


A close-up, side-view photograph of a person wearing a grey suit jacket and dark trousers, riding a red bicycle. The person's right hand is on the handlebar, and their left leg is visible in motion. The bicycle has a red frame, a white fender over the front wheel, and a small headlight. The background is a blurred outdoor scene with green grass and a body of water.

Industrial Zones and Their Connection to the Cycling Network in Martin

Processed by:
TURIEC BICYCLE GROUP
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trendytravel

Intelligent Energy  Europe

Industrial Zones and Their Connection to the Cycling Network in Martin

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CITY of MARTIN

Industrial zones and their connection to the cycling network in Martin

Preface

Majority of Slovaks connects walking or cycling with leisure time or sport activity; only few of them use this means of movement as way to go to work. However, many foreign studies and analyses underline the fact that population, which uses bicycle as means of transportation is much healthy, fit, and stays young longer.

Cycling to work reduces air pollution, traffic congestions and transportation time. Increasing use of the bicycle changes the transport structure, „it humanizes“ built-up area of the city and brings a possitive impact on the health condition of population. Cycling is clean, green and quiet. In comparison with cars - it does not produce any noise, dust or exhaust. It is also much cheaper and after all -it saves also time. Cyclists know, how long takes the journey, because they travel „from one door to another“. They do not need be affraid of traffic jams or stress, where to park their cars. During the traffic peak hours, cyclists in towns are much more rapid than any other motorists.

This study has been processed within the scope of the Trendy Travel Project, and its objective is to design a connection of main industrial zones of the city of Martin to the planned network of cycle routes. The Territorial City Development Plan, the study named "Martin - East Industrial Park", EIA – Environment Impact Assessment / assessment of the industrial zones impact on environment, Cycle Route – Access to ECCO Factory, Urban-Transport Design of Cycling Transportation and Study on the Cycling Routes Network of the City of Martin 2009 are considered as initial documents.

Besides the above-mentioned documents, very important information source is of terrain on-site and recording of situation in the year 2009. The most significant industrial zones of the city of Martin are following:

1.South-West zone - Robotnícka Street and area of former ZŤS Martin*

2.North-East zone - Industrial Park

Both locations significant source of job opportunities, and they reflect the most important objectives for travelling to work by bicycle.

*ZŤS Martin - Heavy machinery industry plant Martin



TRAVELLING TO WORK ON BIKE – AN INNOVATION OF THE 3rd MILLENNIUM

This idea becomes very frequent for many residents over the whole world. Why? Why this issue becomes right now actual? Answers can be found in past.

In the 60-ties and 70-ties of the last century, significant industrial boom occurred, municipalities expanded with industry production. People, that had been using bicycle for travelling to work already more than fifty years (just remember bicycles parked in front of the former ZŤP plant), where buying cars as a result of comfort feelings. Contemporary pictures from Paris, Amsterdam or Berlin show streets which are full of cars.

From spatial point of view, urbanism started to accommodate under motorists' needs. However, it brought some negatives - demolition of many architectonic monuments and green parking zones, reduction of air quality and increasing of noise.

Attention to the declining quality of environment began to be paid in the 80-ties; we faced up this trend 10 years later, thanks also to the revolution in 1989. In that time, several municipalities in Europe already started to solve an unacceptable transport situation via various programmes focusing on support of non-motorized means of transport.



Zermatt – one of the mountain towns in Switzerland, which makes profits from tourism also thanks to a strict transport regulation – absolute exclusion of vehicles from the town.

Another reason was the price of real estates. Big cities couted up, that attractive (and, naturally, extra expensive)urban areas are not situated near main transport routes, but(from transport aspect) in silent city parts, and in city centres. Moreover, some Alpine municipalities in Switzerland and Austria accepted the most radical solution,namely - NO ENTRY for all motor vehicles to the particular municipality. Only one exeption is allowed-

first aid ambulance. Their whole infrastructure complied with this measure, so inhabitants and visitors of these towns can solely use electro mobiles, bicycles, alternative carriages with horses.

By systematic support of non - motorized means of transport, quality of life for inhabitants and visitors of many cities had increased (e.g. Amsterdam, Freiburg, Barcelona, Bern ...). Trend of „living Dwelling Street“ got on.

In U.S., the trend to support the cycling infrastructure appeared only after alarming news about dramatically declining health conditions of the population in connection with obesity. More attention started to be paid on advertising of active motion and healthy life style. This interest was initiated especially by medical and social insurance companies, for which worse health conditions of inhabitants reduced profits.

Reasons for support of travelling to work development by bicycle are as follows:



Ecology

Economy

Health

Ecology

ENVIRONMENT SUPPORT

Travelling to work by bicycle reduces our „carbon footprint“ on environment.

Emissions from transport represent 31% from the overall production of carbon dioxide, 81% of carbon monoxide and 49% of nitrogen oxides. Together dustiness and noise it causes, that our daily transportation by car costs much more than only petrol, which we must buy.

A car produces 60 % of emissions during first several minutes from start, only consequently catalyser starts work effectively. Drive in short distances produces more pollutants per kilometre- in cities; majority of drives is up to 2 km, what means increasing amount of polluted substances in the built-up area air.

In general, the journeys to work by bicycle help to reduce the amount of carbon dioxide, which causes respiratory obstructions for thousands of people, especially for children. Increased usage of non-motorized means of transport will bring a reduced amount of nitrogen oxides in air, what helps to solve problems with smog and reduction of the volume of sulphur dioxide, which causes not only creation of acid rains, but also particles, which we breathe in and which cause respiratory and cardio-vascular diseases.

During last years within the scope of health condition indicators, the Martin District occupies one of the first positions in the Slovak Republic concerning the occurrence of acute respiratory diseases. Moreover, comparing the national average, mortality rate as result of the respiratory diseases in the Martin District is higher. Categories of respiratory diseases typically reach children in groups (multiply higher occurrence), and they appear seasonally. The highest incidence of such illnesses in the years 1995-1996 was recorded during December-January. Besides other reasons (air pollution, life style), the situa-



Children reactions to the air pollution is the most sensitive. Bad dispersion conditions of emissions in Martin (many days with inversion) cause an increasing tendency of respiratory diseases.

tion is significantly determined also by bad dispersion conditions of emissions (a lot of days with inversion). Another illness, which is connected with the environment level and the amount of contaminants in air, is bronchial asthma. Since 1989, it has increasing trend in the Martin District. In 1989, 338 cases were diagnosed; in 1995 already 633.

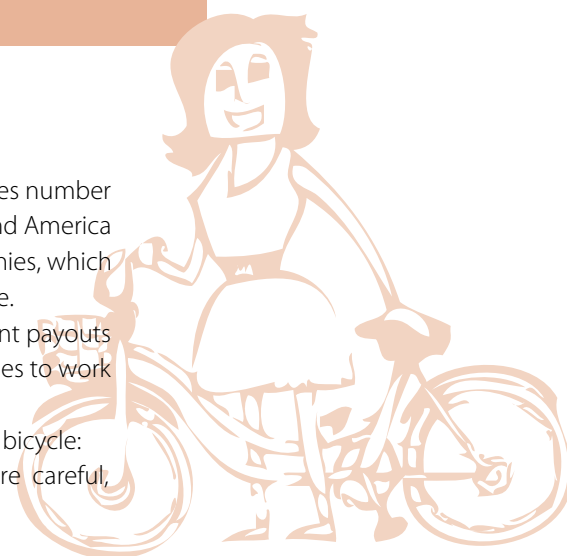
Economy

SAVINGS FOR EMPLOYERS

Cycling to work improves the quality of workforce, and reduces number of absence days. Governments of many countries in Europe and America are aware of these advantages and they cooperate with companies, which actively support their employees, which travel to work by bicycle. E.g. the United States of America allowed companies to account payouts of the annual contribution of 240 USD for each worker, who rides to work on bicycle as eligible costs (together with the state subsidy).

