

**SEVENTH FRAMEWORK PROGRAMME
SUSTAINABLE SURFACE TRANSPORT (SST)-2008-RTD-1**



Integrated system for safe transportation of
children to school

SAFEWAY2SCHOOL
Grant Agreement No. 233967

Project Presentation

| | | | |
|---------------------------------|--|-------------------|--|
| Deliverable No. | D10.1 | | |
| Workpackage No. | WP10 | Workpackage Title | Project Management |
| Activity No. | A10.1 | Activity Title | Administrative and overall management |
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| Status: | F: Final | | |
| Dissemination Level | Pu: Public | | |
| File Name: | SW2S_ D10.1_Final.doc | | |
| Project start date and duration | 1 September 2009, 36 Months | | |

Table of contents

| | |
|---|-----------|
| TABLE OF CONTENTS | II |
| 1. INTRODUCTION | 1 |
| 2. THE CONCEPT | 2 |
| 3. PROJECT OBJECTIVES | 3 |
| 4. PILOTS AND TEST SITES | 4 |
| 5. DELIVERABLES | 6 |
| 6. CONSORTIUM | 8 |
| ANNEX 1: COORDINATOR AND TECHNICAL MANAGER CONTACT DETAILS | 9 |
| ANNEX 2: SHORT PROJECT DESCRIPTION | 11 |

Executive Summary

SAFEWAY2SCHOOL is a European research project carried out by research institutes, universities and industry in order to enhance safety for children on their daily way to school. SAFEWAY2SCHOOL aims to design, develop, integrate and evaluate technologies for providing a holistic and safe transportation service for children, from their home door to the school door and vice versa, encompassing tools, services and training for all key actors in the relevant transportation chain. These include optimal route planning and rerouting for school buses to maximize safety, on-board safety applications (i.e. for speed control and seat belts), "intelligent" bus stops, effective warning and information systems for bus drivers, children, parents and the surrounding traffic; as well as training schemes for all actors. The project innovative systems, services and training schemes will be tested in 4 sites Europewide, including North (Sweden), Central (Austria), South (Italy) and Eastern (Poland) Europe; to evaluate their usability, efficiency, user acceptance and market viability; taking into account the very different children's transportation to/from school systems across the different European regions as well as key cultural and socio-economic aspects.

1. Introduction

Between 1994 and 2001, 361 children were injured or killed during transportation to/from their school in Sweden, whereas 455 were killed or injured in Austria only in 2007 and 97 were killed in Italy in 2005. In a single school bus accident in Greece in 2003, 20 children lost their lives. Different as the above numbers may be, they all tell us one thing: crashes involving school buses and crashes involving children travelling to and from school are far from negligible and require further efforts to be drastically reduced.

2. The concept

SAFEWAY2SCHOOL is an EU-project within the 7:th Framework with a start 1/9/2009, running for 36 months. The total budget is 3,7€ millions. The aims are to design, develop, integrate and evaluate technologies for providing a holistic and safe transportation service for children, from their home door to the school door and vice versa, encompassing tools, services and training for all key actors in the relevant transportation chain. These include optimal route planning and rerouting for school buses to maximize safety, on-board safety applications (i.e. for speed control and seat belts), "intelligent" bus stops, effective warning and information systems for bus drivers, children, parents and the surrounding traffic; as well as training schemes for all actors. The project innovative systems, services and training schemes will be tested in 4 sites Europewide, including North (Sweden), Central (Austria), South (Italy) and Eastern (Poland) Europe; to evaluate their usability, efficiency, user acceptance and market viability; taking into account the very different children's transportation to/from school systems across the different European regions as well as key cultural and socio-economic aspects. The SAFEWAY2SCHOOL concept is based on a holistic approach with a door to door perspective, see Figure 1. To assure a good and safe quality of school transportation several stakeholders needs to be involved.

