



EU Lifelong Learning Programme 2007-2013 - Leonardo da Vinci

Project ISSTE

Improving Safety and Security in Public Surface Transport

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Work Package 5

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Deliverable*

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implementation and
evaluation of results**

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Executive summary

The following paragraph aims at summarising the report, identifying inputs, the innovative approach, the general methodology, also explaining the added value of the process, and the main conclusions.

ISSTE (Improving Safety and Security in Public Surface Transport) is a project co-founded by the European Commission through the EACEA Executive Agency (Education, Audiovisual and Culture Executive Agency) that aims at improving the quality and the safety and security features of public surface transport systems by increasing the vocational abilities of the human resources involved in the field.

In order to achieve such ambitious goal, ISSTE defines, implements and certifies innovative vocational training methods for the human resources involved in surface transport.

Safety and security in public surface transport have a central role in the European passenger mobility systems, for both the European economy and citizens' quality of life.

The ISSTE project is open to an extremely broad spectrum of participants, from transport companies, to university and vocational training organisations and it provides a framework for trans-national co-operation among public transport companies to improve safety and security performances, fostering innovation and promoting at a European dimension new curriculum for drivers.

Within this context, a key role in the project deployment is played by the implementation of the Safety and Security training test, already designed in the previous WP3. Starting from the Innovative Key Performance Indexes to quantify the levels of safety and security of Europe developed in WP2, WP3 identified, selected and innovatively developed the needed abilities for drivers and trainers, producing an innovative S&S curriculum.

In short, WP3 established the roles and requirements for this job and also the needed essential skills, knowledge and attitudes for drivers. These elements were taken into consideration when the new curriculum was designed, in order to improve the necessary skills for drivers. The final and concrete aims are to increase the safety and consciousness while driving a public transport vehicle, to help the adoption of these procedures in case of risk, and also to prevent mistakes while driving.

In order to design a flexible and adaptable Safety and Security training, and with the objective of satisfying the different training needs of different national and local contexts, two ways were suggested in which that curriculum should be tested:

- A S&S training to be delivered separately from any other internal standard training
- A S&S training to be delivered within the internal standard training

Starting from the above mentioned inputs, the two PT operators members of the consortium tested the two formulas, as follows:

- Tramibus (Rome) planned and implemented a training programme designed around a Safety and Security (acronym S&S) module, just after the basic learning. The training started in mid June, till the end of the same month.

and

- RATB (Bucharest) connected the training S&S DRIVING TRAINING INNOVATIVE CURRICULUM within its own training program of the Professional Training Department. The training began on the 1st of June.

Tramibus is the biggest PT company in Italy, with 8.662 employees (6.473 drivers), a fleet of c.a. 2.900 vehicles (bus, tramway and trolleybus). RATB is the biggest PT Company in Romania, with 12.058 employees, of which 4,408 are vehicle drivers (2,768 bus drivers, 975 tram drivers and 665 trolleybus drivers) and a fleet of 2,166 vehicles (buses, tramway and trolleybuses).

The specific objectives of the S&S training were to dramatically raise bus drivers' competences in the main following areas of expertise:

- Protection general measures,
- Causes of injury,

- Alcohol and drugs,
- Specific task co-related risks,
- Work co-related pathologies,
- Prevention measures,
- Theoretic and practical driving rules
- First Aid

One of the key activities of the WP as a whole was the identification and selection of the trainees to be involved.

Strictly following the logic of the two formulas, Trambus and RATB used different methodologies for this task.

Trambus based its selection of bus drivers on three main sophisticated and crossing criteria:

- Corporate age (6 and 17 years of corporate experience)
- Behavioural records (Technical skills, employment and discipline evidence)
- Results obtained on an evaluation questionnaire (to identify the lacks in the S&S knowledge, and, consequently, the need of training)

In this way, the best professional figures, in terms of solid practical experience, adequate flexibility for behavioural change, availability to fruitfully test driving habits, were selected.

On the other hand, RATB driver groups were made up by selecting the trolleybus drivers who registered various traffic events in the last 3 years. For each vehicle driver, was prepared a file with records about his/her traffic events, taking into consideration the event's causes and faults. It was managed in this way in order to have an empirical base for further evaluation of the effects of applying this innovative S&S curriculum.

Several training tools and deliverables were designed and implemented to carry out the training. Together with technical documentation and papers strictly related to the S&S issue, including didactic materials, brochures and booklet, specific tools were produced. In particular, a leaflet was designed and produced (both in English and Italian versions) and distributed to all Trambus drivers. This tool, pocket sized, has the objective to provide an “easy – use” vademecum on driving behaviours and S&S. The leaflet is also designed to be included in the equipment on board, to be helpful in case of emergency. The English version of the leaflet will also represent a dissemination tool to be distributed in external events and future projects. In addition, 3 posters were designed to illustrate safety and security features and to transmit an awareness message to the public transport drivers. These posters were exposed in all the RATB's depots and garages.

After the training deployment, feed-back of the training process were collected to evaluate the training itself, and it was a very useful tool for improving the training method and also for simplifying the given information. This tool represents a mirror of the training, a possibility for knowing the shortcomings and improving the training process.

Once again, due to the different training formula, Trambus and RATB used partially different evaluation process and tools.

Trainers in Trambus, during the last day, in addition to the deployment of the evaluation questionnaire, launched a debate to discuss and analyze in detail results and gaps between drivers' expectations and goals actually achieved.

In this meeting, it clearly emerged an overall appreciation for the training, mainly for practical test use. Attendees realized their skills and limits, also on the basis of a comparison with their colleagues. Comments and suggestions about the margins of improvement for the training modules were encouraged.

Questionnaire verified the acquaintance on subjects treated during the training by questions more detailed than in first level questionnaire, but respecting the same structure for a data comparison. The attendees, except one, had a positive *delta*, i.e. a neat improvement, with an average of 24. Questionnaires analysis demonstrates the value of the training as a tool for the increase of S&S skills and knowledge.

RATB designed 4 sets of assessment questionnaires, and evaluated the 96 trainee's responses at every questionnaire. As far as the final overall evaluation is considered, all trainees answered correctly to more than the minimum trainees admission point, and the majority of them (89.6%)

answered correctly to a really significant number of questions. In addition, regarding the training classes evaluation, it was used a qualitative evaluation file which was filled in by every trainee. The trainees clearly expressed their general appreciation for the training,

The training added value was clear in both companies' practical experimentations.

The innovative curriculum achieved in WP3 took into account the drivers skills and knowledge and it was based on the national occupational standards, already including explicit S&S training. Training on S&S is an essential and primary element for the employment in PT companies. Many information about current regulation on S&S for every task are provided in details at the beginning of the professional career, before including the new employee in his/her department. Starting from this, the training deployed in the two companies was planned to integrate and enhance what already in progress, taking into account training curriculum, innovating it and sharing the outcomes at European scale.

As a result, it permitted to develop specific aspects related to safety driving training, including:

- technical subjects (i.e. practical guide, preventive driving, first aid, vehicle characteristics),
- training tools (i.e. workshop, additional and more detailed questionnaires, innovative materials)
- training hours and modules reassignment

WP5 operative planning and implementation were performed coherently to the certification methodology that will be carried out in the following project step. In this way, the WP4 "New Quality Certification Methods", already started and currently suspended due to the training execution, will be able to fulfill at best its mission.

The aim of the WP4 is to offer optimised procedures for a complete accreditation process, i.e. for an institution that performs the training, the training process itself, the staff involved in training and the infrastructure (educational materials, laboratories etc.) employed for this purpose.

In conclusion, we can affirm that the WP5 confirmed the appropriateness of the previous project outputs. Methodologies and processes developed were coherent with the project mission and produced a positive result in terms of improvement of drivers S&S competences.

Trambus' test showed that the main result was obtained by practical driving section/modules. A special driving circuit was equipped for practical tests on critical driving situations or sudden danger. This driving circuit allowed to evaluate the responsiveness of the attendees. The outcome was extremely positive, because it was proved that experienced drivers need to practice facing sudden or risky situations as well. What is more important, the innovative curriculum is flexible and adaptable to companies' internal training procedures. We consider it as the most important result, in that it ensures the real sustainability of the training proposal and, consequently, the operative chance to replicate it.

As expected, the test showed some areas of improvement. The report clearly mentions these output in that we consider it as the key aspect to help the training customization for PT players. In fact, analyzing the results of the curriculum implementation, other public transport companies can find a new way of tackling and improving safety and security in surface public transport.

The innovations delivered may be imitated, transferred, adopted and implemented by other public transport players (including companies, local and national authorities, legislators, driving schools, etc) according to specific needs.

We can conclude that, the professional training process is very important in order to obtain a service that is viewed in terms of safety, reliability, influencing the inter-modal choice of urban travellers and increasing the relative share of public transport services utilization.

1. INTRODUCTION

1.1 Structure of the report

This report presents the whole work programme of ISSTE Project Work Package (acronym WP 5) and illustrates the training implementation of the innovative curricula developed within this project.

It also describes, largely, the phases of analysis, design, planning, delivery and evaluation of the training.

The training is described for modules, teaching, attendees, selection criteria, final evaluation of learning and feasibility.

1.2 Background

The WP5 represents the operative output of a complex process developed during the previous phases of the ISSTE project.

In particular, in WP2 Key Performance Indicators (acronym KPI) for quality certification were focused and developed, in order to quantify the higher quality standards achieved in Safety and Security (acronym S&S) in Public Transport and to point out, both to the market and to Public Transport (acronym PT) Operators, the new level of knowledge of PT human resources.

In WP3 the innovative training curricula were designed and detailed together with the procedures, application field, didactic methodology, final users of the training and relevant contents.

The innovative curriculum produced in WP 3 of the ISSTE project, and named “SAFETY AND SECURITY TRAINING CURRICULUM” includes special modules for public transport drivers’ training, which emphasize how to improve safety and security in surface public transportation system. The six modules of the Safety and Security Driving Training contain only those elements considered being very important for safety driving in the public transport service.

In WP5, the partners envisaged in the project proposal (RATB and Trambus) have implemented and evaluated the innovative procedures outlined on WP3, through the delivery of the specific trainings for Public Surface Transport (acronym PST) drivers, following the two different approaches designed in WP3.

In fact, one of the most valuable outputs of the WP3 was the capacity to design an innovative Safety and Security training procedure able to be flexible and adaptable to the different standard of training methodologies of the European community of reference. In particular, the procedure foresees two different training formulas:

- One approach can be the implementation of this Safety and Security Training Curriculum separately from the original / basic Driver Training Curricula, at the end of the training period, after testing the driver (learning test) in order to be sure that he/she has acquired the minimum knowledge’s and abilities compulsory for the public transport drivers.
- The other approach can be the implementation of this Safety and Security Training Curriculum within the Driver Training Curricula, integrating the elements of the S&S Training Curriculum to the basic training.

Evidently, the two different solutions need different methodologies and tools to ensure the full achievement of the training objectives.

