

Alexander Soloviev

BUS AND COACH TRANSPORTATION

Buses can compete with air and rail transportation

Thesis

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ABSTRACT

Unit Kokkola-Pietarsaari	Date May 2015	Author Alexander Soloviev
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<p>The aim of this thesis was to understand ground transportation industry closely. Developing buses and coach transportation together with tourism industry. Find out the statistical and practical understandings of nowadays safety and organization level. The thesis explores transportation from aspects of human factors as well as technological and modernization regulation during past years.</p> <p>Presented the issues and features of random region transportation security. The importance of professional driver trainings and regular health checking. Top issues that are directly connected to traffic accidents and which electronic equipment can predict and avoid fatal situations. Research, which was conducted on qualitative semi-structured interview with worldwide and experienced transport companies. The report reflected their knowledge and experience in organizing safe and comfortable travel. The most common issues and challenges that are faced every day in transportation industry together with vision on future development.</p> <p>The findings explained the positive future and sustainable development today. The buses and coaches have possibilities to stand in line with railway and air transportation as one of the cleaner and cheaper mode of transportation.</p>		

<p>Key words Bus, Ground Transportation, Tourism, European Union, regulation, safety, interview, development, technology</p>

LIST OF ABBREVIATIONS

IRU	International Road Transport Union
WHO	World Health Organization
ADEME	French Agency for the Environment and Energy Control
BAC	Blood Alcohol Concentration
PCV	Passenger Carrier Vehicle
ESP	Electronic Stability Program
TPMS	Tire Pressure Monitoring System
GPN	Global Passenger Network
TÜV	Technical Inspection Association
ABS	Anti-lock Braking System
AFS	Advanced Front Lighting System

ABSTRACT

LIST OF ABBREVIATIONS

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1 INTRODUCTION

From the beginning when motor engines were first invented, people started to make from it ideas to carry groups of people on long distance. Nowadays buses and coaches travel all over the world and take important place in global economy and transportation. Only in Europe coach transportation brings 15 billion Euros per year. On the short or middle distances they are the cheapest mode for traveling. The variety of types provide wide selection of services from long distance trips to couple hours excursions around city sightseeing's. The aim of this thesis is to introduce wide possibilities in every day travel and tourism the ground transportation. How companies which are organize trips and safe carry of the passengers meet every day challenges in security, safety and comfort sectors. Theoretical framework also introduces different aspects such as regional statistics of rate of accidents, safety standards and regulations which help to avoid danger situation on the road.

The following chapter defines a historical aspect of the growing bus transportation and creating it from idea to successful carrier mode. Nowadays use of technologies and possibilities of ground transportation. The reader will gather more information about the opportunities gathered through many years of developing and building cleaner engines with low emission rate and the statistics, which showing the high safety level and low fatal rate. The author tried to explain the priority of bus and coach transportation in front of other modes in some situations and especially between short and middle ranges. Connection takes place between transports and tourism that became stronger during the years and modern technologies that becomes common already today.

Third chapter shows the main risks issues and safety development in ground transportation. Chapter shows that safety depends on geographical locations and the various types of security and safety challenges. Some facts show how far they are from international standards. In spite of this transport associations together with governments is making more strict directives and regulations regarding road

flow and transport sector. Some shown regulations are introduced to raise customer's belief in safe usage of buses and coaches during their travel.

Last two chapters focused on conducting the thesis research, analysis and demonstrating the conclusion. By reading this research, the reader will see the objectives of the research. These include practical demonstration and prove the safety statistics. Understand the transportation business as a whole system and find out nowadays most popular options and technical novelties that improving passenger safety.

2 BUSES AND COACH TRANSPORTATION

In thesis the word coach is more related to buses as vehicles that carries passengers with extra comfort and wider equipment capability. Usually they are using for long distance travels. Originally this term was used for carriages pulling by horses for family travels. Today's ground transport plays the important role in all sectors of our economy. Thousands of buses are carrying people and luggage all over the world. It is an excellent solution for travel especially for people who are afraid of flights or just need to get rural areas where there is no any closest airport. Bus transportation is on the second place by carrying after air flights and it is one of the safest modes of travel. Bus equipment and size depends on usage purpose and climate features. Long distance buses must have comfortable seats with options for sleeping and meals consumption. Depending on the season it could be warm during the day and colder in the night, so it is necessary to have auto climate systems. During the summer season in tourism destinations it is popular to use buses for private excursions and sightseeing. Therefore air condition devices should have place. If ten years ago all these options were expensive and rare, today all buses have them as necessary options. The only exclusion is that not all countries still can afford modern buses. (Moskvitch K. 2015.)

2.1 History of buses and coaches

Buses and coaches are designed and used already for hundred years to carry big amount of passengers. The word "bus" is coming from old Latin word "omnibus" and other older words like "autobus", "multibus". The main meaning of "omnibus" is "for everyone". The reason of making this type of vehicle is to bring the group of people from one point to another with low costs and spending. It means that the bus can use all classes of people. The first coach line was organized by the French entrepreneur, who wanted to stimulate the society to visit his bath house. After this idea the bus lines found their places in other cities of France, England and Europe. Those were pulled by horses and established between 1824 and

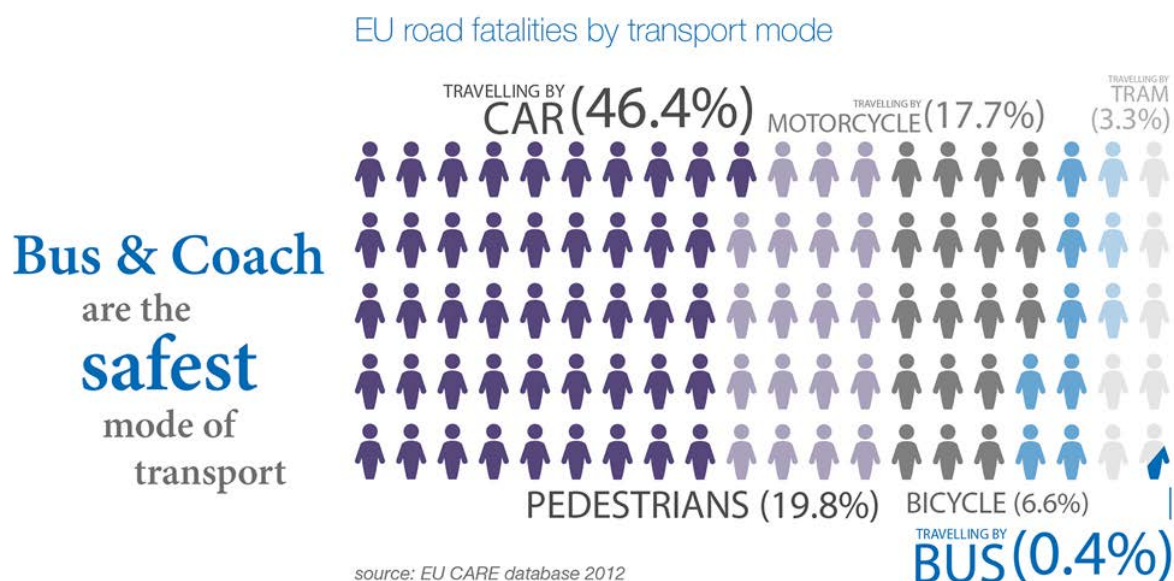
1825. Motor buses firstly were established in the end of 19th century. From that time transportation started to develop rapidly. In the beginning of twentieth century they started to work as city buses. (Bus and Coach Operators 2014)