10 benefits for employers, which support travelling to work by bicycle:

1. Increasing of work productivity – fit employees are more careful, efficient, they communicate better and more effectively
2. Improvement of the employees' health conditions.
3. Reducing the cost for health care - healthier employees can reduce costs for medical insurance.
4. Reducing the costs for establishing of parking places – at 1 parking place for a car, even 12 bicycles can be placed.
5. Reduction of the transport emissions amount.
6. Reducing the fluctuation of employees. An employer, which cares of personal needs of its staff, records a lower fluctuation of employees.
7. To support travelling to work by bicycle is cheaper than establishing of a fitness centre at the work place.
8. It improves a ratio work/life. A journey to work on bike can be a replacement for fitness and it saves time for an employee.
9. Community support: Bicycles can be produced or bought in local shops, as well as their servicing or maintenance, what creates conditions for new job opportunities as a part of sustainable local economy.
10. It improves image of the company.



HEALTH

PERSONAL REASONS WHY TO CYCLE TO WORK FROM THE EMPLOYEES' POINT OF VIEW

1. It improves health:

- Better health condition thanks to cycling and outdoors movement reduces risk of the diseases' occurrence.
- National statistics from the whole world prove that active movement reduces risk of cancer, cardio-vascular diseases, obesity and diabetes.
- Cycling to work allows to include working time into fitness training and daily programme.

2. It cheers you up

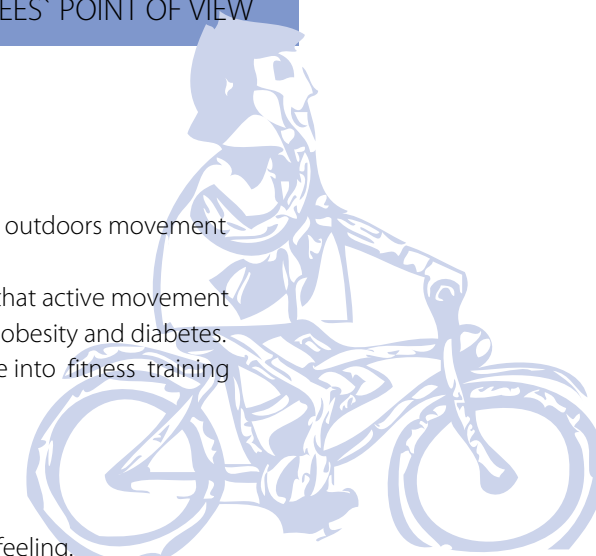
- More energy during all day.
- It improves your health condition and comfort feeling.
- Regular use of bicycle naturally moves your attention to wider surroundings.
- More attention is paid for weather and nature around. Locations and people that we passing by become much known and more personal we become more sensitive about transport traffic.
- It raises your interest concerning quality of environment and esthetical aspect of the town/city in which we live.

3. It saves money

- It reduces costs for operation and maintenance of a car.
- It reduces costs of petrol consumption.
- It reduces costs of parking charges.

| distance in km | petrol consumption l/100km | petrol consumption in l | petrol consumption in Eur | number of days | number of km |
|----------------|----------------------------|-------------------------|---------------------------|----------------|--------------|
| 5 | 7 | 1,75 | 2,1 | 5 | 25 |
| | | 35 | 45,5 | 100 | 500 |
| | | 70 | 91 | 200 | 1000 |
| 10 | 7 | 3,5 | 4,2 | 5 | 50 |
| | | 70 | 84 | 100 | 1000 |
| | | 140 | 168 | 200 | 2000 |
| 20 | 7 | 7 | 8,4 | 5 | 100 |
| | | 140 | 168 | 100 | 2000 |
| | | 280 | 336 | 200 | 4000 |

The table lists the money savings and the fuel consumption savings of a person, who decided to use to work a bicycle instead of a car. Number of such persons significantly increases not only savings but also amount of emissions in the particular town/city. There is a high ratio of cyclists in Martin. If 10 000 inhabitants travel 25 km monthly, it represents savings of 17 00 l of spent petrol and 21 000 Euros.



PRINCIPLES OF THE DESIGN OF CYCLE ROUTES FOR JOURNEYS TO WORK

- Direct connections.
- Fluency.
- Safety.
- Quality of implementation and environment attractiveness.

Principles of the design of cycle routes for journeys to work are identical to the general policy of the cycling roads design. The study with title "Cycling Routes Network of the City of Martin" processed within the Trendy Travel Project in 2008 had focused on this issue.

In regard to the connection of industrial zones to the cycling network, more attention needs to be paid on increased needs for lighting, because various companies operate also during night.

Increasing the safety feeling

For employees travelling to work on bike is a selection of a route a certain key for the safety feeling during ride on bike to work. The safest and the most attractive route, which you would choose for cycling, will be probably different from the car journey. In general, cyclists avoid routes with heavy motor traffic and they look for possibilities of shortcuts and others non-motorist roads. A suitable aid to choose a route is publishing the map of existing or

potential routes on bicycle, where such kind of information as intensity of motor traffic, rest stations or covered shelters in case of rain etc. are drawn in.

If any municipality wants to increase a number of cyclists travelling to work, it also needs to lead edifying campaigns and preventive programmes, which include also such common issues as information about importance to have reflecting items, flashing lights and other items, which allow drivers to see a cyclist on road very well. It is important from the aspect of prevention of transport accidents. In spite of the fact that these subjects are governed by a regulation, it is necessary to talk about them continuously, than the issues become natural for people. The situation is identical also in the case of driving technique in transport flow.

Combined transport

Many employees must travel to work from longer distances, so it is necessary to include a possible transport of bicycle into integrated transport plan, which allows cyclists to overcome distances by other, quicker means of public transport.



Example of the bicycle placement in train.

Greenery

By combination of individual kinds of greenery you can achieved:

- separation of vehicles, pedestrians and cyclist,
- emphasizing of the calming item via tall greenery,
- improving of aesthetical look of the street,
- improvement of microclimate and hygienic conditions in the particular place.

Greenery, trees and bushes, even during their full growth, cannot reach the crossing section of the lane and must not obstruct views of drivers, pedestrians and cyclists and their mutual visual contacts. The greenery must not shadow vertical signs and worsen the lighting conditions of the calming item and its surroundings. Special attention has to be paid on seasonal mobile greenery and regular treatment of the existing greenery during the whole year.

Lighting

Design of the lighting is a part of design of the spatial layout of cycle lane, and at the same time it is also a significant component of architectonic as well as urban composition of street space. During the worse visibility conditions it determines safety of the road traffic. Special attention has to be paid to the lighting on the zebra-crossing for pedestrians and cyclists.

Regulated by STN 36 0400 (standard), alternatively other valid standards on public lighting.

Traffic/Road Signs

Vertical and horizontal signs are a part of the cycle lane equipment. They are designed and implemented pursuant to the Regulation No. 225/2004 Coll. (see 1.6) and other related provisions (see 1.7), and STN 01 8020 (standard).

