A   Introduction

Over 4,000 children are killed in traffic accidents in Europe every year. Years of experience with behavioural training have already documented that traffic accidents can be reduced and thus mobility choice for children improved. There is a need, however, for new innovative tools to support and improve behaviour-based training programmes. That is why we have developed the interactive cycle training programme B-Game.

Objectives

- To develop and produce an Internet based behavioural traffic training programme for children.
- To demonstrate and document that the use of behavioural training can improve traffic safety for children and thus forward greater mobility choice for this category of weaker road users and improve child health through exercise, targeting 4,000 school children at 40 schools in the City of Odense
- To provide a unique traffic training tool as best practice example in Europe.
- To execute training programmes in the use of the tool

A2   Description

Teaching children how to ride their bikes safely in the traffic is in Denmark primarily carried out by the parents. The schools also have traffic training on the agenda, but it is very difficult to prepare the children for the many different challenges that real life traffic presents them with in a class room or on a closed track. To try and improve the traffic education in the schools, the Municipality of Odense wanted to develop a computer game that could improve the children's traffic skills. The main lesson learned is that it is important to keep it simple!

The starting point when the development of B-game was initiated was that the game had to be very realistic and function as a kind of virtual parent that could teach the child to be attentive and aware of the many different challenges that occur in the traffic.

By choosing the medium "computer game" to communicate with the children the Municipality of Odense chose a medium that appeals to and is well known by the children. On the other hand the medium was (at least at the time) not accepted as a learning tool and both the teachers and the school department did not have much experience with using computer games for educational purposes.

Before the actual process of developing the computer game, the school department researched how children can learn through computer games, what types of traffic accidents cycling children are involved in and how children's motor functions, hearing, sight, coordination and reactivity develops.

The conclusion of the study was that the target group of the game should be six graders (11-12 years of age). The reasons are that six graders are able to and allowed (by their parents) to ride their bike alone in the traffic. Their motor functions, hearing, sight, coordination and reactivity are fully developed and they are able to reflect on the situations in a game and transfer the experiences to real life traffic. What this group of road users lack is concentration!

The main idea was that the game had to imitate reality as closely as possible. Due to that fact the game had to be a flow game instead of the traditional stop and go traffic games since you cannot stop the traffic and rest in real life. It was also very important that the situations in the game were as realistic and complex as possible to make the children able to focus on the most essential elements.

A detailed script was drawn up around common situations that occur in the traffic and which causes accident. The game situations were then filmed in real life traffic from the cart of a Christiania Bike so that the view was similar to the view of an 11 year old.

To carry out the objectives a marketing plan and strategy for the campaign was developed in cooperation with a Public Relation Agency, Clockwork. The need for the traffic training tool described in this measure was already on the drawing board 10 years ago and attracted EU funding for a project called SAFEWAY. However, in 1995, the technology did not exist to produce a reliable and universal internet-based tool. In cooperation with Clockwork and the School Department the design and concept were developed.

B-Game is an interactive cycle training tool which can supplement the practical cycling test for pupils in the 6 th grade. But it can be used independently as well – it is a game which the children can play via the internet. B-Game is web-based and consists of video sequences linking together a story about the pupil being a cyclist in Odense. The concept is mainly based on training good and safe habits instead of just traffic rules.

The idea of the game is that you have to cycle safely from one point in the city to the city centre – passing by some of the black spots in the city and other dangerous scenarios.

Before you start the game, you chose bicycle, helmet and one of four "dates" which you which to invite to the movies, when you have managed to ride you bike safely to the movie theatre in the city centre.

You can score points by cycling safely through the different levels in the game. Next to the live footage of the route you are travelling is a cell phone where you get directions and sometimes SMS messages from the date waiting at the cinema. Every time you have manoeuvred successfully though a level in the game, you move to the next level/mission. There are 11 levels in total. When you have completed the levels, you reach the cinema and get to invite your "date" to a movie.

The filming in the game is done from at bicycle, which means that all scenes are happening in the same tempo as in real life. You only have a certain amount of time

to react to a parked truck on the cycling lane, a buss which stops and unloads passengers, playing children along the way, mopeds on the cycle path etc.

Showing the controls in the game

A scene from the game

B   Measure implementation

B1   Innovative aspects

The innovative aspects of the measure are:

- **New conceptual approach.** For the first time in Denmark an interactive traffic training programme has been launched.

