

Pilot documentation

Safety and comfort assurance

Instructor-led driving simulator training for professional bus drivers

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1. The pilot course on Passenger safety and comfort assurance training for professional bus drivers

1.1 Specification of the courses target group and their needs

Professional bus, trolleybus and coach drivers who:

- drive different kinds of buses and trolleybuses, providing urban and suburban transportation services,
- drive coaches, in which seats are not equipped with seat belts,
- drive coaches on distance connections that are covered in at least ¼ of their route with roads of lower classes,
- provide transportation services specifically for children and youngsters (school buses, coach trips etc.),
- provide transportation services for people with disabilities,
- have a documented tendency of violating traffic rules,
- have a long absence from working as drivers of high passenger capacity vehicles or are newly hired workers without any or much experience in driving them,
- have a long absence from or have never taken a driving simulator training,
- remain skeptic towards the necessity of voluntary training (as well as driving simulator training as a whole), but are keen on extending their knowledge and improving their skills in scope of driving the aforementioned vehicles.

Target groups' needs addressed with the pilot:

Subject-related:

- Providing theoretical background on legal regulations regarding driver's responsibility for the passenger carried in scope of a transportation service,
- Providing a thorough review on influence of aggressive-style driving on passengers onboard,
- Sharing the examples of effects of the aggressive driving style on the passengers (complaints filed to the carrier/local transport authority, passenger injuries),
- Raising awareness on punctuality vs. passenger safety and comfort issue, providing the possible solutions for compromising the opposite interests.

Learning-related:

- An enhancement-focused approach which mainly underlines the improvement of skills rather than points out the incorrect performance taken so far,
- Customizing the training exercises to level of skills and work reality of a trainee,
- Close relation between the designed exercises and driving praxis,
- Providing continuous instructor feedback and provision of partial and overall evaluation of the training.

1.2 Description of the selected instructional design approach and its rationales

The course is planned to be designed on a basis of **Gagnes Nine Events of Instruction** (see Niegemann et al, 2008, Gagne, Golas & Keller, 2004). This approach accurately refers to the general process of a course in which a driving simulator together with real-time instructor guidance and feedback are used. It enables the typical activities which are conducted in scope of simulator training, such as e.g. self-assessment of a trainee and providing repetition of exercises in order to improve a specific skill.

Each step of **Gagnes Nine Events** does not have to be considered as compulsory, but a form of broad considerations to be taken into account when designing the instruction. The steps are described as following:

1. Gain attention
2. Describe the objective
3. Stimulate recall of prior knowledge
4. Present the material
5. Provide learner guidance
6. Elicit performance (practice)
7. Provide feedback
8. Assess performance
9. Enhance retention & transfer

The course itself is suggested to be conducted according to the following schedule:

1. Presentation of the course introduction material
2. Adaptation drive on the driving simulator
3. First part of the driving simulator training - taking relevant exercises in order to provide the initial assessment of trainee's skills
4. Discussion on performance of a trainee, presentation of the relevant course material
5. Second part of the driving simulator training – providing the exercises in order to assess the progress in overall performance
6. Presentation of the final results to the trainee, extended review regarding his/her improvement
7. Provision of follow up material to foster learning, taking into account the overall results

In order to implement the **Nine Events of Instruction** the aforementioned steps are suggested to be conducted in the following manner:

1. Gain attention and 2. Describe the objective

The implementation of these two events is planned by delivering a visually attractive material (most likely a .pdf document providing the introduction in the 'infotainment' form) which will help the trainee in being introduced into the thematics of a course. The material can be sent via e-mail to the

trainee before the training itself or presented at its very beginning. Despite this, the trainer is obliged to discuss the principles of the course again during the physical meeting, The adaptation drive itself does not intend to realise any of these two events, yet it is highly possible that the very event of driving a driving simulator will help in gaining attention of a trainee and focusing onto following tasks.

3. Stimulate recall of prior knowledge

This event will be implemented both by the adaptation drive and initial simulator training.

Even though the adaption drive which main aim is to adjust the driver to the simulation environment, does not represent any pedagogical value, it stimulates the recall of particular driving abilities. Additionally, the adaption scenario can be itself designed in a way that can recollect the desirable skills of a trainee.

During the first training unit specific skill-focused tasks will be addressed by the trainer to a trainee, in order to gather the indicators for the initial skill assessment. It is also permissible to implement a scenario with subsequent tasks, in which the trainee will be guided by a voice of a pre-recorded attendant. Still, the real-time feedback provided by the trainer will be compulsory. This stage's aim will be a direct recall of prior abilities and acquisition of data which values will directly affect the following steps of the course.

4. Present the material and 5. Provide learner guidance

After the first training unit, the driver will be guided by trainer through his performance and told about positive and negative aspects of his/her drive. Depending on the results obtained in each of the tasks, the emphasis in the discussion will be placed on the ones performed poorly. Also, the content of learning material provided to a trainee will depend on this as well as the following steps of the course. Customized material will be delivered in a form of structured printed handbook or via e-mail. A certain amount of days (approx. 1-3 days) between the training units is necessary because of the need for resting between subsequent simulator training sessions and giving the trainee enough time to study the learning material.

5. Provide learner guidance, 6. Elicit performance and 7. Provide feedback

Second training unit will be implemented in the timeframe of few days after the previous one, according to availability and readiness of a trainee. It is yet not recommended to prolong the gap as it may become necessary for the learner to get adapted to the simulation environment once again. The driving tasks themselves will be similar or the same to the ones previously taken and addressed to elicit the performance delivered in the learning material This way it will become possible to get most efficient results regarding each of the assessed skills. The same as in the first training unit, a constant learner guidance will be provided by throughout each task. Also, the trainer will deliver detailed feedback and, if necessary, will repeat the scenarios with most complex and difficult tasks. This stage's aim will be to gather the final performance indicators in order to compare them to the initially acquired ones.