Facilities and Service Establishments

In relation to the nature of transport corridor cycle lane, minor service establishments and street mobile items can be situated in the related space. In case of suitable design, these facilities increase utility value of the public domain and, concurrently, they contribute at the appearance of the lane. Information tables, benches, waste bin baskets and similar facilities, which could be placed within the associated space of a road route, they must not interfere into the main transport space and stripes, alternatively lines for pedestrians and cyclists. They have to be situated out of view field of junctions/crossroads, entries and exits. They must not create any obstructions and have to allow an access, movement and using them by persons handicapped physically, and with limited orientation ability.

Engineering Network

Underground network of technical facilities in the area of local roads should be placed in such way, that their underground parts (hatches, grillages, hydrants) in the space of road do not interfere to the ride stripes/lanes. Grillages of the canalization gullies must not endanger ride of cyclists and the pedestrians' movement.



TECHNICAL REQUIREMENTS FOR CYCLE LANES

Reasoning

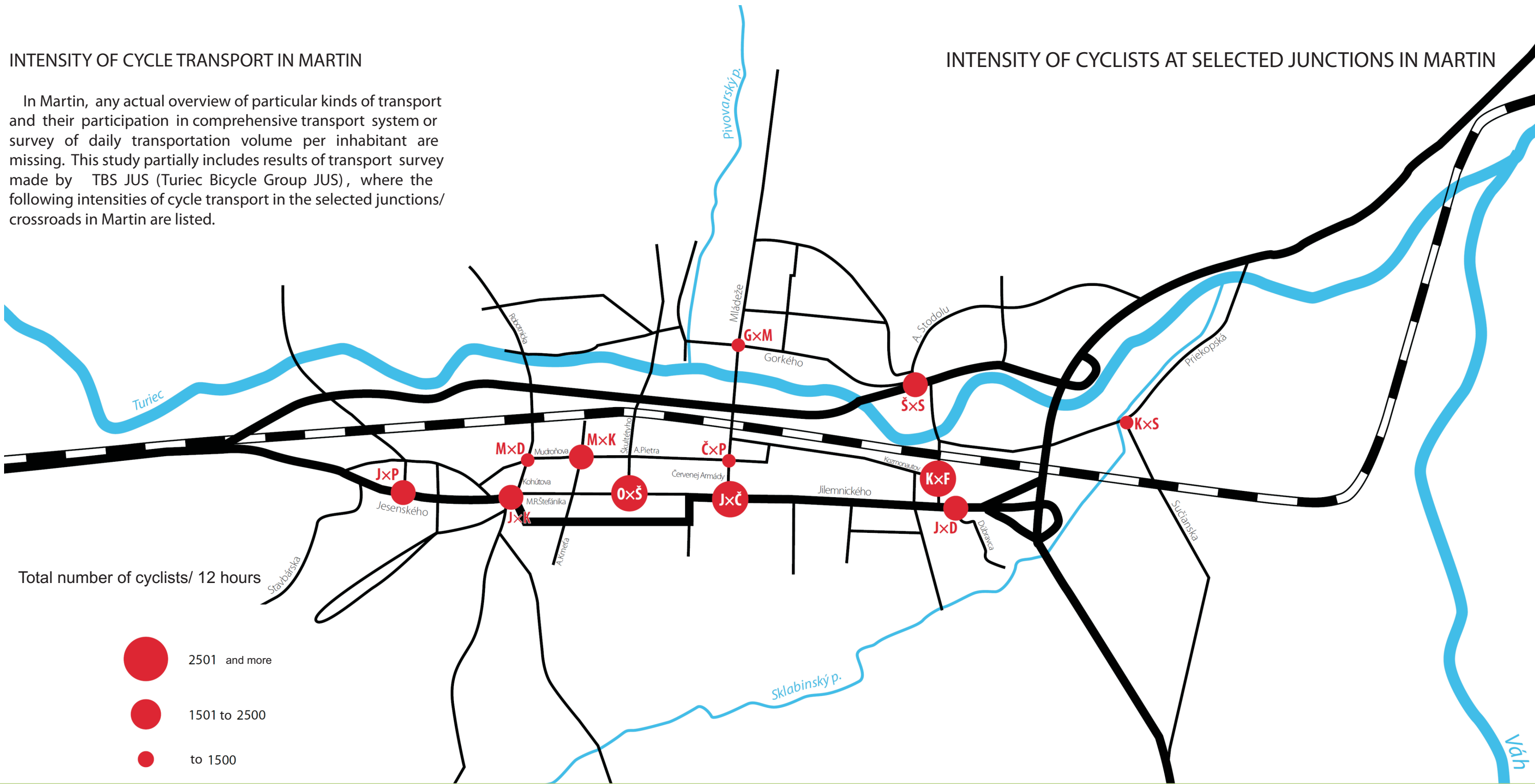
While establishing the cycle lanes, a sophisticated reasoning has to be provided. Construction must not create any difficulty for the rainwater drain. In general, it is necessary to accept such design, which allows adequate maintenance and cleaning, so no splash will be present at the roadway and its surrounded space. This is the

reason why in case of the barrier-free design of waiting spaces in front of crossing, a reduction of the kerb in maximum of 30mm - 40mm, which allows direction of the drained rainwater over the drain strip to the gully, is needed. Correct design of the drain in the calming item significantly helps to achieve a good quality of its use by all participants.



INTENSITY OF CYCLE TRANSPORT IN MARTIN

In Martin, any actual overview of particular kinds of transport and their participation in comprehensive transport system or survey of daily transportation volume per inhabitant are missing. This study partially includes results of transport survey made by TBS JUS (Turiec Bicycle Group JUS), where the following intensities of cycle transport in the selected junctions/ crossroads in Martin are listed.



INTENSITY OF CYCLISTS AT SELECTED JUNCTIONS IN MARTIN

Legend:

- K×S** –junction - Kolónia II. Street and Sučianska Street
- Š×S** –junction of public road I/65 and Aurela Stodolu Street
- J×D** – junction - Jilemnického Street and Dúbravca Street
- K×F** –junction - Kozmonautov Street next to Fatra
- G×M** – junction – Gorkého Street and Mládeže Street
- Č×P** – junction -Červenej armády Street and Ambra Pietra Street
- J×Č** – junction - Jilemnického Street and Červenej armády Street
- O×Š** – junction – Osloboditeľov Street and Škultétyho Street
- M×K** – junction – Pavla Mudroňa Street and Andreja Kmeťa Street
- M×D** – junction - Pavla Mudroňa Street and Daxnerova Street
- J×K** – junction – Jesenského Street and Kohútova Street
- J×P** – junction – Jesenského Street and Prihradka Street

Total number of cyclists – total number of cyclists passing the junction during 12 hours

Cyclists in peak-hours –number of cyclists passing the junction between 2 p.m. – 4 p.m.