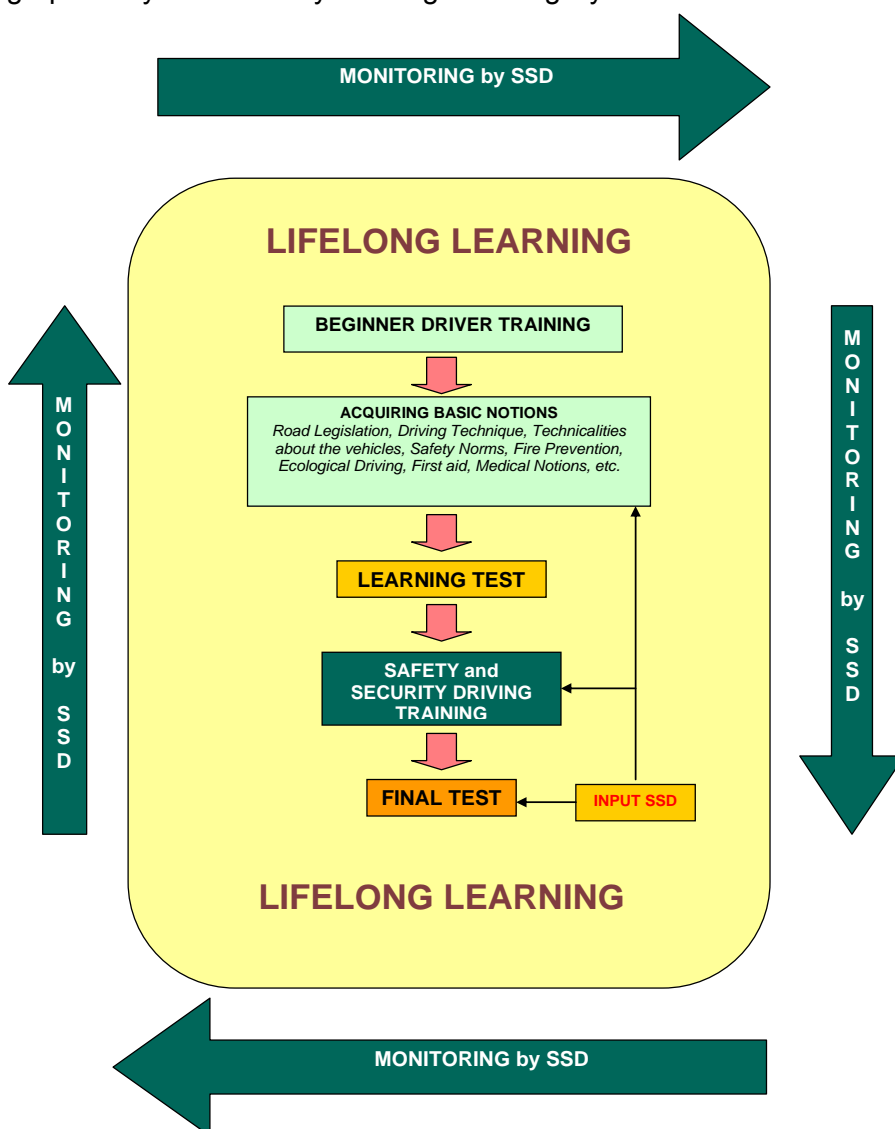
As a consequence:

- Trambus planned a training programme designed around a Safety and Security (acronym S&S) module, just after the basic learning, involving drivers with an average of 7-8 years of corporate experience. The training started in mid June, till the end of the same month,

and

- RATB connected the training S&S DRIVING TRAINING INNOVATIVE CURRICULUM within its own training program of the Professional Training Department. The training began on the 1st of June. RATB planned to apply this curriculum during a period of 4 weeks, on 4 training groups (1 training group/week). The trainees were chosen from the trolleybus drivers.

Summing-up Safety and Security Lifelong Learning System



2. OBJECTIVES

2.1 Overall objectives

The objective of the innovative curriculum implementation was to enhance the vocational ability and skills of the public transport vehicle drivers that attended the courses in order to raise the effectiveness and to improve safety and security in the surface transport delivered to public. Increasing the ability of the human resources is considered to be crucial in the attempt of reducing road accidents, injuries, fatalities, and being capable of managing emergency situations, anticipate operative risks, and all matters that can positively impact on safety and security.

The main objective of the training was to enhance the knowledge of the drivers on S&S. The role played by a PT driver has a crucial impact for traffic and road security.

For instance, in Rome there is a fleet of c.a. 2.900 PT vehicles, running c.a. 140 million kilometres per year, while in Bucharest, RATB has approx. 2,166 PST vehicles that run c.a. 90,6 million kilometres per year.

For this reason, it is easy to understand how improving driving skills (especially how to face risky situations) of the bus drivers was the main purpose of the training, and how it could play a significant role in city's general roads safety.

Driving a PT vehicle is very different from driving any other means of transport, and this for several reasons (safe distance, weight, braking distance, number of people on board, etc.).

Driving difficulties, well managed by bus drivers in normal conditions, increase heavily due to unexpected situations and they generate many risks. Considering this context, the S&S Driving innovative training was planned and developed to increase safety and consciousness while driving, helping the drivers to adopt correct procedures in case of risk/unexpected events, and to prevent errors while driving.

The two ISSTE partners involved in implementing the Innovative Curriculum and chosen to carry out the operative test are among the biggest public transport companies in Europe.

Trambus is the biggest PT company in Italy, with 8.6621 employees (6.473 drivers), a fleet of c.a. 2.900 vehicles (bus, tramway and trolleybus) running c.a. 140 million kilometres per year, and a turnover of € 534 millions.

A Trambus driver, through the standard training programme of the company, enhances his/her skills on following subjects:

- corporate procedures and PT system
- Italian regulation on S&S (D.Lgs 81/2008)
- Fire Prevention
- ISO 9001 , ISO 14001 and SA8000 certifications

Concerning S&S, Italian regulation prescribes a specific training for the employees. In particular for the drivers, Trambus delivers training on S&S, on the following subjects:

- Individuation and description of the figures involved in S&S in the company (employer, management, responsible and employees; S&S Manager, corporate physician, S&S Rep.),
- S&S co-related obligations for each player involved,

¹ Year 2007

- Protection general measures,
- Causes of injury,
- Alcohol and drugs,
- Specific task co-related risks,
- Work co-related pathologies,
- Prevention measures.

As a result, the innovative training delivered during WP5 increased their skills on:

- Road legislation and new regulatory changes on driving under the influence of alcohol or drugs
- Correct reading of dashboard lights and control over basic maintenance prevent accidents or breakdown
- Theoretic and practical driving rules
- Deepest Italian regulation on S&S (D.Lgs 81/2008)
- First Aid.

RATB is the biggest PT Company in Romania, with 12.058 employees, of which 4,408 are vehicle drivers (2,768 bus drivers, 975 tram drivers and 665 trolleybus drivers) and a fleet of 2,166 vehicles (buses, trams and trolleybuses) covering an area of 1,811 km², from which urban area is just 228 km².

In RATB, every 2 years, all drivers must go through training activities. During the period of implementation of the S&S Innovative Curriculum, the Professional Training Department of RATB had planned the training only for trolleybus drivers. The planning for training is approved at the beginning of each year by the Management of the Company.

2.2 Specific objectives

During the training, the trainees must acquire a minimum set of information and knowledge about: rules, regulations and responsibilities regarding the public transport, measures that should be taken in case of traffic incidents and/or accidents and the measures to be taken, preventive measures for driving a vehicle of public transport, technical knowledge about the vehicle, its malfunctions and ways to repair them.

The vocational ability development will constitute the basis by which ISSTE partners will be able to deliver a higher service in terms of quality, safety and security.

Main purposes of the innovative training programme were:

- To design a bridge over the gap of knowledge's on S&S;
- To enhance the knowledge on S&S

For this reason, the most common causes of accidents were analyzed, as follows:

- with a subjective point of view:
 - fatigue,
 - use of pharmacological products,
 - uncorrect diet

- working stress,
- and with an objective point of view:
 - ruined or slick road surface,
 - traffic,
 - narrow and busy lanes,
 - narrow curves.

After this analysis, proper tools and techniques were provided to the drivers to face risky situations and to handle critical driving situations, such as:

- sudden braking for crosswalk,
- aquaplaning,
- reverse gear and low visibility.

The above mentioned issues were theoretically and practically analysed.

3. METHODOLOGY

As above mentioned, the WP5 tested the S&S training innovative procedure designed principally in WP3.

As a consequence, the first step was to plan the operational activities to be performed, in terms of:

- technical content of the training
- human resources to be involved:
 - trainers
 - trainees
- tools and equipments
- timing
- outputs
- monitoring procedures

Because of the different formulas adopted by Trambus and RATB, the two companies proceeded with some variations in the operative planning

3.1. Work Package overall planning

WP5 started on April the 1st, 2009.

During the first weeks the training criticalities were analyzed, and consequent critical success factors were identified.

In particular, the following main elements were considered to deserve special attention:

- training timing. Approaching summer holidays, the rota management of the drivers is always critical
- curricula of the trainees
- curricula of the trainers

Considering the above mentioned elements:

- Trambus fixed the training between the 25th and 26th week
- RATB set the training on the 23rd and between 25th and 27th week

The WP5 GANTT in annex provides the representation of the Work Package planning and execution.

3.2 Training Planning

3.2.1 Trambus

Training programme was designed to properly identify and manage critical driving situations, adopting correct behaviours to avoid risky situations.

Studies and reviews were made concerning:

- Accident statistics and figures,
- Main causes of accidents,
- How to be vigilant even at low speed,
- How to enter the curves,
- Correct driving position,
- How to calculate safe distance,
- Distractions to avoid while driving,
- Correct maintenance of the vehicle,
- Consciousness on own limits,
- Knowledge on correct operations of the most common security systems of vehicles and driving cabins,
- Confidence with the manoeuvre in case of critical situations, where instinct can suggest wrong actions,

The training was held in 7 days (4 hours per day) + 1 day/workshop (7 hours).

Selection of trainers

Teaching was carried out predominantly by internal personnel, with at least 17 years of professional experience and 7 years of corporate experience, selected for skills and technical knowledge related to the training subjects.

Beside them, external experts for specific subjects were involved, basically during the Workshop.

Several meetings were conducted with the trainers to plan training activities and formulate questions for the learning questionnaires. During the meetings the subjects and the duration of each module were detailed. Trainers involved were 9, with 7 main field of training in total.

Selection of trainees

Selection of bus drivers to be involved was based on three main sophisticated and crossing criteria:

1. Corporate age
2. Behavioural records
3. Results obtained on an evaluation questionnaire

The first principal for the selection of the trainees was a specific corporate age: bus drivers ranging between 6 and 17 years of corporate experience.

This criteria was useful to achieve several objectives:

1. Optimization of training effort. The training was not delivered to apprentices, basically because they already benefit of an amount of 120 hours of training per year (for three consecutive years), mandatory by national law. Consequently, new comers already get solid training on these subjects, even not including the innovative aspects of the training into consideration.
2. Professional stimulation. The corporate age ensured that participants were stimulated to upgrade and/or enhance their professional skills compared with daily experience. Furthermore, the transmission of driving “best practice” from older colleagues to younger

ones, through the so-called “imitative process”, was encouraged and stimulated during the training.

3. Appropriate training addressees. Bus drivers ranging between 6 and 17 years of corporate experience permitted to have:
 - professional with solid practical experience
 - adequate flexibility for behavioural change, due to their generally young age
 - availability to fruitfully test driving habits

Based on the above mentioned corporate age principle, selected drivers were 120.

As a result, a successive choice was made based on the second selection criteria: past behavioural records, basically taking into account:

- Technical skills, reported on internal evaluation assessment, ,
- Employment and discipline evidence, such as absenteeism.

In this way was the best professional figures were selected. The application of the second selection criteria produced a list of 50 people.

The 50 bus drivers were invited to fill a skills evaluation questionnaire. The questionnaire was designed ad hoc for the selection of the participants, in order to identify the lacks in the S&S knowledge, and, consequently, the need of training.

The questionnaire was a quiz with multiple answers (just one correct). With a maximum of 100 points, divers who obtained 82 points or less were selected for the training.