Today there are large numbers of bus varieties depending on the use. However, among all of them, some types are ancestors. Those are like single-decker and double-decker. Since it develops very fast, today there are huge amount of bus types. From different sources it is possible to find several names for each of them. After years it is become really complicated. In example, intercity buses in US call motor coach, but in UK and Europe they can be mentioned as coach or just bus. People usually preferred to say simply "bus". (International Directory of Company Histories 2003.)

2.2 Facts about buses and coaches

As it was mentioned earlier, buses and coaches are the key to reach the destination for all social classes and especially those, who cannot drive by themselves. In the twenty-first century buses became safe, green, comfortable and affordable tool for transportation. They took places not only as an intercity lines or long distance coaches and buses, but therewith charter vehicles for excursions, corporative trips or just carrying from airport, railway station to hotel and back. (International Road Transport Union 2014.)

The simple reason why people could prefer buses while their trips is shown below from statistics on 2012, which shown a good example that there is a low risk of getting in accident by using bus transportation in comparison with the rest ground transportation vehicles (Graph 1.). There are several issues that are proved during last decades, transports safety regulations, human factors and road conditions which are explained in next chapter of this report.



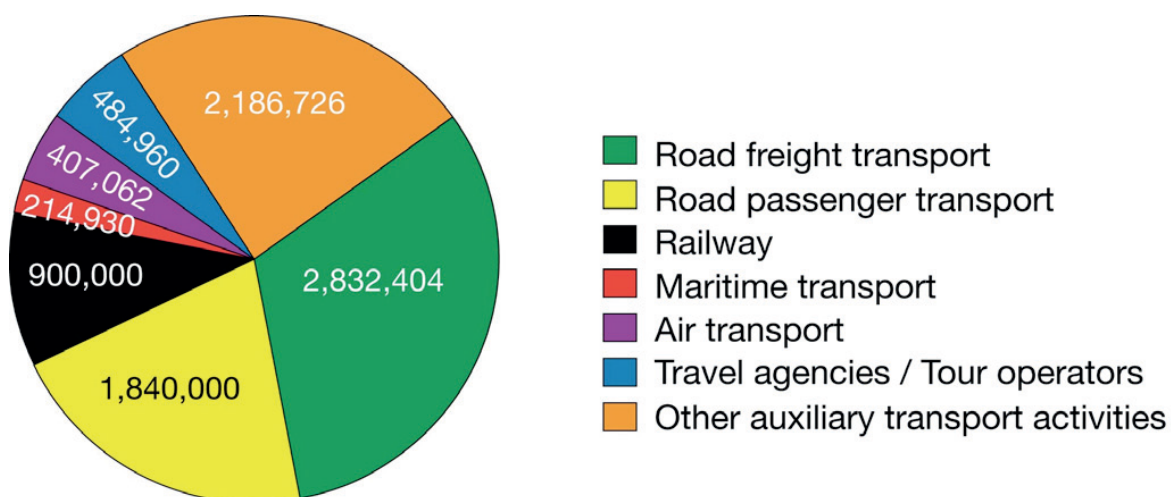
Graph 1. Risk Percentage by mode of transport. (Adopted from International Road Transport Union and EU Care database 2012.)

The emissions or pollution which make all vehicles with an internal combustion engine, one bus is greener than thirty cars today (Graph 2.). As well as all sectors of technology development, there are transports that use electrical energy or combined sources as hybrid engines. The reason why they are the minority is a high price for today's technologies in production. (Mass Transit April 2006.)



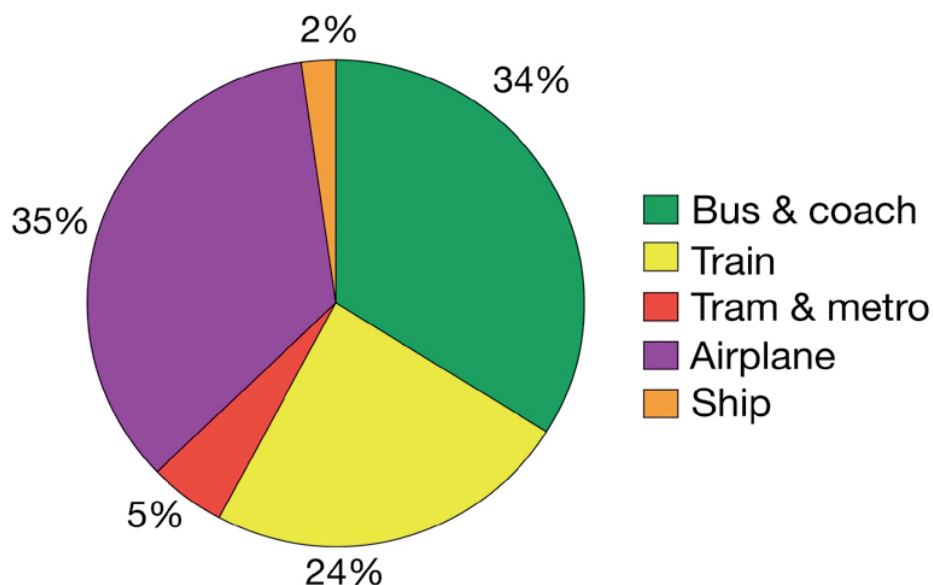
Graph 2. Emission comparison between bus and average cars (Adapted from International Road Transport Union 2014).