- **Use of new technology.** Technology has been developed for the programme to create an authentic environment. All the filming has been done in Odense to create a more realistic scene for the pupils - the user group. The technique for the traffic training programme can be used by other countries adding their local filming.

B2   Situation before CIVITAS

25 years of experience with behavioural traffic training has already documented that traffic accidents can be reduced and thus mobility choice for children improved. There is a need, however, for new innovative tools to support and improve behaviour-based training programmes and to bring the value of traffic training for children to the attention of politicians and the public.

The rate of children walking and cycling to school in Odense is as high as 80 % and has been that for over 25 years. This is good, but children in Denmark are getting more and more inactive through out the 25 years and this affects the percentage of cycling children in the long term. In Odense there is a major risk that only around 60 % of the children will walk and cycle to school in a few years – a tendency which is found in many other cities.

Many parents appreciate that their children can cycle by them selves, but they forget to give the children on site training as part of the every day learning.

B3   Actual implementation of the measure

The measure was implemented in the following stages:

Stage 1: Planning and drawing up the concept – from spring 2005 to summer 2005

- cooperation between the School Department, Department of Culture and Urban Development and PR Agency Clockwork

Stage 2: Filming for the game – summer 2005

- streets in Odense were used as site locations to make the program more realistic for the school children.

Stage 3: Making the interactive game and introducing it for the traffic teachers in the schools of Odense

- The schools in Odense have appointed a traffic trainer – one of the teachers who is responsible for various traffic training activities for the pupils at the school. All traffic trainers were offered a training session in how the game works, how it is set up etc.

Guide for the teachers describing the purpose of the game and proposals for what topics they can discuss in class afterwards based on the experiences from the game.

Stage 4: Launching B-Game – May 2006

Here you can chose which girl you want to invite to the movies

B4   Deviations from the original plan

The deviations from the original plan comprised:

* Venice originally was a partner in this meassure but due to different circumstances Venice left the meassure.

B5   Inter-relationships with other measures

1. Connection between space, transport mode and transport users

The table illustrates how sites, transport forms and users fit together to target change at both zone and city level.

	6.10.O	8.7.O	9.5.O	11.10.O	11.11.O	11.12.O
Transport site	X	X				(X)
Transport form	X	X	X	X	X	X
Transport users	X	X	X	X	X	X

(X) County, city and zone level

2. Connection between target groups and measures

In order to create as much public and stakeholder interest in MOBILIS as possible, different demographic and social groups are targeted as follows:

	6.10.O	8.7.O	9.5.O	11.10.O	11.11.O	11.12.O
Target group	Residents	Economically weak citizens	Families	Children	Families	Everyone

3. Connection between plan types and measures

Within the fields of transport and traffic planning, many specialised plans often operate independently of each other. Odense's MOBILIS project ensures that all relevant plan types are brought together within the project.

	6.10.O	8.7.O	9.5.O	11.10.O	11.11.O	11.12.O
Plan type	Speed Reduction Plan, Road safety Plan, Town Centre Plan, Traffic and Safety Plan for Odense City Centre	Public Transport Plan, City Design Manual (bus stops)	Public Transport Plan	Road Safety Plan, Plan for Safe Routes to School	Public Transport Plan, Cycle Plan	Regional Plan for Funen, Municipal Plan for Odense, Public Transport Plan, Harbour Development Plan. Plan for Ring Road 3

4. Connection between private and public transport firms and institutions

The success of Odense's MOBILIS project is dependent upon co-operation between firms and institutions responsible for the provision of transport in Odense.

	6.10.O	8.7.O	9.5.O	11.10.O	11.11.O	11.12.O
Firm/institution	Odense City Council, Copenhagen City Council, Haulage firms,	Odense City Council, Funen County Council, Private bus companies, Taxi companies, car sharing companies	Odense City Council, Taxi companies, Car sharing companies, Cycle manufacturers	Odense City Council (Technical Dept. + Schools Dept), MOBILIS partners	Odense City Council, Car sharing companies, Route planning web sites	Odense City Council, Funen County Council, Danish State Railways

C   Evaluation – methodology and results

C1   Measurement methodology

C1.1   Impacts and Indicators

Table of Indicators. *Insert own table where available, use landscape layout as necessary*

No.	Impact	Indicator
1	Better cycle abilities among children	Number of children using the B-Game tool
2	Better cycle abilities among children	Success rate for all 11 missions

Detailed description of the indicator methodologies:

- **Indicator 1** (Number of children using the B-Game tool) – Children improve their cycle abilities in a number of ways. The interactive aspect of B-Game can be seen as a fun way for children to improve cycling abilities. By counting the number of children using the B-Game tool we can prove a higher level of involvement among this group of children in improving their knowledge about cycling and safety.

