

# Using simulators to Train and Assess Drivers – A focus on Category D simulators

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# Added values of simulator training



Safety

Comparability

Possibility to measure

Report

Review from different angles

Training that is in reality not possible

Exercises compatible to specific training needs

Taking stress and fear away from starters

# As realistic as possible



Scenery

Behaviour of the vehicle

Motion of the platform

Sound

Setting

Data (consumption, rpm, ...)

Touch screens vs real  
dashboard

# As flexible as possible



User friendly interface

Different kinds of vehicles (artic bus)

Different kind of sceneries

Mobile simulator

...

## Full driving stand, no cabin, seat motion system



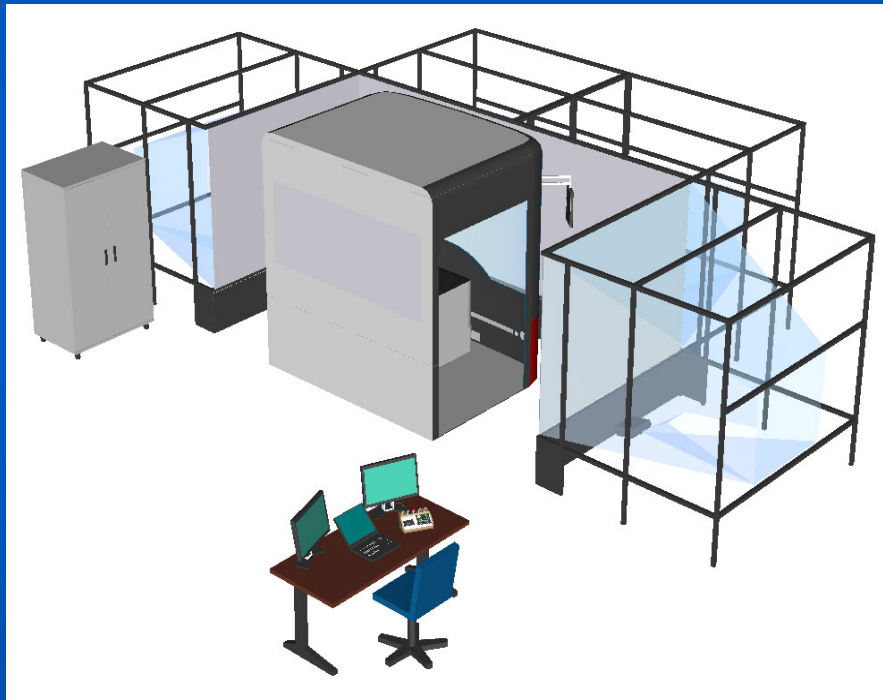
- Price : € 325k - € 400k



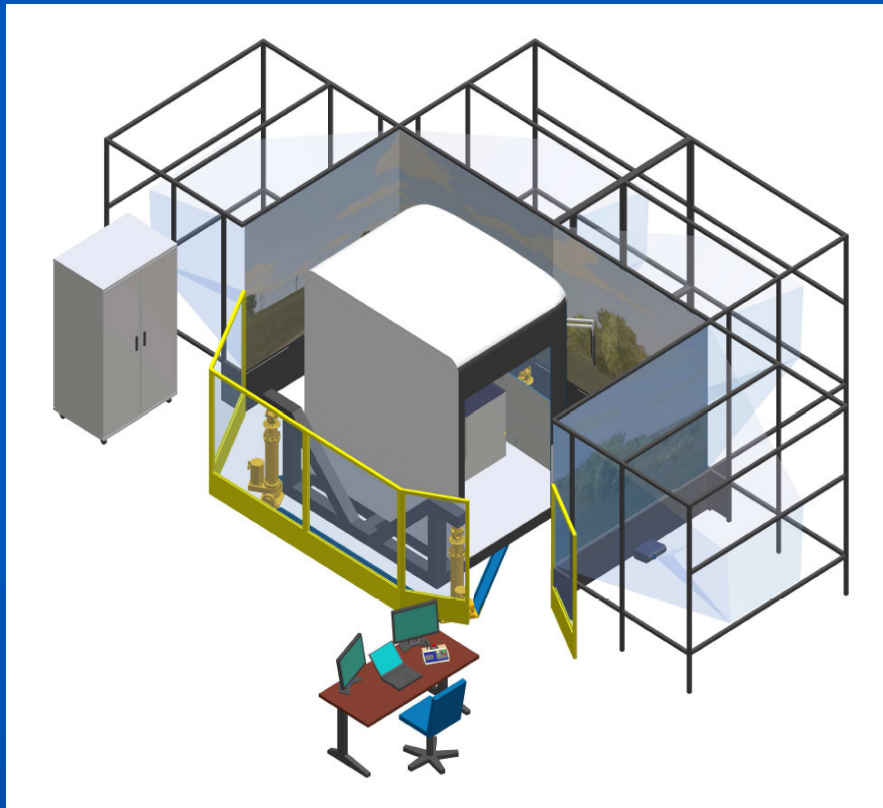
# Full cabin with seat motion system



Price : € 425k - € 550k  
second at 70%



# Full cab, with cab motion system



- Price : € 420k – 680k
- Second simulator :  
70% - 80%



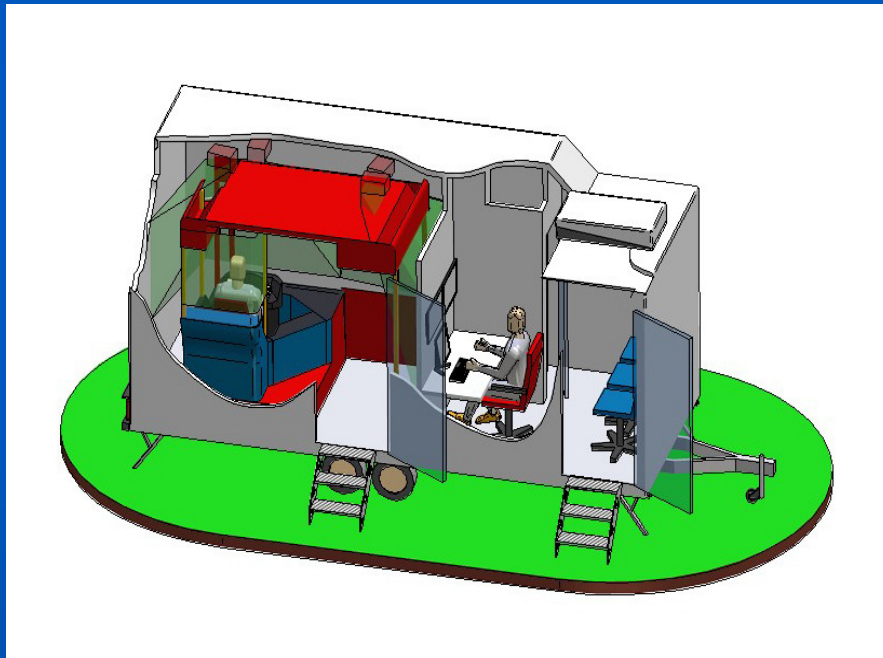




# Full cabin, mobile, installed in a trailer



Price : € 500k - € 800k  
(without the moving  
platform, depending on  
the kind of trailer)



Higher costs in  
maintenance ?

# Desk placed simulators



1 or 3 screens

