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Driving Behaviour based models



5^o, November 2013

octotelematics.com

Agenda

■ Driving behaviour and scoring

■ Ecoprograms

Estimations of vehicle pollutants

Eco driving



More data availability = More flexibility on tariffs

Traditional risk pricing model



- Age
- Sex
- Driving years
- Declared usage
- Declared Km
- Garage
- Claims

Categorizing customers in **few segments**, based on static parameters like sex, age, location, due to **limited data availability**

Imposing inadequate pricing on some policyholder

New possible pricing model



- # driving hours
- time
- Km and location
- Speed/ limit control
- Car maintenance
- Car parking
- Weather conditions

Categorizing customers in detailed segments based on new parameters like speed, sprinting, etc...

Proposing customized tariffs to customer by opening new areas of business

Usage Based Insurance pricing models

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A new perspective for marketing approach



- Pay as you drive: mileage collection and time of driving/stops .

- Pay how you drive: driving style and behavior is considered as predictor of the “ unsafe driving“ because the “dangerous maneuvers” increase the likelihood of accident

- Provide constructive feedbacks to drivers helps potentially improving driving habits. The teen and elderly markets are niche markets that are early adopters of this model.



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Custom Behaviour Based Feedback

By properly applying driving data an insurer can positively differentiate itself in a broader and more sophisticated market and provide:

- Constructive feedback on driver's performance compared against peer groups
- Identify dangerous driving habits and educate drivers on how to significantly reduce their risk by making small changes to their driving behavior
- Provide behavior-changing incentives (i.e. credit against future policies if the driver will not drive on Friday or Saturday nights, safe driver bonus at the end of each month, customer contests, qualified drawings, etc.)

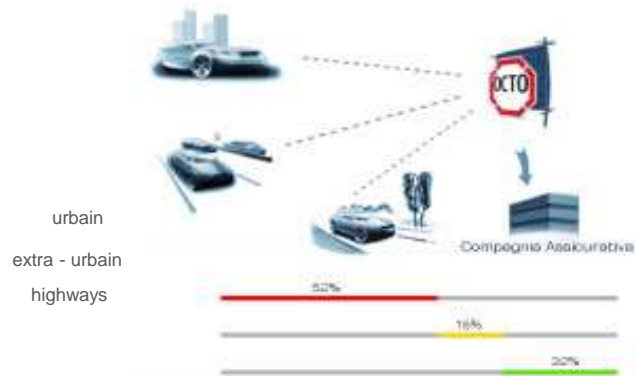




OCTO ARCHITECTURE FOR MODELLING DRIVING BEHAVIOURS

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First view of profiling: Usage based statistics



WHERE

time/mileage driven on road types/areas (e.g., urban areas vs. Motorways)

WHEN

time/mileage driven on days of the week/hours of the day

DURATION

The driving time without a stop.

HOW LONG

Uninterrupte driving time or Km run

SPEED

Average speed on road type.

Where

when

duration

KM run

Av. speed

Summary			
Customer Vehicle registration number	Brand/Model	RENAULT MEGANE SCENIC	
FROM:	25/10/2012	TO:	06/03/2013
		Total Days:	131
Overall time running:	1dd, 23hh, 51min (1.5%)	Overall time parked:	129dd, 19hh, 29min (98.5%)
Accidents:	0		

Summary Miles / Km travelled Weekdays Driving Behaviour

Weekdays			
Customer Vehicle registration number	Brand/Model	RENAULT MEGANE SCENIC	
FROM:	25/10/2012	TO:	06/03/2013
		Total Days:	131

Percentage analysis for weekdays		
	Route:	Overall time parked:
Monday:	4.4%	14.4%
Tuesday:	10.4%	14.4%
Wednesday:	1.5%	14.5%
Thursday:	2.2%	14.4%
Friday:	2.5%	14.5%
Saturday:	43.3%	13.9%
Sunday:	35.7%	14%

Summary Miles / Km travelled Weekdays Driving Behaviour

Miles / Km travelled			
Customer Vehicle registration number	Brand/Model	RENAULT MEGANE SCENIC	
FROM:	25/10/2012	TO:	06/03/2013
		Total Days:	131
Start Km:103880			
Total distance travelled KM : 2757			
Estimated total Km:106637			
Daytime: 96,11%		Night: 3,89%	

City areas:	31,2%
Countryside:	49,66%
Motorway:	19,12%

Summary Miles / Km travelled Weekdays Driving Behaviour

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A more dynamic picture of driving style

Events are provided as overall statistics since the activation of the OBU

The number of events is normalized every 100 Km driven;

Events

Harsh brake

Hard Accel.