- **Indicator 2** (Success rate for all 11 missions) – The missions in the game give a range of different challenges to the children and the success rate can indicate the level of children's abilities in traffic as a cyclist. Each mission consists of a specific situation like handling a right turning lorry with out getting hit.
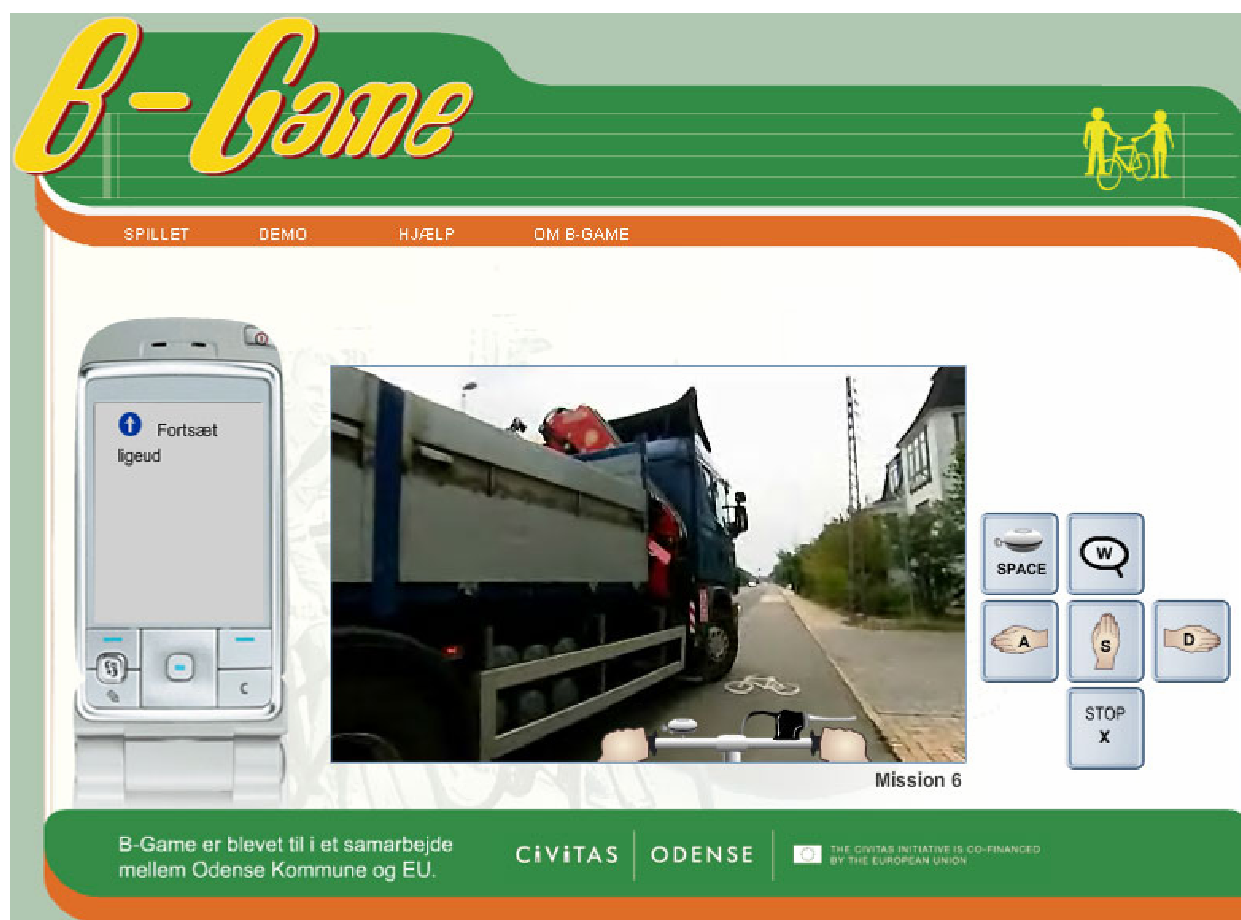
C1.2 Establishing a baseline

The measure hasn't got an ordinary baseline but the system is set up so that the pupils have got to reach a certain quality level from one mission to get to the next. B-Game consists of 11 different levels. This ensures that the pupils become more aware of possible dangers in the traffic than they were before using B-Game.