In this way, experienced personnel with a need of bridging some S&S gaps were identified and involved in the test training. The structure of the questionnaire was agreed and shared with the trainers, in order to ensure the consistency with the training subjects. Questionnaire was made by 20 questions on 5 subjects:

- Safety Rules and Fire Prevention
- Safety driving
- Driving documents
- First Aid
- Vehicle Maintenance

The evaluation matrix of the questionnaire was designed to ensure an assessment able to take into account different and relevant parameters. For every group of questions a different evaluation weight was given, depending on the importance of the subject, as follows:

Group	Subject	Weight	Questions	Correct Answer Rating
1	Safety rules and Fire Prevention	48%	8	6
2	Safety Driving	25%	5	5
3	Driving documents and road code	16%	4	4
4	First Aid	8%	2	4
5	Vehicle Maintenance	3%	1	3

The application of the third selection criteria produced a 24 people list. All 24 attended the whole training; just one retired, after day 1, for private reasons.

3.2.2. RATB

Regarding the ISSTE Innovative Curriculum implementation by RATB, the 4 training periods were:

- 1st class: 01 – 05.06.2009
- 2nd class: 15 – 19.06.2009
- 3rd class: 22 – 26.06.2009
- 4th class: 29.06 – 03.07.2009

Every one of the 4 training groups had their training classes during a period of 5 days (one week), daily from 8:00 to 16:00.

The vehicle driver groups were made up by selecting the trolleybus drivers who registered various traffic events in the last 3 years. For each vehicle driver, was prepared a file with records about his/her traffic events, taking into consideration the event's causes and faults. It was proceed in this way in order to have a solid base for further evaluation of the effects of applying this innovative curriculum developed within WP3.

All the trainers were previously instructed regarding the Innovative Curriculum developed in the WP3. A presentation of the ISSTE project and the WP3 curriculum was realised for all trainers in order to make them notice about the objectives of the project and of the Innovative Curriculum developed within the project. After the short presentation they were given the autonomy to organise their lessons, according to the WP3 Innovative Curriculum, in order to achieve the best results of improving the Safety and Security in surface public transport.

During the training, besides the topics regarding the improvement of Safety and Security aspects, other specific issues of the current professional training plan have been developed. The total number of training hours was 40 hours for each group.

The implementation of the ISSTE Innovative Curriculum lasted a total of 200 hours during which 96 RATB's trolleybus drivers were trained focusing on the improvement of the Safety and Security in Bucharest surface public transport.

The Training programme.

The Innovative training programme was done according to the ISSTE Safety and Security Innovative Training Curriculum.

RATB's implementation of the Innovative Curriculum regarding the improvement of Safety and Security was done during 40 hours of theoretical training. The new curriculum for training the RATB's trolleybus drivers was reconfigured taking into account the safety and security innovative curriculum produced in the WP3 of the ISSTE project.

There were 8 modules of theoretical training and 2 modules of testing and analysing the tests.

1. Road Legislation (13 hours)
2. Technicalities about the vehicles (3 hours)
3. Safety Driving (10 hours)

4. Health and work security (2 hours)
5. Work legislation (1 hour)
6. First Aid and Medical Notions (4 hours)
7. Social Behaviour (2 hours)
8. Automatic Fare System (1 hour)
9. Final test (2 hours)
10. Analysing the test's results (2 hours)

1. Road Legislation (13 hours)

This module skilled the trolleybus drivers regarding the updated notions on the traffic rules (National Road Legislation), the traffic regulations and all the other traffic rules that a public transport driver must know. The most important S&S elements discussed were accomplished by the preventive driving elements of the speed elements, right-of-way rules, vehicle manoeuvres, crossing over/ near certain points (pedestrian crossing, bridges, tunnels, public transport stops, rail way crossing, etc.) and making the drivers aware of the penalties they will have to face, obligations of the vehicle driver before driving the vehicle on the public roads, public road features, and traffic signs, etc.

2. Technicalities about the vehicles (3 hours)

Within this module, the trolleybus driver is trained regarding all aspects of the vehicle related to safe and secure driving on the public roads. The vehicles used are Astra – Ikarus 415T and Astra – IrisBus (the newest trolleybuses types used at RATB).

The most important specific competences acquired during this module are:

- Knowledge's about the different trolleybus vehicles and their onboard endowments.
- Knowledge's about the GPS system and about the latest adjustments on the break system and steering system.
- Knowledge's of the malfunctions of the vehicle, and their causes and also their symptoms.

3. Safety Driving (10 hours)

This module presents the necessity and the importance of preventive behaviour while driving a public transport vehicle.

The driver must acquire specific competences regarding:

- Recognition of the safety driving elements (especially the fact that “The road accident is a preventive phenomenon.”);
- Driving according to the own competences and skills and to the specific conditions (especially the speed and running distance as elements of safety driving);
- Identification of the dangerous situations from the point of view of losing the visibility and adherence and ways to react;
- Awareness of the risk factors regarding the different traffic circumstances;

4. Health and work security (2 hours)

This module is newly introduced in the periodical training curriculum of RATB.

The specific competences acquired at the end of this module should be the awareness of the health and work security norms and how to apply them into the transport activity.

5. Work legislation (1 hour)

After this module, the trainees are aware of the working and resting time and all other obligations, responsibilities and rights of the employees (especially the public vehicle drivers).

6. First Aid and Medical Notions (4 hours)

This module updates and completes the medical notions of the trainees. Applying the first aid techniques, measures to take in case of transporting accidents' victims, identification of the illness that not allows the driving of vehicles and the medication unsuitable for driving a vehicle are the competences acquired during this module.

7. Social Behaviour (2 hours)

During this module, the trainees identify the components and the real causes of the conflicts and they become aware of the drugs consume risks.

8. Automatic Fare System (1 hour)

This module updates the driver's knowledge regarding the automatic fare system of RATB.

During the ISSTE Innovative training Curriculum, only the theoretical aspects were approached. The practical training was removed from this training because it was considered that the practical aspects are already well known, all of the instructed drivers working daily into Bucharest traffic.

For these modules, specific materials were printed and offered to the trainees so they were able to study even outside class hours.

3.3 Monitoring procedures

The monitoring system of the training activity of the WP5 was a tool that basically responded to a twofold objective:

- control and evaluate the correct execution and the outcomes of the training;
- assess the impact of the training course as a whole – thus defining in advance the goals to be pursued and the indicators to quantify them.

Because training was a process, the monitoring system reflects this principle and it was implemented principally to serve as an instrument helpful for trainers to adopt and quickly answer to the needs of the trainees.

It was carried out on an on going basis considering both the efficiency and the efficacy of the training sessions, thus giving the trainers the opportunity to fine tune the training sessions to the wants of the trainees.

Trambus and RATB, the two partners that implemented the innovative curriculum, used 2 Questionnaires designed by Trambus. These Questionnaires were translated and adapted to Romanian local conditions and functionalities.

3.3.1. Trambus

The first input of the system was the entry form filled by the trainees (described in the following pages). It served as a base that permitted the trainers to plan a functional topic schedule and it will serve to evaluate the overall impact of the training, the effective meeting of the requirements of the class.

A second on going input was a weekly form filled by the trainees in which they will indicate the results produced during the learning activities together with an assessment/judgment on quality of evidence in order to conclude whether he/she achieved the learning objectives.

Considering the brief duration of the training (1 week), there were no reasons to administer a weekly questionnaire. In order to ensure efficacy and efficiency, the training was adapted day by day, also following attendees' suggestions. In this way, the trainers, each one for his/her module, were able to focus their lessons according to the effective knowledge and steps of the attendees.

As far as the efficiency is concerned the instruments that were used to measure its level are:

- daily attendance sheet (trainers, tutors and trainees)
- daily check list of the topics discussed and of the group exercises realised
- training material produced and disseminated

Monitoring was based on fixed training goals achievement analysis, through an ad hoc questionnaire administered during the last training day. The questionnaire was aimed to verify:

- efficiency
- efficacy
- appreciation

The questionnaire was structured in subjects, covering every training module, with a section with free answers and another with multiple answers.

This last section analyzed in details:

- trainer performance,
- presentation/relation duration,
- appeal of the subject treated, with a rating of 5 rising values (min. "totally unsatisfactory" max "excellent").

Questionnaire was composed by 10 questions:

- about the training (goals, schedule, logistic organisation and didactic materials),
- 2 on specific subjects treated during the training,
- 2 on workshop,
- 2 on efficacy evaluation of the training.

The outputs evaluation showed a good level of appreciation by the course group about:

- Road Legislation,

- “D.Lgs 81/2008, Security Inique Text – Italian Regulation on S&S
- DVR and specific risks (DVR: risk assessment documents, every corporation must draw up documents about risks for any specific task)
- Safety Driving (theoretical and practical part)

3.3.2. RATB

During the Innovative Curriculum testing, 4 sets of questionnaires were used:

- Questionnaire 1 – before starting the instruction process (this questionnaire was proposed by Trambus and adapted by RATB to its local conditions and functionalities);
- Questionnaire 2 – at the end of the instruction process (this questionnaire was also proposed by Trambus and adapted by RATB);
- The training evaluation file of the training process (proposed by RATB). New questions were added to the usual evaluation fiche used by RATB;
- Final testing questionnaire (currently used by RATB and similar to the Police’s questionnaires).

The 96 trolleybus drivers that attended these courses will be monitored for a period of 3 years after finishing the courses in order to follow their involvement in other traffic incidents.

It is also established that the psychologists from RATB will offer psychological counselling services any time when it is necessary, at the demand of the vehicle driver or at the recommendation of his/her superior.

4. TRAINING IMPLEMENTATION

4.1 Training course

4.1.1. Trambus

In Trambus, newly recruited drivers are trained on several subjects: employment contract, operational training, internal organisation and in particular, as envisaged in national regulation, on S&S in the workplace.

Training on S&S is an essential and primary element for the employment in the company. Many information about current regulation on S&S for every task are provided in details at the beginning of the professional career, before including the new employee in his/her department.

ISSTE Project was aimed to integrate and enhance as already in progress, taking into account training curriculum, innovating it and sharing the outcomes at European scale.

Following this criterion, Trambus planned to train personnel with enough professional experience, to have a feedback by drivers with a proper vocational background, due to many years of driving. In this way, it was possible to test with efficacy and efficiency a new typology of training, and was also possible to put in classroom personnel previously trained, just to be refreshed.

The ISSTE training was structured in 36 total hours, divided in theoretic and practical sections.

The schedule tested by Trambus was composed by 9 flexible modules (see following details). 7 of these modules can be separately re-proposed; the remaining two (the one about the workshop and the conclusive one) were specifically aimed to test the first edition of the training. Even if every module can be delivered separately, it's important to keep in mind that:

- module n.3 “S&S regulation and theoretical fire prevention” should be delivered before module n.4 “Practical test on fire prevention and first aid”
- module n. 5 “Safe Driving” should precede module n. 7 “Safe Driving (Theory/practice)” and then module n.8 “Practical driving”.

The main innovation in planning, structured under the criterion used for ISSTE Project, is that every module can be delivered separately or together with the others, depending on the company's needs.

Operatively speaking, theoretic section was held in Trambus head office, while for the practical part a special driving circuit was arranged in a Trambus Depot.

The choice of a special circuit for practical tests was aimed to:

- Test each trainee on Driving skills in adverse conditions
- Compare skills and knowledge between colleagues
- Bridge the gaps adopting correct driving behaviours

The training had a duration of 2 consecutive weeks, from 16th to 25th of June, 2009 (4 hours per day, before or after work time). The Workshop was a main event, attended also by Italian Authorities and some ISSTE Project Partners.