1 or 3 PC's

Steering wheel

Pedals

Most of the producers do not offer this “entry level simulators” separately from the top of the range simulators.

Price : € 5k – 100k

Compliant to the definition of “top of the range simulator” in the EU 2003/59 ?



# Components en Price



- Cabin : 25%
- Motion Platform : 25%
- Hardware : 20% - 30%
- Database : depending on the geospecificity
  - => real city images : example :  
1000k for a small city like Helsinki  
+ adaptations to the software
  - => the creation of new scenery is included  
in the FCBO maintenance contract
- Software : 10%
- Services : 10%

# The maintenance & updating contract



**SOFTWARE MAINTENANCE & NORMAL  
UPDATES: € 12.000,-/year** (not including travel expenses)

**HARDWARE MAINTENANCE : € 7.500,-**

**Including : 2 maintenances /year**

**10 working days/year for programming**



## Ad Random

Getting used to the simulator

Flexibility

Forces the driver to make choices

## Pre-programmed exercises

- Everybody has exactly the same conditions
- Modules are independent from the instructors
- Quality and efficiency guarantee



Initial training : first acquaintance & last difficult exercises

2 session of 4 hours

Periodic training : (7 hour modules)

=> Defensive driving

=> Ecodrive

=> Driving in difficult conditions (snow, ice, fog, ...)