French Agency for the Environment and Energy Control (ADEME) researched that coaches and buses is the transport most efficient energy consumer transport in the regional field. The cost for trip between 500 to 1000 kilometers is lowest between any other modes of transport. Except fuel economy and possibility to carry big amounts of passengers, bus companies pay less tax, plus governments pay additional amount of subsidies for every passenger. (International Road Transport Union 2014.)



Graph 3. Employment by mode of transportation (Adapted from EU Energy & Transport Figures, 2009)

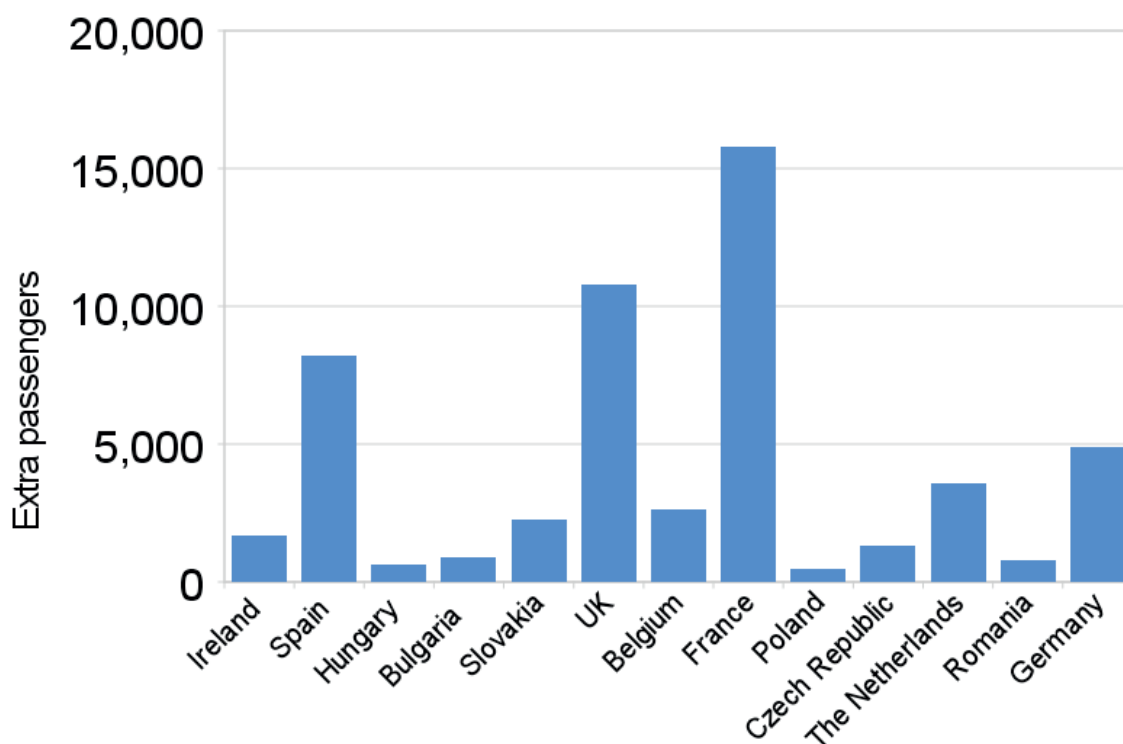
Other interesting fact is that this industry employs approximately 8 million people in Europe. This means that there not all of them are drivers, but those positions are direct or indirect related to transport services (Graph 3). Thence it is creating from three to four work placements in the partner sectors. In example all buses need fuel; it makes demand in petrol stations, factories and delivery. As well as fuel they require technical service and cleaning operations. This ensures additional work places. (International Road Transport Union 2009.)



Graph 4. Passenger carrier model (Adapted from EU Energy & Transport in Figures, Statistical Pocketbook 2009.)

The model above shows the percentage of passengers carrying in EU by different types of transportation (Graph 4.). It proves the facts that buses are becoming the good alternative in comparison with airplanes. It will never replace air transportation on long distances in the ratio of price and time spent on the road and it should not. The main aim was always to make best transportation on distances to 1000 km. This scale includes in city transportation as well, usually they called public transportation, which is provides 55% of all passengers and the rest 45% provides by tram, metro and other modes. In Turkey, 95% passengers use road carriers from which half belong to coach and buses. In US, figure is 751 million passengers per year. Buses and coaches transport 25,000 people per hour in Guangzhou, China. In France this number is even more amazing. Every year more than 1, 1 billion people use buses. It shows why buses and coaches are strongly connected to tourism industry. France is one of the most popular countries for visiting in Europe. (Buss and coach travel 2014.)

Speaking about flexibility as one of the biggest advantages in transportation industry, today buses and coaches are taking part in complement. Transport travelers from departure destination to their final point, railway station, and airport or the accommodation place. Sometimes extraordinary situations happen. One of them was in 2010, when Icelandic volcano ash cloud made crisis situation and paralyzed most of European air transportation. Buses and coaches were able to meet a demand during this crisis. Graph.5 shows numbers of extra passengers that were transported by one of the European companies. Number of passengers increased by 240% compared with regular operation. Almost 2,000 additional coaches were provided by the Eurolines Company. (Buss and coach travel 2014.)



Graph 5. Number of passengers transported extra during volcanic ash (Eurolines 2010.).

2.3 Tourism transportation

According to Duval (2006), increase in the accessibility of tourism destinations by developing different modes of transportation contributed in the tourism industry

success. With other words, tourism cannot survive without transportation and in other way, tourism plays the significant role in the transportation industry. Before transportation in tourism seen as part of travel system, in which buses bring tourists to their destination and leaving when trip is over. But today buses and coaches take part in tourism deeply than ever before. If it is a long journey with rare numbers of visiting destinations on the way, then airlines could be more comfortable, cheaper or faster. Other case is Canada; those families who were living near to US borders had a good choice to visit it for twenty four hours by cars. But there are enough cases that improve coach travelling. In example there is route between two destinations that takes about couple of hours to get there. Between those points there is one or several numbers of places that could be visited as interesting sightseeing. Tourists can have small stops at those points to take pictures, buy souvenirs or other stuffs and go for their needs. Usually those stops are not longer than half an hour. Such tours impacts on these small destinations without developing them into places for long staying that commonly require serious investments. (Duval, 2007, 90-98)

Other sector of coach transportation is charter tours, hired buses and transfer vehicles. Lots of names but most of them are doing similar actions. It is the important sector when there is a need to transport group of people from airport to hotel or back, meet from cruise ships and transport whole day between city tourism sightseeing`s. Those tours are popular nowadays. It gives chance to see the whole city in very short time with guidance or guide that is usually hired with the bus charter. Extra advantage is safety, no stress and comfort. (Cooper, 2008, 413-416)

The most recognizable city tours today provide double-decker buses. They have various names but the famous is "hop on hop off tours". Those buses taking their journey from nineteen century as they were first introduced. It is a great chance to enjoy city views and learn main facts from history through personal speakers in own language. Almost all cities provide such tours for tourists. Tickets that are valid for 24 hours, at least 10 different languages for individual audio head-sets also stops at the most popular tourism destinations and well planned routes, hop on and hop of at any stops and any time, connection Wi-Fi. It is a main advantage.