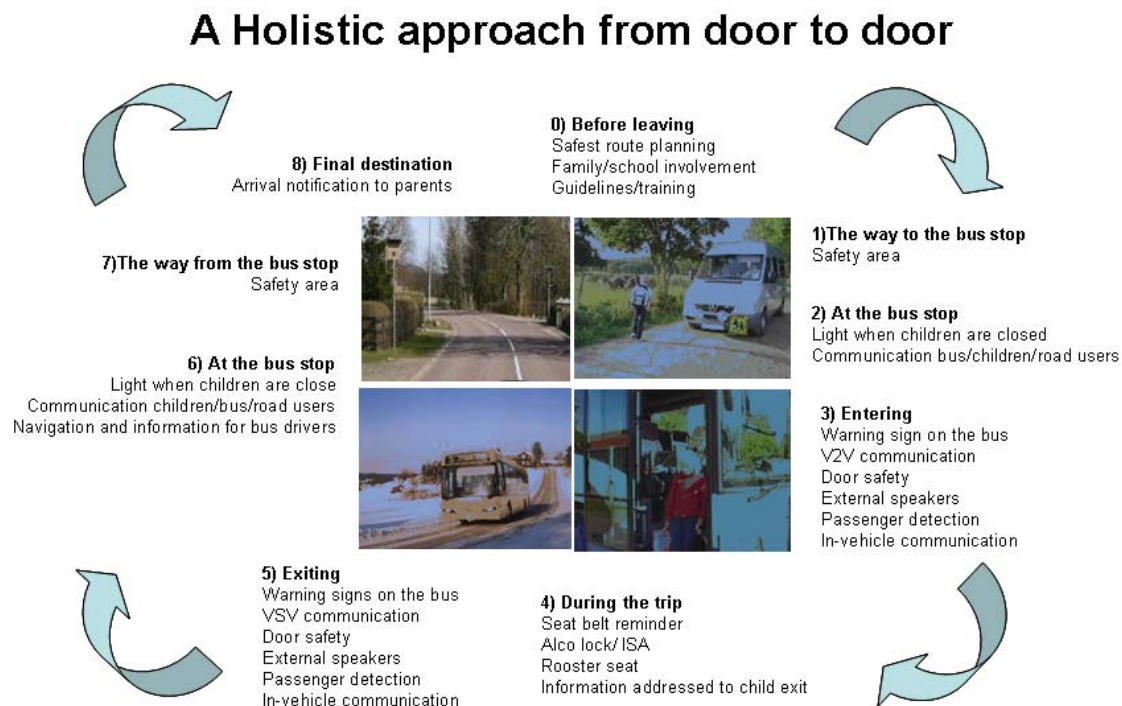


Figure 1 The SAFEWAY2SCHOOL approach form door to door perspective

The project follows a holistic approach from the children door to door perspective. Use cases will be defined at the beginning of the project by collecting crash data through available databases from European countries. To insure children a safe way from home to the bus stop and from bus to school, communication has to be established between children/bus stop and road users. The project's scope include both software and hardware development. A new sign for school transport will be developed to display on buses that assure school transport. An HMI profile in relation to all situations will be developed – from support system for the bus driver to the arrival notification, training schemes and municipality's office.

3. Project objectives

More specifically, SAFEWAY2SCHOOL aims at:

- Developing optimal route planning for school buses, to guide them through areas of low traffic, avoiding black spots.
- Developing optimal real-time route guidance, taking into account dynamic traffic data, as well as the arrival and estimated arrival of children at the bus stops.
- Developing “intelligent” bus stops that understand the position of children and school buses and transmit relevant info and warnings to both actors.
- Developing a seamless, reliable and secure system of school bus position tracking and monitoring and a parents’ notification system, when children are on-board the school bus.
- Integrating safety enhancement applications regarding speed monitoring and safety belt usage for the school bus, while travelling.
- Developing warning systems for surrounding vehicles on the existence of stopped school buses or/and children waiting/ entering/ exiting.
- Developing appropriate training schemes for school bus drivers, children, parents and all drivers, for optimal use of the developed systems and children safety enhancement in general.
- Performing socio-economic analysis, to identify the optimal business plans, legal schemes and organizational incentives for rapid adoption and wide market penetration of SAFEWAY2SCHOOL system.