The training course treated the following subjects (grouped by modules):

1. Road Legislation

- Traffic incidents statistics
- Traffic information control elements
- New code of the road (hints)
- Driving license (relevant discipline)
- Traffic regulations (driving attitudes, speeding regime,)

2. Technicalities about the vehicles

- GPS
- On board vehicle equipment
- Update on brake equipment
- Update on driving equipment

3. Safety rules and fire prevention

- Rules evolution on work safety legislation, (D.Lgs 81/2008); main actors, hints on DVR and specific risks
- Introduction to fire prevention
- Fire and explosion, combustion principles, fire prevention, extinguishing techniques

4. First aid

- Check of psychophysical conditions of the injured: vital functions
- First aid rules in case of: traffic accidents, burnings, electrical shocks, heart attacks, wounds, fractures, bleeding ecc.

5. Safety Driving

- Risk analysis
- Basic preventive behaviors
- Traffic at certain points (pedestrian crossings, bridges, tunnels...)
- Elements for improving active and inactive security of the technical factors
- Driving speed, driving distance, visibility conditions, road conditions, etc
- Factors influencing the physical and psychological state of bus drivers – alcohol, drug, medications, steering-wheel fatigue...
- Mobile phone use, MP3 players with headphones, etc.
- Behaviors in case of accidents: first aid, emergency calls, data collection and finding eyewitnesses
- Elements of ecological driving: reduction in consumption and environmental impacts

6. Workshop

- Welcome speech
- Drug & Alcohol Awareness for safety sensitive employees
- First Aid on the bus
- Transporting passengers with special needs

- Stress management for transit employees
- Panel discussion and debate between speakers and attendees

7. Practical Safety Driving

- Basic notions
- Relation between speed and distance
- Braking typologies
- Bus driving in adverse conditions

8. Practical Test

- Bus driving in adverse conditions
- Fuel saving
- Vehicle deterioration

9. Conclusions

- Summary and final comments
- Feed-back questionnaire delivery

During the workshop the subjects treated were:

- Safe Transportation,
- Fire prevention and emergency management,
- Alcohol and drugs
- Stress Management.

The Workshop was designed and realized to integrate training with special competences of external experts.

The workshop formula also permitted:

- A helpful interaction between external experts and internal trainers
- An interactive session between experts and trainees.

This formula increased considerably the coverage of all training subjects, and represented a good feed back by the drivers. Moreover, the interactive session helped to understand how much competences were effectively increasing in the following issues:

- The comprehension of the subjects treated during the training
- The Awareness on the importance of safe driving behaviours

Firstly, external/environmental elements responsible for stress were discussed:

- adverse environment,
- surface conditions,
- unexpected events
- inner aspects and personal stress response.

Consequently, road security implications were analysed, i.e. how to face unexpected events and how to handle properly critical situations while driving; safety driving, avoiding instinctual

reactions in adverse conditions, such as danger, climate conditions, traffic, road accidents, fire on board, electric grid drop (tramway or trolleybus).

In the second part stress response elements were treated, such as work co-related stress management: environmental typical features like noise, temperature and vibrations; interaction between individual and environment (sociological and psychological aspects); stress response (physical and psychological disorders).

During the final debate the importance of being responsible for it's own health and safety, and for people like colleagues or passengers, emerged strongly, according with social and professional relationships, training and tools provided by the employer.

The final topic discussion was about drugs/alcohol assumption, and co-related accidents/injuries risks (for vigilance/attention reduction, slowing of reflexes or altered perception of risks), regulatory changes on the so-called "zero tolerance" for PT drivers, health checks, internal procedures and counselling.

External experts attended the workshops were:

- Dott. Marino Lizza - Project Manager ISSTE
- Dott. Francesco Caporaso – Rome Local Police officer - (teaching since 2001 at Local Police Academy, Member of District Commission for the Release of Service Driving License)
- Ing. Marcello Lombardini – Rome Fire Fighters Training Manager (fire prevention trainer, Coordination of the 53th Course for permanent firemen),
- Dott. Enzo Valenti – Occupational Physician –SPRESAL ASL RMC Medical Manager - (occupational medicine expert, instrumental check-up quality trainer),
- Dott. Francesco Tulli – occupational psychologist/consultant - Management Consultant for (among others): ASL, Ferrovie e Presidenza della Repubblica; Gregorian University Professor.

Internal Relators were:

- Ing. Enrico Bonanno – Trambus S&S Manager
- Sig. Antonio Liani – Responsible for Trambus Regularity Observatory and Service Quality
- Dott. Antonio Romiti –Trambus Physician.

4.1.2. RATB

The innovative curriculum produced in WP3 and dedicated to improve Safety and Security in surface public transport have been applied in RATB' by its Professional Training Department for periodical training of four classes of trolleybus drivers. The instruction process was started on the 1st of June 2009.

For these instruction classes were selected trolleybus drivers for periodical training, taking into consideration the RATB's professional training plan for 2009, approved by the company' management. In accordance with that plan, during this period, only this category of drivers has to be re-trained (periodical training).

The drivers were selected from those who registered various traffic incidents in the last 3 years.

An analysis of the trainees was performed using the following data: age, sex, total driving experience, driving experience in RATB, history of traffic incidents, etc.

The number of training hours has been rearranged and the thematic was redistributed taking into consideration the content of the modules introduced in the ISSTE innovative curriculum.

The content of the training lessons has been established so it can achieve some specific competences, so that for every theme there are at least one or more specific competences to answer to.

This action was developed with regard to the elaborated operational standards.

4.2 Training tools and deliverables

4.2.1. Trambus training

Abstracts of the subjects treated were distributed to the attendees, referring to safety, and in particular:

- National regulation
- work co-related risks
- first aid rules.

A leaflet on these subjects was designed and produced (both in English and Italian versions) and distributed to all Trambus drivers.

The leaflet in English will also represent a dissemination tool to be distributed in future project and external events.

This tool, pocket sized, was aimed to provide an “easy – use” vademecum on driving behaviours and S&S.

The leaflet includes the following main subjects:

- “Improving S&S in Public Surface Transport” (hints to ISSTE Project)
- “Road Legislation” (hints on regulatory changes and to “point system” driving license)
- “safety driving rules”
- rules evolution on work safety regulation, (D.Lgs 81/2008); main actors, hints on DVR and specific risks
- S&S and Fire Prevention (hints on regulation).

Leaflet is also designed to be included in the equipment on bus board, to be helpful in case of emergency.

4.2.2. RATB training

The didactic materials used by RATB during the innovative training were:

1. Posters (3 different posters);
2. Brochures (preventive driving brochures);
3. Booklet (containing updated driving legislation).

All the printed materials were designed and dedicated to successfully reaching the objective of this type of training.

The 3 posters were designed to illustrate safety and security features and to send an awareness message to the public transport drivers. These posters were exposed in all the RATB's depots and garages in order to be seen by all the drivers and not only by trolleybus drivers.

The brochures containing preventive driving advices and the booklets enclosing the updated road legislation were distributed to the trainees as a training material and for individual study.

4.3 Training feed-back collection and evaluation

Feed-back of the training process is a very useful tool for improving the training method and also for simplifying the given information. This tool should be considered because it represents a mirror of the training, a possibility for knowing the shortcomings and improving the training process.

4.3.1. Trambus training

Trainers in Trambus, during the last day, in addition to the deployment of the evaluation questionnaire, launched a debate to discuss and analyze in detail results and gaps between drivers' expectations and goals actually achieved.

In this meeting, clearly emerged an overall appreciation for the training, mainly for practical test use. Attendees realized their skills and limits, also on the basis of a comparison with their colleagues. In particular, they appreciated the chance to share opinions and suggestions.

Comments and suggestions about the margins of improvement for the training modules were encouraged.

Trainees suggested:

- to broaden and deepen "Road Legislation" and "First Aid"
- "Maintenance" should be more focused on practical aspects.

Additional suggestions were related to:

- training scheduling,
- topics sophistication for drivers with a certain corporate experience.
- Exchange of visions and practical experience between new and old employees

About the analysis of Safety Driving expertise questionnaire, during the planning phase the main aspects to be tested for drivers' skills assessment were individuated.

Questionnaire verified the acquaintance on subjects treated during the training by questions more detailed than in first level questionnaire, but respecting the same structure for a data comparison.

As the previous, the questionnaire was made by 20 questions on 5 subjects:

- Safety Rules and Fire Prevention
- Safety driving

- Driving documents
- First Aid
- Vehicle Maintenance

The evaluation rating had the same criterion, as follows:

Trainee	1st Questionnaire rating	2nd Questionnaire rating	Δ
1	45	96	51
2	51	95	44
3	52	85	33
4	58	94	36
5	64	90	26
6	64	100	36
7	65	96	31
8	68	100	32
9	68	90	22
10	69	95	26
11	69	86	17
12	69	100	31
13	71	66	-5
14	71	94	23
15	72	95	23
16	73	100	27
17	77	94	17
18	78	100	22
19	78	94	16
20	78	95	17
21	78	85	7
22	79	82	3
23	82	96	14

Δ = Rating 2nd questionnaire / Rating 1st questionnaire

$$\bar{x} = \frac{\sum_{i=1}^N x_i}{N}$$

It is recalled that evaluation consistency between the two questionnaires is ensured by:

- coherence on treated subjects,
- coherence in number of questions for each subject
- use of the same weighting criterion for each question (see page 15).

Moreover, it is specified that the first questionnaire was aimed to provide a selection for training attendees, while the second one represented an overall learning evaluation. In fact, the questions of first level questionnaire were more wide-ranging, while in second level were more specific, because of attendees' knowledge improvement during the training.

The attendees, except one, had a positive Delta, i.e. a neat improvement, with an average of 24.

Questionnaires analysis demonstrates the value of the training as a tool for the increase of S&S skills and knowledge.

As far as the efficacy is concerned, special emphasis was given to evaluate the effectiveness of the single training sessions through:

1. individual tests – in order to verify the correct understanding of the subjects
2. group exercises
3. class evaluation form

The final Class Evaluation Form is described as follows:

Trainee Name	
Question	Yes/No Answer
Were the classroom facilities adequate?	
Were the goals and objectives clearly stated at the beginning of class?	
Were the students allowed to introduce themselves?	
Did the instructor have good eye contact?	
Did the instructor adequately answer any student questions?	
Was the class too in-depth?	
Did the instructor begin the class on time?	
Did the instructor state his name at the beginning of class?	
Were the refreshments adequate?	
Were the handouts adequate and thorough?	
Was the classroom neat and orderly?	
Was the instructor knowledgeable about the subject?	
Were the classroom facilities adequate?	

In conclusion, at the end of the training an appreciation questionnaire was deployed to participants, including the following questions:

Trainee Name	
Question	Yes/No Answer
Do you deem that the goals and objectives of the training were completely cleared up?	
Did training contents comply with the expectations you had while reading the training programme?	
Did logistic organisation and materials deployed during the training comply with your expectations?	
Were Training subjects treated in an exhaustive way?	
Evaluate every single module, showing your appreciation with reference to: speakers, relations duration, subject treated	
which subjects to you deem must be deepen?	
Did Workshop's subjects comply with your expectations?	
Which subjects were, in your opinion, more interesting than others?	
How do you evaluate the overall efficacy of the training for your	

4.3.2. RATB training

RATB evaluated the trainee’s responses question by question, at every questionnaire.

