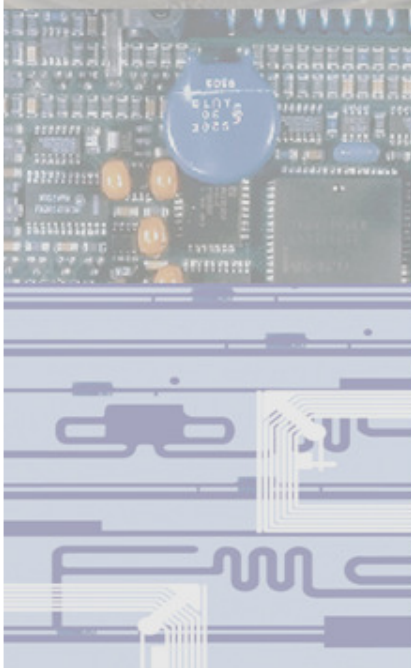# CANbus in transport

On the road to R.O.I.

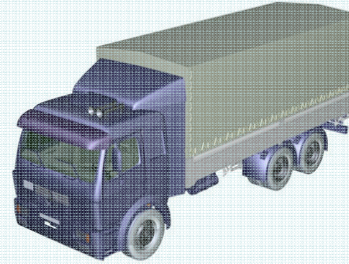T.Tjiook

October 15 2009, Prague

Squarell Technology

- Specialized in CANbus technology
- Cars, Machines, agricultural-, Industrial…

- CANbus equipment
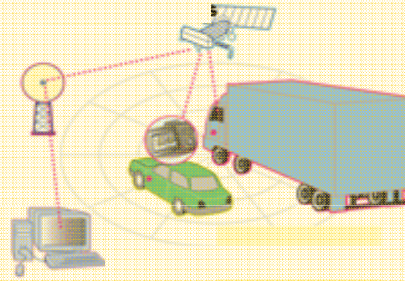- CANbus solutions
- CANbus knowledge

- Brand independent

Area's:

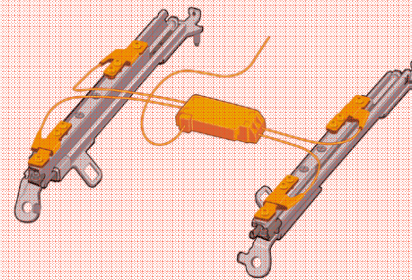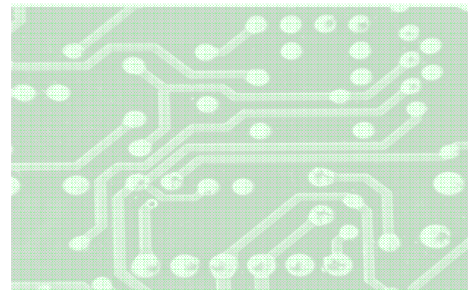|		
Solutions for Truck & Driver Performance		Transport Driver trainers Workshops
Solutions for board computing & Telematics		Telematics Fleet Management Contract & Leasing
Components for system integration		Manufacturers research Engineering
Customer specific Development		Special products

CANbus

Is a system which could bring you

Return on investment

And therefore...