Vary depends on the service providers and cities. (The Original London Sightseeing Tour, 2014.)

Except travel types there are also business purposes. Today there are transfer companies that offer charter transfers for companies and businessman. Transporting passengers from airport to hotels, meetings and seminars and even on bus conferences during the travel from one destination to another are possible. In example, the Estonian famous company Hansa Buss offers the wide selection of transfers for the wide target group. It could be corporative trips, school travel, and incentive travel. Company provides the big selection of bus classes and equipment that needed during the trip. (Hansa Buss, 2015.)

When it comes to destination, transportation together with tourism influences very much in economical side. Bus transportation gave more possibilities in destination accessibility. Therefore the number of visitors rises together with investments in local infrastructure and work placement.

2.4 Future today

Today we can see first steps to the future in bus and coach transportation. During the last 20 years the accident statistic dropped by 44%. New engine and material technologies provide lower pollution and environmental poisoning. 20 years ago we could not think that buses can have pneumatic suspension which makes more comfortable bus entering. Electronics than can predict danger situation on the road and rear view portable cameras for better and safer parking. Soon there will be more developed intercity buses with electrical engines that provide transportation with clean energy and fast charging. Nowadays some countries already use smartphone applications for viewing online schedules and bus positioning and interacted bus stop with real-time bus departures, arrivals and delaying (VisitEstonia 2015.). Already today mixed transportation is become popular and available. Buses that connected with air transportation or train schedule make comfortable travel for travellers. (Steinberg 2014.)

3 RISKS AND SAFETY

Every day buses and coaches bring their customers safely and comfortably to destination with lowest influence on the surrounding environment. At the same time the amount of transportation usage is increasing. Nevertheless, people are still sceptical about high level of safety. It is easy to understand since there are plenty issues and reasons of getting in to accidents. Nowadays risks are connected to region on the World map. If the main points are weather conditions, technical problems or human factors, then in some places there are chances to being robbed or even become a victim of terrorist acts.

3.1 Main issues

According to P.Tarlow (2014) there are four main groups of challenges that transportation industry meets during tours, long way coaches, excursions and other modes of bus usage. Bus security issues, which in turn is divided into six sectors. Those are vehicle tires condition, that means all situations related to tires. In example it is necessary to check bolts on wheel. Sometimes they can become loose or even break which might entail unpleasant consequences. Depending on region environment and weather it is important to use winter tires in cold seasons. Another issue is engine service. Vehicles always should be checked by technical control. Nowadays it is thr obligatory process in most countries. Old buses used to be checked every year and new every several years. Buses have very complicated systems due to increase safety. The simple comparison between the normal car or truck and the bus is that buses have the main brake system and secondary as well to prevent system failure on the road. Road regulation and conditions, which are used for transportation services takes important place in building safety conditions. Regulations are made by transportation ministry or any other organization that is in charge. They regulate some basic standards' for all types of transportation including buses and coaches. In example basic things are the regulated numbers of seats for an exactly types of vehicle, speed limit, belts

usage and so on. Unfortunately regulation could differ and in some places have weak pursuance. Driver factors such as illness or weariness are most important issues.

An issue of bus security divides in several types. Robbery is the common problem in some crime regions of Latin America, Africa, Asia and Europe. Violence could take place during robbery and even rape. Terrorism is even more aggressive act of crime that could be committed. In politically unstable countries passengers could be kidnaped or killed by explosion. This crime is part of act of intimidation. Active shooter is new term nowadays that came from the USA and defined as person who is killing people without choosing exactly target in crowded places. Fracas between passengers can disturb the driver's attention on the road and make bad and unpredictable casualties. (A Study of Active Shooter Incidents in the United States 2006.)

Safety issues off the bus that take place during bus tours are indirectly connected to transportation safety. One of the causes could happen from local restaurant where tourists had a lunch in example and latter during the trip they got illness. Other possibility is the hotels air conditioning. There is always the high risk to catch a cold in a short time. Accidents caused by another driver follow everywhere. Especially on busy traffic streets, coach driver should always check the place for the safe stop not only for vehicle, but same time for hop off tourists. Situation when another driver knocks down the tourist while he is crossing the road. Extraordinary situations outside of bus (fire) are happening rare. It is hard to believe, but in example tourist bus came to national park or sightseeing in mountains that surrounds with forest. During hot summer there are many regions where of fire occurrence is possible. The risk to get injury is rising very fast.

Issues of off-bus security concerns customer property, vehicle keeping and customer life. When the bus arriving to unfamiliar city for the night stay, it is important to have a secured parking place that exclude steal baggage or break in. Otherwise the company is responsible for customer belongings. Terrorism is danger not only for the bus while it is going, but also for customers while they are exploring sightseeing by walk or in shopping. In 2013-2014 there was a terrorist

attack on the shopping centre in Africa. It could be one of the examples when tourists being a victim of crime act while left bus to buy souvenirs and walk around. Always should be considered tourists safety in hotel rooms during trips that lasts more than one day. Companies that offer packages that include accommodation with transportation should assess hotel safety and location.

As it was already mentioned before, some places have lack of security. As example, the tourist bus was travelling to Rio de Janeiro. The tourist was raped in front of other passenger's shows poor security organization. Road conditions are playing significant role in the rate of accidents. In countries like Mexico and Peru news shows only the small part of dramatic accidents that are in real life. In 2012 the tour bus near Puerto Vallarta with 22 passengers was robbed. This kind of situations says that robbers get information where bus is going to be and they targeted especially on tour buses. Another accident of 2013 in Italy took 39 lives when their bus plunged off a ravine. In this case it was the intercity bus, not a tour bus; tell us that safety could be strong enough in one sector, but weak in another. (Tarlow, 2014, 191-193.)