7. Provide feedback and 8. Assess performance and 9. Enhance retention and transfer

After the second training unit, the trainer will lead a summary discussion regarding trainee's final training results. Each of the performed tasks will be thoroughly discussed both in terms of obtained progress and the driving behaviours that still needs improvement. Depending on trainee's performance it will be possible to provide additional training session that will focus on his/her mostly undeveloped skills in a few following days or even the same day, depending on his/her comfort. The overall progress made in scope of each skills will be delivered to a trainee in a short summary together with the certificate confirming the completion of a course. Additionally, in order to foster the transfer of learning the trainee will be provided with the learning material regarding the weakly performed elements of the training. He/she may also be called to take an additional, more detailed simulator training.

1.3 (EQF) Learning outcomes associated with the course

Knowledge	Skills	Competences
<p>The professional bus driver knows:</p> <ul style="list-style-type: none"> - The basic road traffic regulations and applicable road signs in Europe - Fundamental physical essential principles in bus driving <ul style="list-style-type: none"> o Acceleration force, o Brake force, o Centrifugal force etc. - The basic principles of drivability of buses under different weather/road/lighting conditions (e.g. wet, slippery, mountainous etc.) - The general expectations borne by passengers for both a safe and comfortable bus journey. <p>SPECIFIC TARGET GROUPS</p> <p>a) For professionals involved in driving children and youngsters: understanding of relevant aspects of child</p>	<p>The professional bus driver can:</p> <ul style="list-style-type: none"> - Drive a bus in accordance with road traffic regulations and relevant road signs applicable in Europe - Demonstrate awareness of various driving situations: <ul style="list-style-type: none"> o Drive a bus under various weather conditions o Drive a bus under various road/terrain qualities - Adopt mastered acceleration, braking and turning techniques known to provide safety and comfort to passengers - Demonstrate adaptability to various types of passengers of driving patterns applied - Anticipate road, weather and traffic risks in order to safely implement 	<p>The professional bus driver is able to effectively drive a bus, whilst respecting road traffic rules, regulations and signs, autonomously and self-dependently, in order to meet expected safety and comfort expectations. He/she autonomously adopts a driving behaviour best fitted to provide a maximum level of safety and comfort to passengers notably through smooth maneuvering and movement of the vehicle. He/she efficiently adapts autonomously his/her driving behaviour according to evolving weather/traffic/terrain conditions, and in accordance with the safety and comfort-related driving requirements stemmed from the autonomously made assessment of the specific</p>

<p>psychology</p> <p>b) For professionals involved in driving disabled persons : a general understanding of most commonly observed impediments, <i>e.g.</i> how these can affect motor passengers' functions or ability to communicate.</p>	<p>appropriate safe and smooth driving behavior and patterns</p> <ul style="list-style-type: none"> - Read and use safety assistance devices (<i>e.g.</i> GPS, sensors etc.) <p>SPECIFIC TARGET GROUPS</p> <p>a) For professionals involved in driving children and youngsters: open an effective communication channel with youngsters (enabling clear instructions to be followed such as to remain seated, to remain quiet in order to be able to hear outside safety-affecting relevant traffic or meteorological noises/sounds etc.)</p> <p>b) For professionals involved in driving disabled persons : assess the communicational abilities of the disabled passengers and assess the levels to which motor functions are affected</p>	<p>situations of passengers on board.</p>
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1.4 Description of the pilot training material and overall course outline

AFT has completed its two-session simulator-based pilot training in its Monchy Saint-Eloi (France) training facility in the Summer of 2014. The first day of training took place on 5 August 2014 and was followed a week later, on 12 August 2014, by the second and final training session. The course was designed in close cooperation with the Motor Transport Institute (ITS) from Poland and was designed to focus on *Passenger Safety and Comfort Assurance Training for Professional bus Drivers*.

As AFT had no available bus simulator at the time, a truck simulator was used, though it was running under bus simulator software. This prevented participants from sitting in the back and gaining physical sense of the comfort assurance provided by the trainees' driving, but they could watch the simulation on a screen in an adjacent room while still having some sense of the driver's performance on the simulator.

In total, seven participants voluntarily engaged in the pilot course, among which :

- 1 female trainee undergoing initial bus driving qualification
- 1 professional truck driver

- 2 urban bus drivers
- And 3 long-distance coach drivers.

The pilot was supervised by a team of three AFT staff members, including two members of the Transport & Logistics research department and one in-house trainer specialized in SBT.

The pilot training was conducted under the assumption that all trainees had already received some background training elements on professional driving and on safety-related issues, whether under the framework of their initial qualification training, or under that of their periodic compulsory training. To refresh their knowledge on professional driving, participants were handed, prior to the initial simulator drive, short and written pedagogical material covering a variety of thematics they were expected to have in mind in order to reach the objectives set by the pilot training. These topics covered (see annexes) :

- The issue of systematic checks to be performed by drivers before actually maneuvering the bus
- Elements of the relevant road transport legislation
- The anticipation of potential hazards
- The anticipation of other roadside users' behavior
- A special emphasis on student discipline (using the Positive Discipline method).