Save money
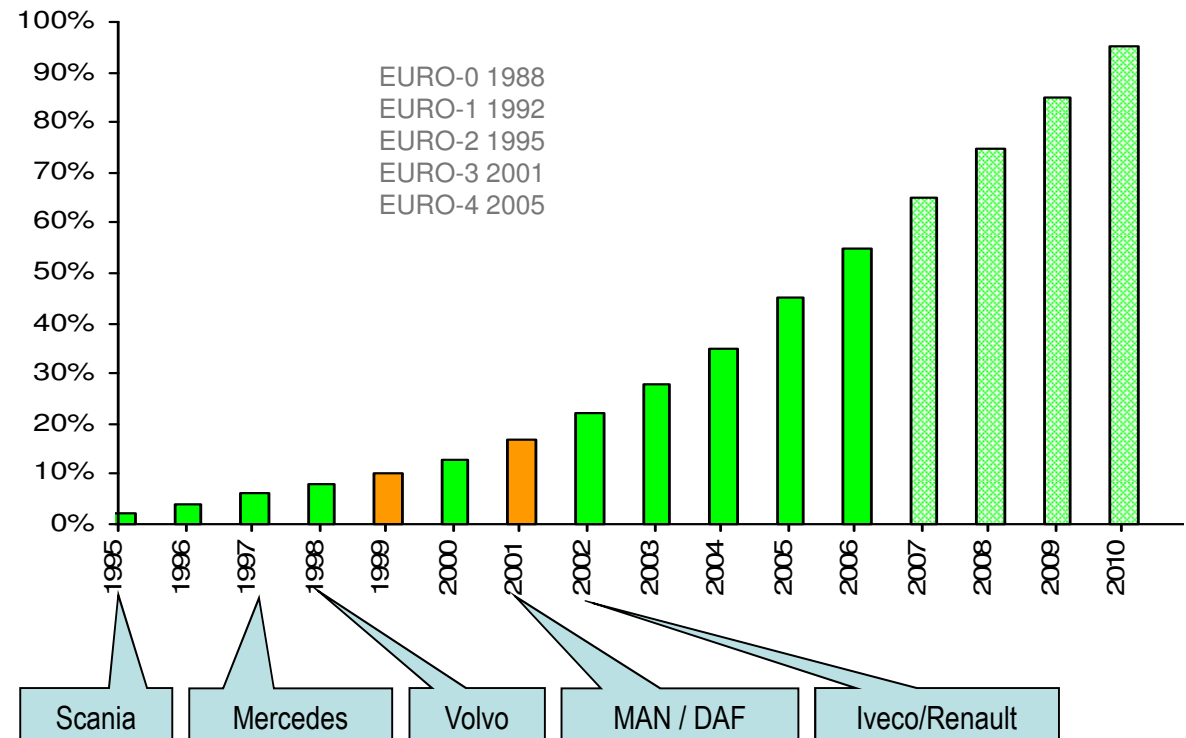
Information from

Engine management
Trailer
auxiliary …

Information

From several

specific sources

Does your vehicle have CANbus?

- Since 1995
- 2006: >50% has CANbus
- Each year +10%

EURO-0 1988
EURO-1 1992
EURO-2 1995
EURO-3 2001
EURO-4 2005

- **But** to read CANbus, you need a **FMS interface**!
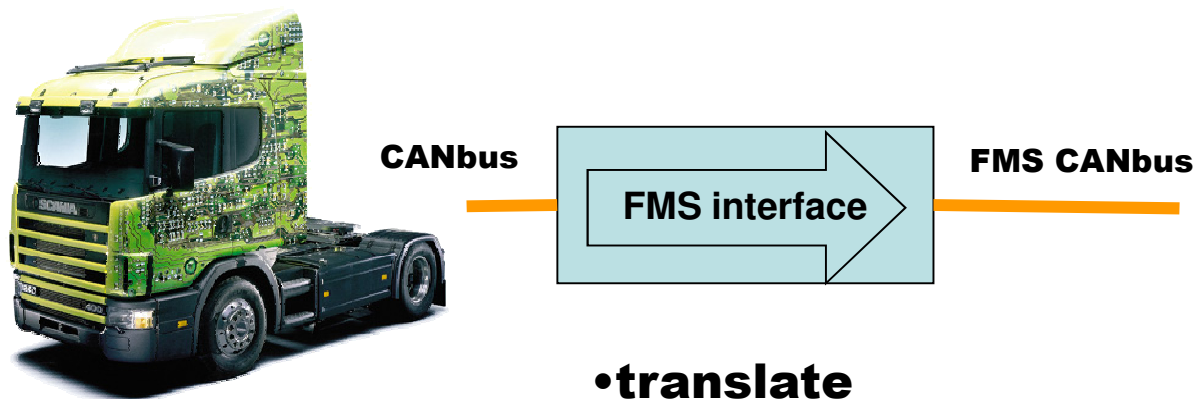
FMS interface

1999

- Scania makes CANbus available via a FMS interface

2001

- Truck manufacturers agree to one universal FMS standard

2004

- All manufacturers provide their own FMS interface

CANbus → **FMS interface** → **FMS CANbus**

- **translate**
- **secure**
- **Filter**

FMS Standard

Squarell technology

## Agreement between all Truck manufacturers:

- Brake switch
- Vehicle speed
- Cruise control status
- Clutch switch
- PTO status
- Gas pedal position
- Total fuel consumption
- Fuel level
- Engine tork
- Axle position
- Axle pressure Truck