The separate paragraph should be mentioned about age and health risks of bus and coach drivers. The reason of such a detail consideration is high direct influence on risk and safety. From all accidents that contribute to bus or coach, 41 per cent could be assigned to driver errors and reaction (Kilbey et al, 2012). Based on National Institute for Occupational Safety and Health (NIOSH) researches and MFL Occupational Health Centre, drivers are more exposed to some illness than workers from other sectors of industry. Researchers' suspected 120 per cents higher risk of 10 chronicle disease between transportation workers that others. The higher rate is hypertension (high blood pressure). This health problem leads to such things like hearth attack and strokes. In example, in USA this disease takes leading place in the general population. Another chronicle ailment that is very potential for drivers is back pain, asthma, depression, and diabetes. Depressions and mental problems can take place from stressful work schedule, lack of sleeping and some personal problems. For sure there is connection between age and health issues. After retirement only 6 to 10 per cents of drivers can continue their work in transportation industry seeing with professional health

check (MFL Occupational Health Centre, 1998). In one line with health issues, drinking is a problem as well. In some countries the problem of drunk drivers is on quite high. Alcohol leads to low concentration and slowing reaction time. For example, in Europe just 20 per cents of all death accidents are related to alcohol consequences. After police check in 17 countries, 55 bus drivers were having above alcohol limit; five were suspected drugs under effect. Even though bus and coach drivers rate of alcohol use is very low (0,15 per cents) among other traffic users, it is very danger. It was calculated that only 0,8 g/l of alcohol in blood increases crash risk by 2.7 times. Except lower reaction and eye concentration, alcohol reduces the ability to do two or several tasks at the same time. (The European Transport Safety Council 2009.)

3.2 Safety and standard increase

Graphs that were shown earlier give a picture of increasing safety rate. From the end of twentieth century most countries started to develop different ways to make bus and coach transportation safer. Except some unique technologies there are some methods which were widespread. Speed limiters quickly found its application between vehicles over 3,5 tones and commercial transport with more than 9 seats (Repussard 2007). Limiters were introduced as speed control and fuel consumption reducing devices. Common this devise is directly connected to the engine and limits the maximum vehicle speed. Lower speed reduces the risk of accidents and raises fuel efficient by lowering environmental pollution and fuel expense. Although, speed controlling causes less wear and tear of main units like breaks, tires and engine parts. This improves safeness. (Robert Viennet, 2011)

Another part of safety improvement is professional bus driver training. In English it is often called PCV D (Passenger Carrying Vehicle). After getting bus driving license such a D category in EU, all drivers who are going to carry passengers must participate in obligatory professional trainings. In some countries the amount of hours can differ, but it is approximately 70 hours of intensive training. After this training all drivers should pass the exam and receive certificates. The course

consist of topics such as passenger service level determinants and causes, legislation governing the organization, required amount of passenger transport driver, charging carriage of passenger types and forms, classification of the bus line and the concept of time, the driver and passengers' rights and obligations and many other situations that concern bus and coach transportation. After some years or when the bus driver changes work placement, it is necessary to pass additional training, which consists of about 35 hours. It is made for refreshing professional skills and knowledge. Withal, some transportation organizations organize events or new methods for increasing driving skills and professionalism. Gathered in Biarritz, France, a group of public transport called "Small and Medium Enterprises" tested the first bus driving simulator. New simulator platform called Cassiopeia is going to train 7,000 employees. Training platform can make more than 50 different scenarios with different situation impacts and behavior. It can reproduce extraordinary situations and modes that can happen or have never happen with drivers every day. (Robert Viennet, 2011.)

Except bus company own safety strategy and training systems there are directives and regulations which improve general safety. Some directives are obligatory and some of them are voluntary. Directives are accepted by European Union or other public institution. By Directive 71/320/EEC and UNECE Regulation 13.10 Electronic Stability Program (ESP) system is a part of the braking system and equipped in modern buses as a common system, which improves dynamic stability control of the vehicle. As an additional system (TPMS) which is now comes together with ESP is optional but recommendable. TPMS - Tire Pressure Monitoring System which however is voluntary. (Bus and coach road safety handbook 2015 5.)

By Directive 2003/97, buses must be equipped with rear-view mirror which is a common option for any transport nowadays; anyway systems as camera monitoring systems are used by the choice of transport companies. During last year's many transport sectors installing rear-view cameras and devices that help to predict impacts by driving back way and parking. For preventing fire accidents and overheating there are several regulations like UN/ECE Regulation No. 107 and No. 118 which requires having fire detection systems in engine block and

interior smoke, heat detection. The last was adopted in 2011. During 2011 and 2012 regulations about the materials used in interiors were tightened, which prevents fire or at least retard it to have time for passenger evacuation. According to EC Regulation No. 661/2009 all vehicles should be designed in matter of safe operating even if it is fully loaded. Safe access to and exit should be made in emergency cases. All emergency exits must be marked with lights. (European Commission, Directives and regulations, 2015.)

Coming to technical part of vehicles there are many novelties which are helping, supporting or prevent danger situations. From simple cruise control to distronic or adaptive cruise control systems, tire pressure monitoring systems, forward collision warning system are voluntary at the moment. However, brake monitoring system and lane departure warning system are mandatory from 2014 (Regulation 661/2009/EC). Last one is relatively new option, which is warning the driver after changing position according to traffic lines. Some of those systems can even independently turn the vehicle to return it on safe position. According to National Highway Traffic Safety Administration (NHTSA) 40 to 60 per cent of all traffic accidents in USA are directly or indirectly connected with the situation when the vehicle loses his line position. (Howard 2013.)

As mentioned above, driver health is very important. Regulations, which are connected to drivers work are most important and in some countries strictly enforce. Regulation 561/2006/EC on EU Driving and Rest Time Rules since 2007 sais that weekly rest period should be 45 hours and minimum every second week. Any decrease of 45 hours must be later compensated in next 3 weeks by additional rest. Every 24 hours is required for 11 hours of rest, but it can be gutted to 9 hours only 3 times in a week. Every 4,5 hours of driving should be paused for a 45 minutes break. Total driving time for a whole week is maximum of 56 hours. Any additional driving periods that the driver can take on his charge cannot be measured as a rest time. (Bus and coach road safety handbook, 2015, 10-11)

To make passengers sure that all bus and coach drivers are professional and competent to carry them, rules are enforced. According to tachograph Regulation No. 3821/85/EC since 1985 all driving and rest actions must be written in

tachograph. Tachograph is a device that records the driving time, breaks, rest periods and other work made by drivers within the bus and coach. It made to enforce rules for rest and driving and increase safety on the roads. All vehicles on European Union territory must have it. Except EU, Tachographs are obligatory in Russia, USA, Canada and some other non-European countries. From May 2006, all new vehicles must be equipped with a digital tachograph that provides more secure and accurate data recording. In advantage they can record speed, distance better than analog items. This modern system includes the printer for printing quotes and personal drivers card with microchip which is shown on Table.1. This card ensures that the driver has a professional trainings and same time makes the inspection easier. (European Commission, 2015.)