=> Driving in the mountains

\* Upcoming : Comfort driving

Driving on the left side of the road





1 day simulator training for 8 persons : € 1.250,-

Max. capacity : 150 days/year

=> max income :

187.500

€

# ROI - Expenses



Investment :	€ 420.000
Depreciation : (no experience !!)	€ 42.000
Instructors (2), housing, electricity, heating :	€ 168.000
Maintenance and updating :	€ 25.000
Overhead :	<u>€ 15.000</u>
	€ 250.000

€ 250.000 / 150 days = € 1667,-/day

Operational costs : € 1286,-/day **=> ROI = 0**

# The FCBO business model



Social Fund : employers organizations and unions

4,6% of the social security taxation

0,2% for training purposes => periodic training : FCBO

0,2% covers the fix costs & investments

Operational costs are covered via the pricing

Partnerships with public training institutes for unemployed

# Effectivity & Efficiency of simulator training



The EFFECTIVITY is proven

Sustainable results are subject to repetition

EFFICIENCY-GOAL : 4 hours simulator training  
equals 7 hours bus/coach-training

Conditions : good methodology, good exercises.

## 4 vs 7 hours



Higher frequency of learning situations

Stronger and personalized learning situations

Better feed back possible

Group discussions can be supported by reports and reviews

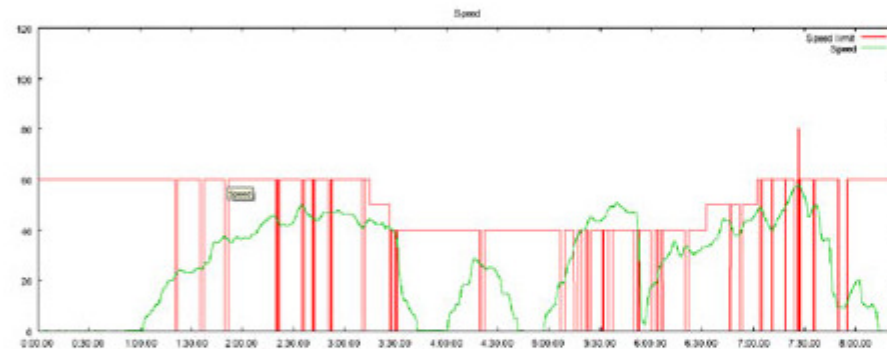


- Voertuigbeheersing
- Veiligheidsafstand
- Zwakke weggebruiker
- Verkeerssituaties
- Economisch rijden**
- Natuurelementen
- Evaluatie

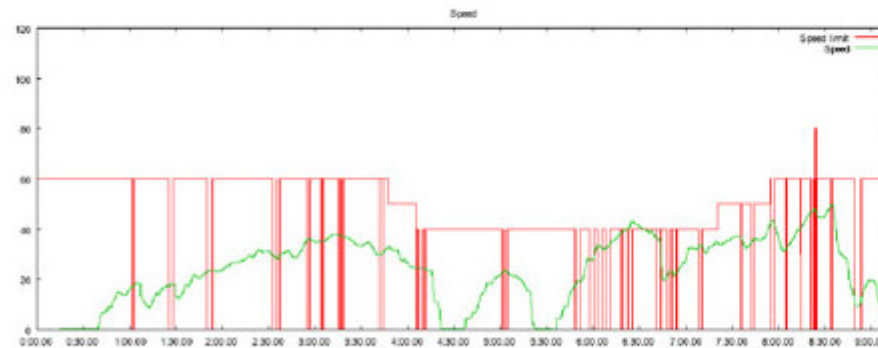
**Hoofdstuk 2 - Rijgedrag - Economisch rijden 11**