According the methodological objectives set out, the implementation of the training met the following schedule :

Day 1

- 1. Adaptation to the simulation environment : 10 min. ride covering a straight urban road with a small amount of turns
- 2. Observation of other trainees carrying out their adaptation drive
- 3. Training exercise n° 1 : 20 min. ride covering the following key aspects to passengers' safety and comfort :
 - A. Stopping at bus stops (at least 3 stops)
 - B. Reacting to pedestrians crossing the street in unauthorized locations
 - C. Reacting to a passenger car enforcing the right of way at an intersection
 - D. Efficiency in driving on the roundabouts (at least 2 roundabouts)
 - E. Driving behaviour at different levels of traffic intensity (acceleration pace, braking, overall speed, etc.)
- 4. Feedback given by the instructor with a focus on passenger comfort and safety issues

Day 2

- 5. Exercise n° 2: a 20 min. ride covering the same aspects and route as in Exercise n° 1, but with different locations set for start point, finish point as well as for the places where different potentially dangerous events would be inserted into the simulation.
- 6. Final instructor feedback and training evaluation based on questionnaires handed out to the instructor as well as to the trainees

The instructor's feedback will be notably based on objective parameters such as speed measurement, acceleration, pushing gas, brake and clutch pedals etc. Other more subjective evaluations of the driving would result from the impression voiced by other participants watching each driving simulation from a screen located in an adjacent room.

A few days after completion of the training, participants were provided with electronically integrated documents substantially covering, among other topics, bus maneuvering and defensive driving.

2. Testing of the pilot

2.1 Implementation of evaluation and testing measures

A series of evaluation questionnaires have been handed out to two experienced professional truck/bus driving trainers and to one experienced professional driver prior to the implementation of the pilot. In addition, after completion of the pilot course, the in-house inspector who conducted the training and the trainees were handed two distinct questionnaires for feedback. Hence, evaluating the pilot course at two different moments allowed to put an emphasis on certain topics highlighted by the first evaluators and to gather both a theoretical view (before implementation) and a more factual and actual view (upon completion) of the pilot course itself.

2.2 Evaluation and testing results

Though evaluators generally provided positive feedback as regards the methodology we intended to implement (e.g. two-day training sessions, providing collective feedback to participants, group observations of other trainee's performance etc.), the first series of evaluations carried out before the end of the implementation of the pilot course pointed to the usefulness of putting an emphasis on certain elements in order to ensure a more profitable learning experience.

For instance, these evaluations raised consciousness of the necessity insisting on the need for professional drivers to find a balance between sticking to the schedule when conducting urban rounds and guaranteeing the safety and comfort of the passengers on board. We were also strongly urged to systematically put in place exercises leading to multiple bus stops in order for drivers to gain confidence in mastering this approach. Exercises leading to learners being forced to develop anticipation skills were also recommended.

An indication that these initial evaluation points were effectively taken into consideration lies in the fact the evaluations provided by the instructor as well as those provided by the participants after completion of the course no longer raised the usefulness on stressing these points any further.

However, final evaluation did point to the need for an extra day of training in order to more reliably assess the extent of the learning provided to each participant. Though evaluators did acknowledge, personal satisfaction expressed through highly appreciated questionnaires can be a good indicator of

the success of the piloting, and that the reduction of mistakes made during the simulation drives can indeed illustrate the newly acquired skills, most of them tended to believe a third simulator drive could ensure a confirmation of such an assessment.

Overall, the most appreciated element of this pilot was its innovative topic as none of the participants, nor the trainer had ever been involved in a simulator-based training session combining in one single training module both safety and comfort assurance which are – not surprisingly- two of the most fundamental expectations urban transportation users/passengers tend to voice.

3. Reflections on the courses instructional design

3.1 Professional drivers needs and characteristics

Consideration of the target groups needs with regard to the instructional design:

Subject related considerations

Both simulator training scenarios and self-study material still need to be developed. Preliminary considerations show a clear need for customization the course to the skills shown by the learners. That it why the overall content of self-study material will be divided into parts addressing detailed theory-based advice on each of the skills that will be defined as deficit of the target groups.

Using driving simulator which has proven to be an efficient learning tool will significantly help in fostering the skills into real-life conditions as well as basing on the instructional design approach to prepare the training framework. Additionally, simulation environment pushes the learner towards self-recall of prior abilities what will help in further structuring them. This will be the main role in scope of the whole training and is a principle of each and every course that includes simulator training. Also, the real-time trainer guidance and possibility of immediate feedback during the tasks will help in providing the solutions for comprising the opposite interests of drivers and passengers as well as raising awareness on their safety and comfort.

Learning related considerations

The approach to focus mainly on the driving skills which will be significantly improved by the learner does not equal the simultaneous omission of the work on poorly performed tasks. It is yet considered that fostering the motivation is most likely to happen when the accent during the course is put mainly on the positive performance of the trainee. Nevertheless, an efficient praxis of smoothly including the 'poorly performed tasks'-oriented training activities to the further steps of training has to be worked out.

During the further steps of course design a strong emphasis will be put on customization of training. Design of elementary simulation scenarios seems inevitable not only in terms of customizing to the learner's needs but also to smoothly allow the newly learned skills to be applied in praxis. Additionally, the individual approach for each trainee is thought to create an additional positive

factor that will help in motivating him/her and attracting the attention to the thematics. Driving simulator create even higher learner motivation with the continuous trainer guidance and feedback.

3.2 Aspired learning outcomes

Consideration of the aspired learning outcomes with regard to the instructional design:

The target groups specified In scope of the course are likely to have a rather varied set of prior abilities on the topic. Prepared study-material will have to be organized in such a way to provide certain information for both experienced drivers and novice learners. This is why the content will have to be divided into ‘portions’ that will include very detailed advice regarding certain driving behaviour. The information presented as a self-study material will be customized due to needs identified in scope of the course. That is why a strong emphasis will have to be put on the identification of driver’s needs, so the addressed learning outcomes would not be considered by the trainee as unnecessary. This creates a strong need for implementing the strategy that could bind the skill assessment with the self-study material presented. Such approach will effectively help in transferring the knowledge according to the characteristics of the target groups and individual performance.

3.3 Appropriateness and contribution of the chosen instructional design approach

The course was designed on the basis of Gagnes ‘Nine Events of Instruction which explicitly stimulates recall of prior knowledge. This reference to prior knowledge allows to focus on the specific objectives of providing enhanced comfort assurance and security for passengers by stimulating specific driver abilities, without having to spend too much time on the more basic and general abilities drivers would need to possess.