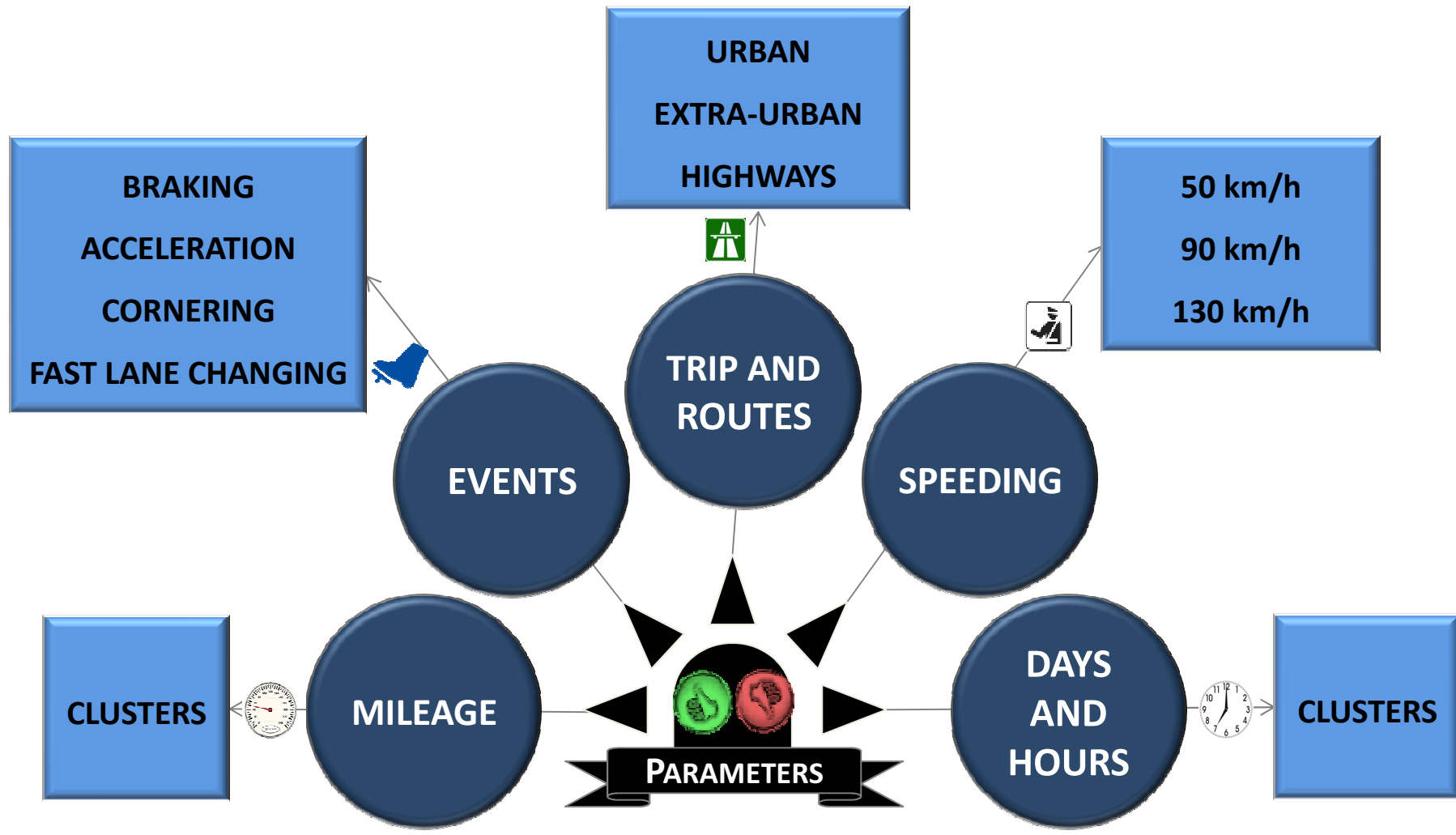
Cornering

F. line change

Speeding

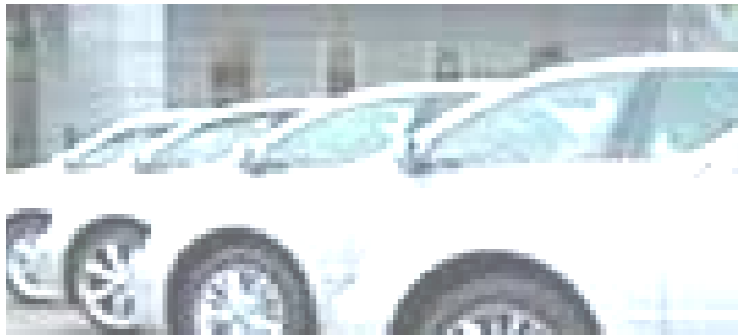


Octo Model: the parameters



Customer Behaviour Score – catch your view!

■ The “Scoring” service is defined as an additional algorithm that determines a score for each user based on “Driving behaviour” parameters reported.

