INNOVATIVE TECHNOLOGIES IN THE FUNCTION OF TRAFFIC SAFETY AND ENVIRONMENTAL PROBLEMS OF COUNTRIES IN TRANSITION

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Summary: *The process of transportation is a process with which it's possible to take control with the use of intelligent transport methods, which is especially related to the safety management, which would significantly reduce the number of dead, hurt people, as well as material damage. As part of the ITS, intelligent vehicles are being developed, intelligent roads, wireless 'smart' cards to pay for transportation, adaptive systems of crossroads, more efficient public transportation, automated answering and positioning of vehicles in accidents, biometric systems of passenger protection, etc. The bottom line of ITS is to integrate some solutions, starting from common ITS architecture, and well developed specification systems. The EU considers an important part of their transportation policy, the research of resource efficient transport that takes care of environmental protection in all types of travel. ''Smart, green and integrated transport'' has been determined as the main challenge of financing the project within the EU research project ''Obzor 2020'', in the period of 2014.-2015., which strives to ensure that Europe is always in the loop with technological progress in transport.*

Keywords: *transport, intelligent transport systems, traffic safety, environmental policy, sustainable development.*

Introduction

The sector of transportation was the key initiator of economic development and transition of the country. Traffic is the cornerstone of european integration and is tightly connected with creating and finalizing the inner market, which in turn increases employment and economic growth. As one of the first areas of common policies of today's EU, traffic is considered the key to accomplishing the three of four freedoms of the common market.

In the past 60 years, the development of traffic in the EU has progressed immensely and still has great importance for the wellbeing and employment in Europe. In the transport industry now, there are 10 million people employed, which makes 7% of the entire number of employed people in the EU, and they, in a similar percentage, contribute gross to the domestic produce (BDP), 40% of public investment and almost 30% energy consumption. Good traffic connections are very important for the EU economy, in matters of export – transport makes 90% of outside market in the EU. In the past few decades, the changes in European traffic politics brought

on the expansion of the internal market of the EU, by opening national markets on which public monopolies have prevailed, like it was the case with the air and rail transport. The expansion, modernisation and the infrastructure coordination across the EU have a fundamental importance for creating networks across the borders without any obstacles for different types of travel. Because of that, the policy for trans-european networks has been built into the Maastricht Treaty from 1992. Furthermore, with the treaty, requests for environment protection have been regulated, as help for the completion of the internal market.

Also, the purpose of the transportation policies in the EU is to help people and protect them in the time of travels, which is one of the accomplishments for insurance and protection of the travelers. However, the traffic doesn't pose a problem itself, but this problem appears in occurances, relations and activities of the human society. The safety system is very complex, precisely because of the width of the problems, which vary by kind, nature and way of influence.
EU's goal is to create a european space of road and traffic safety during the 2010-2020 decade and to improve the safety of road traffic and with that to contribute to the sustainable mobility.

According to the statistic for the year 2012, there was more than 27.7000 dead and 313.000 severely wounded on the roads of the Union. That decrease of 9% in comparison to the modest 2% in 2011, means that we can hope to achieve the goal according to which the number of dead on the roads will be decreased by the double by year 2020, even though for the achievement of that goal, the Commission considers that the yearly decrease has to at least reach 7%. With time, the transport systems will become bigger and more complex. From the transport, bigger amounts of travelers and goods, and at the same time fulfillment of ecological, timely and financial limitations are required. The whole process of the transport is being optimized so that the time needed for the transport is as short as possible, and the needs of storing the goods are reduced. In order to accomplish the mentioned requests, more intelligent transport systems are being used, which allow the use of information and communication technology. The transport process is a process with which is possible to manage with the help of intelligent methods.

With that, it's possible to increase permeability of existent traffic infrastructure with relatively little investments insofar as the amount is compared with the amount of needed investments for the extension of existing traffic infrastructure, by constructing new roads. Within ITS, intelligent vehicles are being developed, intelligent roads, wireless 'smart' cards to pay for transportation, adaptive systems of crossroads, more efficient public transportation, automated answering and positioning of vehicles in accidents, biometric systems of passenger protection, etc. The bottom line of ITS is to integrate some solutions, starting from common ITS architecture, and well developed specification systems. Cities that have organized public transportation don't have the possibility anymore to perform its' function without the use of ITS. ITS makes i possible, not only to support the functioning of public transportation, but it

changes its' functioning, and that contributes the more efficient public transportation, successful problem solving in traffic conduction and performing passenger transport in cities. In the western European countries, the implementation of ITS are led by big companies that construct motorized vehicles together with universities in technical domains. Countries in transition have technologically outdated elements of transportation systems. Those elements, regardless of how outdated they are, represent the basis of progression and with correct planning and management, the needed technological level of inclusion to the integrated transport process can be achieved. However, environmental and technological possibilities limit the progress of intelligent transport systems. The modern society has a need for integrated transportation system based on a fast, available and safe infrastructure which offers services to individuals, as well as business companies.

The development of intelligent transportation systems gives an opportunity to the use of advanced technologies into the systems and on methods of transportation for efficient, comfortable and safe highways, railways, waterways, airports, harbours and connections between these different types of transport.

I SAFETY OF ROAD TRAFFIC IN BOSNIA AND HERZEGOVINA AND THE WORLD

1. The basics of safety of road traffic in Bosnia and Herzegovina and the world

Road traffic is one of the important characteristic of the modern civilization. All the benefits of this phenomenon, sadly, we still pay for with a high price of unneeded human suffering. Road traffic represents a part of an all-inclusive traffic system, which is a significant factor of social happenings, because it's an inseparable follower of the progression of the modern society and today, it represents the most common aspect of wide and individual transportation, thanks to the advantage which it has in regard to the other aspects of traffic. The traffic doesn't pose a problem itself, but this problem appears in occurances, relations and activities of the human society. The safety system is very complex, precisely because of the width of the problems, which vary by kind, nature and way of influence. Because of that it's hard to maneuver this system, because all the elements cannot be covered entirely. For efficient approach of goals and activities which will lead to decrement of the cause to the occurrences of traffic accidents, it is necessary to have reliable results of the analysis and checked foundings which will contribute to a safe environment for all users of road traffic. A plan and goals of activity in the field of safety are needed to create strategic, operational and additional activities.

2. European strategy on safety of road traffic

The safety of road traffic has become a part of global policies in all countries, and especially the countries of western Europe. After a line of individual activities of subjects who were in charge of safety of road traffic and achievements of certain, brief results, it came to a conclusion that without a systematical and continual implementation of measures, there is no achievement of long lasting goals. Therefore, countries of the European Union have set up a goal that, by the end of 2020, out of one hundred thousand residents, the number of dead would be decreased to six.

The management of traffic safety (management of risks in traffic, that is traffic accidents), represents a big challenge for every country because of the complex and diverse contexts of activities and specifics in prevention of traffic accidents. The data from year 2014 show that the number of dead in traffic accidents in the EU is about 25.700 people. In comparison to data from the year 2010, the decrease of numbers of dead in traffic accidents in evident, by about 17,5% in the past few years. At this pace of the decrease of dead in traffic accidents, in year 2020 the number of dead in traffic accidents would be around 20.000 people. In order for the planned goals until the year 2020 become reality, it is necessary to undertake additional actions. Because of the goal plan fulfillment in road traffic the European Union, though the European EU commision, continually suggests new directives with measures to increase safety in traffic. In the basis, new regulations on traffic safety of the European Union are in place, which should raise the level of safety. Also, as directives and guidelines, ways of their realisation is being continually followed, and new changes and additions are being reacted to.