Table.1 Electronic tachograph card with chip (Adopted from UK Motorists 2015)

The tachograph chart

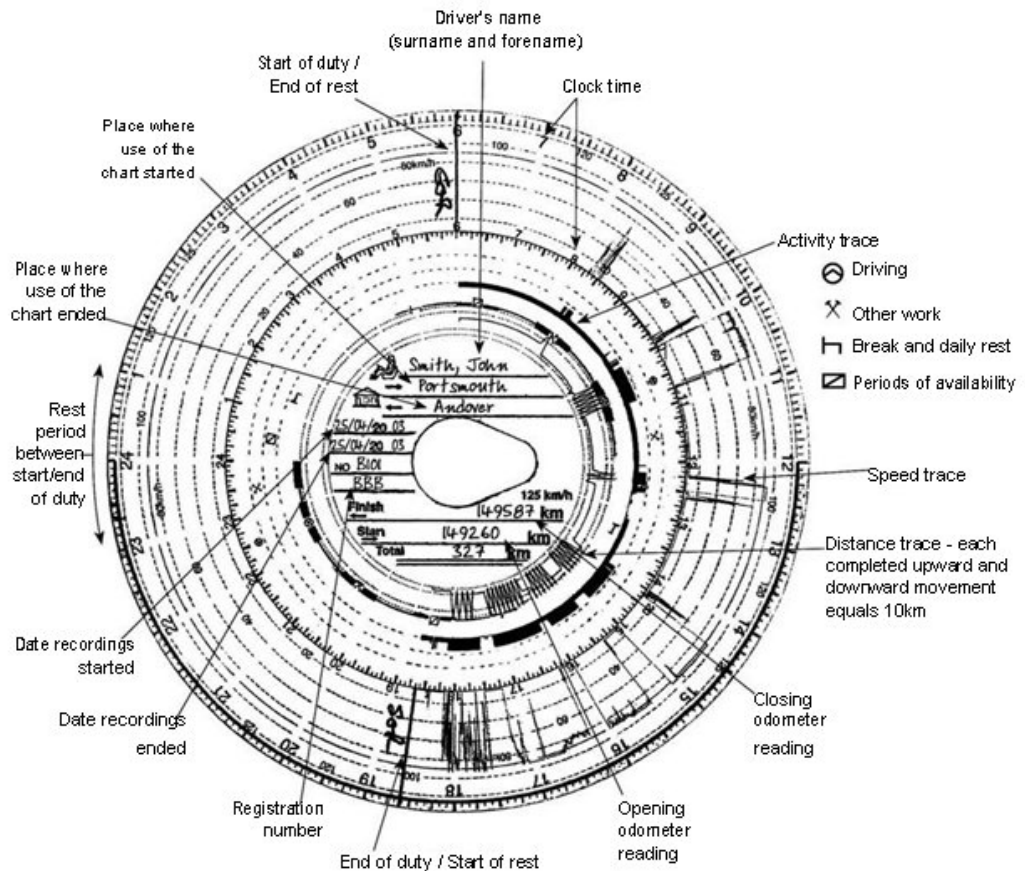


Table.2 Tachograph disk for all driving actions. (Adapted from UK motorists 2015)

Table.2 shows tachograph disk, which was in use before 2006 and are still used by older vehicles. All fields are obligatory to fill and can be checked by custom or police in any time of driving. Some countries are very strict for improper filling. Every disk is made only for 24 hours period. The only possibility that allows use the second disk within 24 hours if the first one got damaged. All drivers are required to return used disks to employer no latest than 42 days even if the employee changed working place. Driver has a right to make entries on a disk in case of system malfunctions. (UK motorists 2015.)

As it was mentioned before, all drivers are obligated to have professional training certificates. By Driver Training Directive 2003/59/EC since 10 September 2008, drivers should have Certificate of Professional Competence (CPC same as PCV) which requires 280 hours of training. After every 5 years training must be refreshed by 35 hours of additional courses. The main target is to ensure

passenger safety and comfort, make drivers acknowledged about safe driving techniques, fuel efficient driving, awareness of road traffic risks and importance of mental and well-being. (Bus and coach road safety handbook, 11-13)

4 CONDUCTING RESEARCH

This chapter introduces the whole sector of conducted research from explanation of chosen research method to planning the interview and finding the right target group. Each interview helped to gather the important data for analysing and giving the reliable conclusion on thesis research in bus and coach transportation business.

4.1 Research method

According to Creswell, research is a process with steps used for collection and analysing information for clear understanding of the issue or topic. Pose a question, collect data to answer the question and present an answer to the question – are three main steps. To understand which research method is best suit important to set the objectives of the research results. The main idea of reporter is to understand the bus and coach transportation sector and issues related with carrying tourists and organisation safe trips. Between quantitative and qualitative methods, second one is more preferable in matter that the main objective is collecting non-numerical data. (Creswell 2012.)

In research methods there are two techniques. Quantitative stands for collecting numerical data and analysing statistical results. Qualitative techniques are contrastly different from first one. Qualitative techniques are involving gathering quite big amount of accurate information in few cases like people, organisations, facilities, programmes, locations. Basically, this method gives practical information from people, organisations which are involved in the sector of research. It gives complex of textual description on the topic. Quantitative methods are targeted to confirm hypotheses about phenomena, qualitative seek to explore phenomena. Qualitative research methods are separated in groups of methods like informal and in-depth interviews, group interviews or focus groups, participant observation and analysis of texts. (Veal 2006.)