Target Groups of the project include:

- School bus drivers.
- Students/ children: 6-9, 10-12 and 13-16 years old, with and without disabilities, when they may travel alone from/to school bus, although some applications (e.g safety belt use) are for all ages.
- Families of the children.
- Infrastructure (i.e. bus stops or bus fleet operators).
- Car manufacturers (OEM's).
- Authorities (legislators, municipal and school authorities).
- All drivers (i.e. of surrounding traffic vehicles).

The project aims to combine a wide range of technologies on localization, route planning, route guidance, vehicle to infrastructure and on-board systems and sensors, short-range and GPRS communications, etc; in order to solve holistically the issue of safe transportation of children from their door to the school and vice-versa.

4. Pilots and test sites

The largest effort in the project will be spend to test services and training schemes in 4 sites in Europe: Sweden, Austria, Italy and Poland, see Figure 2. Here the systems will be evaluate regarding their usability, efficiency, user acceptance and market viability; taking into account the very different children's transportation to/from school systems across the different European regions. The pilots will utilise off-the-shelf technology, in order to create a driver support system that raises the level of routines in school transportation and facilitates communication between the drivers and the children.

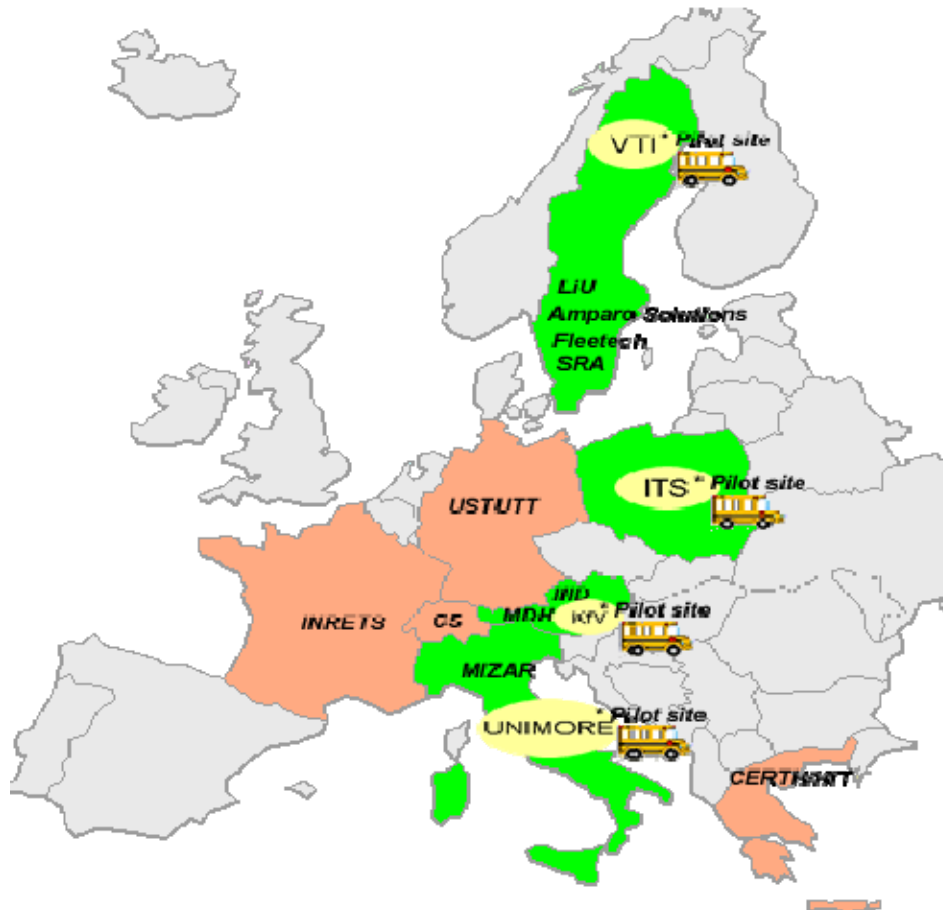


Figure 2 Pilot sites with in SAFEWAY2SCHOOL, the buses represent the pilot sites and countries in colour are beneficiaries' representation within the project.

The draft of the system architecture gives a first idea of the different systems involved and stakeholders' interests see Figure 3.