3. Starting base strategies on safety of road traffic in Bosnia and Herzegovina 2008-2013

With the strategy on safety of road traffic goals, development and functioning safety systems of road traffic of Bosnia and Herzegovina are being defined, and that is the expression of her commitment to be a part of the regional and global systems of safe traffic. The strategy treats interests of the country, safety goals, safety risks and challenges,the possibilities of the country Bosnia and Herzegovina to react on those risks and challenges, as well as the system structure of the country safety of road traffic.

The starting base strategies of road traffic in Bosnia and Herzegovina (2008-2013) have been done according to the request of the Council of ministers of Bosnia and Herzegovina, and that came from the need for professional exploration and determining the conditions and factors which decide the place and role of the safety of road traffic in Bosnia and Herzegovina. Road traffic in Bosnia and Herzegovina is regulated on country and entity levels, and with passing the country law on safety in traffic on roads in Bosnia and Herzegovina, this segment of traffic has to define and realize on a country level, certainly helped by entity institutions (ministry of transport, ministry of internal affairs, ministry of education, ministry of healthcare, directorate for roads and others).

Equally, the safety in traffic as a dynamic system, expresses the need for adequate initiative undertaking and measures in the next time period, as a natural continuation of research in frame of the safety systems, which implies the opening of processes and securing the systematic, thematic research.

4. The condition of traffic safety in the world

From the start of organized traffic up until the year 2014, in traffic accidents around 40 million people have died, and during 2014 traffic accidents were the tenth cause of people dying in the world. Following the data from WHO - The World Health organization, in the year 2014, 1,119 million people have died in traffic accidents in the world, and the fact that a big number of the hurt people are left with lasting health consequences has to be pointed out. Also, according to the data of The World Health organisation, in newer time more than 1.5 million people die in traffic accidents each year, and about 15 million are injured. In some countries the number of dead in traffic accidents is 4% of all dead, that is albeit 50% dead from the population group of 15-24 year olds. According to the report of the World Health organisation under the name 'World report on road traffic injury prevention' from the year 2015, has predicted that the yearly expenses for traffic accidents in countries of Central Europe and Eastern Europe in economic transition will make out to be about 1.5% of the expected gross national produce, and in the Western European countries, the highly motorized countries about 2% of the BND.

5. The conditions of traffic safety in the European Union

According to the available data in the safety segments of road traffic, the total number of traffic accidents in a period of 6 years is about 30% smaller than the number of traffic accidents in the year 2007, and it counted 24.680, that is about 8.500 traffic accidents less in comparison to the same year. Such a change in reduction of the number of traffic accidents had a consequence of the reduction in the number of victims in traffic accidents, dead as well as injured people.

6. The conditions of traffic safety in Bosnia and Herzegovina

Looking at the segment of dead in traffic accidents in Bosnia and Herzegovina with adequate measures in the time period from the year 2008 to 2013, the number of dead people has decreased from 429 to 312, that it there was about 117 less dead people in year 2013 compared to the year 2007. Forward mentioned data of the betterment of the degree of safety in road traffic in Bosnia and Herzegovina until the year 2013 show that BiH is amongst the countries with a medium number of traffic accidents and number of dead in traffic accidents in Europe. On the roads in Bosnia and Herzegovina in 2014, 35.344 traffic accidents happened. In those accident 297 people have died, while the number of injured people was 9.956. As in the majority of countries, in Bosnia and Herzegovina the younger and older population is exposed to a high risk in traffic. During the last year, 2014, 500 more accidents have been registered compared to thee year 2013, which, expressed in

percentages, shows the increment the total number of traffic accidents for 1.40%. The number of traffic accidents with dead/injured people is also increased, and that is 158 traffic accidents or 3.37%. When talking about traffic accidents with material damage, in the last year 937 more traffic accidents have been registered compared to year 2013, or percentage wise that is 3.25%. Looking from the aspect of the total number of traffic accidents by entities/district, it is noticeable that the death rate is bigger in Republic Srpska and it consist of more than 15 dead people on 1000 traffic accidents, in the Federation of BiH it's a little bit less than 6 dead people on 1000 traffic accidents while in Brcko Distrikt there is a bit more than 11 dead on 1000 traffic accidents. Looking at the up front mentioned, with a special review on the facts that in during the last year the number of traffic accidents has been increased, that the number of dead in traffic accidents decreased, but it came to the increment of the number of seriously injured people by 32 people, that is 1.9%, and the number of slightly injured people by 317, that is 3.9%, that the sale of new cars has been decreased, and the import of older, used cars has been increased, you come to the conclusion that the condition of road traffic in our country is still unsatisfactory.

7. Measures for resolving the causes of traffic accidents

For taking efficient measures and activities that will lead to the decrement of causes of traffic accidents, it is necessary to have trusted analysis results and checked findings that will lead to a safe environment for all users of road traffic. The measures can be different, and the measure plan has to be logical and it has to have a source of the main, concrete issues.

7.1. Preventive measures in decreasing the number of traffic accidents

In Bosnia and Herzegovina a fast tempo of motorisation development has been realized, and that is calling for changes in the behaviour of all participants in traffic. Preventive-educational work with all participants in traffic is of great meaning for attaining and raising the traffic-technical culture to a higher level at all. When pedagogical measures are in question, creation and development of humane relationships between all participants in traffic is needed, and after that the development of moral norms, ethical value and the development of needed consciousness about solidarity in traffic.

7.2 Regulated and organized measures in decrecement of the number of traffic accidents

Regulated and organized measures imply the activities that are being taken for suppression of negative occurrences in traffic, regulation and organisation measures of traffic on roads.

7.3 Short- and long-term strategic measures of safety in road traffic

The safety of road traffic has, undoubtedly, become a part of global policies of all countries, and especially the countries of Western Europe. Without systematic and

continuous implementation of measures there is no achieving of long-term goals. For joining the European Union, it is needed that Bosnia and Herzegovina accepts the directives and guidelines which require the countries that are members, to increase the safety of road traffic.

Strategic measures on safety of road traffic need to orientate on the these activities:

- Decrement of the strongest consequences of traffic accidents in the conditions of the constantly growing traffic,
- Bringing Bosnia and Herzegovina into the appropriate group of European countries, according to the number on the dead people on the streets compared to the number of residents, or in 100.000 registered vehicles.
- Significant increment of modern, repressive activity of the police and according preventive action.
- Raising the awareness of people about the problem of safety in traffic via media companies.

With quality measures, the decrement of number of dead, severly and slightly injured people has to be achieved, and it has to prevent the growth of the total number of traffic accident.

8. The conditions of road infrastructure in Bosnia and Herzegovina and the perspectives of development

The road network of BiH is amongst the less developed ones in Europe. The old age of asphalt roads in BiH is about 30 years , and the density of the network is 0,414 km/km2, that is 4.69 km/1.000 of population which is 2.5 to 4 times less than in the countries of Western Europe. ALso the roads of Bosnia and Herzegovina are behind on technical indicators, elements of the route, as well as on extended and transversal profiles compared to the roads in well developed countries. The participation of shares of the roads with the curtain width of 5,0m makes out 26%, and even on 41.5% of shares, there is an existent slope bigger than 6%, while on 14 shares the slope is bigger than 10%.

9. Legal legislative in the area of road traffic in Bosnia and Herzegovina

Recently, Bosnia and Herzegovina has implemented a framework traffic policy for the period from the year 2015 to the year 2030, so that the door can be opened for financing the build of new projects from the EU.