After collecting and analysing the answers of the 96 trainees (for the 4 sets of questionnaire) the situation of the curriculum testing is as follows:

At the Questionnaire 1 (enclosing 20 questions) generally the wrong answers (figure 1) were on the following questions:

- Question 2: 50 wrong answers (52%);
- Question 18: 45 wrong answers (46.8%);
- Question 6: 42 wrong answers (43.7%);
- Question 20: 22 wrong answers (22.9%).

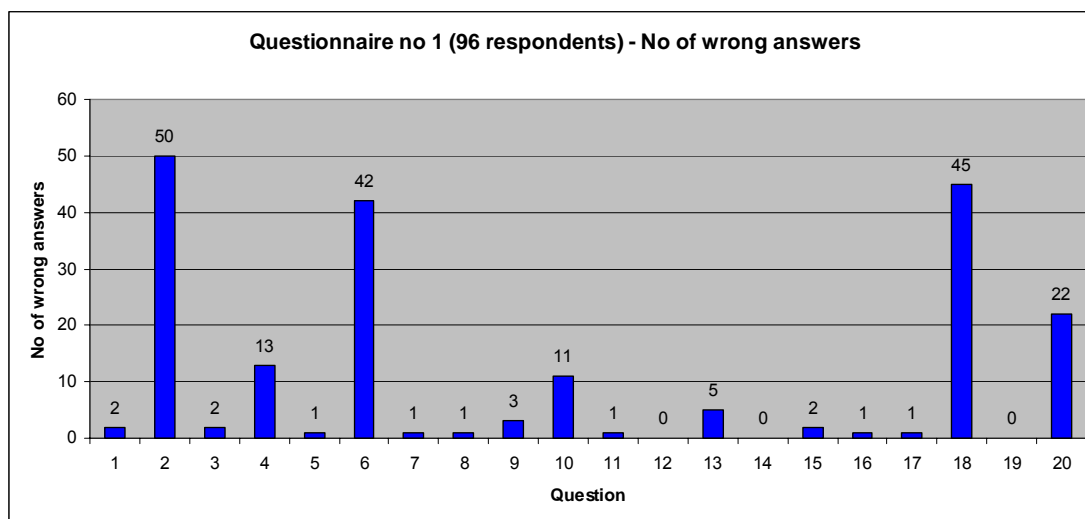


Figure 1

Question no. 2 tackle the way the vehicle drivers acknowledges information about the specific department of work health and security inside the company.

Questions 6, 18 and 20 presents very important aspects regarding the S&S in public transport system and it need to be explained more clear in the future, in order to be better assimilate.

Considering the above, these questions were discussed again in order to be better understood. Also, on the following training, this issues will be underlined, better explained and assimilate.

Regarding the total number of the correct answers on this questionnaire (figure 2), the following aspects arises:

there was noticed that 76% of the trainees answered correct to 18 or 19 questions;

- only 2 trainees answered correct to all 20 questions;
- only 2 trainees answered correct only to 11 and 14 questions;
- overall, 95.8% of the trainees answered correct to 15 to 19 questions.

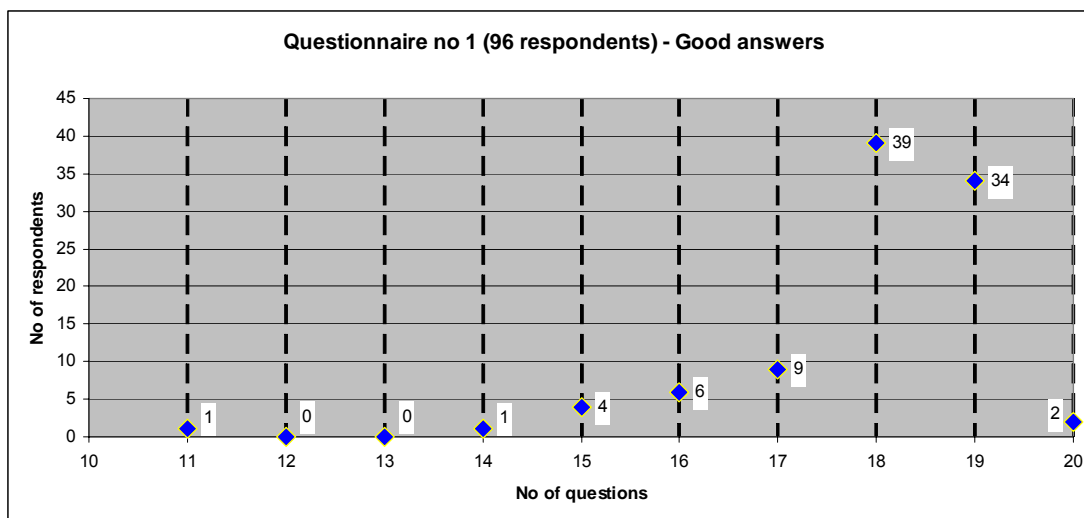


Figure 2

At the Questionnaire 2 (enclosing 18 questions) generally the wrong answers (figure 3) were on the following questions:

- Question 7: 81 wrong answers (84.4 %);
- Question 10: 74 wrong answers (77%);
- Question 12: 58 wrong answers (60.4%);
- Question 9: 30 wrong answers (31.2%);
- Question 17: 24 wrong answers (25%);
- Question 18: 18 wrong answers (18.7%).

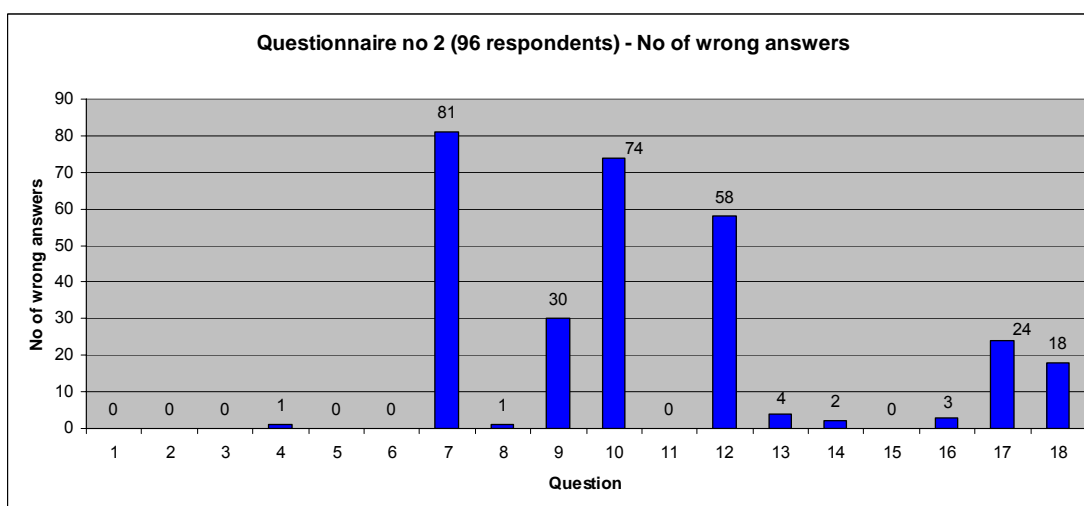


Figure 3

After analysing the answers form the Questionnaire 2, it becomes visible that the question 7 needs to be redesigned because it was not well understood.

The other questions with high percentage of wrong answers will need to be explained better in the future, because it tackles important issues regarding the S&S of the surface public transport.

Regarding the total number of correct answers on this questionnaire (figure 4), it was noticed that:

- all trainees answered correctly to more than 13 questions;
- 40 trainees answered correctly to 14 questions (41.6%);
- 25 answered correctly to 15 questions (26%);
- 81.2% answered correctly to 14, 15 or 16 questions.

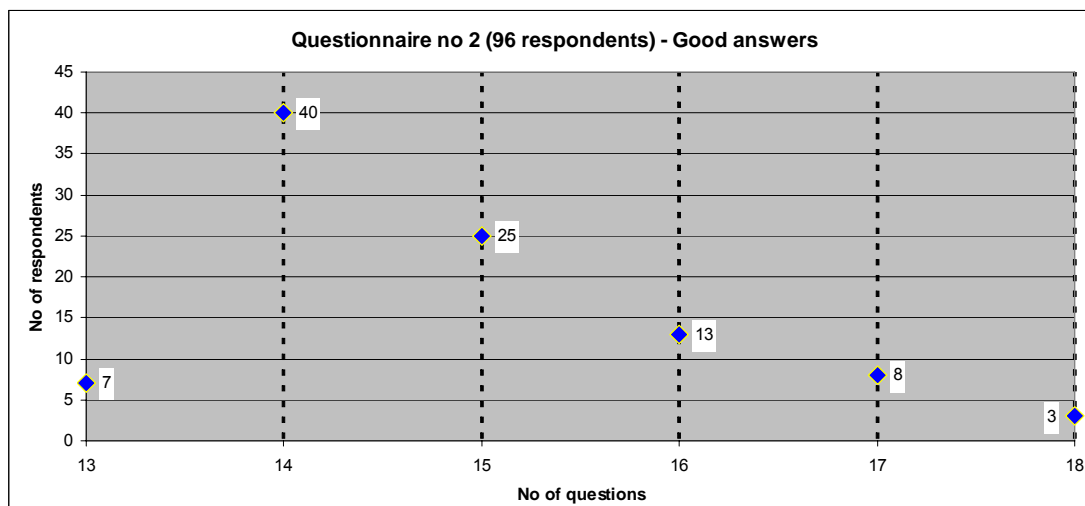


Figure 4

Regarding the Final testing questionnaire (similar to the Police’s questionnaires and containing 26 questions) frequently used by RATB, and the base for vehicle drivers evaluation, the results were (figure 5):

- all trainees answered correctly to more than 22 questions, this representing the minimum trainees admission point (similar to the Police testing);
- Most of the trainees (89.6%) answered correctly to 23, 24 or 25 questions.

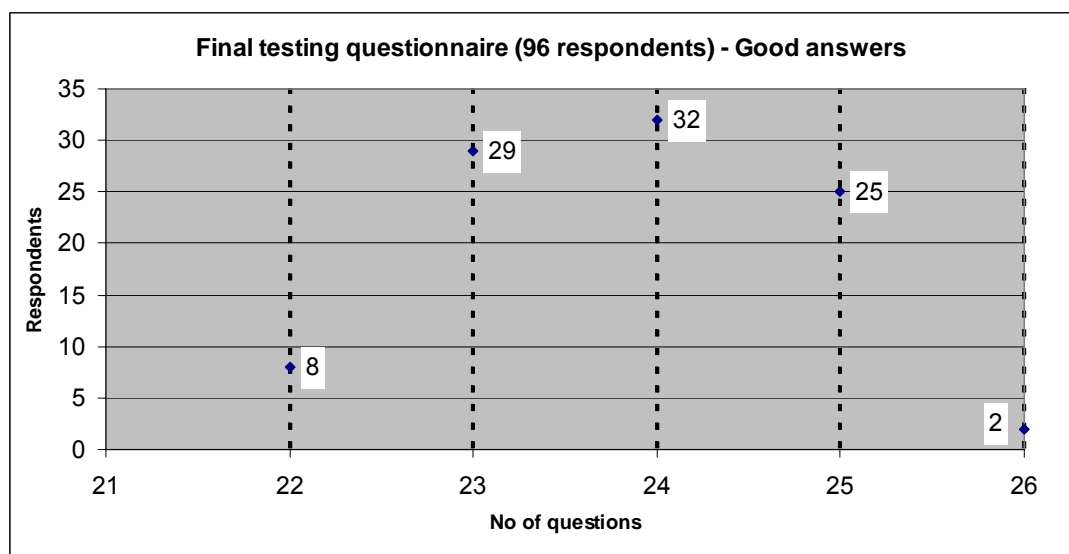


Figure 5

Regarding the training classes evaluation, it was used a qualitative evaluation file which was filled in by every trainee, and in which the trainees expressed themselves about the satisfaction degree of the various training classes evaluation. The results of this analysis are revealed in the figures 6 to 11.