- Total Engine hours
- Chassis number
- Software Identification number
- Mileage
- Next maintenance interval
- **Tachograph information**
- Tachograph vehicle speed
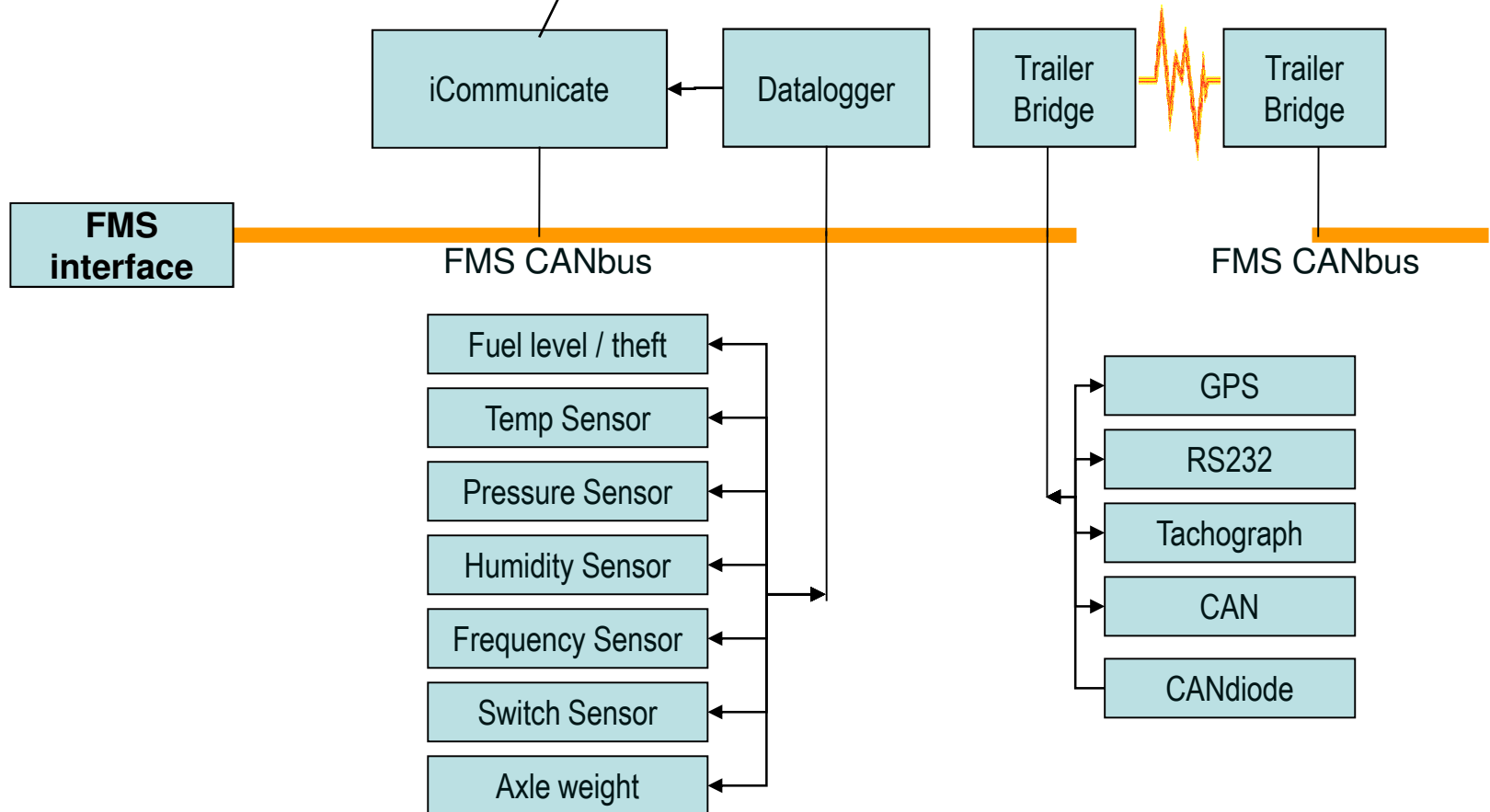- Coolant temperature engine
- FMS-standard information

FMS-Standard

FMS CANbus

Truck specific

FMS standard

your Sensors
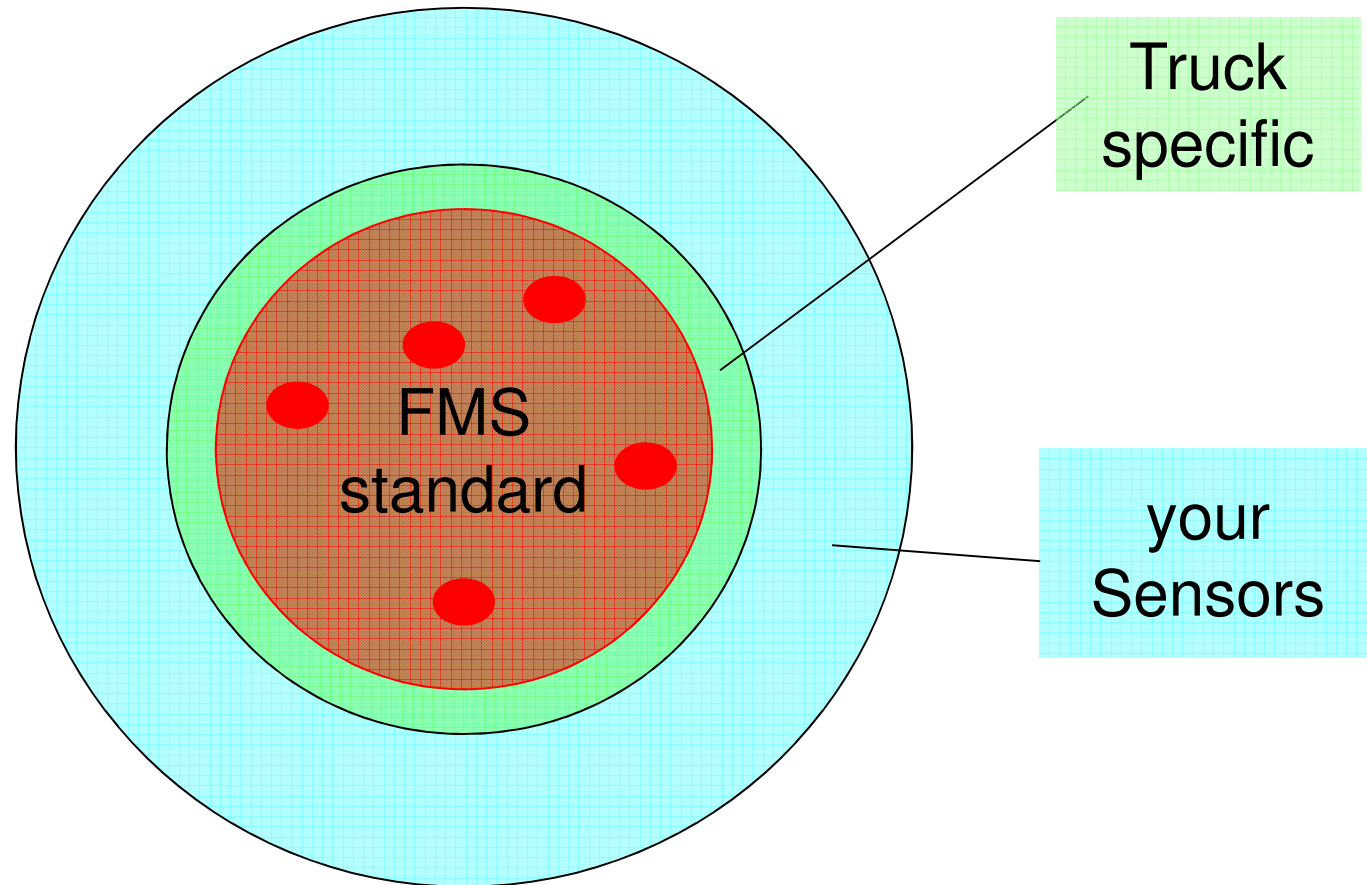
Squarell creates with the CANbus a reliable -, and complete set of data.