Moreover, the nine-step Gagnes approach is particularly suitable for a multi-session course that calls for a combination –throughout the overall duration of the course - of learner guidance, hands-on application, assessment of driving performance, and feedback from the trainer. This chosen approach has allowed all these elements to be carried out in a sequential and logical order though subtly enabling learners to constantly be in a process of processing experience and information received in a way that seamlessly leads to the development and strengthening of abilities and competencies.

3.4 Educational quality

Considerations with regard to educational quality within SBT application:

1. Detailed report provided on the target groups

A detailed specification and a thorough analysis on the learning groups is inevitable to address an application well-fitted to the needs of the receivers. This is important not only in terms of providing

the detailed information but also to gain the learners' attention and customize the training depending on the specific needs of an individual, yet still provide only the desired knowledge and skills.

2. Capability of transferring the need for improvement of a specific skill to a simulation scenario

Simulation environment has its obvious limitations. Therefore, it is compulsory to define the prior abilities in such a way that they can be smoothly transferred to virtual reality. In case they are not possible to be provided as a task in simulation scenario, it has to be considered if the improvement of the ability can be achieved by performing a different task. Additional limits are have to be considered regarding the driven vehicle types – it is not possible to take all the details differences into the consideration. Therefore, a thorough discussion will need to cover the topic of how to replace each of the aforementioned elements in order to address the course to the individual learner and fully customize its elements.

3. Adaptability of the learners to the driving simulator

Unfortunately, not all of the drivers can be trained on the driving simulators. It is estimated that around 5% of the population is unable to take a simulator training, following further 20% that severely feels the effects of significant symptoms of simulation sickness which results from labyrinth's disorders caused by the non-realistic driving environment and non-adequate change of body position to the change of displayed simulation image. Additionally, the sickness symptoms increase along with the length of the training and its complexity (e.g. number of turns performed, the slope of the road etc.). This is why an efficient SBT application has to offer a compromise between its educational value and the number of indicators causing simulation symptoms.

4. Conclusions

4.1 Improvements proposed for the pilot course

Evaluation results show that the preliminary written material distributed to learners could be enhanced to describe further aspects of security and comfort-related driving (e.g. defence driving) and could provide marginal blank areas on which to write down preliminary questions drawn by learners and that should addressed before the first trial SBT drive.

Moreover, a longer duration of the course that could include up to four driving sessions is likely to ensure a deeper acquisition of competences by learners as two driving sessions, though may be sufficient to show signs of progress in the development of skills ensuring enhanced security and comfort for passengers, they are not sufficient to verify whether or not these abilities have been sufficiently assimilated to become common practice in the long run for drivers.

This also leads to the assessment aspect of the acquired abilities during the course. An in depth analysis of how comfort can be assessed would prove useful. In the case of our pilot, considering the fact no other passengers could be on board, the assessment relied on the analyses of objective

indicators such as acceleration or braking patterns. A reflection on how comfort can be assessed would be highly welcome.

4.2 A SWOT analysis of the pilot course and computer-/simulator-supported training for professional drivers in general based on the pilot experience

	Helpful	Harmful
Internal	<p>Strengths</p> <ul style="list-style-type: none"> • Sessions can be repeated • Difficult and dangerous training situations can be trained and practiced • The driving situation can be 100% controlled and steered • Innovative & motivating training method • flexible approach • Zero risk • No fuel costs 	<p>Weaknesses</p> <ul style="list-style-type: none"> • Programming would be expensive • No specialized training for the trainers • Lack of recognized training covering these thematic
External	<p>Opportunities</p> <ul style="list-style-type: none"> • Positive response given by professionals • A market for specialized training in these thematic • This training makes it possible to increase the much awaited comfort improvement for urban passengers 	<p>Threats</p> <ul style="list-style-type: none"> • High cost of training • No official qualification addresses safety & comfort assurance altogether

4.3 Quality considerations on technology-supported training for professional drivers drawn from the pilot implementation

Our pilot course has highlighted the need for trainers to receive specific training on SBT. Though the trainer of this pilot is familiar with SBT which he runs on a regular basis, the lack of specific training on characteristics of learning with a simulator (as opposed to real-life driving) constitutes a shortcoming that can and should be avoided, especially considering the fact SBT is now common place in France when training professional drivers and also because the topic of security and comfort assurance for bus passengers is deemed to be better served through the use of a simulator, rather than through purely theoretical teaching. In this regard, a special focus could be made on the

organization and implementation of debriefing sessions addressing groups of learners, as this has been one of the most highly valued aspects of our pilot.

The learning outcomes approach adopted in our pilot has not been regarded as a novelty as this approach has been already applied in France for a long time, regardless of the use of technology or not in the design of the courses.

However the evaluation process put in place during this pilot has pointed to usefulness of seeking evaluation feedback from both learners and trainers soon after completion of the course. The novelty of the topics addressed in the course may have enticed participants (learners and the trainer) to express more freely the enhancements the pilot course could benefit from.

4.4 Contribution of the pilot to the relevant policy framework

Our pilot was organized in a scale too small to impulse consistent policy change in the use of SBT. However it has created the belief among the trainer, our evaluators and the learners that perhaps other “unusual” topics can be fitted to be taught through the use of technology-based training, whether SBT or CBT. Such a consciousness of the under-use of technology to train professional drivers in new fields, if widespread, could sparkle in the future new sets of training topics tailored for technology-based training solutions.