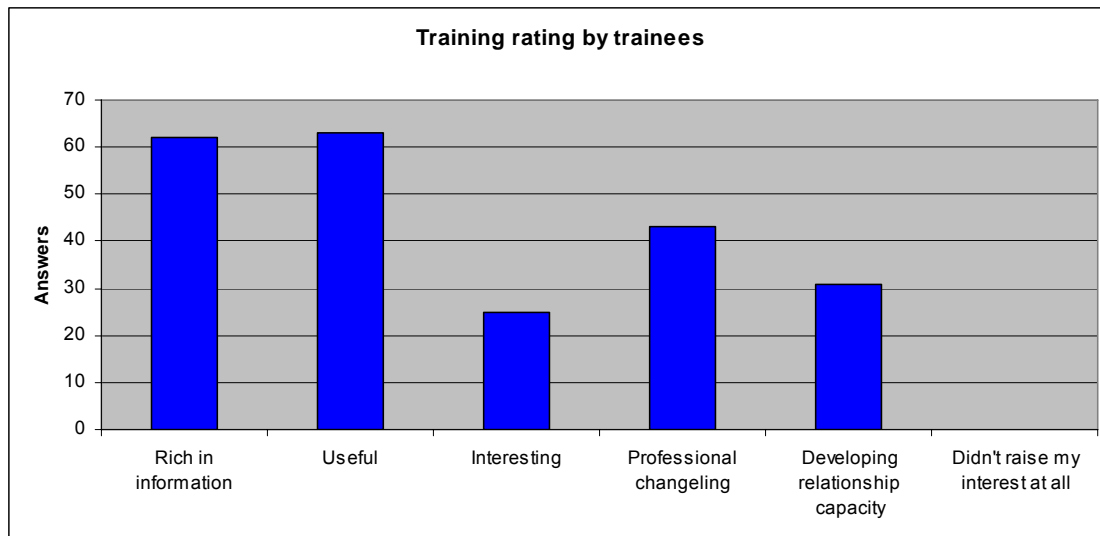


Figure 6

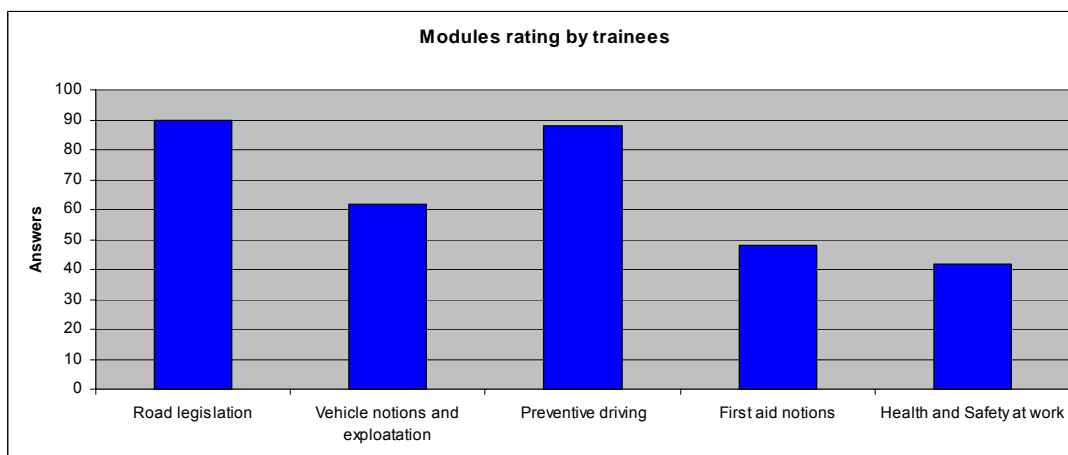


Figure 7

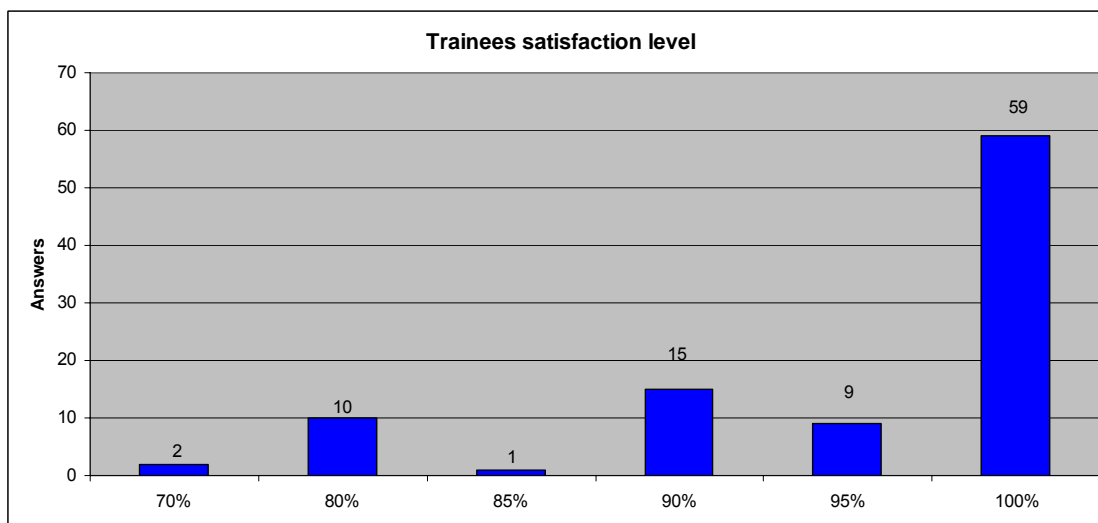


Figure 8

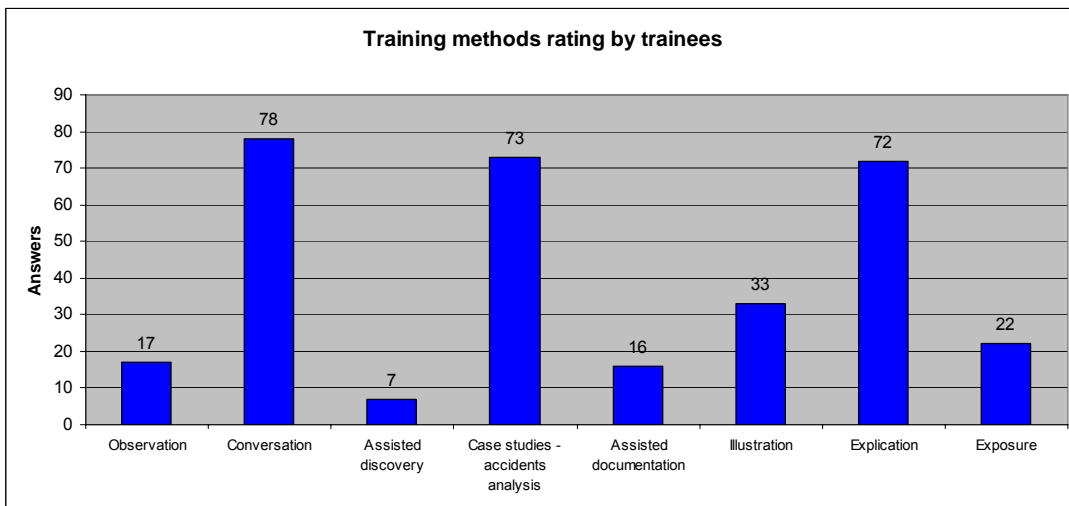


Figure 9

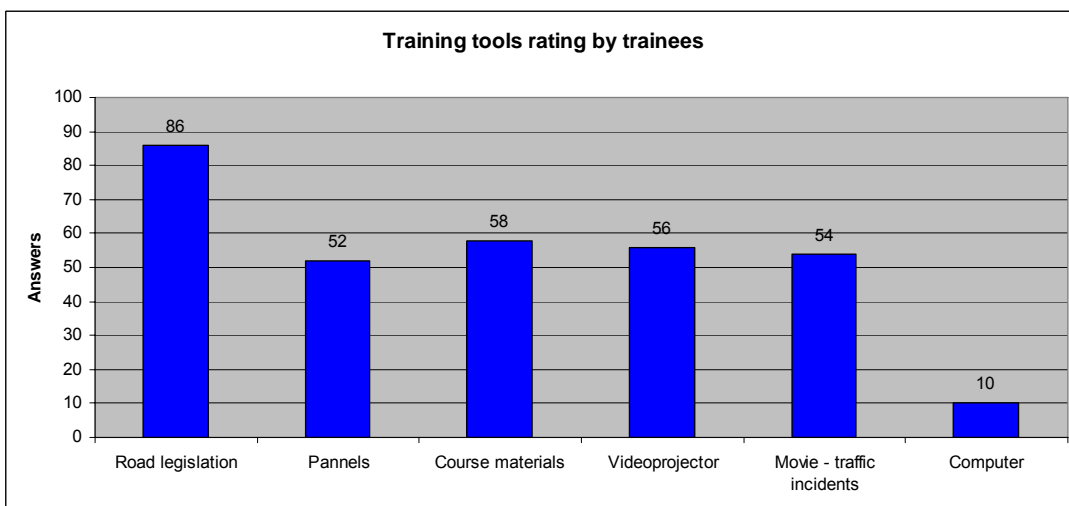


Figure 10

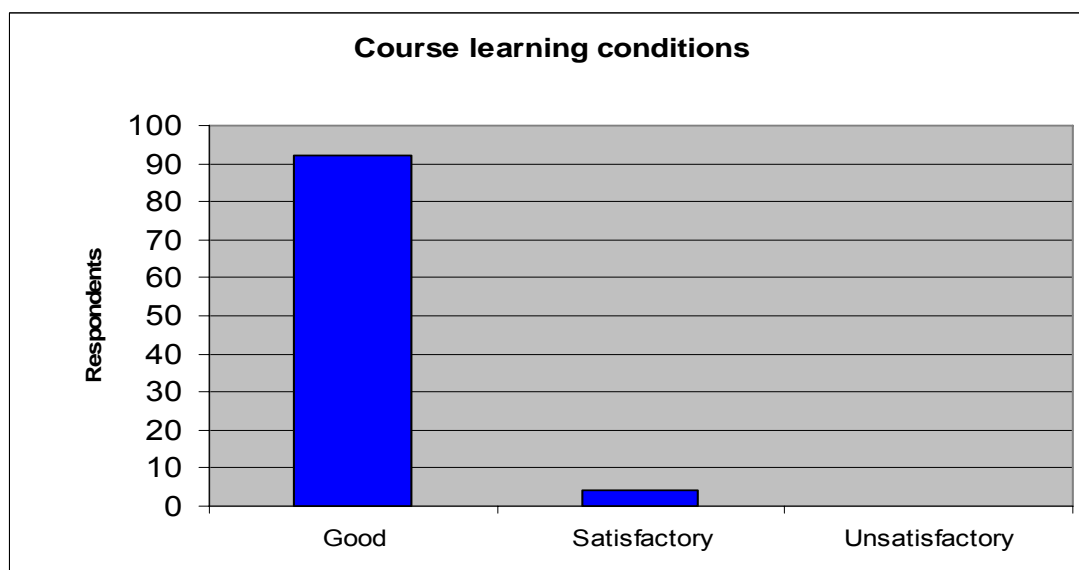


Figure 11

The final class evaluation form from RATB is annexed (annex 3).