Interviews have four types. The first type is in-depth interview or unstructured. In here interviewee is trying to explain his experience and point of view on topic or part of the checklist. The person can talk freely and researcher asks questions that not always prepared as in questionnaire. Both of them use feelings and improvisation to collect or give more information. This is the aim of unstructured interview with no exactly frames or layouts. Other type of interview is structured. Usually this type uses a set of questions. The structure of question is set by the exactly topic which is going to be discussed with respondent. Structured type is similar to quantitative research since there are structured questions, boxes and layouts. Third type is focus group interviews. It is popular to use in market and community researches. In this case the researcher becomes as the facilitator and the respondents interact with each other and researcher as well. This type is close to in-depth interview. Basically it is a group discussion on researcher's topic which is recorded and summarized in the end. The last and most important type is called semi-structured interview. The idea of this type is to make a set of check list topics and use them during all interviews with respondents personally. During this type, the researcher can make some questions or additional topics to be better prepared for discussion. After all recorded interviews, it is possible to compare the results and make conclusion. The structure is non-strict and the researcher can collect different information. The flexibility of this type shows the reason of popularity in thesis researches and that is why it is used also in this project. Together with interview report includes media analysis. This means that the results will be conducted according to interview data and also using the analysis of important text and media such as company's websites, statistics and information which explores the company's objectives and strategy. (Veal 2006.)

4.2 Interview planning, processing and target group

Conducting semi-structured interview requires some main steps for success. First of all identifying the target group, then deciding the number of interviews for reaching validity and quality of the final result and finally preparing the interview.

Final step is the comprehensive analysis of gathered data which is described in the next chapter.

When it comes to identifying the target group, it is important to understand that respondents should have direct connection with the research topics. Theoretical and practical experience is very important. It is good step to draw up a list of potential respondents and companies which are involved in the specific sector. In case of this report, the main respondents are bus and coach transportation companies with big experience in Finland, Europe and other countries. Therefore it was carefully chosen companies to achieve research objectives. (Keller, Conradin 2012.)

To plan the number of interviews always good to have the bigger amount of respondents in matter of conducting more accurate results. However, from 3 to 6 interviews is quite enough considering the size of interviewing companies as they are one of the main transportation suppliers in their regions. The main European respondents were Hansa Buss from Tallinn (Estonia), Lux Express Group European leader in transportation services and German company Meinfernbus Flixbus. Unfortunately Lux Express provides only important material from e-resources without interview, which still is reliable. Interviews were made between 20th of March and 10th of April. The results were gathered and introduced in the following chapter.

4.3 Reliability and validity

The aim of this thesis is to explore deeply the bus and coach transportation business in Europe and possibility to compete with railway and air transportation industry. The interviews are implemented to discover the common issues, challenges and objectives during the transfer organisation. Media analysing is strongly supporting the gathered data from international companies. The reliability is the matter that shows similar results of gathered information even if it will be collected after some time in the same field and the result will be same. Anyway, including region and human factors, the result can differ slightly from each other.

The positive side of using the interview method is that during the planning process, the target group was carefully chosen for better reliability, but in the other hand those persons could introduce only the limited picture on phenomena, since there are corporative confidential aspects which are forbidden to share with mass.

5 ANALYSING RESULTS

This chapter shows the gathered data and reflects the results which help to understand the situations and important aspects in bus and coach transportation business from practical point of view. The results compared with theoretical framework and shows similarities and differences between statistical information and practical information which was shared by experience professionals in transportation industry that covers Germany, Estonia and the whole Europe. First of all this chapter will explain the results that were gathered from each Interviewer and conclusion is having the final result and the summary of reached results and success.

5.1 Transportation service in Estonia

The market in Estonia is quite small and competition is very high. The most serious aspect of running the business in transportation industry is the climate specification. There is a low season and high season. Usually the high season is starting in March and ends in October. This means high demand in transportation during summer time and lack during winter time. To understand how companies deal with all aspects, author had an interview with Jaanus Kukk, the head of sales and services in HansaBuss Company. This is the leader in transfers and charter transportation in the whole country. The company as many others started its journey in 1996 with only one small buss and was offering commissioned transport services as charter. The main objective at that time was to offer the best transportation service. During the years company was growing and purchasing modern vehicles. By 2003 the company already had 40 buses and 3 different comfort classes as First Class, Classic and Basic. Except normal transportation services, HansaBuss established Hop On Hop Off city tours with red double-decker buses and made Tallinn City Tour brand in 2005. Nowadays the company has 240 modern buses and year turnover of 20 million euros with 400 employees and around 7 million passengers every year.

When it comes to technical equipment, the company is having vehicles with modern options and all standards. When the buses getting old or technically non reliable, then they are replacing with the new one. Speaking about financial aspect, equipped buses are very expensive and could cost more than hundred thousand euros. Not all companies can afford modern vehicles for transportation. There are many small companies which has older buses. These vehicles could be less equipped and less comfortable, but still very safe since they are all passing the technical inspection 2 times in a year. As it was mentioned before HansaBuss as all others faces different challenges during work and the main is the season. At high season they are fully busy, but during winter time in matter of low season and even with loss high competition must work to compete with other companies. There is a chance to have an extraordinary situation on the road or during the trip. As it was described in theoretical framework, driver can get sickness, vehicle can break down or some other situation. In this case HansaBuss is a member and cooperates with Global Passenger Network (GPN). This organisation helps all members in whole Europe in case of problems and cooperation. This membership allows using other country driver for emergency replacement. Another possibility is that HansaBuss sending their own driver to replace the old one. Such organized system allows continuing trip without discomfort for customers.

The unique difference in HansaBuss is that they are concentrating on strong and high quality service in the transport part and the office part as well. This is a very important moment, since there are many small companies that do not put enough energy on customer service and management. Sometimes there could be good transport, drivers and big potential for growing, but weak office management which slows the whole working process and success. Speaking about the drivers training and health checks, HansaBuss providing professional training for their own staff and regularly doing health checks which is very important before any trips. This process prevents letting drivers to work being drunk or being very tired. Concerning the safety rate in the region and what could be changed, Jaanus said, that by his opinion, Estonians follow rules very well and the situation as whole is very positive. This makes bus transportation in Estonia safe. The rules are strict and penalties are quite high and chance to lose the driver in this case is high.

When it comes to future prospects, main objective of Hansabuss is to extend their position on Estonian market share. Speaking about future as a whole ground transportation industry, Jaanus opinion is that safety is becoming and will be most important together with new engine technologies, which gives less emissions and lower fuel consumption. Finally, the bus and coach transportation can compete with railway and air transportation, because they are much more flexible.