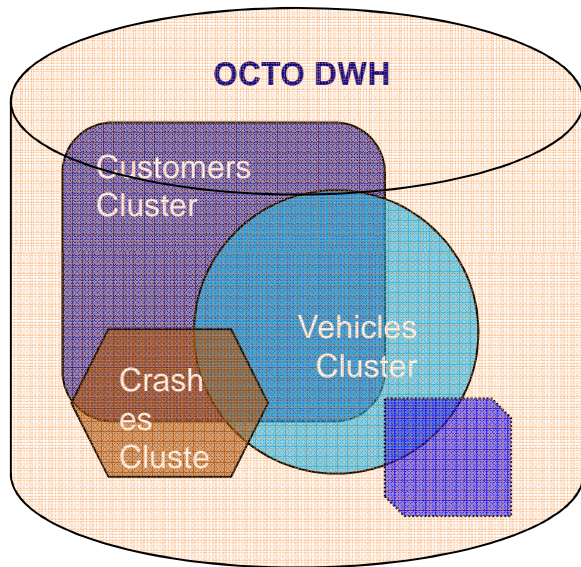


Goal

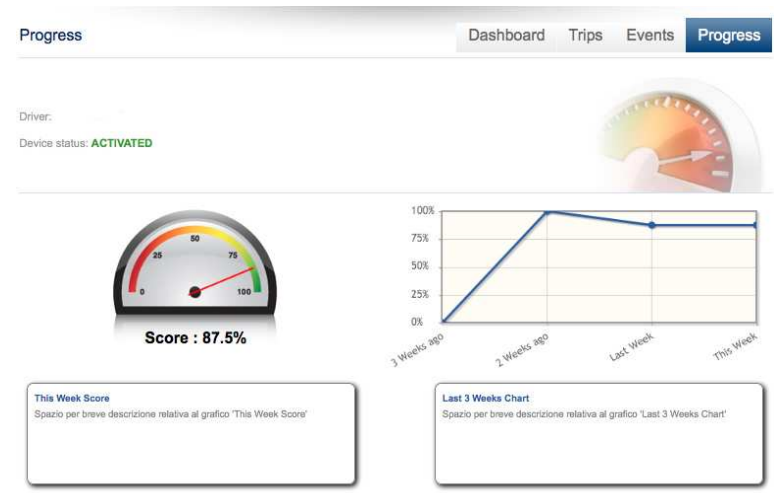
- **Customer Selection**
- **Innovative risk assessment parameters,** based on actual driving behavior characteristics for **tariff modification**
- **Effective predictive model to assess right tariff**