Motorists in peak-hours – number of motorists passing the junction between 2 p.m.-4 p.m. (Number marked in red is an estimation implied from half-hour summation between 2 p.m. – 2.30 p.m.)

| Flow and intensity of the road traffic of cyclists and motorists at 12 selected Martin junctions/crossroads on the day of 30 July 2001. | | | | | | | | | | | | | |
|---|-------|-------|-------|-------|-------|------|-------|-------|-------|-------|-------|-------|---------|
| Junctions | KxS | ŠxS | JxD | KxF | GxM | ČxP | JxČ | OxŠ | MxK | MxD | JxK | JxP | Average |
| Number of cyclists | 1258 | 1516 | 1912 | 2528 | 1102 | 1006 | 2727 | 2620 | 1670 | 1083 | 2348 | 1593 | 1780,3 |
| Cyclists in peak-hours | 346 | 378 | 409 | 631 | 249 | 245 | 672 | 607 | 399 | 266 | 563 | 365 | 427,5 |
| Motorists in peak-hours | 558 | 1337 | 2878 | 1 | 1248 | - | 4363 | 706 | 1481 | 1331 | 2459 | 1558 | 1629,1 |
| Ratio of cyclists in peak-hours (%) | 38,27 | 22,04 | 12,44 | 99,84 | 16,63 | 100 | 13,35 | 46,23 | 21,22 | 16,66 | 18,63 | 18,98 | 35,36 |

Connection of Cycling Network in Respect of Industrial Zones in Martin and the Particular City Parts:

IZ NE North-East Industrial Zone Martin
IZ SW South-West Industrial Zone Martin

designed inter-city connection of IZ NE- Sučany



| List of source points | | |
|---------------------------|-----------------------|--------------------|
| City part | Number of inhabitants | Number of cyclists |
| Priekopa | 9581 | 3194 |
| Záturečie | 7958 | 2653 |
| Košúty I.,II. | 6103 | 2034 |
| Sever | 6883 | 2294 |
| Podháj, Stráne | 7237 | 2412 |
| Martin-stred | 6398 | 2133 |
| Ladoveň, Jahodníky | 12168 | 4056 |
| In total | 56328 | 18776 |

Minimal number of inhabitants, which will derive profit from building of cycle routes in Martin

| List of source points | |
|-----------------------------|--------|
| Type of establishment | Number |
| Sport facilities | 149 |
| Health institutions | 321 |
| Social establishments | 6 |
| Education institutions | 50 |
| Cultural institutions | 31 |
| Administrative institutions | 24 |
| In total | 581 |

Target points are concentrated especially in the city centre, what means, that the main target place is the city centre.



Technical designIndustrial Zones in Martin

South-West – Robotnícka Street – Area of Former ZŽS

Industrial zone is situated in South-West part of the city within the cadastral territory of the city of Martin. From the East part, it is demarked by the Turiec River, and the railway, from the North part, by the Slovak Army barracks and parking place with bus stops at CSA Street with direct extension to Gorkého Street. >From the South part, the delimiting factor is Bambusky, housing area.

In the area and at the surrounded territory of this urban part, several production plants and operations are located, whereas the number of which is variable. The main factories are following: ZTS TEES Martin, Van s.r.o., Brantner Fatra s.r.o., Martinská tepláreň (heat and power plant), printing companies, Duropak s.r.o, Javisková technika (stage techniques), ZŽS TEES Martinské strojárne, a.s. Martin, ZŽS TEES VOS, a.s. Martin, ZŽS TEES Energetika, a.s. Martin, MOBIL TEC Martin, Martinmetal Zlieváreň, a.s. Martin. The number of jobs positions is not specified.

Transport

Transport is provided via local service road – Robotnícka Street, which cross the Turiec River (bridge) next to OMW petrol station and is connected to bypass of the city – to the public road of the 1st class No. I/65 – Martin - Banská Bystrica. The second connection is led through so called Kamenný most (Stone Bridge) for Prednádražie, residential area, and the Railway station.

Cycling Infrastructure

Besides the bicycle stands (bike racks), any other cycling devices are not located in the industrial zone. There is a need to connect the zone to the network of designed cycling routes – direction of Podháj and the city centre, and from there to other residential zones in Martin.

Ownership Relations

Cycling roads connecting the industrial zone are designed for the existing urban roads, which are owned and administrated by the City of Martin.



Significant firms in the industrial zone and the number of employees

| Whole territory VPP | | |
|---------------------|-------------|---------------|
| firm/company | employees | area |
| SAND | 20 | 20000 |
| Moris | 12 | 300 |
| Probugas | 61 | 63900 |
| Delta | 10 | 17900 |
| ECCO | 623 | 85000 |
| Volkswagen | 299 | 198500 |
| ZSR | 63 | 94300 |
| Zdroj MT | 15 | 35200 |
| Galimex | 51 | 11000 |
| spolu | 1154 | 526100 |

North-East – Industrial Park

East Industrial Park is situated in the North East part of the city of Martin in the direct relation to the cadastral territories of Vrútky and Sučany, and their industrial areas (e.g. ŽOS Vrútky, Warehouses of economic centre of the Railways of SR in Sučany). From the North part, it is demarcated by the railway No.180 Žilina - Košice, from the West, by railway No. 171 Vrútky - Zvolen, from the South, by leading connection of existing industrial and warehouse areas, from the East, by option transits if the planned highway D1 Martin (Dubná skala) - Hubová and highway conduit.

At the present time, companies as Volkswagen Slovakia, a.s., ECCO Slovakia, a.s., ČSD – freight station, Pro Wood a.s., Stavebná nákladná doprava (Construction cargo transport), Probugas a.s., Veľkosklad ovocia a zeleniny (Warehouse of fruits and vegetables), Galimex s.r.o., and others.

Transport Situation

East Industrial Park is situated on the both sides of the road I/18, and, in the present, it is accessible with level crossroad/junctions from the road I/18 and the road through Košúty II, neighbourhood unit. Specifically, Sučianska Street, which serves the North part of the Industrial park and the road I/18 (areas which belongs to the SR Army, ČSD-freight station...) and the access road from Sučany, which makes accessible the areas of Volkswagen Slovakia a.s., Warehouses of economic centre of the Railways of SR with their leading system, as well as other enterprises.

Also connection of a part of the industrial areas via Košúty II, the neighbourhood unit, is temporary (in the present time the transport load of the residential territory is already very high)

Cycling Infrastructure

Besides the bicycle stands (bike racks), which are situated in areas of some plants, any other cycling devices are not located directly in the industrial zone. There is a need to connect the zone to the network of designed cycling routes-direction of Priekopa, Košúty and the city centre, and from there to other residential zones in Martin. Nowadays, on the service road a green cycle-tourist sign is led, whereas Martin inhabitants use this cycle route frequently for recreation.

Ownership Relations

Lands assigned for building-up are mostly privately owned by physical entities. Besides that, there are many lands which are property of the Railways of SR, SIP š.p. Bratislava and the City of Martin. Service roads, which are out of internal areas, are administrated by the City of Martin.

Property-legal status of individual lands is recorded at the drawing No.7 and within the 2nd part of the study entitled "Martin-East Industrial Park", which was ordered for processing by the City of Martin in 2000.

The number of employees is too variable, so we list figures from the year 2000, which give a picture of a planned situation in the biggest companies. Today is the situation different, new companies are growing, and so the number of employees.

DESIGN OF CYCLE LANES – INDUSTRIAL ZONES

1. NORTH-EAST INDUSTRIAL PARK

Initial Situation

A starting point for the designed section is Dúbravca Street in Košúty, neighbourhood unit. This street is temporary used as transport service road to Ecco factory especially by freight vehicles. Farther parts of the Industrial Park direct their transport to the circular junction / roundabout with public road, Sučianska Street and Priemysel-ná Street.