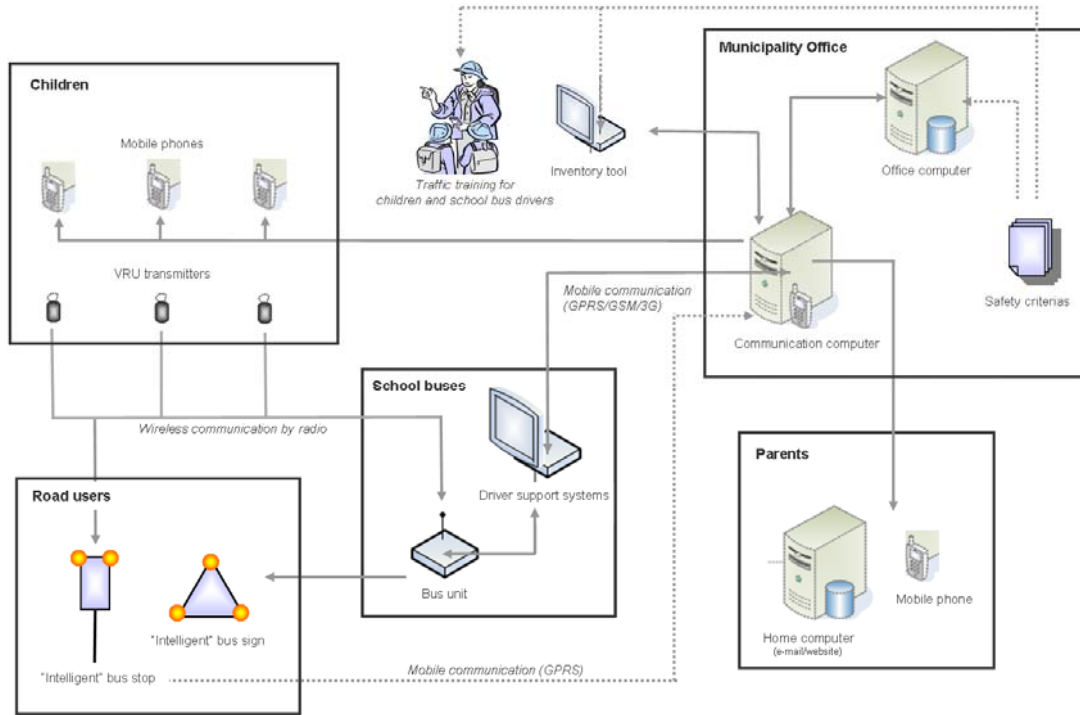


Figure 3 Draft system architecture for SAFEWAY2SCHOOL

The project will provide guidelines for authorities and give input for training courses for children, parents, bus drivers and other relevant stakeholders. Recommendations for policy and standardisation of school transportation through European members' countries will be delivered within the project. Moreover, a user forum and workshops will support dissemination of the project and provide us valuable feedback from stakeholders.

5. Deliverables

Within the SAFEWAY2SCHOOL project in total 42 Deliverables will be written, see Table 1, most of them Public.