4.4 Training added value

The innovative curriculum achieved in WP3 took into account the drivers skills and knowledge and it was based on the occupational standards (papers defining the necessary competences for the efficient achievement of the professional activity).

The occupational standards were adopted taking into account the need of assuring the best working mechanism of cooperation between the suppliers of training and the real demands of the working places.

Competence is the capacity of putting into practice, combining and transforming the knowledge and skills you have into various working situations; making possible the accomplishments of the activities required by the job at a level of quality specified in the occupational standard.²

Job requirements:

- to apply the technical specific knowledge;
- to analyze and take decisions;
- to use creativity;
- to work with others as a member of a team;
- to communicate efficiently;
- to adapt to the working environment;
- to face the unknown.

The new elements brought by the occupational standards are:

- the continuous development of the professional training initiation adapted to the work requirements;
- the qualitative improvement in the content of the professional training courses;
- the recognition of the professional skills no matter the way they were acquired;
- assuring the transferability of these competences from one professional domain to another.

Starting from what above mentioned, the ISSTE S&S training deployed in Trambus permitted to develop specific aspects related to safety driving training, including both technical subjects and training tools.

In particular, with reference to technical subjects:

- Practical guide
This Safety Driving training allowed participants to practice on an equipped driving circuit. In this way they could test or correct their driving behaviours in risky situations. Moreover, in the theoretical part, behavioural cautions were defined and focused, for example: correct hands position on the wheel, driving position, safe distance
- First Aid

² 'Guide for evaluating professional competences' – Romanian Logistics Association – Networking Supply Chain Professionals

This subject represented an innovation in the usual training sessions, because it was focused on deepening content. This module was not aimed to provide paramedical notions to train first aid officers (figure for which in Italy there is a special training of 16 hours); it was, instead, aimed to provide clear indications on how to behave in presence of injured and how to facilitate the aid.

- Vehicle characteristics

The module on maintenance was aimed to show vehicles' characteristics and maintenance, to enhance an overall knowledge of safe driving behaviours.

As far as training tools are concerned:

- Workshop

A comparison with Institutions, with a deep impact on the subjects treated, provided important information to be insert in Trambus standard safe driving training.

- Questionnaires

Their processing allowed to be acquainted on the most interesting subjects for the attendees, as described at paragraph 4.3.

The training added value within RATB's experimentation emerges from several points of view. In particular, instead of two questionnaires used currently in the RATB professional training process, in this phase four questionnaires were used.

The evaluation fiche of the instruction process, used currently in RATB for each group of trainees, was completed with new specific questions for the approached domain.

Specific materials were printed (posters, brochures, booklets) for some of modules, which were handed over to trainees, in order to learn also after training hours.

The number of hours of the training process was reassigned and the topics were redistributed taking into account the content of the new modules in the innovative curricula. The contents of the modules, that are leading to achieve the specific abilities so one or more specific abilities to match to each content, were established.

During the implementation of the training innovative curricula at RATB, the trolleybus drivers' skills enhanced on the following:

- The updated notions on the traffic rules (National Road Legislation), the traffic regulations and all the other traffic rules;
- Updated technical notions about the trolleybuses;
- Preventive driving;
- Latest Romanian legislation on S&S;
- First aid and extended medical notions.

Regarding the 1st and 2nd Questionnaire, some questions were discussed again in order to be better understood. These questions revealed a weakness in the training process and on the following training; these issues will be underlined, explained more clearly, assimilated in order to strengthen the S&S training of RATB.

5. NEW QUALITY CERTIFICATION METHODS – THE ACCREDITATION

5.1 Introduction

During the several ISSTE project phases it was emphasized many times how beneficial the procedures and the curricula, as long as the integration of the S&S training with the normal activities of the public transport company can be in improving the general perception of the public transport system. It is notable that a good performance of a public transport system can be also measured in the “feeling of confidence” that a secure and safe transport is being offered to public. Therefore, a specific attention has to be taken to the effectiveness of the S&S training in a public transport company, finally contributing to the overall quality of the transport process.

The accreditation is the way of quality assurance which certifies compliance with standards for the operation of programs providing education and training. The accreditation is proposed and is granted on the basis of outcomes of external evaluations carried out by specialised institutions, in recognition of the quality of an educational institution or an organization providing education that has been provisionally authorized to operate and which meets the minimum requirements of standards and performance indicators for quality education.

The accreditation is therefore a complete process, including:

- Assessment of the material resources (infrastructure, equipment used for training and / or simulation, documentation etc.);
- Assessment of the human resources employed in training (trainees and trainers);
- Assessment of the methodologies, procedures and general process flow employed in training;
- Compliance with standards at different levels;
- Assessment of social aspects according to each country’s specific applications;
- Continuity of the evaluation during the lifetime of the transport and S&S training processes;
- A form of feedback for discovering and correcting laps and gaps of the S&S in public transports;
- A tool for measuring the public transport company performances etc.

Based on the above, the WP5 operative planning and implementation were performed coherently to the certification methodology. In this way, the WP4 “New Quality Certification Methods”, already started and currently suspended due to the training execution, will be able to carry out at best its mission. The aim of the WP4 is to offer optimised procedures for a complete accreditation process, i.e. for an institution that performs the training, the training process itself, the staff involved in training and the infrastructure (educational materials, laboratories etc.) employed for this purpose.

P4 UPB-CEPETET (WP4 leader) has studied and cooperated with the ISSTE partners to evaluate the best practice in public transport vehicles training. Based on the KPI defined in WP2, the curricula developed in WP3, the implementation in WP5 and the results of a questionnaire sent amongst the ISSTE project partners, P4 is developing a set of procedures for accreditation in the field of safety and security training for public transport companies. In our opinion, the accreditation process is a complex and integrated one, involving the participation of several internal and external actors. The generation of trust, necessary in an accreditation process, is best illustrated in the figure below:

In addition, it is considered the term “Accreditation” is more complete and will be used instead of “Certification” in the works at the ISSTE project.

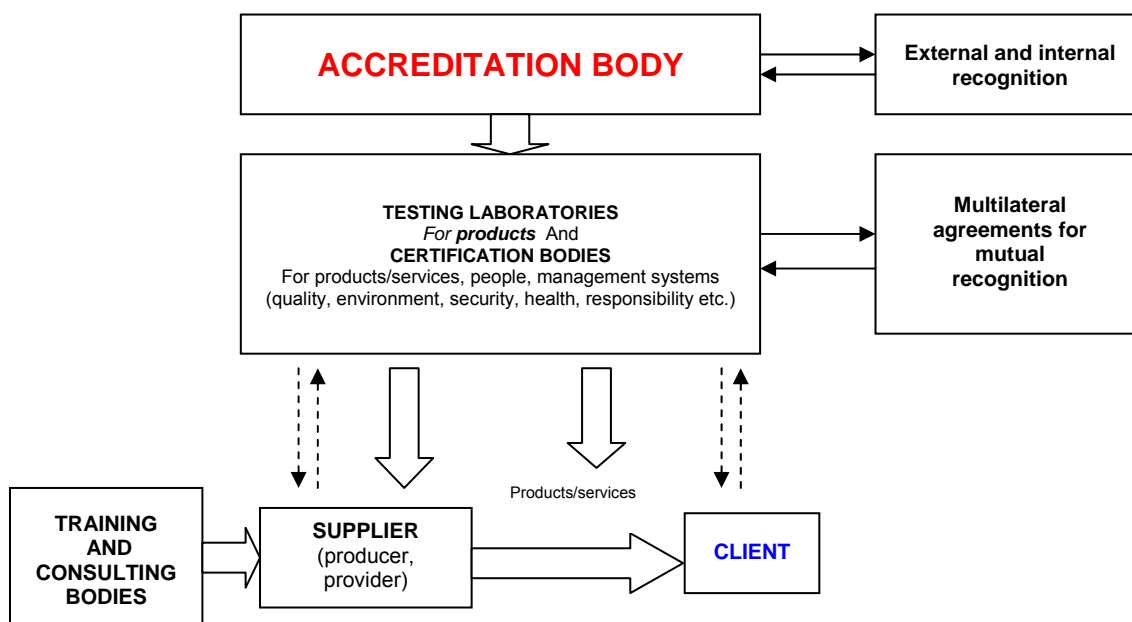
5.2 Flow of activities regarding new accreditation methodologies

The result of the quality accreditation is that the nominated training entity has the qualities that allow for being trusted on the market and the results of the training process offer the guaranty of good education and skills in terms of safety and security for public transport drivers. By employing a well defined strategy for quality assessment and accreditation, a specific public transport drivers training institution offers to its beneficiary, the travellers better services in terms of comfort, social behaviour, actions employed in specific situations etc.

Another goal of this WP would be to support the assessment process of a public transport company, by defining the procedures for KPI (developed in WP2) evaluation.

Therefore, the certification is, in fact, a procedure for obtaining accreditation. The accreditation is the result of an extensive assessment process, which has as goal to determine if the training process, the actors involved and the material basis are appropriate for this purpose.

GENERATION OF TRUST by certificates and accreditations:



The procedure for accreditation (complete certification) has to be in respect with several specific standards: international, national or local rules. While the process has also to follow a general, standardised pathway, specific rules may apply, according to local legislation. The WP4 also dedicated a part of the work to the study of these applicable standards.

In order to be able to quantify the results achieved in terms of increased qualitative standards delivered and to clearly outline to the market all of the project’s innovative tangible and intangible features, innovative accreditation methods have been studied, analysed, selected, and improved in WP4. These new quality accreditation methods may be used in providing the possibility to recognise the higher level of quality in terms of safety and security offered.

The actions performed to-day in WP4:

- Cooperation with other ISSTE partners in finalising and improving the quality of the WPs;
- Analyse of the KPIs defined in WP2;
- Analyse of the innovative curriculum developed in WP3 and cooperation with RATB (P2);
- Development and analysis of results for the specific questionnaire regarding the training certification procedures (distributed amongst the project’s partners);
- Analyse of the implementation of training procedures provided in WP5;
- Analysis of available international, EU, national standards and local legislations in terms of quality assessment and accreditation;
- Development of accreditation procedures for the S&S training centres in public transport companies (in progress).

In order to obtain a better accreditation methodology P4 is proposing a specific flow of actions for the next period. As stated before, it is considered that the training and the effective work are two inseparable items and therefore they have to go together.

In the previous WPs, two separate ways to deal with the S&S training have been emphasized:

- A S&S training module that is to be delivered separately from the other training process in the public transport company;
- A S&S training that is to be delivered embedded with the standard internal training.

While both of these ways allow for a higher level of S&S implementation, each methodology could have advantages and disadvantages from the accreditation point of view:

Separately delivered S&S training module		Integrated S&S training module	
Advantages	Disadvantages	Advantages	Disadvantages
Can be conceived as a short-term training	Might need specific procedures for accreditation	Does not need specific procedures for accreditation	Cannot be conceived as a short-term training
Might require less training personnel	It offers less “feeling” of connection with the work	Offers more connection with the work and the regular training itself	Might require more training personnel
Can be conceived as a “supplementary” training to persons involved in traffic incidents – evaluation can be carried on anytime	Might disturb the overall work process flow, shifting of personnel etc.	Intensive training can be obtained by increasing the number of S&S training hours during the period of training	The evaluation of the trainees has to take in account longer periods of time

As it can be seen from the above table, both procedures can be used in S&S training. A big public transport company would know how to manage its resources in order to obtain best results. A compromise can also be employed, by integrating the two procedures for training: delivering a basic S&S training for the continuous improving of performances and delivering a S&S training for corrective actions or reducing the impact in traffic incidents or other kind of incidents involving safety of security of PTV, passengers etc. We propose an analysis of the impact of these approaches in the next steps of the project.