BiH puts the railway Sarajevo-Belgrade on the top of the priority list, over Tuzla and Zvornik. The plan is to better the connection Sarajevo-Belgrade with a railway and the nomination of a part of the railway from Trebinje to Montenegro, as well as the close up of Luka Bar.

9.1. The construction of the Adriatic-Ionian highway

The construction project of a part of the Adriatic-Ionian road through Bosnia and Herzegovina is 117 kilometers long. This way, the region will be connected between each other, primarily Bosnia and

Herzegovina and Croatia, but other countries as well - Montenegro, Serbia, Macedonia, because the Adriatic-Ionian highway will connect countries from Italy, Croatia, Bosnia and Herzegovina, over Montenegro, Albania.

A highway that would connect Budapest and Osijek, Sarajevo with Ploce has a great significance. The highway in Bosnia and Herzegovina is 335 kilometers long. Up until now 91 kilometers of the highway has been built on two shares. Tracin - Zenica West and Zvirovici - Bijaca. The construction of two more subshares, 3.10 kilometers long (Biljesevo-Gorica) and 2.9 kilometers (Gorica drivusa) is under way.

The EU emphasizes that from year 2030, the region has to connect between each other, and therefore has to adapt to the transportation network of the EU. However, to ensure the resources for that, the EU is expecting the continuation of the reforms and quality preparation of the projects.

10. Action safety plan of traffic in Bosnia and Herzegovina 2011-2020

The action plan is focused on the construction of the institutions of local capacity development and the key factors of risks, so selected actions can be started.

Key goals:

1. 7% of the yearly decrement of the final number of dead compared to the previous years (around 50% decrement in 10 years)
2. 7% of the yearly decrement of the number of accidents caused by excessive speed compared to the previous year.
3. Increase rate of the use of seat belt (safety belt) by 80%, by the end of the year 2013, and 90% by the end of the year 2015.
4. Decrement of the percent of dead pedestrians by 30% by the end of the year 2015, and 17% by the end of the year 2020.
5. Incidence of accidents caused by driving under the influence of alcohol decreased by 7% each year compared to the previous year.

10.1 Pillars of the action plan in Bosnia and Herzegovina 2011-2020

Pillar 1: Management of the plan in Bosnia and Herzegovina 2011-2020

Safety of road traffic is a multisectoral question which requires a multidimensional system of management, and appropriate technical and financial resources which would enable the responsible agencies to develop and implement appropriate strategies, policies and plans, and to coordinate different actors involved in road safety on all levels.

Pillar 2: Infrastructure

The infrastructure plays a key role in the safety of road traffic. Quality projection of the road traffic can help the people to use roads in a safe manner, and it can decrease the risk of accidents. Within this pillar, the plan will focus on engineered solutions that will decrease speed through the measures of 'calming traffic' and managing speed, especially in zones with high number of wounded on the road, like schools and

residential areas, in built zones and areas of linear villages along main roads.

Pillar 3: Safe vehicles
Improvement of safety in a collision and safety in vehicles are proven factors for the decrement of dead and wounded people on roads. In the past few years, it came to a significant progress in safety of vehicles which protects travelers and other participants in traffic, and it better the ability of avoiding a collision.

Pillar 4: Safe behavior of road users
Within this pillar, the plan focuses on the main factors of 'risks'. That includes low rates of safety belt usage, fast driving, driving under the influence of alcohol, and inadequate safety objects for pedestrians.

Pillar 5: Nourishment after an accident
It is a high possibility that it can come to death from a serious injury due to the impact, in road traffic in FBiH. The non-existence of a unique number for the emergency service and uncoordinated saving action can result to being late in providing emergency treatment to the critically injured victims. Every ten delayed minutes in pulling out a seriously injured victim from a damaged vehicle, can decrease the chance of survival by 10%. The key principle is that the injured receive initial condition stabilisation in time of the golden hour (that is the first hour after the injury) and that the number of trained people in first aid, that are often on the road, increases.

II ROAD INFRASTRUCTURE

1. Traffic policies in the EU

Traffic is the cornerstone of european integration process and is tightly connected with creation and it increases the employment and economic growth. As one of the first areas of mutual policies of the modern European Union, traffic is considered to be crucial for the realization of three from four freedoms of common market.

In the last 60 years the development of traffic in the EU has significantly progressed and traffic still has a has great importance for the welfare and employment in Europe. In the transport industry there is 10 million employed people, which makes 7% of the whole number of employed people in the EU, and they contribute the similar percent to the gross domestic product (BDP), 40% of public investments and almost 30% of energy usage. Good traffic connections are very important to the economy of the EU, in matters of export -- the transport makes 90% of foreign trade of the EU. In the last few decades the change in european traffic policies has contributed to the expansion of the EU internal market, opening national markets which used to be prevailed as public monopoly, as it was the case in air and rail transport. The expansion, modernisation and harmonisation of the infrastructure across EU has a fundamental importance for creating overborder connections without obstacles for differents types of traveling. Because of that, the politics of transeuropean connections are built into the Maastricht contract from 1992. Apart from that, according to the contract requests for environment protection as a helper for the

completion of internal trade have been included into traffic politics. Also, the purpose of traffic politics of the EU is to help people and to keep them safe i times of traveling which is one of the accomplishments for insurance and safety of rights of the travelers. EU is the first and only region in the world whose travelers enjoy comprehensive and integrated basic rights in all modes of transport. The end goal is to create a unique, european traffic space which will help Europe to stay competitive with the increase of efficiency of the whole transport sector for general welfare.

2. Infrastructure

Traffic infrastructure in Europe is currently unevenly developed. In many countries, which have recently become full members of the EU, built high speed lines do not exist and the connections of their highways are on average less developed than in the countries who are old members. To that, it is needed to develop the missing connections, a big part of the european traffic infrastructure needs to be expanded and upgraded.

It is the goal of the transeuropean traffic connection, or of the TEN-T: longlasting and ambitious project for modernisation and ''joining'' the existing, separated national connections into a functional network, with which all the parts of Europe are connected, while the different types of transportation are being used in the best way possible.

EU is planning, inside of TEN-T, to establish a central network by 2030, which will fulfill the missing overboarder connections and make the network 'smarter', and with the deadlines they will make sure that the implementation of all projects which contribute to the establishment of the central network which has priority.

The goal is to gradually ensure that until the year 2050, a big part of the population and companies in Europe isn't more than 30 minutes away of traveling to the extensive network. Beside the easier and faster traveling , with that network the traveling will be ensured to safety with less traffic jams.

2.1. Innovations and sustainable developments

EU considers the research of efficient resource transport to be important to their traffic policies with which they take care of the environment protection with all sorts of traveling. 'Smart, green and integrated transport' is proven to be the main challenge of financing the projects within EU, and for researching the 'Horizon 2020', for the years 2014-2020, which seeks to ensure that Europe always is in the loop with technological progress in traffic.

The technological progress represents the base of the future european transport and the transport industry will, thanks to that, be among the most compelling industries in the world. It represents the key to the reduction carbon emissions in traffic because with the innovations and progression, it can contribute to the efficiency - airplane and car motors, for example, or replacing the energy source based on oil. Road traffic is one of the examples of how, with implementing

innovative technologies, the drives can be helped with the reduction of spending fuel and lead them to available parking spots and help them evade traffic jams and collisions.