Dúbravca Street in Košúty II. In front of the entrance area of Ecco factory is also a junction as a conjunctive point of several cycle routes within the designed network-the Industrial Park is connected there to the existed, but also planned network of cycle routes in the city of Martin. This place is a meeting point of routes of main North-South road through the city – direct connections to the city parts of Košúty I., Sever,

city centre, and indirectly also for the neighbourhood units of Záturčie and Podháj. Also connection to the city part of Priekopa with the planned cycle path by the railway trucks and Jordán stream seems to be very important. Other significant feature of this locality is also the fact, that the existing cycle routes passing this point as well as the planned network of so called green recreation ring road around the city of Martin – see „Study on the Cycling Routes Network of the City of Martin“.

Because this is considered as a significant junction of cycle routes within the whole urban area, the greater attention needs to be paid to this area, as well as to equip it with other information components and additive cycling accessories– e.g. information table, cycle roofed shelter, sign of information point. In this study, this point will be called “Dúbravec”.



Connection: Dúbravec - Industrial Zone – Martin Part

Concerning the connection of the industrial part of the North-East Industrial Park to the network cycling roads in Martin, we propose two variants. Both options use the existing network of service roads built up within the industrial zones, which are completed by new-designed cycle paths.

The main objective is to allow for cyclists from Martin a speed and save transit to the „heart“ of the industrial zone – to Volkswagen factory and then, by the existing roads to the other production plants of the industrial zone.

Under the terrain inspection we found out several „paths“, which were by people themselves, and which represent ideal shortcuts in the way to work. Until now, they are open spaces with purpose to build up other plants. Therefore we highly recommend to consider designs of cycle routes within this territory, and in case of legislative proceeding about new industrial build-up area, to consider also cyclists’ needs and implementation of cycling infrastructure.

Geomorphologic aspect of the terrain does not require any special foundation or other construction objects as bridges, foot-bridges or reinforcing of the slope (bank). The terrain is flat, ground up to the depth of 1,4 m is created by clay loam of a stiff consistency of stratiform structure, what allows easy foundation of a building (a survey provided by GEOstatik s.r.o. Žilina).

Concerning the location of the cycling road and its length are the proposed variants different (not identical).

A good network of transport service roads, from which is the transit transport excluded, exists in the area of industrial zones. Intensity of motor vehicles is relatively low, so there is no need to provide any construction works on the existing roads.



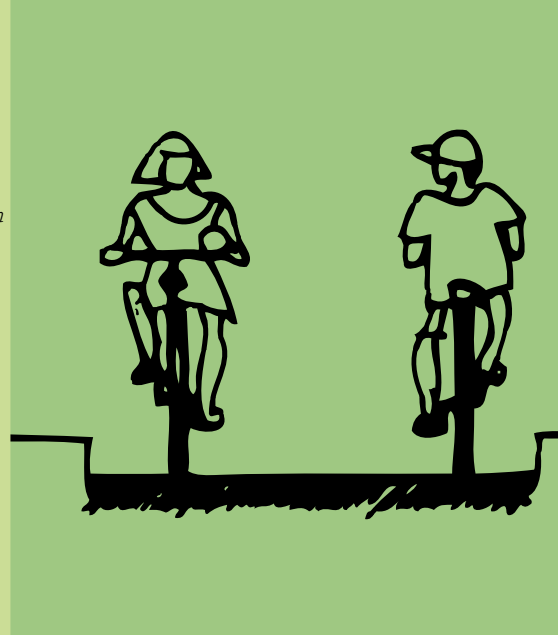
Dúbravca Street (Košúty II., neighbourhood unit) represents a significant nod of cycling network, where cycle routes are intersected with transport and recreation functions and, concurrently, with starting point for to the industrial zone – North-East.



A very progressive parking area for bicycles in the front of the Volkswagen area. During our visit - 58 cars and 29 bikes were parked there.



Nowadays, a well trodden paths lead to the industrial zone area, which employees use as shortcuts from the bus stop Košúty, some from Priekopa. Both designed variants of cycling lanes in this klocation respect this fact.



The reality, that now the trodden paths are respected by cyclists, is proved by the purposely-constructed cross railway track connected with shortcuts leading to ZOS area and Probugas.



Variant 1.

Cycling route starts in the starting point of Dúbravec , and the first 770 m leads on the existing service road in a joint transport strip without special repairs. With respect to the traf- fic intensity in this section, any other measures for cyclists are not required. In case of recon- struction of the road, we suggest to add lighting, because people go to work also for shifts, and an unlighted road uses to increase feelings of social uncertainty and safety.

A new cycling path in the length of 1180 m starts in the space close to the Gardening Com- munity, which is surrounded by an untreated field - path. The route flush crosses a railway train owned by ŽOS Vrútky, whereas it further continues by the fence of the Ecco and Volks- wagen areas, where it connects to services roads and parking place next to entrance gateway.

We suggest processing of the spatial design of cycling roads as cycling strip of the width up to 2 metres, directionally undivided, concrete surface treatment, which is easily visible in worse light conditions than black asphalt. Assumed costs for the route implementation represent 170 thousand Euros. The price does not include any costs for possible repurchase of lands and for lighting.

Other construction objects – lighting along the whole route.

Total length of the route within the option 1: Dúbravec – entrance gateway to Volkswagen is 1950 m-new cycling path represents 1180m of it.

Variant 2.

Cycle route starts in the starting point of Dúbravec and the first 1 180 m leads on the existing service road in a joint transport strip without special repairs. With respect to the traf- fic intensity in this section, any other measures for cyclists are not required. In case of recon- struction of the road, we suggest to add lighting, because people go to work also for shifts, and an unlighted road uses to increase feelings of social uncertainty and safety.

A new cycling path in the length of 1000 m starts in the space close to the firm of Probugas and crosses free grassy open spaces with different kinds of bushes along to the entrance gateway to the Volkswagen area.

We suggest processing of the spatial design of cycling roads as cycling strip of the width up to 2 metres, directionally undivided, concrete surface treatment, which is easily visible in worse light conditions than black asphalt. Assumed costs for the route implementation represent 170 thousand Euros. The price does not include any costs for possible repurchase of lands and for lighting.

Other construction objects – lighting along the whole route.

Total length of the route within the option 2: Dúbravec – entrance gateway to Volkswagen is 2400 m - new cycling path represents 1000 m of it.

Examples of the cycle path constructions for cycle lanes with excluded freight transport:

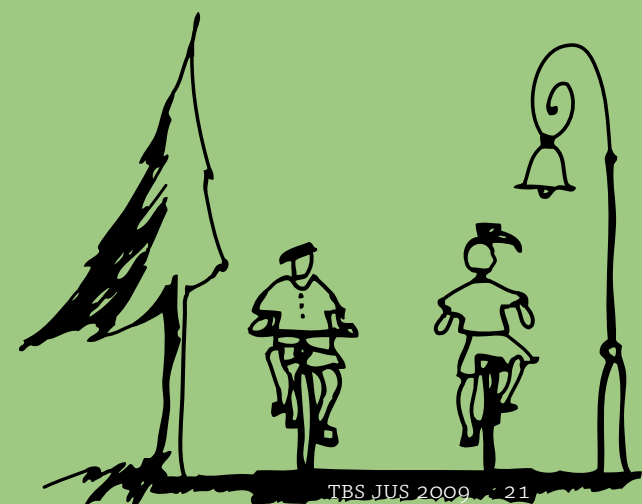
| | | | |
|--------------------------------|-------------|--------------------------------|--------------|
| Asphalt concrete | AB III 4 cm | Mastic asphalt | LA 3 cm |
| Stoneware reinforced by cement | KSC 10 cm | Coating stoneware | OK III 10 cm |
| Width | 14 cm | Sand | P 5 cm |
| | | Width | 18 cm |
| Asphalt concrete | AB III 4 cm | Asphalt+cardboard | LA+LEP 3 cm |
| Ground concrete | B135 10 cm | Stoneware reinforced by cement | KSC II 10 cm |
| Width | 14 cm | Sand | P 5 cm |
| | | Width | 18 cm |
| Sewage cover | | | |
| Coating stoneware | OK I 5 cm | | |
| Broken stone | ŠD 15 cm | | |
| Width | 20 cm | | |