Because the training process has to be a continuous one during the activity of the personnel in a public transport company, it has to be performed and evaluated on a regular, periodic basis. Therefore, we suggest that the accreditation process should be also a periodic one, allowing the public transport company to maintain and have control of high quality training and services. The accreditation and quality control has to be performed in two ways:

- Internally, using a dedicated department;
- Externally, employing a dedicated accreditation institution.

The accreditation should be performed in time, taking into account at least two steps, before the cyclic process begins:

- A “Before study” regarding quality of service in terms in S&S, performed on a public transport company that employs the former methodology for training; in order for this study to be effective, results in terms of S&S events should be taken into consideration, e.g., if specific KPI does not apply in the initial phase, then develop new indicators, such as the no of accidents (or incidents) with PTV involved; causes of the incidents; an indicator could be the number of incidents per year, for 100 PTVs having as main cause the low adherence to S&S regulations, coming from the PTV drivers; the frequency of the training courses; the regularity etc.
- An “After study” regarding quality of service in terms of S&S; this study has to be performed after the application of the newly developed training methodologies in WP3.

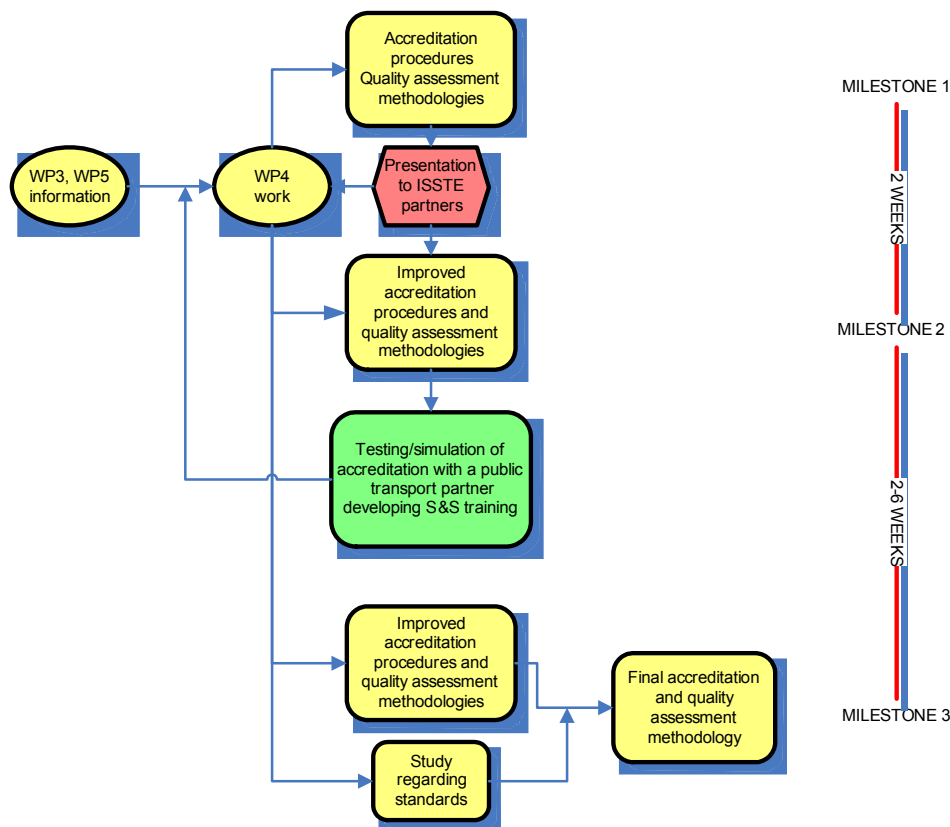
The accreditation process is a complex one and it has to follow the specific flow. The accreditation (certification) methodology presently developed in WP4 is taking into account:

- The development of a specific methodology for the S&S training centres accreditation and quality assessment (based on international standards and specific procedures used in higher level education):
 - Objectives of accreditation (overall and specific);
 - Internal audit;
 - Eligibility requirements;
 - Accreditation procedures;
 - Certificates issuance (training certificate, certificate of proficiency etc.);
- The quality assessment:
 - Concepts of Quality Assessment and Quality Culture in Education and Training;
 - Means for Quality Assessment in Surface Public Transport Safety and Security;
- Support in developing a methodology for KPI assessment and certification of a public transport company in terms of S&S training

The flow of WP4 next activities should include:

- Development of a draft accreditation and quality assessment methodology for S&S training; definition of terms of reference: standards employed, methodologies, procedures etc.
- Presentation of the methodology to ISSTE project partners and corrections to it, according to observations of the partners;
- Proposal for the testing of the methodology: this should include the involvement of RATB and/or Trambus;
- Simulation of the accreditation methodology: applied on the dedicated training department of the selected partner;
- Performing the “Before Study” based on the previous experience of RATB and Trambus;
- Performing the accreditation procedure on a selected period;
- Performing the “After Study”: evaluation of results in terms of quality of the training process for a selected period;
- Feedback and corrections to procedures.

The above flow of activities is considered to be a good way of obtaining best results in terms of quality assessment and usage of good practices. The following picture is presenting this flow.



5.3 Conclusions regarding the accreditation procedures

- In WP4, direct evaluative actions did not take place yet, but an evaluation of the training process for drivers in the public transport has been performed by the means of a dedicated questionnaire distributed amongst the project’s partners;
- Standards applicable in terms of quality assessment and training may differ slightly, so corrective actions are necessary; adaptability should be one of the attributes for the certification/accreditation methodology developed in WP4;
- The project’s strategy for accreditation and quality assessment is being developed based on the past work performed in WP2, WP3 and WP5. Segments of this strategy are already functioning in big transport companies, as part of the quality process flow. The complete implementation strategy and procedures are to be discussed and finalised in the next meetings and in continuous cooperation with all project’ partners;
- The accreditation/certification methodologies are developed in accordance with the newest standards and with best practice in high education (universities and academies);
- The term “accreditation” is proposed to be used instead of “certification”, as it is considered to be more appropriate for the purpose of the actions developed in WP4, and it also means performing all activities, including issuance of a certificate of accreditation. In our opinion, the term “accreditation” includes the procedures of “certification”.

6. CONCLUSIONS

Safety and security in public surface transport have a central role in the European passenger mobility systems, for both the European economy and citizens' quality of life.

The ISSTE project is open to an extremely broad spectrum of participants, from transport companies, to university and vocational training organisations and it provides a framework for trans-national co-operation among public transport companies to improve safety and security performances, fostering innovation and promoting at a European dimension new curriculum for drivers.

The developed work program and the proposed methodology was based on the initial framework analysis (WP2), made in order to identify the methodology and the categories of innovative keys performance index related to safety and security in public surface transport. One of the main result of this framework analysis was to identify the *Human Behaviour* at the core of the safety and security improvement in surface transport.

As a result, in the WP3 an integrated research addressing innovative curricula and vocational skills' developing for the human resources involved in the surface public transportation sector was developed. The most important knowledge and abilities were identified, together with and innovative learning process for drivers. The relevance of developing a flexible training system, able to match with companies' processes was clearly identified and processed.

In WP5 the Innovative Curricula were tested and evaluated. The two ways of implementing the training developed in WP3 lead to more than a few conclusions, linked one with another.

Trambus' test showed that the main result was obtained by practical driving section/modules. A special driving circuit was equipped for practical tests on critical driving situations or sudden danger. This driving circuit allowed to evaluate the responsiveness of the attendees. The outcome was extremely positive, because it was proved that experienced drivers need to practice facing sudden or risky situations as well.

Theoretical section allowed participants to compare their skills and knowledge between them and to fill eventual gaps, specially on new driving solutions like: wheel with central stirrup, ABS, etc..

Moreover, the specific modularity of the training allowed to fit it for any formative need.

Trambus took also the chance to test a specific interesting training module, "First Aid". In fact, in the company this task is carried out by personnel duly trained as envisaged by Italian current regulation (16 hours of theory/practice). ISSTE Project provided the occasion to extend First Aid training to the drivers as well.

Trambus, considering the interest obtained, will include these training modules in its internal training catalogue.

Implementation in RATB, showed that the evaluation of the results of the innovative curriculum testing, together with the appreciation, generally positive, of the trainees, regarding the content of the module as well as regarding the methods and means of training, offers us the image of a training program which can bring important benefits to the periodical training of the surface public transport drivers.

Moreover, the RATB training implementation highlight that there are elements that can have an afterwards improvement, so the training process of the vehicle drivers lead to the best performances regarding surface public transport safety and security.

After testing the curriculum at RATB, some elements were highlighted for the improvement of the training quality regarding the surface public transport safety and security:

- A closer partnership between the Training Department and the Exploitation Units (Electric Unit and Auto Unit) regarding the design of the testing questionnaires so, additionally to the standard elements, new safety and security aspects can be updated in do time;
- Setting up the trainees groups according to specific criteria's, such as: traffic incident involvement, guilty /not guilty in traffic incidents in which they were involved, etc., and in this way, the efficiency of the training is maximised;
- The training must include, in a higher degree, the use of simulations and case studies, together with video projections;
- The vehicle drivers involved in special traffic events, positive and/or negative, regarding the safety and security will be invited to the training sessions. After the vehicle driver will describe the traffic event to the trainees, the trainer can moderate a free debate between him/her and the trainees;
- Setting up a monitoring system of vehicle driver's behaviour, as well as an evaluation system of their professional performances. Additionally, the encouragement of the vehicle drivers with good results can lead to the improvement of their behaviour and performances, and consequently to the enhancement of safety and security in public transport.

In conclusion, we can affirm that the WP5 confirmed the appropriateness of the previous project outputs. Methodologies and processes developed were coherent with the project mission and produced a positive result in terms of improvement of drivers S&S competences.

What is more important, the innovative curriculum is flexible and adaptable to companies' internal training procedures. We consider it as the most important result, in that it ensures the real sustainability of the training proposal and, consequently, the operative chance to replicate it.

As expected, the test showed some areas of improvement. The report clearly mentions these output in that we consider it as the key aspect to help the training customization for PT players. In fact, analyzing the results of the curriculum implementation, other public transport companies can find a new way of tackling and improving safety and security in surface public transport.

The innovations delivered may be imitated, transferred, adopted and implemented by other public transport players (including companies, local and national authorities, legislators, driving schools, etc) according to specific needs.

We can conclude that, the professional training process is very important in order to obtain a service that is viewed in terms of safety, reliability, influencing the inter-modal choice of urban travellers and increasing the relative share of public transport services utilization.

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8. ANNEXES

- 1) RATB Questionnaire 1
- 2) RATB Questionnaire 2
- 3) RATB's training evaluation file
- 4) RATB Printed materials (posters, preventive driving brochure and booklet of updated driving legislation)
- 5) Trambus leaflet
- 6) Trambus Feedback Questionnaire
- 7) WP5 GANTT

Glossary

Driver: personnel trained for passengers' transportation

Module: training part or section

DVR : acronym for "Documento di Valutazione dei Rischi (Risk Assessment Document)", i.e internal document that points out every task, in the company, on S&S in the workplace as envisaged by Italian regulation (D.Lgs 81/08 and following D.Lgs 106/09).

WP: Working Package

PT: Public Transport

PST: Public Surface Transport

S&S: safety and security

MP3: Moving Picture, vers. 3

KPI: Key Performance indicators

D.Lgs: Legislative decree

End of the Document