2.2. Pollution caused by traffic

While in cities, thanks to the big bus, taxi and delivery van fleets, which are used in city areas, it's possible to influence the widespread use of alternative fuels and energy sources, in many rural areas the needed infrastructure is missing. The EU strategy for promoting clean fuels in traffic speaks of it, whose goal it is to promote their breakthrough on the market, which by now wasn't able to breakthrough because of their insufficient infrastructure for charging batteries and fueling, and because of the high cost of fuel and low acceptance between the users.

3. Investing and Financing: The instrument for connecting Europe

The construction and upkeep of the infrastructure is an expensive venture. It is expected that the development of the needed infrastructure, needed for satisfying the foreseen growth of traffic need in Europe, will cost 1.5 trillion EUR by the year 2030. It's estimated that only by the year 2020 500 billion EUR will be needed for finishing the transeuropean network, and about half of that amount will be needed for the removal of the main narrow gorges. With the TEN-T[1] network, the connections will transform, the narrow gorges will be removed, the infrastructure will be updated and the overboarder traffic operations will be coordinated. The resources for transportation in the IPA [2] include a big part of the money only for the poorest regions in the EU.

With that amount, a better connection to the east and west will be better secured and the development of the most important connections inside and in between those countries. That way, the completion of the transeuropean transport network will be established, especially the planned central networks.

4. Future challenges

- The growth of demand for traffic is expected (only for cargo transport, the demand will grow by 80% by 2050.) and the trend of urbanization will continue.
- The transport sector of the EU, especially the road traffic sector, almost completely depends on oil as a source of fuel. Considering the irregular markets of oil and the possible future hardships with the supply, it is needed to find trusting alternative fuels.
- The EU has committed to decrease it;s emissions of greenhouse gases by at least 80% by 2050. As a main source of pollution responsible for a fourth of emissions of greenhouse gases in the EU, the transport sector has to make a significant contribution at reaching that goal.
- One of the worst traffic problems is the condensation, especially on roads and in air traffic. The

[1] TransEuropean Network

[2] Instrument for pre-accession assistance

condensation costs Europe yearly about 1% of it's BDP and causes big amount of emissions of carbon and other non-gaseous emissions.

- It is needed to increase the efficiency of traffic, which includes and upgrades logistics and development of a smarter 'behaviour while traveling', with the optimal utilization of modern systems of the IKT and satellite technology.
- While a significant progress towards the completion of the inside market has been realized in the department of traffic, in some sectors, like the road and railway traffic, it is needed to continue working on opening a market and ensuring a fair and open market competition.

III MOTORIZED VEHICLES

1. Vehicles as active participants in traffic

A motorized vehicle is described with two main characteristics:

- A product intended for wider usage, that is in traffic, and
- A product with a very complex structure (very complex technical system)

And because of that, motorized vehicles at an exceptionally big rate do affect the safety of traffic, that is the safety of people, the quality of living and work environment and economical interests of society. On the other hand, the abrupt development of the automobile industry is inevitably followed by a string of problems, like: constant increment of the number of traffic participants, **increment of the number of technically defective vehicles,** increment of the number of traffic accidents, big material and non-material damage and consequences, as well as a string of other economic damages and consequences. Because of multiple influences of motorized vehicles on the economy of the society, but also on other vital interests of the society, in matters of safety, motorized vehicles are with a reason among the most dangerous technical systems of common usage.

2. The influence of technical states of vehicles on traffic safety

There is a big number of **'technically defective vehicles'** that influence traffic safety. It's is a worrying fact that from the total number of vehicles which participate in traffic, about **40%** is 'technically defective vehicles, and the growth trend continues. A contribution to this assertion are undisputed facts: expressed commercialisation of traffic, constant increment of the number of traffic accidents, bit material and non-material damages and consequences, increased economic damages and consequences, etc. On the other hand, the technical condition of vehicles is constantly changing - getting worse and all that **without settled laws.** WIth the act of technical deterioration state of vehicles, every vehicle is with automatism and without anyone's will or influence classified in more numerous group of 'technically damaged vehicles' and as such, in that group, they are treated as potential dangers, that a factor with harmful influence on '**general traffic safety'**. Because of that the technical-exploitation demands are being vitaly

imposed: professional training of influential factors in traffic, on time and quality information, quality use of traffic, social aspect, decrement of harmful influences, rigorous control of technical functionality of vehicles and others.

3. Technical - Exploitation demands

The exploitation of vehicles is a special technical process which has its own parameters and demands. The basic demands of this process are:

- **Good technical condition of motorized vehicles, and**
- **The use of only technically functional vehicles in traffic**

During the exploitation of vehicles, their condition changes - gets worse, so its existence is entirely realistic, ie its being imposed through other very important and influential technical-exploitation demands, such as:

- Increment of professional competence of the drivers, but also others,
- On time and correct information about the state and condition in traffic,
- Quality and sophisticated handling of traffic,
- The social aspect - quality and safe living and working conditions,
- Minimal harmful influence of outside factors (the circumstance and condition of the roads), etc.

IV INTELLIGENT TRANSPORT SYSTEMS

1. Informational transport systems

In a world of expansion and usage of informational technologies, intelligent transport systems are more frequently used in all sorts of transport. These systems have found a wide use in road traffic (active and passive security of vehicles, automated following of vehicles, charging tolls…) The last four decades have marked a sudden increase of the number and complexity of electronic systems in cars. The participation of electronics in today's cars makes even 25% of the total production cost. Analysts estimate that more than 80% of innovations in the car industry is based on electronic systems. The term intelligent transport system represents a system of measures and technologies on a national level, whose goal it is to increase the levels of safety in traffic, more efficient unfolding o traffic with less hitches and decreased levels of pollution of the environment.The use of ITS applications, which are a constituent part of vehicles, in the most number of cases need to help the driver in times of driving and to decrease the risk of creating a traffic accident. These systems, in most cases are used as a prevention of traffic accidents, but they are used as well for reduction of consequences of traffic accidents. According to the placement of the informations being transmitted to users, we differentiate these:

- Intelligent transport means
- Intelligent roads

The functions of intelligent transport means, with a goal of preventing traffic accidents, help the driver to evade or

forestall a traffic accident using the systems which are placed in the vehicle and which estimate the nature or meaning of the threat, considering the condition of the driver.

Intelligent roads represent systems which are a part of the equipment on roads, and are used for increasing the safety in traffic and betterment of the efficiency of the traffic system. Depending on the roles in the system, we differentiate a few types of ITS based on infrastructure:
Systems to manage traffic on roads, systems to control traffic, systems to inform the travelers, systems to manage traffic on intersections, systems of pedestrian safety etc.

COnsidering that ITS help with removing negative influential factors on safety of vehicles and travelers, their effect can be looked at from two separate segments of vehicle safety, and those are:

a) active safety, and
b) passive safety.

By which, every of these segments has many influential factors, which is hard to number. The use of ITS in active and passive vehicle safety has a wide spectre and covers almost all segments.

Active vehicle safety

From the aspect of vehicles, the basic elements of active safety are:

- Driving safety (the possibility of timely and trustworthy management and braking, acceleration and similar others),
- Conditional safety (comfort driving: comfortable and ergonomic seats, noise and oscillation of the vehicle, ventilation and air conditioning),
- Safety of managing and handling (trustworthiness of the system: tires, brakes and management systems),
- Timely observation, under which we can count signalisation equipment and lighting, visibility through the drivers glass (defrosting, drying and the wiping of windshields, acoustic signals for warnings and alarm).

Passive safety

The main function of passive vehicle safety is:

- Decreasing the consequences of injuries of the drivers in case of a traffic accident,
- Decreasing the consequences of injuries of the other traffic participants, including pedestrians.