Proposed cycle path constructions

| | |
|--------------------|--------------|
| Cement concrete | CB III 16 cm |
| Broken stone | ŠD 20 cm |
| Calcic stabilizing | S 30 cm |
| Width | 66 cm |

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| | |
|-------------------|-------------|
| Asphalt concrete | AB III 4 cm |
| Coating stoneware | OK II 4 cm |
| Coating stoneware | OK III 5 cm |
| Broken stone | ŠD 35 cm |
| Width | 48 cm |





The field-path under the bridge of the public road 1/18. During the wet weather is the present field foot-path impassable.

Priekopa – Industrial Zone

Cycling route starts in the starting point of Dúbravec, and leads on the existing field-path along the railways Vrútky – Banská Bystrica and the Jordán stream to the city part of Priekopa. Industrial Park is planned on the right part of the designed cycle lane. During the wet weather is the present field foot-path impassable.

A new cycle path in the length of approx. 900 m leads on the flat terrain up to the junction with Sučianska Street. We suggest processing the spatial design of cycle lane as cycling strip of the width of 3 metres, directionally divided. More generous design of the new cycle lane proposed also from the reason, that this route will a part of the connection not only for direction of industrial zones, but also the connection of urban agglomerations and a part of recreation cycling ring road, which can be - in future – frequently used because of the fact, that it will represent only one direct connection of Priekopa with the city centre by fly-over crossing with frequent public road No. 1/18. Assumed costs for the route implementation represent amount of 200 thousand Euros. The price does not include any costs for possible repurchase of lands and for lighting.

Other construction objects – lighting along the whole route

Total length of the route: Dúbravec – Sučianska Street represents 900 m.

Note on safety:

Following the terrain inspection, nowadays, majority of Sučany population travels to work to the Industrial Park. Sučany cyclists use for transportation dangerous public road of the 1st class 1/18. Dangerous transport collisions between cyclists and motorists occur very often. Therefore we suggest solving this situation in cooperation with the municipality of Sučany, the Slovak Road Administration; alternatively it should be integrated in design of highway feeder of the planned highway D1.

The proposed cycling strip of the section of Sučany – Priemyselná Street (entry to the industrial zone from the roundabout on the public road 1/18 is approx. 1400 metres long) .

2. SOUTH-WEST INDUSTRIAL PARK

South-West Industrial park – former ŽŤS Martin area was built-up many decades ago, and transport operation of the territory runs on the well-designed service roads. With respect to its location, three big barriers – river, railways and the city bypass - seem to be the biggest problem of its connection to the other city parts. The Study on the Cycling Routes Network of the City of Martin 2009 focuses on solving these obstructions. Two starting points concerning the connection of industrial zone to cycle-routes resulted from the above-mentioned study. The first one is situated at Robotnícka Street—a bridge next to the OMW petrol station; and the second place is so called Kamenný most (Stone Bridge) on the left part of the Turiec River embankment.

We recommend furnishing both points with information table describing the network of cycle lanes within the city of Martin, alternatively with other additional information – as time, distances and so on. The importance of the starting point by so called Kamenný most (Stone Bridge) is evident also because of a connection to green recreation routes – a part of Martin green circuit – along the Turiec river and connecting to the suburban recreation area, Stráne, with connection to Martinské Hole.



Robotnícka Street - Bystrička

Cycle lanes from the neighbourhood units of Jahodníky, Ľadoveň and Bystrička flow into this point. The street is directly connected to the residential area of Prednádražie and the main Railway Station, important matter especially from the point of view of combined transport.

A design of cycle lines in this area does not require any other constructions works. The traffic intensity at the service roads of the industrial zones surroundings is low, and any other configuration of the route cross profile should be inefficient at the present time. The service road leading along the Turiec River facing South direction to Bystrička is 2,2 km long. As per transport summation in the year 2005, 24-hour traffic of 2454 motorists was measured, what can be defined as a low intensity. Any addition of cyclists on this place was not made.



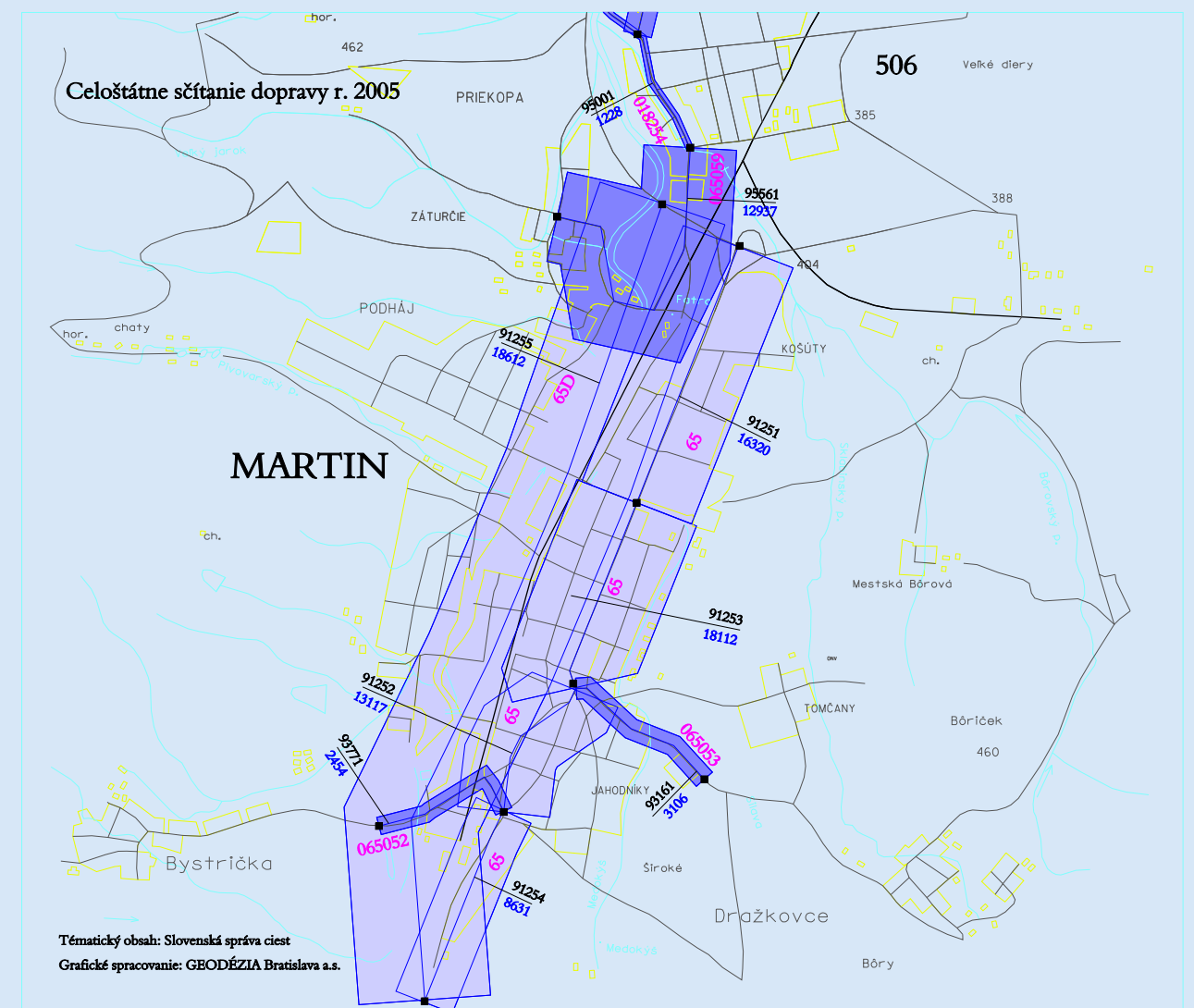
Kamenný most (Stone Bridge) – Robotnícka Street