C1.3 Building the business-as-usual scenario

Children's abilities in the traffic as cyclists aren't monitored anywhere in Odense or in Denmark which could provide a baseline for the business-as-usual scenario. Instead B-Game records the children's actual level of understanding during their use of the program. This is a game played on the internet, so their abilities in traffic aren't monitored during this measure, but they all have to pass the actual cycling test after using B-Game.

C2 Measure results

The results are presented under sub headings corresponding to the areas used for indicators – economy, energy, environment, society and transport.

C2.1 Economy

The more children who can cycle independently to school the more the city budgets will save according to transport budgets for school transport in busses and taxies. If a family can save a private car – often the second car in the household – it's equivalent to a yearly expense of € 5 - 10,000.

Odense Municipalities makes a bench marking of the travel habits among school children every 4-5 year and this gives the local tendencies by figures related to age and geography.

C2.2 Energy

This measure doesn't affect the energy consumption in the short run. But it gives children better abilities for cycling independently in daily traffic, which reduces the need of cars to transport children in Odense. These habits often last into their adult lives and therefore could help reduce energy consumption in the long run.

C2.3 Environment

By teaching children safe traffic behaviour, B-Game can be seen as a tool to encourage families to let their children use the bicycle more as they become more capable of cycling safely in dense traffic. This means that for example the trip to school can be done by bicycle instead of by car. If children are taught to use their bicycle as a natural mode of transportation, they are more likely to choose the bicycle for transportation when they grow up. In the long run this will reduce fuel emissions in the city.

Experiences of the past 30 years, concerning safe routes to school and traffic training for school children, have helped Odense to reach a much higher percentage of cyclists among children and adults than other similarly cities.
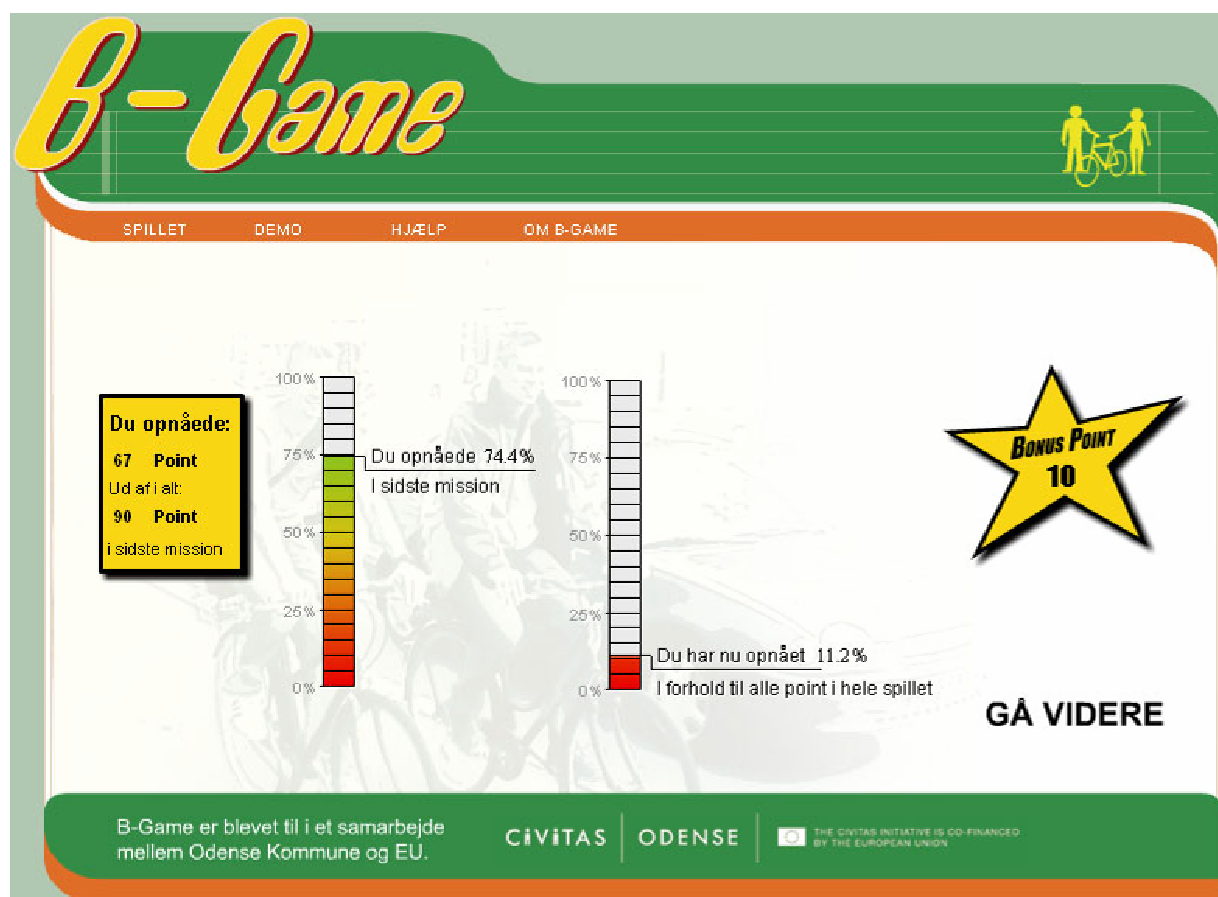
Showing the points earned after finishing a mission