2. Cooperative systems in traffic and transport

2.1. What are cooperative systems?

It is possible to define cooperative systems as a combination of technologies,people and organisations which eases the communication and coordination needed for a random group to efficiently perform different activities for the realisation of the common goal, and to reach a use of all members. Cooperative systems in traffic and transport are systems in which a vehicle, wirelessly communicates with another vehicle, with infrastructure (roads

and following equipment) and other users (pedestrians, VRU[3] and others.) In regard to other existing systems, the technology of cooperative systems enables a two-way communication: V2V - vehicles with vehicles, V2I - vehicles with the infrastructure, V2U - vehicle with other users (f.e. VRU), I2U - infrastructure with other users (f.e. VRU). This approach is coming close to natural communication of more participants on a job.

2.2. Autonomous systems in traffic and transport

Transport systems are becoming bigger and more complicated. It is required from transport for bigger amounts of travelers and goods to be increased fulfilling the environmental, weather and financial restrictions.The whole process of transport is being optimized so that the time needed for transportation is as short as possible and the needs for storage of goods is as little as possible. How all these requirements can be fulfilled, the intelligent transport systems are being used more and more, which enable the usage of informational and communicational technology. The process of transport is a process which is possible to be managed using the intelligent methods. With that it's possible to increase the permeability of the existing traffic infrastructure with proportionally little investments, if the amount is compared to the amount of needed investments for the extensions of the existing traffic infrastructures by making new roads. As of right now, the needed traffic managing systems require constant observation of operators and the ability of suing new managing methods by the knowledge of the operator. A possibility of communication of such systems with other traffic managing systems is limited.

2.3. Location information in traffic

Cooperative intelligent transport systems, C-ITS include advanced technologies which make it possible for vehicles and the surrounding infrastructure to share the three main informations (of location, speed and direction) with other users of C-ITS. These informations are used for the advancement of the traffic system, but they can, with the use of equipment in the car, contribute to the optimized vehicle management (maximal efficiency, energy saving and other). Problematics of the dynamic location elements of the traffic system, primarily vehicles, is one of the main challenges of C-ITS. The location question and it's precision includes a global and local aspect, the absolute location of elements, but above all their relations of all participants of C-ITS system. Therefore are the all-present solutions based on global navigation systems., GNSS (Global Navigation Satellite System) are facing a new challenge which, for an effective solution, will need a row of innovative and advanced location technologies.

2.4. Virtual Road Train

Intelligent vehicles and intelligent roads make different ways of traffic, compared to those which we know, possible for drivers. The virtual road train is one of the innovative services which is being offered to the drivers and travelers in road traffic,

[3] Vulnerable Road User

using cooperative systems. Compared to a real train, the connection between vehicles in traffic in a virtual road train is communication. Communication, sensor and management technologies make an invisible communication between cars possible which then act as a read train. The column of a few cars, without extra intervention from the drivers, autonomously and on a safe distance make traffic possible, one behind the other. Such a concept in the traffic system offers a bit potential of betterment of the flow, decrement of traveling time, increment of comfort and decrement of gas usage and CO2 emissions.

2.5. The significance of communication in cooperative systems

The needs for mobility in everyday life lead to a continued increment of traffic which generated serious problems in matters of pollution, safety and environment influence. However, information and communication technologies (ICT) offer advanced solutions for today's traffic problems. Today's communications represent a backbone to the development of intelligent transport systems (ITS), that is cooperative systems from the traffic sector.

In the past few years, the accent was put on the research of intelligent vehicles, which wirelessly communicate with one another and/or with the infrastructure, and with other users. Such cooperative systems backed by information technologies and mobile communication can increase the quality and reliability of the accessible information about vehicles and traffic infrastructure, movement and placement of vehicles and the traffic surroundings.

V SUSTAINABLE MOBILITY

1. Mobility and transport

In the past four decades the mobility of European citizens have reached a completely new level:
In 1970, on average we traveled 17km daily, and today it's 34km daily.
Taking a look on the past 20 years, we see that there has been a lot done in view of european traffic policies: long lines on the borders are a distant past, increased safety of rights for the travelers, larger safety rules have been introduced to the people who work in the transport sector (pilots, bus drivers, trucks etc.) and with that, the safety of travelers grew; with the encouragement of the competition in air traffic and the establishment of precise standards for safety in air traffic, airplanes are being used more and more as means for public transport; the increased number of connections of the fast railway (from 1,024km in 1990, to 6,830km in 2011.) enabled faster and shorter travels with the train; constant attention on the conditions on the road and vehicle safety by using new technologies for safety in traffic, they halved the number of dead in traffic. Also, sea traffic has endured significant improvement in view of increasing the amount of cargo which is being transported by this type of transport, as well as in view of the decrement of accidents (2010/2011 13 thousand tons of oil has been poured out into the sea, compared to the 100 thousand tons recorded in the period of 1980/1990) and bigger security for tourists and people

who travel because of business using sea traffic.

2. What is sustainable mobility

Sustainable mobility implies active devotion for changing the way of transport, habits and behaviour of travelers with the goal of decreasing negative consequences of transport for the public, ecology and economy, as there are:

- Air pollution, which results in climate changes;
- Traffic jams;
- Traffic accidents;
- Degradation or urban environments (decrement of space for pedestrians due to the increase of the number of vehicles);
- Exploitation of land (bigger construction of roads and infrastructure).

From the social point of view, transport is sustainable when it's accessible to people with disabilities and impaired mobility, when a possibility exists for alternative ways of transport (f.e. Fast information over the phone or internet, better connection of public traffic, construction of infrastructure for bicycle transport or moving on foot…), decreasing traffic jams and better safety for travelers. From the aspect of environment safety, sustainable mobility implies the decrement of pollution and noise, while from the economic aspect, it implies the decrement of expenses for the use of public transport, individually or in a group.

3. Future Challenges

The main challenge which will affect the development of traffic policies in the decades to come are:

- Aging of the population and bigger requests for mobility of older citizens,
- Migration and the inside mobility of citizens,
- Bigger urbanisation of towns and globalization,
- Sustainability of the environment and energetic challenges due to the decrease and lack of fossil fuels.

For solving these problems, the European Union directs its public policies in the traffic section towards modern styles of transport, integrated and easy technologies which are attainable to all citizens, with the focus on needs and rights of users and workers of this sector.

The goal until 2050: leaving the need for vehicles which use traditional fuels in Europe

Until the year 2050 the ejecting the need for vehicles which drive on traditional fuels. This is one of the goals of green transport which has been launched by the European commision, with a special desire to decrease the dependency on oil which today amounts 96% and the goal to, by the year 2050, decrease the emission of CO2 between 80 and 95%. To be able to fo this, the European Union has to decrease the usage of vehicles which emit carbon dioxide by 60%. This process will get going in a few steps by 2030. The years of passenger vehicles and vehicles of public

traffic which emit pollution will be halved, and cargo transport will use eco-friendly fuels. Also, the middle and long travels for both goods and people will be redirected from road to rail and water traffic. In that context, the European commission has set up a goal of a three times stronger connection of the fast railway by 2030. The number of road vehicles with the need of alternative fuels has risen since 2009 by 5%. The majority of these vehicles use liquefied petroleum gas (LPG)m while with electric vehicles only 00,2%. The introduction of electric vehicles (EV) and hybrid electric vehicles (PHEV) is still very difficult in Europe. The main factors which are influence are: high prices of electric vehicles, decreased acceptance on the side of users and the lack of space and stations for fuel supplement which represent a vicious circle.