Possibilities FMS CANbus

Boardcomputer

iCommunicate	Datalogger

Trailer Bridge	Trailer Bridge

FMS interface

FMS CANbus

FMS CANbus

Fuel level / theft
Temp Sensor
Pressure Sensor
Humidity Sensor
Frequency Sensor
Switch Sensor
Axle weight

GPS
RS232
Tachograph
CAN
CANdiode

Squarell technology

- To use CANbus you need:
  - » A truck from the CANbus generation
  - » FMS interface
  - » System which is capable to process CANbus

But...

What can you do with the CANbus ?

Philosophy

Squarell technology

Cruise = off

Temp. 72 C

consumption l 45 l/h

Axle weight 12 T

Speed=80km/h

0010001000111101101

x100
1/min

Less fuel

Less maintenance

Higher productivity

Cost reduction

liability

Higher quality

Truck performance

Tracking

Drive style improvement

Cargo information

....

Hardware   **Data**   **Information**   **Knowledge**   **advantage**

Save fuel

- Mileage and litres

License number	Driver	Distance	Litres	Consumption
BB-SL-96	Karl H	1200 km	375	1:3,2
BB-SH-55	Josef G	2400 km	800	1:3,0
BD-VT-66	Felix R	120 km	40	1:3,0
BD- VT-89	Mark H	500 km	1804	1:2,8

» Always in retrospective
» A figure, without background
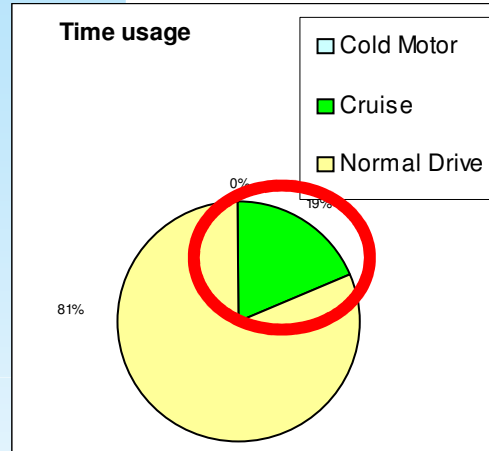» How is improvement possible?

» Measure = knowledge = control = adjustments

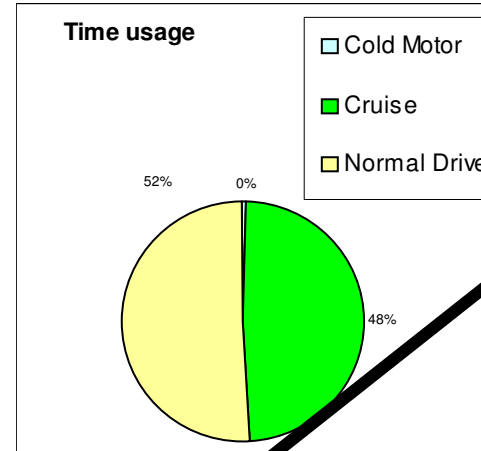# How improve behaviour to reduce fuel consumption?