4.5 Further conclusions and recommendations

Though security is a notion that regularly pops up in training courses devoted to professional drivers, it has become clear from the feedback received from all evaluators that comfort assurance has been widely overlooked in the training offer for bus and coach drivers. This could warrant the development of a more consistent course on this subject, with enhanced written training material to be developed under the constant consciousness that the use of a simulator is highly adequate for such a training as it allows for energy-efficient group training under maximum levels of safety.

5. Comprehensive summary of the overall pilot for publication

If safety is a concern most professional drivers encounter during their training – continuous or initial-comfort assurance appears to be less widely tackled for an unexplained reason. ITS and AFT have chosen to put place these two notions at the center of this piloting endeavor entitled *Passenger safety and comfort assurance training for professional bus drivers* in order to test a n SBT course aimed at providing answers to a certain number of questions including :

- How can a SBT course be developed in order to address an uncommonly referred to topic in the usual professional bus/coach driver training offer ?
- What kind of training material should support the course knowing it mostly focuses on a hands-on learning process ?
- How can we make develop satisfactory assessment procedures of the abilities and competences acquired ?
- How should the interaction between trainer and learners be organized in order to make sure information and thus adjustments are flowing back and forth in a timely manner in order to allow swift and adaptable learning?

This course was designed using a learning outcomes approach compatible with the EQF (European Qualifications Framework).

Course structure

Based on the topics addressed and on the analysis of the projected target groups, the course was built on the *Gagnès' Nine Events of Instructions*, essentially because this



approach allowed for the regular flow of information and feedback all along its duration while also recalling prior knowledge and thus speeding up the process of mobilization of learners' pre-acquired abilities.

The course itself was conducted according to the following schedule:

1. Presentation of the course introduction material
2. Adaptation drive on the driving simulator
3. First part of the driving simulator training - taking relevant exercises in order to provide the initial assessment of trainee's skills
4. Discussion on performance of a trainee, presentation of the relevant course material
5. Second part of the driving simulator training – providing the exercises in order to assess the progress in overall performance
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7. Provision of follow up material to foster learning, taking into account the overall results

In order to implement the **Nine Events of Instruction** the aforementioned events have been conducted in the following manner:

1. Gain attention and 2. Describe the objective

The implementation of these two events is planned by delivering a visually attractive material (most likely a .pdf document providing the introduction in the 'infotainment' form) which will help the trainee in being introduced into the thematics of a course. The material can be sent



via e-mail to the trainee before the training itself or presented at its very beginning. Despite this, the trainer is obliged to discuss the principles of the course again during the physical meeting, The adaptation drive itself does not intend to realise any of these two events, yet it is highly possible that the very event of driving a driving simulator will help in gaining attention of a trainee and focusing onto following tasks.

3. Stimulate recall of prior knowledge

This event will be implemented both by the adaptation drive and initial simulator training.

Even though the adaption drive which main aim is to adjust the driver to the simulation environment, does not represent any pedagogical value, it stimulates the recall of particular driving abilities. Additionally, the adaption scenario can be itself designed in a way that can recollect the desirable skills of a trainee.

During the first training unit specific skill-focused tasks will be addressed by the trainer to a trainee, in order to gather the indicators for the initial skill assessment. It is also permissible to implement a scenario with subsequent tasks, in which the trainee will be guided by a voice of a pre-recorded attendant. Still, the real-time feedback provided by the trainer will be compulsory. This stage's aim will be a direct recall of prior abilities and acquisition of data which values will directly affect the following steps of the course.

4. Present the material and 5. Provide learner guidance

After the first training unit, the driver will be guided by trainer through his performance and told about positive and negative aspects of his/her drive. Depending on the results obtained in each of the tasks, the emphasis in the discussion will be placed on the ones performed poorly. Also, the content of learning material provided to a trainee will depend on this as well as the following steps of the course. Customized material will be delivered in a form of structured printed handbook or via e-mail. A certain amount of days (approx. 1-3 days) between the training units is necessary because of the need for resting between subsequent simulator training sessions and giving the trainee enough time to study the learning material.

5. Provide learner guidance, 6. Elicit performance and 7. Provide feedback

Second training unit will be implemented in the timeframe of few days after the previous one, according to availability and readiness of a trainee. It is yet not recommended to prolong the gap as it may become necessary for the learner to get adapted to the simulation environment once again. The driving tasks themselves will be similar or the same to the ones previously taken and addressed to elicit the performance delivered in the learning material. This way it will become possible to get most efficient results regarding each of the assessed skills. The same as in the first training unit, a constant learner guidance will be provided by throughout each task. Also, the trainer will deliver detailed feedback and, if necessary, will repeat the scenarios with most complex and difficult tasks. This stage's aim will be to gather the final performance indicators in order to compare them to the initially acquired ones.

7. Provide feedback and 8. Assess performance and 9. Enhance retention and transfer

After the second training unit, the trainer will lead a summary discussion regarding trainee's final training results. Each of the performed tasks will be thoroughly discussed both in terms of obtained progress and the driving behaviours that still needs improvement. Depending on trainee's performance it will be possible to provide additional training session that will focus on his/her mostly undeveloped skills in a few following days or even the same day, depending on his/her comfort. The overall progress made in scope of each skills will be delivered to a trainee in a short summary together with the certificate confirming the completion of a course. Additionally, in order to foster the transfer of learning the trainee will be provided with the learning material regarding the weakly performed elements of the training. He/she may also be called to take an additional, more detailed simulator training.

Findings & conclusions

Though evaluators generally provided positive feedback as regards the methodology we intended to implement (e.g. two-day training sessions, providing collective feedback to participants, group observations of other trainee's performance etc.), the first series of evaluations carried out before the end of the implementation of the pilot course pointed to the usefulness of putting an emphasis on certain elements in order to ensure a more profitable learning experience.

An indication that these initial evaluation points were effectively taken into consideration lies in the fact the evaluations provided by the instructor as well as those provided by the participants after completion of the course no longer raised the usefulness on stressing these points any further.