4. Sustainable plans of urban mobility

A sustainable plan of urban mobility is a plan of local authorities for solving the problem of city transport efficiency. It is based on existing practices and laws of countries who are members, and its key characteristics are:

- Participatory and integrated access
- Pledge for sustainability
- Clear vision with goals and measurable results
- Oversight of transport expenses and acquires

The policies and measures defined in a sustainable plan of mobility has to include all forms of transport attainable in the whole town area: public and private, passenger and freight, motorized and non-motorized, as well as traffic and parking.

5. Smart cities

A smart town is based on six main forms: economy as a competitive system; mobility as an attainable and sustainable transport integrated with new technologies; environment as a security and advancement of natural resources; people in terms of a social capital; way of life as a social cohesion and quality life; government which implies the participation of the citizens in public policies. With the liberation of the transport sector, it came to an increase of competition with big use to the citizens of EU who travel. However, it is necessary to implement legislation in the EU about the rights of travelers and an even more efficient fight with unfair practices and irregularities.

6. Top 10 best systems of public transport

Public transport is the key for a successful solution for traffic in big cities. Individual transport of automobiles implies a following infrastructure (highways, by-passes, parking sports, etc.) traffic jams, air pollution and noise pollution, problems with existing road and street infrastructure which has to receive bigger loads with the increase of the number of citizens, etc.

Considering that public transportation makes a backbone of a functional city gives an overlook of 10 best examples of public transport systems in the world, selected by

the site AskMen. With this overlook, the Big Dif project is being represented - the construction of the tunnel in Boston which needed to relocate the highway from the center of town.

No.10 - Metro in Copenhagen

The metro in Copenhagen, capital city of Denmark, was finished in 2002 and was connected with the railway system S-train which connects the capital city with the suburbs and the rest of the country.
Apart from the metro, Copenhagen has public bicycles as well which are rented when you leave money and get it back after you return the bicycle. In 2006 this metro had a percentage of reliability of 98-99% with passenger wagons which are known for their hygiene, which also is directly connected with the exceptionally high level of culture of the Danish. Metro relies on an automated system of stopping - ATS (Automated Train System) which with the help of computers manages the whole system in a safer and more efficient way.

Copenhagen

Berlin

Hong Kong

New York

No.9 - U-Bahn, Berlin

The underground railway (subway) in Berlin is made up of 132km of tunnels. The metro is connected with the S-Bahn, the above-ground railway which connects Berlin with other parts of Germany. The complete network of tunnels has availability to the networks of operators of mobile telephony. The rain comes into the station every two of five minutes, both in rush hour as well as outside of it.

No. 8 - Hong Kong MTR

About 90% of people transport in Hong Kong happens in public traffic, and the biggest part is in metros - MTR (Mass Transit Railway). With the metro, which is 172km long, daily there is about 7 million people who ride it, and the trains are known for their punctuality. The doors of the wagons have platforms which increase security for the passengers who are entering the train. Buying the Octopus Card is very known option, a card with which a traveler can limit the amount he wants to spend on transport, parking, fast food on metro stations, etc. Also, a full coverage of 3G network for mobile phones and computers is provided.

Honorary Place - Portland, Oregon

This is one of the newest systems of public transport in the USA. It is made of buses know for their punctuality, easy railway, trams and cable cars, in the central zone of town the bus rides are free. The town is known for advances cycling and good bicycle track coverage. Apart from personal bicycles, the citizens and visitors can ride with bicycles as part of public transport.

No.7 - Metro in New York

The New York metro is one of the icons of the town, like the Statue of Liberty. It's over 100 years old and today it has a total amount of 375km of railroad. In the system there are also express lines, and the metro works every hour of every day in the year. After 11th September, security in the metro has been significantly increased, and together with that, hygiene (it was also know for the graffiti). The system is daily being used by 4.5 million people.

No.6 - Metro in Paris

Alongside 110 years of tradition, the 214km of railroad with the shortest stations in the world, the Paris Metropolitan Metro is distinguished and the biggest metro station in the world - Chatelet les Halles. Daily, 4,5 million people ride it, and it covers a bigger area from the one on which the travelers can use Navigo Card (charge card). The system of transport in Paris includes buses, the fast railway (RER) to suburbs, but also Velib - a system of public bicycle transport. The buses have an advantage compared to individual transport with automobiles, white other think that the metro isn't reliable like in other towns, especially when traditional strikes of french workers happen.

Paris

London

Seul

Taipei

No. 5 -Metro in Seoul

The Metropolitan metro in Seoul daily drives 8 million people on lines 287km long, which are connected to public bus transport. This metro is especially known by their relationship to the travelers: daily notifications on LED screens (on English as well), Wi-Fi connection, robots which give information, etc.It's not surprising because South Korea plans to, in the period between 2015-2020, to have a robot in every household and their set up in the metro is just a big test for this idea.

No. 4 Tube in London

Tube, the well known metro in London, is the oldest and longest in the world - the complete network of underground lines has 400km. In 2007, it was recorded that thismetro has brought millions of travelers together. The metro is connected to other railway systems out of town, including Docklands Light Railway (light rail) which drives the passengers by the Thames. Tube is characterized by upholstered seats, LED information screens, but also occasional delays. Of course, the metro is covered by the famous London system of CCTV cameras which cover the whole town.

Shanghai metro - is made of classic underground and light railway. It was opened in 1995 and today is one of the most modern systems with the fasted advancement in the world. It has 268 stations and over 420km of rail which is at the same time the longest system of city rails in the world. During 2009, daily it drives 3,56 million passengers and noted a record of 6,46 million people.

No.3 - Taipei MRT

The metro in Taipei, Taiwan, is one of the most expensive metros constructed in the world. However, this has been paid off, because for three years now, it's being values as the best metro in the world as to safety, reliability and quality. MRT offers it's passengers informations on four languages. In the metro (on the stations and trains) it is forbidden to smoke, eat, even chewing gum. The passengers on the metro gave it's a score of 95,5% on tidiness. Apart from the metro, the public transport system in Taipei includes a system of ropeways with a total length of 4km which daily drives 1,1 million travelers on the relation between the zoo - suburbs of Maokong.

Moscow

Tokyo

No. 2 - Moscow metro

This is one of the oldest systems of underground city railways and one of the most affected in the world - it drives over 7,5 million passengers daily. The metro in Moscow has a total length of 293km, and it's known for the representative stations which distinguishes a high level of hygiene but also the architecture which is worth to see. However, maybe the best characteristic of the Moscow metro is the efficiency. Many think it is the best in the world, because sometimes it reaches to even 40 trains an hour. Apart from all, this metro is known for the small number of accidents and for many it represents the best metro in the world.

No.1 - Metropolitan metro, Tokyo

The underground railway in Tokyo drives 8 million passengers daily, and is a part of the big railway network with a total length of 27.270km. The seats in the trains have seat warmers, notifications are on Japanese and English, and it's said that it's impossible to see trash. The Tokyo metro is known for its precision, lack of vandalism and crime, and on the platforms there are marked places where the train doors will be when it stops on the station. However, the popular scenes seen on Youtube in rush hour, workers in white gloves will literally push you into the crowded wagon.

Big Dig

Big Dig is the unofficial name of the projects for the construction of the tunnel in Boston, which should relocate the highway 93 out of the center of town. The total length of this road under Boston is 5,6km, and the project was followed by the construction of the tunnel Ted Williams (the connection of the highway 90 to the airport), the bridge over the river Charles and the 'green line' Rose Kennedy Greenway on the place of the former route of highway I-93.

