljana, Geographica Slovenica, 150 p.

Število prebivalcev in naravno gibanje prebivalstva, Slovenija, letno. 2017. Retrieved from http://pxweb.stat.si/pxweb/Dialog/varval.asp?ma=05A2010S&ti=&path=../Database/Dem_soc/05_prebivalstvo/05_osnovni_podatki_preb/10_05A20_prebivalstvo_letno/&lang=2 (20.3.2017).

Teden EKO-Potovanj. Retrieved from http://www.schoolway.net/index.phtml?id=1204&ID1=1072&sprache=en (3.12.2015).

Teze za trajnostno prometno politiko. 2006. Ogorelc, V. (ur.). Gradivo za medije. Ljubljana, Koalicija za trajnostno prometno politiko, 4 p. Retrieved from http://www.focus.si/files/mediji/gradivo_mediji_TPP.pdf (10.11.2016).

The walking bus. A safe way for children to walk to school. London, Friend of the Earth, 13 p. Retrieved from http://www.foe.co.uk/sites/default/files/downloads/walking_bus.pdf (6.11.2015).

Traffic Snake (Igra prometna kača). Retrieved from http://www.trafficsnakegame.eu/slovenia (31.10.2015).

Trains from Merano to Mals. Virail. 2016. Retrived from https://www.virail.com/train-merano-mals (24. 12. 2016).

Trajnostna mobilnost. Ekošola. Retrieved from http://ekosola.si/2016-2017/projekti/trajnostna-mobilnost/ (7.12.2016).

Učni načrt. Izbirni predmet: program osnovnošolskega izobraževanja. Geografija: Življenje človeka na Zemlji, Raziskovanje domačega kraja in varstvo njegovega okolja. 2004. Ljubljana, Ministrstvo za šolstvo in šport, Zavod RS za šolstvo, 14 p.

Učni načrt. Izbirni predmet: program osnovnošolskega izobraževanja. Okoljska vzgoja. 2004. Ljubljana, Ministrstvo za šolstvo in šport, Zavod RS za šolstvo, 21 p.

Učni načrt. Program gimnazija: splošna, klasična, ekonomska gimnazija. Geografija. Obvezni predmet, matura. 2008. Ljubljana, Ministrstvo za šolstvo in šport, Zavod RS za šolstvo, 62 p.

Učni načrt. Program gimnazija: splošna, klasična, strokovna gimnazija. Okoljska vzgoja kot vzgoja in izobraževanje za trajnostni razvoj. Kroskurikularno tematsko področje. 2008. Ljubljana, Ministrstvo za šolstvo in šport, Zavod RS za šolstvo, 26 p.

Učni načrt. Program gimnazija: splošna, klasična, strokovna gimnazija. Študij okolja. Izbirni predmet. 2012. Ljubljana, Ministrstvo za šolstvo in šport, Zavod RS za šolstvo, 48 p.

Učni načrt. Program gimnazija: splošna, klasična, strokovna gimnazija. Sociologija. Obvezni predmet, matura. 2008. Ljubljana, Ministrstvo za šolstvo in šport, Zavod RS za šolstvo, 25 p.

Učni načrt. Program osnovna šola. Družba. 2011. Ljubljana, Ministrstvo za šolstvo in šport, Zavod RS za šolstvo, 21 p.

Učni načrt. Program osnovna šola. Državljanska in domovinska vzgoja ter etika. 2011. Ljubljana, Ministrstvo za šolstvo in šport, Zavod RS za šolstvo, 22 p.

Učni načrt. Program osnovna šola. Geografija. 2011. Ljubljana, Ministrstvo za šolstvo in šport, Zavod RS za šolstvo, 39 p.

Učni načrt. Program osnovna šola. Spoznavanje okolja. 2011. Ljubljana, Ministrstvo za šolstvo in šport, Zavod RS za šolstvo, 31 p.

Urbanc, M., 2002. Kulturne pokrajine v Sloveniji. Geografija Slovenije 5. Ljubljana, Založba ZRC, 52 p.

Von Rainer, E., 2009. Emanzipation der Südtiroler: Die Neue Vinschgaubahn. Von Basel nach Meran am schnellsten mit dem Postauto. Der Fahrgast, 2009, 3, pp. 38–43. Retrieved from http://www.der-fahrgast.de/Archiv/2009/2009-3-38_43.PDF (24.12.2016).

Zakon o prevozih v cestnem prometu. 2013. Uradni list RS, 39, pp. 4665–4667.

Zakon o spremembah in dopolnitvah Zakona o prevozih v cestnem prometu. 2015. Uradni list RS, 92, pp. 10389–10396.

Zgrajene AC, HC ter druge javne ceste v okviru NPIA. DARS, 2016. Retrieved from https://www.dars.si/Dokumenti/O_avtocestah/Nacionalni_program_izgradnje_avtocest/Zgrajene_AC_in_HC_30.aspx (9.12.2016).

Zupančič, N., 1997. Lead pollution of Ljubljana – Zagreb roadside soils. Rudarsko metalurški zbornik, 44, 3–4, pp. 169–185.

Zwei Millionen Fahrgäste pro Jahr: Neue Vinschgerbahn wird neun Jahre alt. 2014. Retrieved from http://www.provinz.bz.it/news/de/news.asp?news_action=4&news_article_id=457391 (24.12.2016).

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