However, final evaluation did point to the need for an extra day or two of training (with extra simulator drives) in order to more reliably assess the extent of the learning provided to each participant. Overall, the question of assessment of comfort-assurance-related skills was raised and led to the consideration of the need for the definition of specific indicators in this regard.

The lack of specific training of trainers, focusing on group training and on collective debriefing sessions was also expressed. Trainers usually are trained on the technical features of a simulator, but no such training aims directly at the didactical aspects of SBT. Though the trainer of this pilot is familiar

with SBT which he runs on a regular basis, the lack of specific training on characteristics of learning with a simulator (as opposed to real-life driving) constitutes a shortcoming that can and should be avoided, especially considering the fact SBT is now common place in France when training professional drivers and also because the topic of security and comfort assurance for bus passengers is deemed to be better served through the use of a simulator, rather than through purely theoretical teaching. In this regard, a special focus could be made on the organization and implementation of debriefing sessions addressing groups of learners, as this has been one of the most highly valued aspects of our pilot.

Though security is a notion that regularly pops up in training courses devoted to professional drivers, it has become clear from the feedback received from all evaluators that comfort assurance has been widely overlooked in the training offer for bus and coach drivers. This could warrant the development of a more consistent course on this subject, with enhanced written training material to be developed under the constant consciousness that the use of a simulator is highly adequate for such training as it allows for energy-efficient group training under maximum levels of safety.

List of references:

- Gagné, R.M., Golas, K. & Keller, J.M. (2004). Principles of Instructional Design, Performance Improvement, Volume 4, Issue 2
- There is practically no material available regarding this specified driver training, however elements from the Oklahoma School Bus Driver Manual have been used to inspire the implementation of the piloted simulator-based driving training sessions.¹

Annexes:

- Course material
 - Annex 1 Pilot preparatory material
- Evaluation and testing
 - Annex 2 : External Evaluation Questionnaire
 - Annex 3 : Participants' Evaluation Questionnaire
 - Annex 4 Pilot Trainers Evaluation Questionnaire

For further information on the project please consult:

www.project-ictdrv.eu

For further information on the paper please contact:

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¹ S. GARETT, Oklahoma School Bus Driver Manual, revised in June 2009, available at : <http://ok.gov/sde/sites/ok.gov.sde/files/documents/files/Manual.pdf>

Annex 1



Preparatory material prior to pilot SBT **Security and comfort assurance** (instructor-led driving simulator training)

prepared by:

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-

WP 03 ▫ del: 04-07 ▫ last update: September 2013

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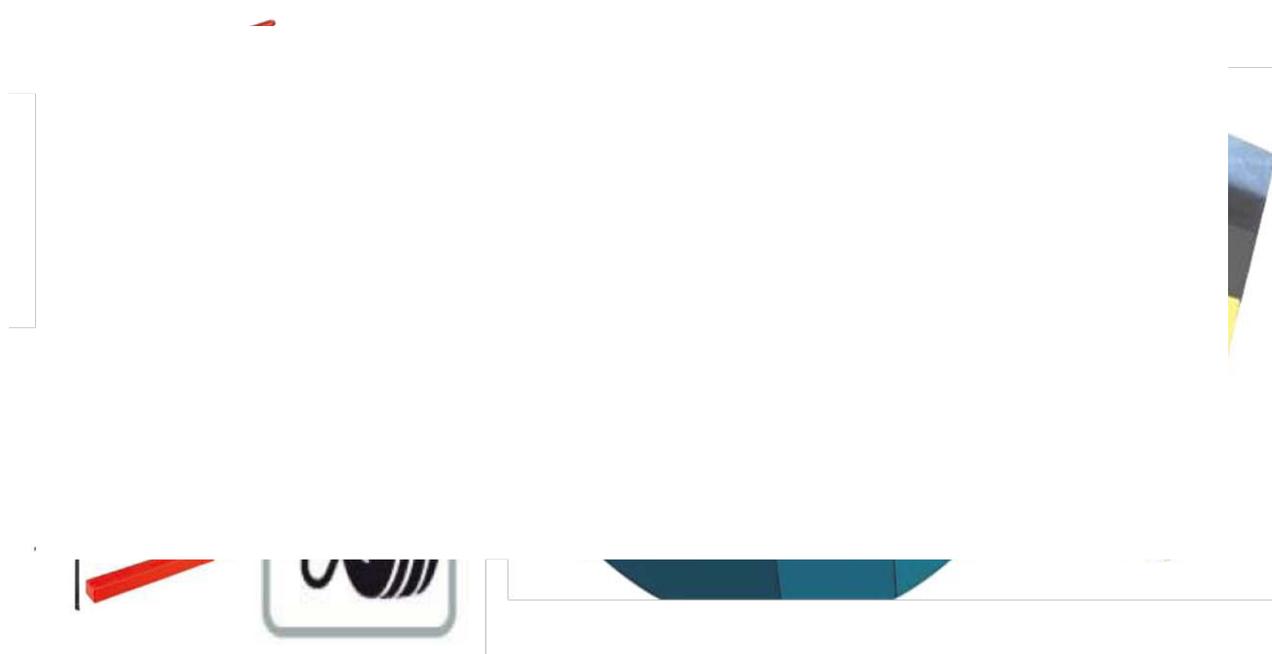
Dear learner,

You are about to undergo a simulator-based pilot training entitled “Passenger safety and comfort assurance for professional bus drivers”. In order for you to draw from this training its maximum potential, the pedagogical team would like to present you with the following basic notions you should- and most probably always do- have in mind whenever driving a bus in a professional capacity.