Table 1 List of Deliverables within the SAFEWAY2SCHOOL

| Del. No. | Deliverable name | Lead beneficiary | Dissemination level | Delivery date (proj. month) |
|-----------------|--|-------------------------|----------------------------|------------------------------------|
| 1.1 | SAFEWAY2SCHOOL benchmarking database | UNIMORE | PU | M6 |
| 1.2 | Comparison and analysis of user and stakeholder needs across different countries | Kfv | PU | M8 |
| 1.3 | SAFEWAY2SCHOOL Use Cases | CERTH/ HIT | CO | M9 |
| 1.4 | Accident Analysis report | VTI | CO | M6 |
| 2.1 | SAFEWAY2SCHOOL System Architecture | VTI | CO | M12 |
| 2.2 | SAFEWAY2SCHOOL System Specification | Amparo Solutions | CO | M18 |
| 2.3 | SAFEWAY2SCHOOL Risk Assessment | CERTH/ HIT | CO | M30 |
| 2.4 | Security and privacy issues abiding checklist | CS | PU | M18 |
| 3.1 | Prototype Implementation of the Safe Route Planning and Monitoring System | MIZAR | CO | M22 |
| 3.2 | Surrounding traffic information and warning system | Amparo Solutions | CO | M24 |
| 3.3 | On-board traffic safety systems | Fleetech | CO | M24 |
| 4.1 | VRU identification and monitoring unit | Amparo Solutions | CO | M20 |
| 4.2 | "Intelligent" bus stop | Amparo Solutions | CO | M24 |
| 5.1 | HMI concepts | USTUTT | PU | M12 |
| 5.2 | School bus notification and warning module | INRETS | CO | M20 |
| 5.3 | VRU notification and warning module | LIU | CO | M18 |
| 5.4 | Family and third party notification module | CERTH/ HIT | CO | M20 |
| 5.5 | Surrounding traffic info and warning visual and audio signs | IIID | PU | M22 |
| 6.1 | DSS prototype | MIZAR | CO | M22 |
| 6.2 | OBU prototype | Fleetech | CO | M26 |
| 6.3 | VRU unit | Amparo Solutions | CO | M26 |
| 6.4 | SAFEWAY2SCHOOL system integrated and installed at pilot sites | Amparo Solutions | CO | M26 |
| 6.5 | Technical verification report | UNIMORE | CO | M28 |
| 7.1. | Pilot plans | LIU | PU | M18 |
| 7.2 | Pilot consolidated report | LIU | CO | M34 |

| Del. No. | Deliverable name | Lead beneficiary | Dissemination level | Delivery date (proj. month) |
|-----------------|--|-------------------------|----------------------------|------------------------------------|
| 8.1 | Dissemination Plan | CS | CO | M3 |
| 8.2 | Project logo, leaflets, posters, web site | CS | PU | M3 |
| 8.3 | Dissemination strategy and actions | CS | PU | M6 |
| 8.4 | Project workshops | CS | PU | M9 |
| 8.5 | Market analysis | Amparo Solutions | PU | M12 |
| 8.6 | Project video | CS | PU | M30 |
| 8.7 | Impact assessment and socio-economic analysis | CS | CO | M34 |
| 8.8 | Exploitation plan | MDH | CO | M36 |
| 8.9 | Consolidation of Dissemination Actions | CS | PU | M36 |
| 9.1 | Training schemes and content | ITS | PU | M30 |
| 9.2 | Application guidelines and best practices | Kfv | PU | M35 |
| 9.3 | Policy and standardisation recommendations | SRA | PU | M36 |
| 10.1 | Project Presentation | VTI | PU | M2 |
| 10.2 | Project Management and Quality Assessment plan | VTI | RE | M3 |
| 10.3 | First Periodic Management Report | VTI, CERTH/HIT | CO | M20 |
| 10.4 | Second Periodic Management Report | VTI, CERTH/HIT | CO | M36 |
| 10.5 | Final Report | VTI, CERTH/HIT | PU | M36 |

6. Consortium

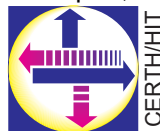
Consortium for SAFEWAY2SCHOOL is composed by a combination of beneficiaries from research institutes, universities and industry. In Table 2 the beneficiaries and their logos are presented.

Table 2 Beneficiaries represented in the SAFEWAY2SCHOOL consortium

Swedish Road and Transport Research Institute, Linköping (Coordinator), Sweden



Center for Research & Technology Hellas/ Hellenic Institute of Transport, Greece



National Institute for Transport and Safety Research, France



The French national institute for transport and safety research

Amparo Solutions, Sweden



Fleetech ab, Sweden



Vagverket, Sweden



Kuratorium für Verkehrssicherheit, Austria



University of Modena and Reggio Emilia, Italy



University of Stuttgart, Germany



Mizar Automazione S.p.A, Italy



Motor Transport Institute, Poland



International Institute for Information Design, Austria



Conncpt Swiss GmbH, Swiss



Linköpings Universitet, Sweden



Mälardalens högskola, Sweden



For further questions please look at our website www.safeway2school.eu or feel free to contact: Anna Anund, Coordinator anna.anund@vti.se or Evangelos Bekiaris, Technical Manager abek@certh.gr.