- Measure consumption
- Why is consumption high/low different?

- Measure drive style
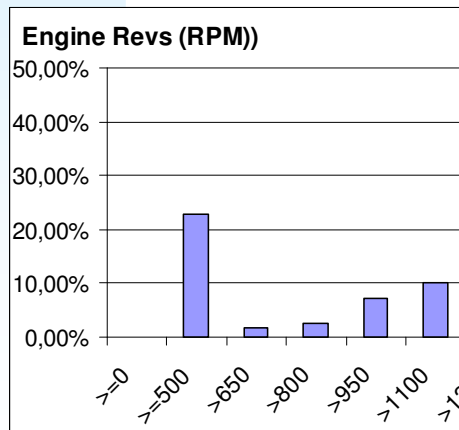- accelerate, decelerate

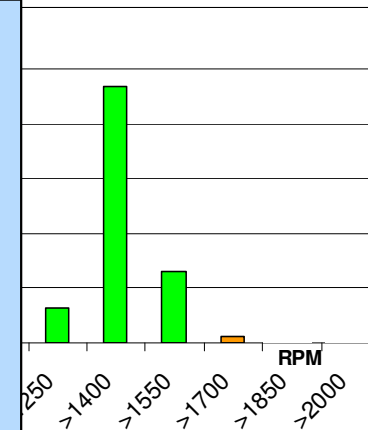- Analyze the data

- Take action

Save fuel

Squarell technology

Time usage

- Cold Motor
- Cruise
- Normal Drive

0%
19%
81%
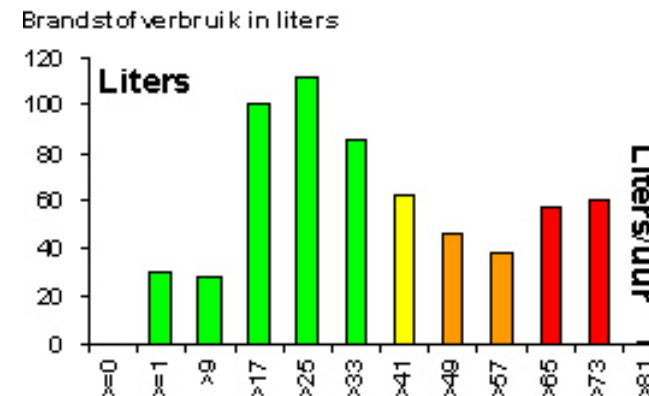
consumption 1:2,9

Brake: 302

Emerging brake applications: 6

Ave. Speed: 54

Time usage

- Cold Motor
- Cruise
- Normal Drive

52%
0%
48%

Consumption 1:3,3

Brake: 197

Emerging brake applications: 0

Ave. Speed 56

Engine Revs (RPM))

50,00%
40,00%
30,00%
20,00%
10,00%
0,00%

>=0 >=500 >650 >800 >950 >1100 >12

**Savings:
>
10%!**

250 >1400 >1550 >1700 >1850 >2000 RPM

Let's calculate

- 150.000 km/year
- 1 liter = 3 kilometer

- 50.000 liter diesel = 50.000 Euro per year
- 10% saving = **5000 Euro per year**

  - » = 1 month free diesel per year
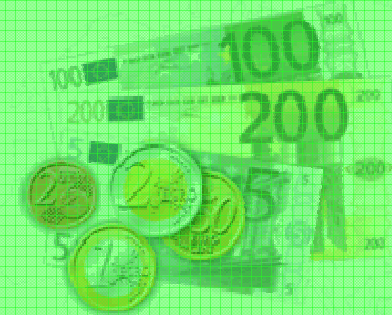 - » = 2% more profit
  - » = ROI?

Squarell technology

- 150.000 km/year
- 1 liter = 3 kilometer

- 50.000 liter diesel = 50.000 Euro per year
- 10% saving = **5000 Euro per year**

GO GREEN

- » = 1 month free diesel per year
- » = 2% more profit
- » = ROI?

Squarell technology

- For:
  - » lower fuel consumption
  - » Better driving behaviour
  - » Less wear
  - » Less maintenance
  - » More safety