Big Dig was the most expensive project of highways in the USA. Even back in 1995, it was estimated that the expenses will be 2,8 billion dollars then, but the price came over 8,08 billion dollars (14,6 dollars of value in 2006). In July of 2008, Boston Globe wrote that the interest amounts 7 billion, which will raise the total price to 22 billion dollars, and the missing payments will last until 2038.

Many assumed that something like that can just happen, and one congressman even

asked: 'Isn't it easier to raise the whole town instead of letting down one highway?' Beside the price, the project was followed by arrests and charges worth half a billion dollars because of the poor work done.

The park Rose Kennedy Greenway, opened in 2008, long about 2,4km and is actually made of parks and public surfaces in the center of Boston, on the place of the former highway I-93. It represented the final phase of the project Big Dig. However, the park is still not done, even after announcing on speakers in 2001 that it will happen in 2005. The construction of a building for culture on this move was planned, but those works have been delayed because of the crisis and the production of a space for urban analysis.

7. Environmental policies of the EU and sustainable development

7.1. Environmental policies of the EU

Environmental policies in the EU has an important place in the activities of the EU. The European association has only at the beginning of the seventies of the 20th century started to undertake more intensive and political actions in this area, which is coinciding with the growing trend or raising awareness about the significance and global consequences of problems of the environment.

The protection and advancement of the environment is more and more becoming the first plan of the EU policies with clearly positioned goals: preservation of the environment and betterment of its quality; protection of human health; careful and rational use of natural resources; advancement of measures on a international level for overcoming regional and global problems of the environment.

The international association also correctly notices the danger from different types and aspects of harming or threatening of the environment. In that directions today, in international circles, a unique base in the direction of achieving ''sustainable development'' of the environment has been set up according to the economic and social needs. That is the new social relationship with the environment, spca and natural resources with full awareness of existing responsibilities in front of future generations.

8. Sustainable development in countries in transition

8.1. How to achieve sustainable development in countries in transition

The transition doesn't take place on a space and in surroundings which are completely new and unburdened, but it includes a complex task of reformulations of old social and economic relations. A new, capitalistic system would have to be constructed on leftovers of old and ruined communist systems. Furthermore, the sustainable development in countries in transition would have to use it a good bit, because it didn't have access to anything else. Breaking the communist regime in 1989, countries of eastern Europe have walked into a hard and complex period of transition. This process included, before all, a political democratization of the country and community, as well as the transition to trade economy. In the beginning, in the countries of postcommunism and in the west it was considered that it was enough to pass through political and economic models of west European countries and that will in a reasonable time period ensure a full advancement towards the western economic and political system.

The level of change acceptance was also different from the public. Balkan countries have faced a low level of the transition acceptance, as an inevitable process, for many years (both, from ruling elites, as well as the public), and the wars in this area of former Yugoslavia have considerably affected the process of transition to flow slowly with many sacrifices. The mentioned reasons have led to today, after almost two decades, it is hard to find common threads which would unite the experiences of all countries in transition. Because of that, the stigma of economy in transition has to be understood literally, more like a regional-territorial, than a social and economic entry.

The transition, towards trade economy the way it happened in the countries of central and eastern Europe, covered all the meaningful political, economic, social and other institutions, affecting among all, the use and management of natural resources as well. For this segment of the transition, the most meaningful mechanisms were next.

The process of transition leads to change of the whole value system. Changed of the economic and social system values, among all, bring different expectations and uses of natural resources in the future. Based on the experience of countries who are finishing their transition process it can be talked about four phases through which the ruling perception of resource use is changing, today.

The first phase represents a period of centrally planned economy before political and economic changes. In the second phase, which matches the first years of transition, it comes to a crash of marketing channels, for inputs as well as for placement, and crushing lawful and institutional structures needed for any kind of economic activity. Old structures are ruined, and new ones have to be built. This phase is characterized by institutional chances, liberalisation, restructuring and (usually) inflation. The subvention system is cut or majorly lowered, as well as the demand on market, which leads to an unfavorable relationship between the input and output. This unfavorable economic climate affects the environment favourably.

In the third phase, which is characterized by establishing new rules in economy and society, and by forming new institutions, the system of the environment is still under reduced pressure. The chronic lack of capital still isn't allowing the economic activities to recover fast, which would affect the environment. What is characteristic for this phase is the renewed 'finding' that the problem of protection of the environment exists. The transition is finished with phase four, whose characteristics are set up policies of environment protection, institutions and systems of managements of natural resources and the environment.

9. Dimensions of sustainable development

Sustainable development, as it was described in the previous chapter, doesn't represent only the environmental question. Three aspects of sustainable development have been determined, ie:

- Economic sustainability
- Environmental sustainability
- Social sustainability

The first aspect implies the economic growth and development, the second includes the integrity of the ecosystem and care of its capacity and biodiversity, while the last one includes values like equality, competence, availability and participation of individuals in social life. Apart from these three components, the leading principles of the sustainable spatial development of the european continent are introducing a fourth dimension, that is cultural sustainability. Cultural sustainability is made of normative eco-

development which appreciate the plurality ‘’local, that is economic, cultural and social specifics.’

The term sustainable development is usually being brought in with protection of the environment, planning of social development, ecologic, economic and political questions. The concept of sustainable development represents a new developmental paradigm, new strategy and philosophy of social development. In that context, the term ecology is often wrongfully considered protection of the environment.

Ecology is a science which deals with studying the interpersonal relations between living being and the outside environment, and the protection of the environment is just a small segment of it. Actualities of the term sustainable development especially contribute challenges, which come with endangering the environment. The economic growth isn’t without risk, because if the economy grows too fast, it can come to the exhaustion of resources and pollution of the environment. Sustainability of the economic growth in conditions of exhausting the natural resources is more and more complicated.

VI HUMAN RESOURCES IN TRAFFIC

1. Managing human resources

Human resources are one of the most recent and the most publicized themes of the 21st. century, imposed by challenges of the ‘new economy’ - economy of knowledge, economy which is global and which is in a constant fight with uncertainty and changes. That ‘new economy’ was made as a new direct consequence of a big progress of computer science technology, science and technology in general, changing the characteristics of the work environment, which compared to the sixties and seventies of the 20th century become more and more complex. The interdisciplinary concept of managing the human potentials is showing a need for recognizing the human factor as the most important resource in the company. The work environment imposes a high need for active participation of companies and creating changes, as well as the need for fast adaptation of permanent and new business conditions. So the question becomes, how to make it possible, how to make a company creative and adaptable with the goal of surviving in the trade market - humans. So, for any company and its success, capabilities, knowledges and creativity of its workers are crucial. Introducing the concept of ‘managing human potentials’ in companies in departments of traffic, the paradigm of the content of work and ways of organizing personnel functions is changed. With that the workers, people, are becoming a key factor in the business success. For managing human resources, it is important to set up a vision, mission and policies of the company which is considered to be the best matching business goal that fits. The company policies imply each aspect of business, and with that the policies of managing the human resources. The role of human resources is key and special, for which there is a need for education and implementation of new technologies for management of crucial significance.

2. Employees as the most important resource in companies

Statements known as ‘For the success of the company all workers have to contribute, but failure occurs mostly because of poor quality handling. ‘. The workers are the most important resource in the works of a company. the quality of a service which is provided to the users depend on the

engagement of the employees. Apart from the services which are the most important, we can mention a few more employee influences like usage, efficiency, productivity and rentability of other resources which are used in the company and which are in the most part depending on human resources which work with them. Because of that it's needed for all companies to define the methodology of managing than human resources as a foundation for long term, strategic planning of human resources on objective showcases. long-term planning of human resources implies processes, procedures and methods which have the goal to describe , analyze, predict and plan in the which way the human resources will progress the company so they could secure the realization of the organizational goals and realization of the company on a turbulent trade market. With this base act, the foundation areas of human resources are are covered and brought on inspection methods and techniques which they use from the moment of attracting the candidates, and through their career path in the company to the department of the employees into retirement.