Cycle lanes from the city parts of Podháj, the city centre and recreation circuits flow into this point. In the past, a main transport artery not only for cars, but also for thousands of pedestrians and cyclists directing to the ŽTS Martin factory, was leading here. Nowadays, the re-constructed bridge offers a very constrained space for all. For motorists, cyclists and walkers. Outrun racing is always connected with a stress especially for the more endangered traffic participants - cyclists, whose are moving within the main transport space of the bridge.

A repair of the railway bridge (railway train to the heavy machinery industry plant), which should be used by pedestrians and cyclists, can be considered as a certain variant design. Also calming the traffic down on the present bridge should be useful.

Technical conditions of TP 15/2005 (by the Ministry of Transport, Posts and Telecommunication of the SR):

Transport summation in Martin – 2005, Slovak Road Administration.





Kamenný most (Stone Bridge) is the simplest connection over the Turiec river from the city centre to industrial zone South-East and to the city part Podháj.

Change of the Roadway Surface

A change of a texture or colour of the roadway surface brings for drivers information about a need of the mode change, what requires an increasing attention and carefulness of the drivers. The change of the roadway surface/cover is provided by use of paving, the treatment of surface properties of the roadway by application of new surface or paint. Particular trimmings can be provided in different ways. Optical and acoustical items are usually made by application of the colour substances. Also paving lines fit across the roadway bring an identical effect, which influence not only eyesight, but especially hearing and feel/touch through vibrations from car to the whole driver's body.

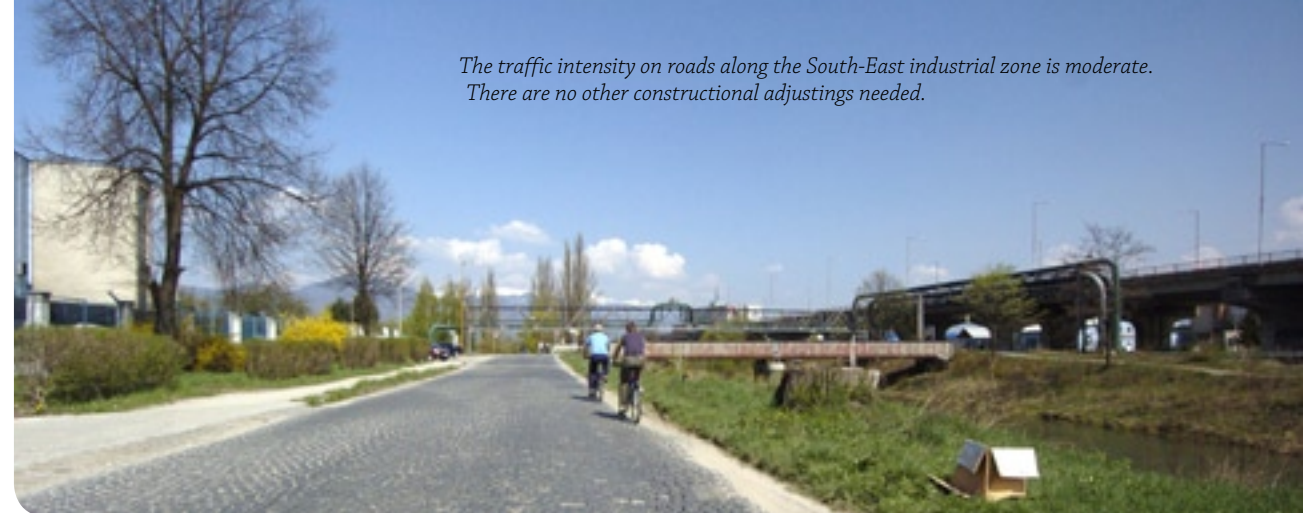
The paving causes an increasing noisiness, so it should be applied in the places when optical and acoustic effects are needed to be reached. Acoustic effects of the paving stones are necessary to design in accordance with the Regulation No. 40/2002 Coll. (see 1.6) which specifies rules for noise from the transport. The change of the roadway surface brings a better aesthetic appearance of streets, so it is necessary to be

very careful while you design these measures. Any trimmings what would cause reducing of quality of the surface characteristics of the roadways and traffic safety must not be used.

Long Cross Threshold and Elevated Surfaces

Characteristic geometric arranging of the slowing down threshold is defined by its length and width. The crucial component of the slowing down threshold is an entrance ramp, whereas its inclination significantly influences reduction of excessive speed of vehicles to the desired speed.

Width of the threshold has to be over the whole width of the road line. Height of the threshold (in case of car traffic) is 75 mm - 100mm, sinusoid shape 75mm-120mm, in case of bus traffic – maximum 75 mm. Total length depends of the applied shape. The elevated surfaces are designed with longer length that the long cross thresholds. So also the bigger vehicles have, at the same time, all their wheels on this surface. Long cross thresholds can be of trapezium, circle, elliptic and wave shape



The traffic intensity on roads along the South-East industrial zone is moderate. There are no other constructional adjustments needed.

(STN 73 61 10).

Short Cross/Transverse Threshold

The short cross threshold is the most simply type of the physical slowing down threshold. Its length does not exceed axle base of personal cars, and usually is shorter than 1,0m.

Short cross thresholds are designed before exits on the blind places and on other surfaces with a limited view, or during side cuts and entries to the other specific areas with the connected places of local roads. Various shapes and material are used for the short cross thresholds (mounted, prefabricated, etc.).

Multi-Purpose Lines

The multi-purpose lines (STN 73 6110) could be established on the roads especially of the 3rd class and on the connected local roads. The lines are used for leading of cyclists, or temporary activities (loading/shipping) in the main transport space of two-lined, two-way, little loaded local roads. They are part of the road lines, and their width cannot be shorter than 3,5m. The multi-purpose lines are marked by road signs and optical separation. They can be applied in habitations with population over 20 thousand inhabitants, on collecting local roads of the function class B2.

After crossing the river, we get on the service road around the whole industrial zone area. The cycle lanes design does not require any other construction works neither there. Transport intensity on the service roads around the industrial zone is low and any other configuration of the cross profile of the route would be in the present time insufficient.

Necessary additional cyclist accessories as e.g. roofed bike racks are necessary to solve in cooperation with representatives of the companies which run their activity within this territory.



The bridge over the Turiec river close to the Kamenný most (Stone Bridge) was originaly built for railway to ZTS. It represents an alternative of connection to industrial zone.