5.2 Transportation service in Germany

Moving forward to Germany, the results are reflected after interviewing with Bettina Knauer from Meinfernbus Flixbus. The company was established in Munich in 2011 by Jochen Engert, André Schwämmlein, and Daniel Krauss with the aim of offering a great-value, comfortable, and sustainable alternative for long-distance travel. On February 13, 2013, FlixBus was the first company to operate a route under the new legislation and, by the end of the year, was also the first bus company with a Germany-wide city network. In 2013 Flixbus had 3 daily routes in south Germany with 10 employees. After the merger with MeinFernbus, company operates over 180 routes and reaches 13 European countries. The main objective for Flixbus together with MeinFernbus is to become most popular bus company in Europe.

When it comes to vehicles, Flixbus has over 560 buses from more than 160 regional partners. Technically, buses are regularly checked to ensure that the highest safety measures are achieved. Germany has a Technical Inspection Association (TÜV) which inspects buses every two years and guarantees the safety and high standards of the buses in Flixbus and in whole Germany. In matter of competition and corporative secrets, companies don not like to share information about common problems, but in case of extraordinary situations, Flixbus always has a possibility to change the driver, vehicle and call a doctor. All companies are trying to offer some unique services to their customers. Flixbus offers modern, comfortable, and environmentally friendly mobility for the best price

including free WIFI, low ticket prices, snacks and drinks on board, sockets, and guaranteed seats together with seats that provides extra legroom and free transportation of customer's luggage. In safety matters Flixbus has modern equipped buses with trained staff and all passengers have to wear their seatbelts which is not common in many other countries.

As it was mentioned before, some companies and even some countries cannot afford modern expensive buses, this is also reflects on safety level. in Comparison with old buses, new ones like in Flixbus have innovations like electronic assistant systems that support all safety measures. Together with this, buses have Electronic Stability Program (ESP), Anti-lock Braking System (ABS), and Advanced Front Lighting System (AFS), Lane departure warning system (LDW), light sensors and much more. Traveling by bus is the safest way to travel on Europe's roads, according to the German Statistical Federal Office. Furthermore, Germany is one of the safest countries in the world. (Flixbus 2015.)

The Flixbus look on the bus transportation is very positive in matter that Since the new legislation the demand is still increasing and there are trends towards modern mobility against people`s own cars. So, the long-distance transportation is on the right way. Environmental friendly buses with free Wi-fi, low tickets prices and comfort seats make ground transportation competitive with other modes of transportation. Flixbus and many other companies are improving the equipment of their buses which gives future increasing safety and comfort.

5.3 Baltic transportation service

Nowadays long distance transportation developing very fast in order to offer economic and comfort transportation for customers. Lux Express Group Is the largest international coach operator in the Baltic region. Except European countries, this company provides routes to St. Petersburg, Moscow and Minsk. The company started in 1993 with routes between Estonia, Latvia, Lithuania and Germany. Nowadays it has international routes between most European cities like

Helsinki, Berlin, Warsaw, Riga, Vilnius and Tallinn. The main objective is always raising the level of service standards. Today the company invested 3.2 million euros in purchasing new coaches. Lux Express operates 65 modern coaches with high technology equipment like free Wi-Fi, conditioners and individual tabs for customers during their trips. The missions and values are to provide best way for travel, trying to be a leader in innovations and raise professional skills. Prices are cheap in comparison with railway and air transportation. Having a discount which offers a special price for first passengers on some of the routes gives a good possibility to travel very cheap.

6 CONCLUSION

The history of buses and coaches started more than hundred years ago and developed amazingly till today. Nowadays, ground transportation plays significant role in tourism and every region economics. Wide range of specification provides the ability to use buses and coaches for different roles. Intercity buses are transporting population all over the city as the same time it is a good transportation for the tourist. This method lowers air pollution and helps to avoid traffic jams. Transfer buses are the good choice for carrying people between the airport and the hotel and back or to any other destination. At the same time charter buses or transfer buses provide transportation between sightseeing's or for private excursions. In other words it is the best solution in distances between 1 to 1000 kilometres with several stops.

Research helps to prove the high level of safety and security in Europe. Big companies are raising the level of transportation in matter of safety and comfort by using new buses, technologies, improving staff competence and trainings for drivers. Together with that the health check is taking important place for avoiding bad habits like drug intoxication, alcohol and lack of sleep.

New regulations and rules is another tool for low fatal rate in Europe, most of them are obligatory and some are voluntary but gives the possibility to have the very high safety level. Technical aspects are helping drivers to predict danger situations or directly participate in a save driving process. From other side there are many small companies which cannot afford modern buses and accounts to use older buses without automatic systems which do not give higher level of safety. Anyway, strict technical inspection in every country gives confidence to customers that all buses are in good condition. Research improves this fact that successful way of growing is to develop safety and provide best service for customers starting from office to transportation. When it comes to the price, most of the countries offer cheap prices in comparison with air transportation and in some places with rail transportation. Priorities in front of other modes are flexibility, environment friendly and price. Buses have possibility to reach most urban places I the world. Airplanes

are traveling faster, but it takes quite much time for registration, waiting flight and picking up the luggage. In this case buses are more comfortable and mobile. All those facts are saying that buses and coaches can compete with rail and air transportation.

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Interview plan for bachelor's thesis	Company	Interviewee	Interviewer	Date
			Supervisor	
Part 1. Start Up, strategy and objectives	<ul style="list-style-type: none"> ➤ ➤ ➤ ➤ ➤ 	<p>How your company started? What was the first objective or target?</p> <p>How was your company developing from beginning till today? Which solutions or ideas helped to reach today's level?</p> <p>What are today objectives?</p> <p>How many buses company has and do you have any kind of rules when buses should be changed for newer?</p> <p>What are the most common problems, challenges that company faces every day? For example if bus is brake down somewhere with passengers or driver is sick.</p>		
Part 2. Safety, comfort and trainings	<ul style="list-style-type: none"> ➤ ➤ ➤ ➤ 	<p>Is there some difference from other transport companies? Unique aspects?</p> <p>How do you provide safety in your company? Are there common challenges connected to safety and security during trips, bus parking, and passenger's safety?</p> <p>Can you tell about bus equipment in safety matter? Digital Tachographs? Some additional equipment that helps predicts danger situations?</p> <p>Are you making professional trainings for your bus drivers, health check and how you control working conditions?</p>		
Part 3. Future Prospects	<ul style="list-style-type: none"> ➤ ➤ ➤ ➤ 	<p>What do you think about safety rate in your Region? Is it good enough or something should be changed?</p> <p>Future vision on your company?</p> <p>How do you think can buses and coaches can be competitive with other modes of transport?</p> <p>How do you think will look tomorrow bus? Better safety equipment?</p>		

Notes, additional information	
Part 1.	
Part 2.	
Part 3.	