The management methodology of human resources determines and defines:

- Recruiting candidates from the labour market
- Employment, progression and movement,
- Selective procedure (procedure of choosing candidates),
- Organisational orientation,
- Estimation of work success,
- Exit interview

The base in 'Methodology of managing human resources' makes the organisational orientation. Organisational orientation is a structured process with which new employees transform into efficient members of the company. It refers to newly employed and prentices. It's being implemented in three phases, which don't have to happen one after one another, but they can happen at the same time, depending on the work and capabilities of the new employee:

1. Socialisation of the new employee into the work environment
2. Introduction into the job, and
3. Confirmation in the job.

Socialisation starts at the very coming of the employee into the company, and its structure and length depends on the work space, work in chronological organisation which the employee will do and the skills, knowledge and capabilities of the person. The direct manager has a job to give the new employee a warm welcome and basic information about the organisational unit and importance of the job which he will be doing, and to take him to his work spot, introduce him to the mentor and work colleagues. Mentoring in every company is an important segment of management of human resources which you cannot neglect and in whose development every member of the company has to participate, and with that making it possible to develop further and develop the company itself. The importance of mentors in development of a new employee doesn't end with writing a report about the work of the new employee, but it continues further. Findings that the mentos owns about the new employee can help the direct managers a lot in grading the work success of the employee.

Conclusions and recommendations

On the streets of Bosnia and Herzegovina in 2014, there were 35.344 traffic accidents. Like in the majority of countries, in Bosnia and Herzegovina the older and younger population is exposed to a high risk in traffic. During 2004 and 2005,about 14% of death cases and 27% of injured in Bosnia and Herzegovina in traffic, was at the age of under 24 years. During 2005, up to 40% of injured were younger people. The

statistic in traffic accidents on roads of Bosnia and Herzegovina is in the process of development and currently there are only basic indicators available. For taking efficient measures and activities which will lead to the decrease the causes of traffic accidents, it is needed to have reliable analysis results and checked foundings which will contribute to a safer environment for all users of road traffic. The measures can be very different, and the plan of the measures has to be logical and it shouldn't spring out of the nub of the concrete problematic.

Strategic measures of safety in road traffic have to orientate to the next activities:

- The decrease of the hardest consequences of traffic accidents with conditions of growing traffic,
- Bringing Bosnia and Herzegovina into the appropriate group of european countries according to the number of dead people on roads with regard to the number of citizens or with regard to 100.000 registered vehicles,
- Significant increase of modern repressive acting of police and appropriate preventative action,
- Raising awareness of the citizens to the problem of safety in traffic via media companies.

The action plan is focused on constructing institutions for developing local capacity and on key factors of risks, so that certain activities can be started.

Key Goals:

- 7% decrease of the total number of dead in regards to the past year (about 50% decrease in 10 years)
- 7% decrease of the number of accidents caused my speeding in regards to the past year
- Increased rate of using the safety belt by 80% by the end of 2013, and 90% by the end of 2015.
- Decreased percentage of dead pedestrians by 30% by the end of 2015, and 17% by the end of 2020.
- Incidence of accidents caused by driving under the influence of alcohol decreased by 7% each year in regards to the previous year.

In the past decades, changes in the European traffic policy have contributed to the expansion of the internal market of the EU, by opening national markets on which public monopolies have prevailed, like it was the case in ai and rail traffic. Expansion, modernisation and convergence of the infrastructure in whole EU have a fundamental importance for creating overborder networks without obstacles for different types of traveling. Because of that, the policies of trans-european networks have been implemented in the Maastricht Treaty in 1992. Besides that, by the contract, requests for securing the environment have been included into the traffic policies as a help to finish the inner market. Also, the purpose of traffic policies in the EU is to help people and keep the safe in times of travel, which is one of the accomplishments for security and protection of people's rights. The transport systems are becoming bigger and more complex. It is requested from transport to have a bigger quantity of travelers and goods, and in the same time to fulfill the environmental, weather and financial restrictions. The whole process of transport is being optimized so that the time needed for transport is as short as possible and the needs for storing goods is less. So that all these requests are fulfilled, intelligent transport systems are being used, which enable the use of informational and communicational technology. The needs for mobility in everyday life lead to a continued increase of traffic, which generated serious problems as in

asphyxiation, safety and influence on the environment. However, informational and communicational technologies (ICT) offer new, advanced solutions for today's traffic problems. Today's communications represent a backbone to development of intelligent transport systems (ITS) that is cooperative systems from the sector of traffic. The main challenges which will affect the development of traffic policy in the decades to come are:

- Ageing of the populations and even bigger requests for mobility of older citizens,
- Migrations and inner mobility of citizens,
- Even bigger urbanization of cities and globalisation,
- Sustainability of the environment and energetic challenges amidst the decrease and lack of fossil fuels.

By 2050, it is planned to eject vehicles that run on traditional fuels out of use. This is one of the goals of green transport which the European commission has launched, with the special wish to decrease the dependence on oil, which today reaches about 96% and with the goal to, by 2050, reduce CO2 emissions between 80 and 95%. Implementing electric vehicles (EV) and hybrid electric vehicles (PHEV) is still a difficulty in Europe. The three main factors which affect this are: high prices of electric vehicles, decreased acceptance from the side of users and the lack of space and stations for recharging fuel, which represent a vicious circle.

Europe has provided significant investments to encourage the creation of smart cities, which are actually cities which offer clean and affordable energy for all, connecting racional uses of natural resources alongways of the integration of clean technologies. A smart city is based on six main characteristics: economy as a competitive system; mobility in form of affordable and sustainable transport integrated by new technologies; environment as a protection and advancement of natural resources; people as a social capital; lifestyle as a social cohesion and quality life; government which implies the participation of citizens in public politics.

Human resources are one of the most actual and most publicized themes of the 21st century, imposed by challenges of the 'new economy' - economy of knowledge, economy which is global and which is in a constant fight with uncertainty and changes. That 'new economy' has appeared as a direct consequence of a big advancement of computer technology, science and technology in general, changing the characteristic of the work environment, which compared to the sixties and seventies of the 20th century become significantly more complex. The interdisciplinary concept of managing human resources highlights the need for recognizing the human factor as the most important resource in the company. The work environment imposes a big need for active participation of companies in creating changes, as a need for fast adaptation to permanent, new conditions of business. The question arises, how to make the company creative and adaptable in order to survive in the trade market? The concept of human potential speaks just about that and emphasises on what is inside the companies - people. So, for any company and it's success abilities, knowledges and creativity of their workers is crucial.

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OVERVIEW ON FINANCING PUBLIC TRANSPORT BASED ON PPP EXPERIENCE

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***Summary**: The development of public transport modes is growing and becoming an important part of the urban sustainable development. Rail based modes are quite expensive for its construction. City or even State budgets could not easily cover the capital for new systems. As a result, the private sector taking its part in developing financial ambient for building new projects. The main principles of Public Private Partnership (PPP) as well as few examples were presented in this paper. Because of the size restriction of this paper more PPP practical cases will be shown in the Author slide presentation.*

***Keywords:** Urban transport, Light Rail Transit, Financing, PPP*