Marketing and Advertising

To support travelling to work by bicycle especially requires choosing of suitable means of promotion and motivating for inhabitants. Also cooperation with companies that care about their employees and create for them alternative conditions for travelling to work, and that are willing to establish covered bicycle parking area, showers or changing rooms for their employees, is very important.

It is generally known, that women use bicycle for travelling to work less than men, because of a weak feeling safe, i.e. insufficient cycling infrastructure. Basic planar survey showed, that in countries with a high number of persons riding on bicycle, the percentage of people suffering from obesity is lowest, what reflects the complex health conditions of population. Also a change of the population value orientation towards environment can be a significant step. Naturally, the municipalities, which pay greater attention to establishing of cycle routes inspire more people and support developing of healthy community.

Positive examples attract people so participation of famous personalities and politicians of the particular locality is essential.

FOR AND AGAINST travelling to work by bicycle

Many people have a „reason“, why they cannot travel to work by bike. However, solutions exist for everything.

1. It is too far – if you live far away from your work, you can combine transport means –

part of the journey by bus or train, another part-by bicycle. In many countries, the „bike and ride“ system represents a part of the integrated transport system. Buses or trains provide a special space for transport of bikes.

2. It takes long time – you would be surprised! Within the built-up areas with exhausted traffic (majority of cities), for the distance of 3 - 4 km is cycling much quicker than driving a car. Concerning the longer distances, you should consider it as a daily training – you save time assigned for regular exercises.

3. I must wake up earlier – if journey to work is shorter than 10 km (what represent approx. 30 minutes of travel time on a bike), difference between travelling by car or by public transport is minor. If a ride on a bike takes longer, 30 minutes of shorter sleep is replaced by a good morning exercise, which keeps you fit for longer time.

4. I can not find a special bicycle for work – you do not need any. Any old dusty bicycle, which you have in your garage, is enough for you, and it is also less interesting for robbers. For money saved for petrol and maintenance, within a year you can buy a new bicycle.

5. I have to wear nice clothes for work – it is true, that cycling for longer distances requires a cycling dress (e.g. reflecting items, helmet and so on). In such case, it is important to have

a possibility to get change to suitable working dress in a changing room, or dressing room in your workplace. For shorter distances you can ride a bicycle nicely dressed. Nowadays, so called e-bikes are very trendy, also folding bicycle with additional motor, which easily help to overcome bigger climbing or stronger wind without any sweating. They look very esthetic, with accessory baskets and porters e.g. for computers.

6. I cannot take a shower in my work – once again: to get e-bicycle, which allows a comfortable ride without any sweating, and than cyclist does need any shower as a person who travels to work by means of the public transport or by car. Basic hygienic facilities, where you can get wash, are available in each workplace.

7. I do not want to travel at night – in the marked you can find many lights for bicycle and reflecting items, which visualise cyclists within the transport traffic. Many streets in the cities and cycling paths are lighted.

8. I need a car for my job – let's think about that – which business journeys are really necessary arrange by car and which can be

done by bicycle. If it is really impossible, use bicycle as a way to relax actively after work, and – as a driver – have a nice attitude towards cyclists.

9. Va`afZShMŠ` kb`SUNfa bSd` _ kT[UKUW – neither at home, nor in my work. This is a key issue, which needs to be solved in co-operation with triangle municipality-company-employee. A municipality can help to build parking areas within the neighbourhood units, which are main residential zones. And, companies can build covered parking places within their areas. In Martin, enterprises consider the issue relatively progressively, and the areas of both industrial zones are equipped with comfort parking places for bicycles

Many cities in Europe and U.S. participate in the campaign of so called „Commuting Day“, travelling to work by other means - by bicycle, by walk, car-sharing etc. Benefits are not only ecological, economic, but in case of elected representatives, also political. They represent a possibility of direct contact of the communal representatives with the city inhabitants and voters on the purely positive base – in connection of health-sport-work-ecology. Probably from this reason the cycling to work becomes popular.





WHAT DOES THE CYCLIST NEED

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Brief survey of proposed measures concerning the connections of industrial zones in Martin to the cycle lanes' network

| North-East Industrial Park (IP) | | | | |
|---------------------------------|-------------|------------------------------------|--------------------------------|-----------------------|
| Section | length in m | Character | Objects | Assumed costs in Euro |
| Dúbravca – PP, variant 1 | 1950 | 1180m long, 2,00 m, cycling strip | information system, lightening | 170 000 |
| Dúbravca – PP, variant 2 | 2400 | 1000 m long, 2,00 m, cycling strip | information system, lightening | 150 000 |
| Dúbravca – Sučianska Street | 900 | 3 m, cycle path, asphalt | information system, lightening | 200 000 |
| In Total | 5250 | | | 520 000 |
| South-West IP | | | | |
| Section | length in m | Character | Objects | Assumed costs in Euro |
| Robotnícka – PP – Bystrička | 2200 | joint strip | | unsolved |

As a summary we submit a proposal of main measures, which should help to solve the connections of industrial zones to the cycling network in Martin. Concerning the North - East industrial zone, construction works – building up of new cycle-paths – are necessary. In this case, there is a need to set a priority solution, for which the project documentation for the

building permission will be processed. This study offers only a possible design.

Concerning the South - West industrial zone, any construction works for cyclist within the area are not needed. However, the safety of crossing over so called Kamenný most(Stone Bridge)in ČSA Street. The study suggests several possible actions.



Afterword

This document especially bases on the elaborated study of the Trendy Travel Project with title “Study of Cycling Routes Network”, whereas an abstract model of the cycling routes network in Martin and its surrounded suburban parts and neighbourhood units were processed within the scope of it. This model was suitably used as a base for design of concrete cycle routes directed to industrial zones. Maybe mapping seems to be very easy, but the reality is different. I need to mention one negative example which recently occurs in Martin. It is the construction of Kaufland,commercial centre,which

was not consulted with the transport architects in advance. Moreover, any cycling connections between two neighbourhood units, in centre of which is the above - mentioned Kaufland situated, are missing in the design of transport infrastructure (now also in reality).Paradoxically, the cycling path was on that place before, now it is not there, in fact, it ends in the field furrowed by heavy cars.

Maybe this is the reason why my final statement is focused only on a challenge, that I address to the project researchers, their managers, and to all activists of the Trendy Travel Project to look for ways how to avoid future so called “quick solutions”, and to find suitable motivations for the competent municipal representatives to act conceptually also because of similar studies and documents processed via the Trendy Travel Project. This is the only way how satisfy several groups if inhabitants of this city, as today. Or will we face the issue of cycle-paths in the industrial zones identically as the Kaufland case?

Author:
Viera Štupáková
Dušan Kubička,
TBS JUS

Text:
Viera Štupáková

Photo:
Tomáš Paľo
Viera Štupáková
p. 6 – bellow – internet
Type and graphic layout:
Tomáš Paľo

Dušan Kubička

NÁVRH HLAVNÝCH CYKLISTICKÝCH KORIDOROV V MESTE MARTIN



Brendy Bravel

Intelligence Energy & Environment



*Cyklista je súčasťou
dopravnej premaniky.
Potrebuje priestor!*

*Cyklistické pruhy
nemôžu končiť
pred križovatkou!*

- Cyklistické komunikácie s dopravným významom
- Cyklistické komunikácie s rekreačným významom
- Cyklistické komunikácie v priemyselnej zóne
- Varianta II.
- Miesta napojenia na plánovanú cyklistickú sieť

*Neignorujeme cyklistov
v hlavnom dopravnom
priestore!*

SUČANY