*Grafiek: snelheid*

■ **Chauffeur 1:**  
verbruik  
24.5 l/100 km -  
duurtijd rit:  
7.25 min



■ **Chauffeur 2:**  
verbruik  
19.7 l/100 km -  
duurtijd rit:  
8.15 min



Hoofdstuk 2 - Rijgedrag - Economisch rijden 11



- Voertuigbeheersing
- Veiligheidsafstand
- Zwakke weggebruiker
- Verkeerssituaties

**Economisch rijden**

Natuurelementen

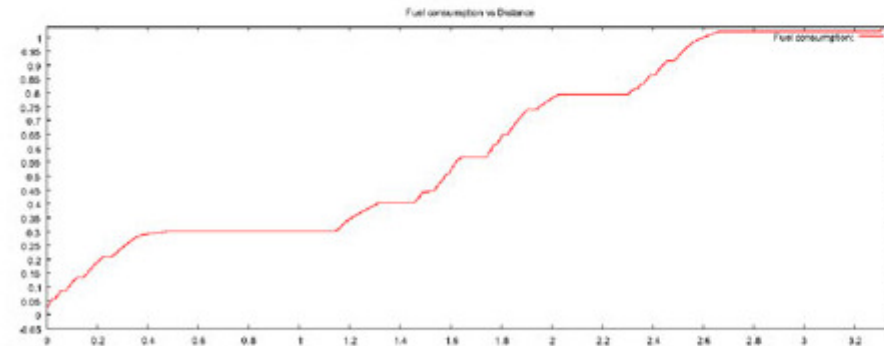
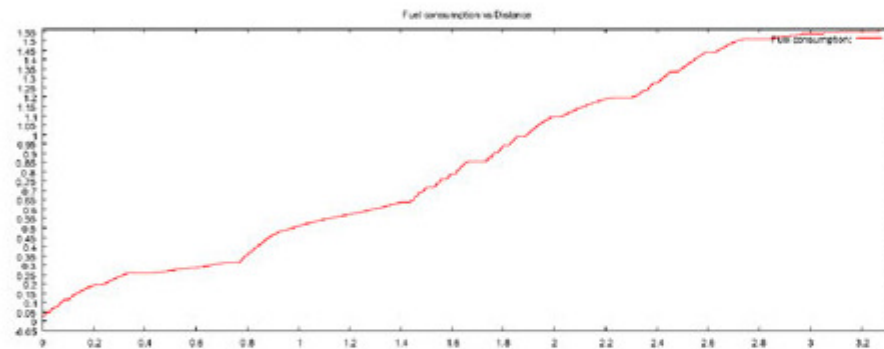
Evaluatie

**Hoofdstuk 2 - Rijgedrag - Economisch rijden 14**

*Grafiek:*  
*brandstofverbruik*

■ **Chauffeur 1:**  
**verbruik**  
**47 l/100 km -**  
**duurtijd rit:**  
**4.35 min**

■ **Chauffeur 2:**  
**verbruik**  
**33 l/100 km -**  
**duurtijd rit:**  
**4.50 min**



Hoofdstuk 2 - Rijgedrag - Economisch rijden 14





# Price Bus/Coach vs Simulator



## BUS / COACH

1 day , 1 bus/coach = 4 pax

1 pax : 90' driving

Year cost : €30.900,-

Day cost : € 206,-

Cost/pax = 90'-cost :

€ 51,50

## SIMULATOR

1 day simulator = 8 pax

33' driving (3+5+10+15)

Year cost : € 68.000,-

Day Cost : € 453,-

**Cost/pax : € 56,63**

90' cost : € 113,25

4/7 rule => 90' = 51,50' :

51,50' => € 64,80

# Experience in periodic training



90% theoretical modules : € 500,-/10 persons

- \* communication
- \* mechanics
- \* transport of students & children
- \* what to do in case of an accident

Simbus :

- ecodrive

# CONCLUSIONS



Some things can only be done on a simulator

Bus/Coach is more cost efficient

Simulator is more time efficient

Define the needs before buying

All producers can deliver almost every feature

Importance of the maintenance and update contract

Expandable software is important

Inter-Producer-Exchangeable software not available

**THANK YOU!**

2010 Driver Competence  
Seminar, Brussels,  
Belgium