**Annex 1: Coordinator and Technical Manager Contact
Details**

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Annex 2: Short Project description

PROJECT INFORMATION

Project acronym: SAFEWAY2SCHOOL

Project name: Integrated system for safe transportation of children to school

Grant agreement no.: 233967

**Priority component: SEVENTH FRAMEWORK PROGRAMME
SUSTAINABLE SURFACE TRANSPORT (SST)-2008-RTD-1**

Project Logo:



Project Web Site: www.safeway2school.eu

List of participants:

| Beneficiary Number * | Beneficiary name | Beneficiary short name | Country | Date enter project | Date exit project |
|----------------------|--|------------------------|---------|--------------------|-------------------|
| 1 (Coordinator) | Statens väg och transportforskningsinstitut | VTI | Sweden | M1 | M36 |
| 2 | Center for Research & Technology Hellas/ Hellenic Institute of Transport | CERTH/HIT | Greece | M1 | M36 |
| 3 | National Institute for Transport and Safety Research | INRETS | France | M1 | M36 |
| 4 | Amparo Solutions | Amparo Solutions | Sweden | M1 | M36 |
| 5 | Fleetch ab | Fleetch | Sweden | M1 | M36 |
| 6 | Vagverket | SRA | Sweden | M1 | M36 |
| 7 | Kuratorium für Verkehrssicherheit | KfV | Austria | M1 | M36 |
| 8 | University of Modena and Reggio Emilia | UNIMORE | Italy | M1 | M36 |
| 9 | University of Stuttgart | USTUTT | Germany | M1 | M36 |
| 10 | Mizar Automazione S.p.A | MIZAR | Italy | M1 | M36 |
| 11 | Motor Transport Institute | ITS | Poland | M1 | M36 |
| 12 | International Institute for Information Design | IIID | Austria | M1 | M36 |
| 13 | Conncept Swiss GmbH | CS | Swiss | M1 | M36 |
| 14 | Linköpings Universitet | LiU | Sweden | M1 | M36 |
| 15 | Maelardalens hoegskola | MDH | Sweden | M1 | M36 |

Total project cost: 3 668 737 Euro

Commission project funding: 2 764 638 Euro

II. PROJECT MAIN GOALS

SAFEWAY2SCHOOL aims to design, develop, integrate and evaluate technologies for providing a holistic and safe transportation service for children, from their home door to the school door and vice versa, encompassing tools, services and training for all key actors in the relevant transportation chain.

III. KEY ISSUES

With help of a holistic approach increase safety and security for children going to and from school by bus.

IV. TECHNICAL APPROACH

Optimal route planning and rerouting for school buses to maximize safety, on-board safety applications (i.e. for speed control and seat belts), “intelligent” bus stops, effective warning and information systems for bus drivers, children, parents and the surrounding traffic; as well as training schemes for all actors.

V. EXPECTED ACHIEVEMENT / IMPACT

SAFEWAY2SCHOOL aims to increase the level of safety and security of the overall transport operation of children going / returning from school and all its components (trip to the bus stop, ingress / egress, while on-board), thus reducing the number of relevant accidents and fatalities.

SAFEWAY2SCHOOL builds automatic interfaces between the driver and the children on-board (i.e. to automatically check that they wear their seat belt), the operation and the parents / school authorities (automatically informing them that the specific child is safely on-board), the child and the driver before boarding (i.e. automatically informing the driver through the intelligent bus stop that the child is there and waiting or at a near distance, etc.). Relevant interfaces are iteratively developed and optimised within WP5 of the project, with emphasis also on human interfaces that are intuitive, user-friendly and standardised (i.e. through standardised icons and signs to inform the surrounding traffic that a bus is transporting children or that they are embarking / disembarking at this moment).

SAFEWAY2SCHOOL develops modular systems that can be used by dedicated school buses as well as generic public buses transferring children. Thus, it aims to maximise safety and security of operation, without requiring of extra vehicles or travellers in any country. The consequence will be that children and parents will feel more confident to use the bus (public or specific purchased) instead of a passenger car. The final result will be a reduction in the CO2 emissions.

VI. COORDINATOR CONTACT DETAILS

| | |
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