But not like....
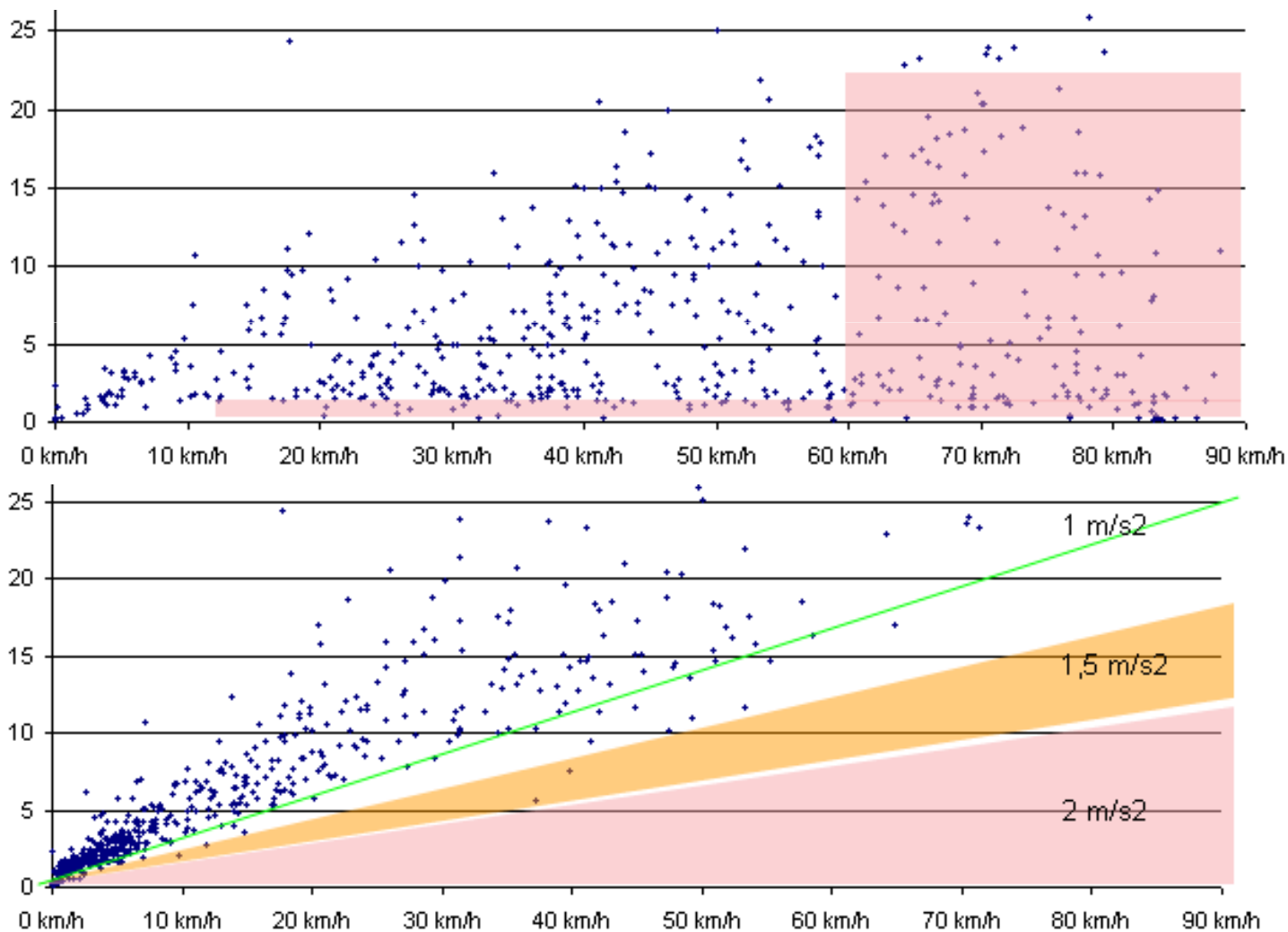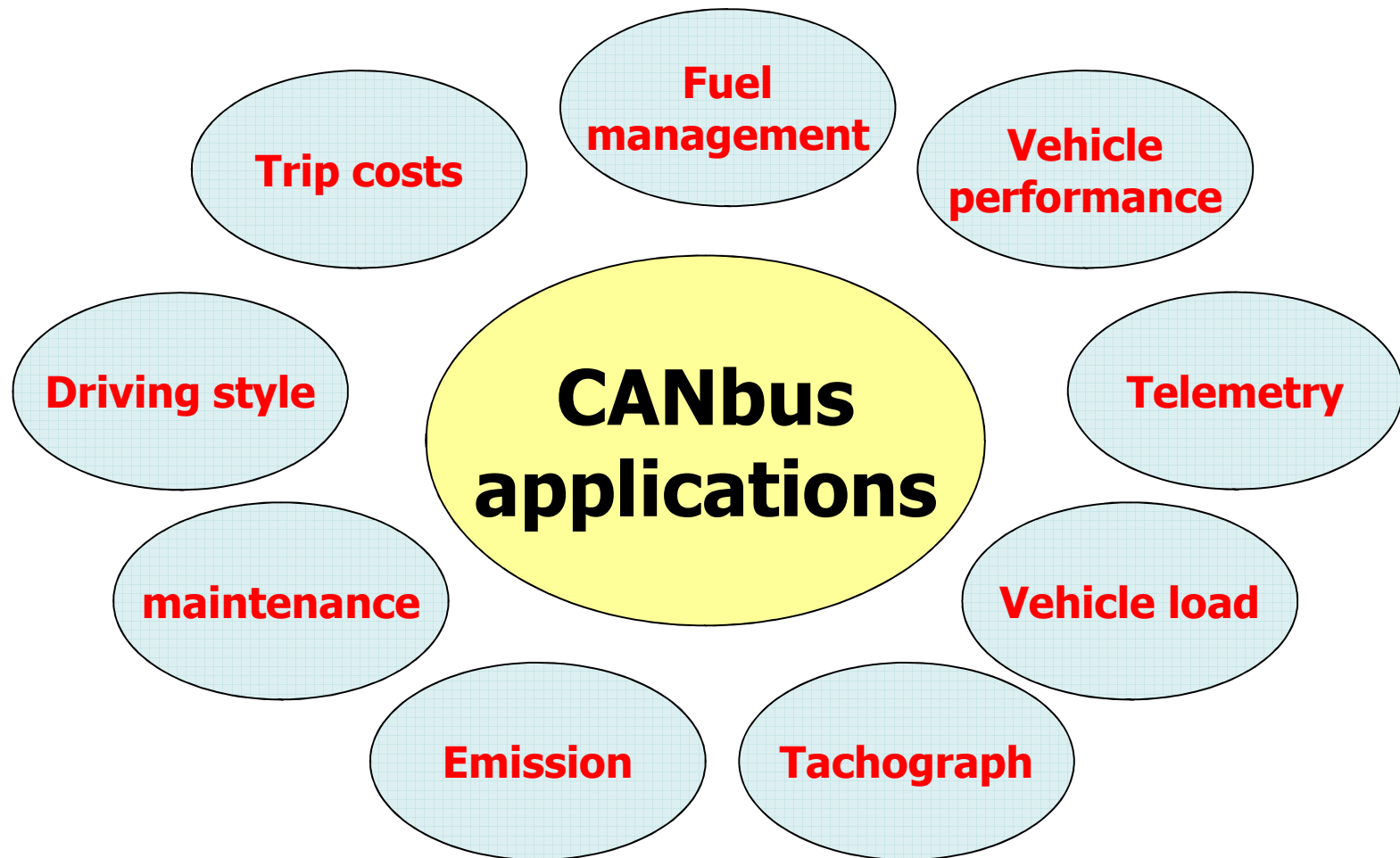