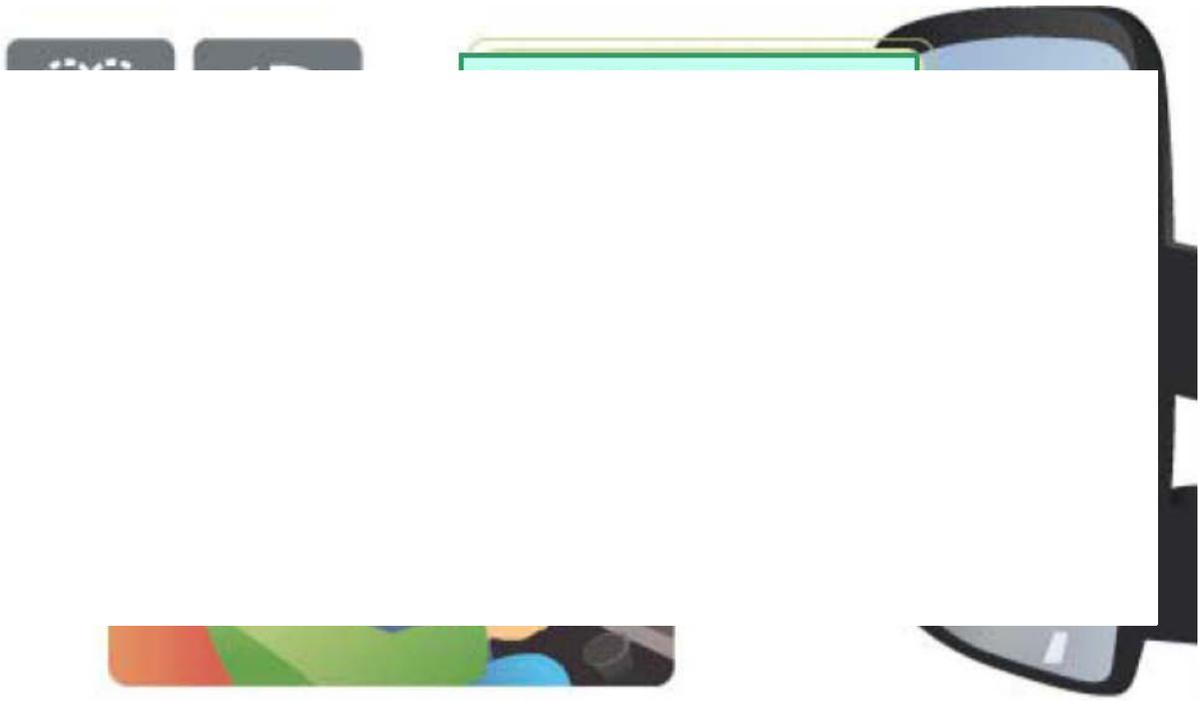
The following elements are not meant to provide you with comprehensive knowledge on the thematics dealt with, but rather - as you will be reading this documentation prior to the actual simulator training – to prompt you to get into the right frame of mind, to have you start the driving phase of your training having in mind a set of highlighted core questions and principles that may very well guide you throughout your training.

We wish you to get the most out of this training session. Fellow road-side users and your future passengers will thank you for it !

You must make sure you are always in a capacity to **control** your vehicle so that you are able to drive **safely** and respectful of the **environment** !



Make sure your vehicle is **clean** !



Make sure to conduct **external checks**...

Check			Observations
• Documents			
• Fire extinguisher			
• Tasks			
• Level (engine oil, cooling system, windscreen washer)			
• Clutch, steering wheel, breaks			
• Tyres			
• Suspension			
• Cleanness of all glass/mirrors (windscreen, rear view, lights etc.)			
• Make sure lights are in good working order			

...and make sure to conduct preliminary **internal checks**

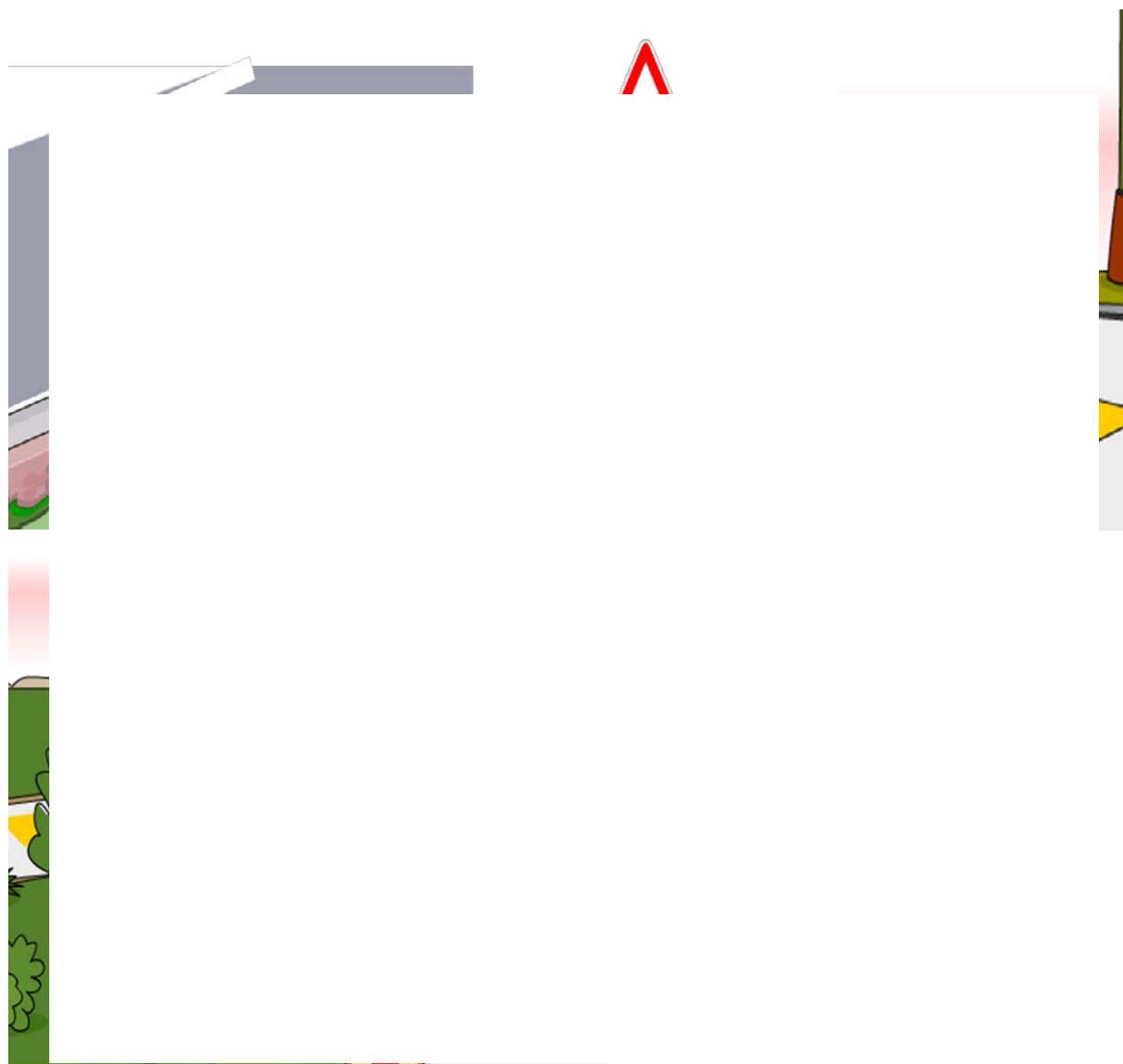
Checks	😊	😞	Observations
• Warning lights and manometers			
• Make sure control and assistance devices are in good working order			
• Make sure air tanks are under pressure			
• Conduct rapid checks of driving, parking and emergency breaks			
• Check pressure during each break check			