C2.4 Transport

The first trip of the day often affects the travel modes of the rest of the day. This means that if parents don't need to drive their children to school any longer, some of them would also choose not to use the car themselves. This change in behaviour isn't justified by this measure, but it's a theory we assume based on year long efforts to change transport habits in Odense.

C2.5 Society

By giving children the opportunity to learn how to travel safely by bicycle, they are able to move around more freely in their own city. Benchmarking is described in C2.1.

B-game has been used 1,694 times during the project period. 50.4% of the games played were made by girls. Boys succeeded all 11 missions in 86.5% of games played while girls succeeded in 84.1% of them. This shows than the pupils kept playing until most of them succeeded all 11 missions and that the difference between the boys and the girls is almost none existing in this field.

All schools in Odense were invited to use B-Game. However only 12 out of 53 schools used the game. This means that 3 out of 4 schools weren't active using B-

Game as an integrated part of the education despite the encouragement from the project manager and the training scheme of the safety officials.

C3   Achievement of quantifiable targets

No.	Target	Rating
1	To develop and produce an Internet based behavioural traffic training programme for children.	**
2	To demonstrate and document that the use of behavioural training can improve traffic safety for children and thus forward greater mobility choice for this category of weaker road users and improve child health through exercise, targeting 4,000 school children at 40 schools in the City of Odense. Reasons for not having a full success are described in D1.	*
3	To provide a unique traffic training tool as best practice example in Europe.	**
4	To execute training programmes in the use of the tool	**
NA = Not Assessed 0 = Not achieved ✶=Substantially achieved (at least 50%) ✶✶**= Achieved in full ✶✶✶= Exceeded**		

C4   Up-scaling of results

The measure should have included all secondary schools in Odense but many chose not to participate in the training scheme. A full involvement would have resulted in 4 times as many pupils with a higher and better understanding in the safety matters for cyclists.

B-game could easily be up-scaled to the whole of Denmark. This would take some funding for training activities, which has been presented for a trust connected to one of Denmark's leading insurance companies. Unfortunately the application was rejected.

Another option is to up-scale B-Game to a European level. This would set a demand for local filming to include local traffic design and traffic rules. Still this could be done for approximately half the costs of the measure in Odense because most of the basic tools could be used again.

Ideally another similar measure should also include a long term evaluation based on traffic accidents. Due to the rather low number of traffic accidents involving children this would take a number of years to show statistical significantly so changes in transport modes is another useful indicator.

C5   Appraisal of evaluation approach

By including the evaluation tool into the system, we could tell how the pupils' abilities improved during the 11 missions in the game.