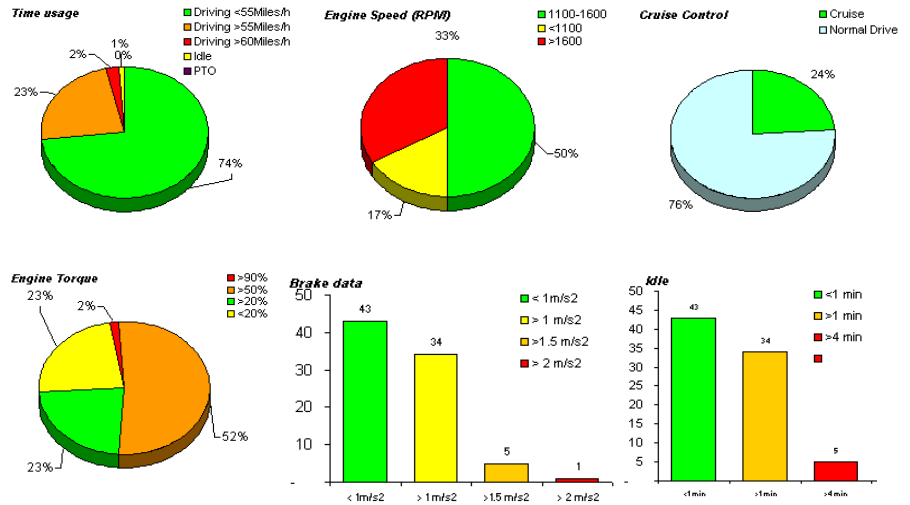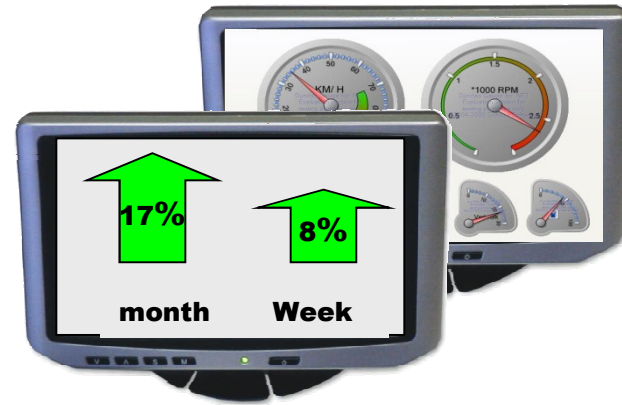
Measuring >> >>>Feedback