Always **respect** road **legislation** !



Always **anticipate** potential hazards or obstacles such as :

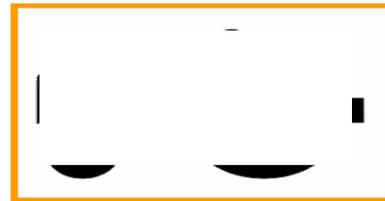
- A pedestrian crossing the street
- A right of way
- A crossroad/junction
- A car door open ahead
- Children playing on the side of the road
- A vehicle at a standstill right after a curve



Anticipate other road users' **behaviour** !



Knowing the **specific hazards** of certain types of vehicles (tractors, driver's license exempted vehicles):



- **Deficient markings** sometimes



- Low **speed** is often **misleading** !

Annex 2



External Evaluation Questionnaire

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Evaluation questions & answers:

1. How would you evaluate the defined needs and characteristics of the target group in the context of our piloting course? If applicable, what would you modify or add in order to consider the relevant needs/characteristics of professional drivers sufficiently for the implementation of our pilot course?
2. The defined learning outcomes are supposed to lead the overall design of the course. Do you consider the defined learning outcomes as appropriate? Would you suggest any modifications or additions?
3. Based on your experience, do you believe that the preliminary considerations on the course implementation (didactical considerations) are appropriate in order to:
 - meet the learning needs of the professional drivers,
 - address professional drivers characteristics and
 - reach – under consideration of the defined characteristics – the aspirde learning outcomes?If not, please propose modifications and additions! Please feel free to make also further or alternatic suggestions for improvement.
4. What are from your point of view the indicators for quality in such a SBT course and how do you see these indicators realized in our initial outline? Where do you see potential for quality improvement in our plans for the pilot course?
5. What are, from your point of view, the limitations of such a technology supported course in the context of professional driver training? Where do you see options and potential? What requirements need to be fulfilled from your point of view in order to implement such a technology supported course successfully?
6. Do you have any further suggestions for improvement or further development of our piloting course?

Annex 3



Participants' Evaluation Questionnaire

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Evaluation questions & answers:

1. Looking back at the pilot course you just attended, what do you like and what do you dislike ?
2. What do you expect from a simulator-based course for professional drivers ? Did this course met your expectations ? Why ?
3. What makes a technology-supported training course such as the one you attended attractive to you ? Did our pilot course meet those criteria ? Why ?.
4. Compared with a regular classroom training course, where do you strength and weaknesses of the kind of pilot course you participated in ??
5. In case you already attended a classroom training course on a similar topic, how would you describe the differences between those two courses with regard to your learning, the courses relevance for your daily praxis and your motivation to attend a similar course again during and after course attendance ?
6. Where do you see room for improvement in our course ?
7. What are, from your point of view, the limitations of such a technology-supported course in the context of professional driver training ? Where do you see options and potential ? What requirements need to be fulfilled from your point of view in order to implement such technology-supported course successfully ?

Annex 4



Pilot Trainers Evaluation Questionnaire

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Evaluation questions & answers:

1. What experiences did you make with the pilot course material?
2. How would you evaluate the integration/addressing of the participants needs and characteristics in the course?
3. To what extent do you consider the overall course appropriate in order to reach the aspired learning outcomes of the course you just facilitated?.
4. How would you describe the differences between the pilot course and a regular classroom based course on a similar topic with regard to the participants' learning, the course's relevance for the participants' daily praxis and their motivation to attend the course?
5. What are from your point of view indicators for quality in such an SBT course and how do you see these indicators realized in the pilot course material presented to you? Where do you see potential for quality improvement in the course material?
6. What are, from your point of view, the limitations of such a technology-supported course in the context of professional driver training ? Where do you see options and potential ? What requirements need to be fulfilled from your point of view in order to implement such technology-supported course successfully?
7. Do you have further suggestions for improvement or further development of our piloting course?