We did not evaluate on the impact of the game concerning children's behaviour in the traffic after implementing B-game in the schools. This could of course be relevant if this measure was to be copied, in order to get another level of evaluation.

C6   Summary of evaluation results

The key results are as follows:

- **Key result 1** – B-Game has been used 1,694 times in total, primarily in 12 secondary schools

- **Key result 2** – 85.3% of the trials in all 11 missions succeeded

    We didn't get any key results on how children act in real traffic and how this might affect the numbers of traffic accidents. This is because that it would have taken longer time and higher budgets and it would involve evaluation of other activities like the safe route to school program and the program for practical cycling tests.

D   Lessons learned

D1   Barriers and drivers

D1.1   Barriers

- **Barrier 1** – The involvement of the schools succeeded very differently. Many of the schools already had so many other external training and educational programs planned related to e.g. drugs, alcohol, and health. This could explain why many schools chose not to participate despite the well planned project, the training schemes and the general support from the school department. Schools could have chosen to dedicate one day for transport and health - healthy children learn more easily which saves time in the long run.

- **Barrier 2** – Many teachers didn't even try out the programme themselves – if they had done so, many would have seen the high qualities in the system, which focuses on the cyclist's behaviour and not on traffic rules. Headmasters should have told the teachers to use an hour for preparing their training sessions.

- **Barrier 3** – We didn't manage to attract the attention and participation of the National Safety Council. They were very busy with their own measures and couldn't find time for a national broadcast of B-Game. If they were involved as partner in the Mobilis contract they could have felt more involved.

- **Barrier 4:** -Technical aspects. First of all the game consist of two platforms – the actual game and a administrator platform, where the teachers have to

create a class "account" where all the student have to be created as users before they can log in and play. That way the teachers can afterwards use the statistic platform to see how each student did in the game and talk to them afterwards about the things they had to be more aware of. But instead of being a helpful educational tool, the statistic platform is a huge barrier – the teachers perceive the game to be complicated to use.

Secondly many teachers are not familiar with using computers and games as an educational tool - maybe due to the fact that at many schools the teachers have to book a special computer room in advance if they want to use computers. And when the students are finally placed by the computers some of them may not work, the game server was down, or the internet connection was to slow…all these obstacles combined causes' barriers for the teachers to use B-game.

Because of the way the game is constructed technically (the schools, the classes and the individual student all have to be created as users) and the fact that it is hosted by the private company who developed the actual game, it can only be spread to six graders in other municipalities if they pay for access. Due to the price of that access the game has not been made available to other municipalities.

The conclusion is that the game should have been simpler to use and made available for everybody to play for free online. That way the students could have used the game wherever and whenever they wanted!

D1.2 Drivers

- **Driver 1** – The school department dedicated a school consultant to manage the educational part of the project. This gave a very high quality level for the system.

- **Driver 2** – Filming was done in a very realistic way thanks to on site filming from a special bicycle. The system was tested on a selected focus group of children to monitor the effect on the children and to see if the system seemed attractive and exiting for them.

- **Driver 3** - The project manager has been responsible for children's safety in more than 15 years and was deeply engaged in the project.

D2 Participation of stakeholders

- **Stakeholder 1** – The school department became highly involved in the process and in the objectives of the program.

- **Stakeholder 2** – Some schools took very high interest in the measure while others chose not to get involved at all.

D3   Recommendations

- **Recommendation 1** – When spending such a large budget and so much manpower on such an ambitious project as B-Game, a stronger commitment form the schools should have been obtained in advance.

- **Recommendation 2** – B-Game could be used as part of a central event for school children combined with other safety arrangements. In this way children could be instructed by staff from the project management.

- **Recommendation 3 -** The game should have been simpler to use and made available for everybody to play for free online. That way the students could have used the game wherever and whenever they wanted!

D4   Future activities relating to the measure

B-Game can still be used in Odense by all the schools – this would only happen if a dedicated project manager would set up the scheme and get the attention among the schools and the teachers.

There are no other plans about using B-Game for other purposes in Odense at the moment. However, it will probably be used at Odense's participation in Expo 2010 in Shanghai, China. Odense has been chosen to participate in the best practice area with a cycling exposition under the title: The revival of the bicycle.