Another example

What to expect from the CANbus?

- Accurate data
- Objective data
- Actual data
- Control and feedback

- savings are substantial:
  - » 6-16 on fuel
  - » 10-40% on brake wear
  - » 5-10% on maintenance

Invitation

- We invite you to…

  » Strive to get the highest efficiency from your driver and your vehicle

  » Accomplish substantial and structural savings

  » Shift focus from "in control…."
    to increase the ROI within your company

Transport Emission Balance Weekreport

Company   Korindo

Country weekly average vs. last week	⭕	-5%
Fleet Week average vs. last week	⭕	2%

This week is better than last week

A positive trend in fuel consumption reductions

A downwars trend in ton km

Fuel ranking	License plate	TonKm	Km	Liters	Fuelusage this week	Fuelusage prev week		% change	Advice
	BP-LL-59	132.238	7.107	1.797	3,95	3,05	⭕	23%	
	BP-LL-14	76.249	2.842	724	3,92	3,15	⭕	20%	
	BP-LL-44	204.560	6.911	1.803	3,83	3,16	⭕	17%	
	BP-LL-69	188.171	6.627	1.796	3,69	3,20	⭕	13%	
	BP-LL-04	127.217	6.816	1.938	3,52	3,06	⭕	13%	
	BP-SL-92	113.228	5.315	1.447	3,67	3,22	⭕	12%	
	BP-LL-84	131.590	6.459	1.693	3,81	3,50	⭕	8%	
	BP-LL-09	50.714	3.426	1.035	3,31	3,05	⭕	8%	
	BP-LL-19	5.471	2.710	801	3,39	3,31	⭕	2%	
	BP-LL-34	193.467	7.380	2.384	3,10	3,06	⭕	1%	
	BP-LL-39	594	153	41	3,69	3,86	⭕	-5%	
	BP-LL-54	39.682	1.906	545	3,49	3,96	⭕	-13%	1
	BP-LL-64	5.304	1.089	357	3,05	3,61	⭕	-19%	2
	BP-LL-79	81.981	3.053	979	3,12	3,79	⭕	-22%	3
	BP-LL-24	110.835	4.211	1.333	3,16	3,94	⭕	-25%	4

average improvement = **2%**

Advice

1.   Use more cruise
2.   Brake less and softer
3.   Hi fuel usage caused by hi load
4.   Not enough data available

Compare
Compare previous week
Conclusion
Load
Trend
Signaling
Advice

Transport Emission Balance

Company	Korindo
Vehicle/Object	BP-SL-92
Brand	Scania
Type	R400
Class	Euro 4
Operation type	Flowers

Energy Analysis

Last vs this year	⬆	3%
Transportclass	⬆	2%
Transporteffectivit	⬆	11%

Year		2008	2007	2008	2008	2008	2008
				Fleet avg	Brand/type avg	Transport class	Fleet total
Kilometers	⬆	152.011	140.655	142.000	104.000	143.067	4.260.000
Fuel	⬇	46.864	41.862	42.262	30.321	44.431	1.267.857
Ton Kilometers	⬆	3.496.253	3.894.410	2.698.000	2.496.000	3.290.541	80.940.000
Fuel consumption	⬆	3,30	3,36	3,36	3,43	3,22	101
CO2 (Ton)	⬇	27.638	25.117	25.357	18.192	26.658	760.714
NOx (Ton)	⬇	276	251	254	182	267	7.607
HC (Ton)	⬇	147	134	135	97	142	4.057
CO (Ton)	⬇	2.194	1.993	2.012	1.444	2.116	60.374
Driving style indicator	⬆	7,12	5,44	7,22	6,12	6,80	7,22

Effectivity per tonkm

Energy	⬆	131,752	135,281	156,642	121,477	135,026
CO2 (kg)	⬆	79,051	81,169	93,985	72,886	81,015
NOx (kg)	⬆	0,791	0,812	0,940	0,729	0,810
HC (kg)	⬆	0,422	0,433	0,501	0,389	0,432
CO (kg)	⬆	6,274	6,442	7,459	5,785	6,430

Advice:	Importance
Anticipated driving	50%
Idle	30%
Harsh barking	20%
400->380 PK	10%
Cruise	2%

Compare last year

Compare branche/class

Improvements CO2 per ton/km

**Km Fuel consumption Load**

Trend

Driving style indicator

Emission per ton/km

Advice

Tachograph data

- **1318 Tachograph (electronic)**
  - » no CANbus, no Driver ID
  - » no drive time overwriting signal

- **1324 Tachograph (electronic)**
  - » with CANbus, no Driver ID
  - » no drive time overwriting signal

- **1381 Tachograph (digital)**
  - » with CANbus, Driver ID = ?
  - » With drive time overwriting signal

Digital Tachograph
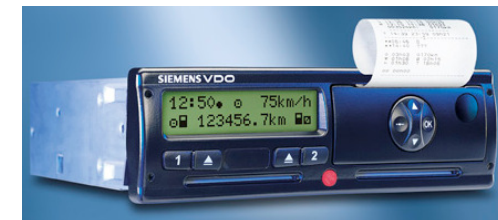
- Actual data via CANbus
  - » Speed
  - » Mileage
  - » Work status (work buttons)
  - » drive time overwriting signal
  - » Tacho operation

- No historic download

- In some cases no Driver ID
  - » Ask your truck supplier!