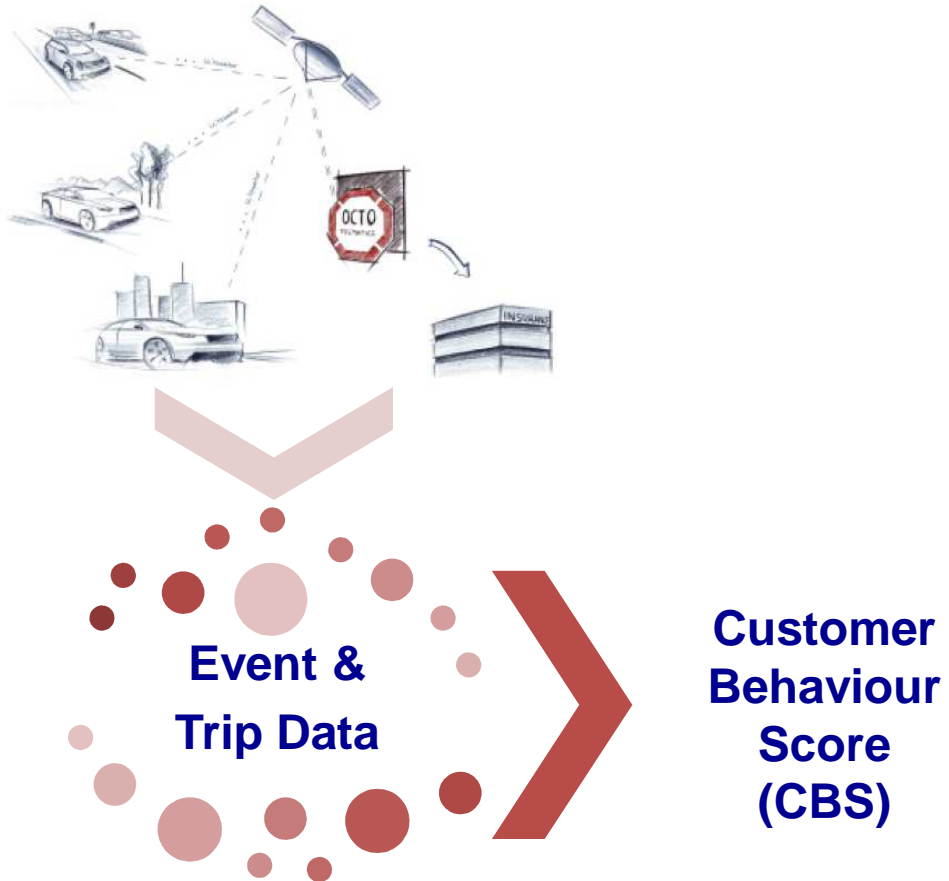
Customer Behaviour Score



RANKING



Customer Behaviour Score: CBS, PPS



“Scoring” is a model to provide feedbacks

Scoring Model

A
B
O
L
U
T
E



The score of the driver depends only on the driving behaviour of the driver himself/herself on a predefined scale.

R
E
L
A
T
I
V
E



The score of the driver depends on the driving behaviour of the driver himself/herself with respect to the driving behaviour of the whole population of drivers being considered

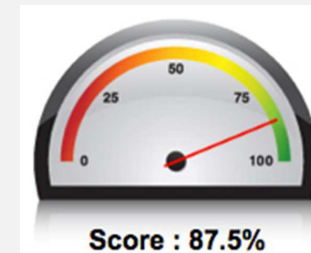
Data presentation: make it easy



The *discrete* presentation shows the category of the driver defined on *scoring thresholds*



The *continuous* presentation provides the actual value of the score on a continuous scale.



Example of Customer data layout - Trips & Events

Weekly Summary

- ▶ WEEK September 12-18, 2011 33 trips, 142.8 miles, 6.1 hours, 35 events
- ▶ WEEK September 5-11, 2011 22 trips, 110.2 miles, 4 hours, 15 events
- ▶ WEEK August 29-September 4, 2011 44 trips, 168.2 miles, 8.9 hours, 35 events
- ▶ WEEK August 22-28, 2011 34 trips, 139.9 miles, 5.7 hours, 23 events
- ▶ WEEK August 15-21, 2011 2 trips, 6.6 miles, 0.3 hours, 0 events
- ▶ WEEK August 8-14, 2011 27 trips, 92.2 miles, 4.8 hours, 14 events
- ▶ WEEK August 1-7, 2011 3 trips, 76.9 miles, 2.7 hours, 7 events

Journey Summary

Description	Date & Time	Duration	Summary
▶ Trip 1	08/02/11, 12:40 PM	1.1 hours	41.5 miles
● Braking	08/02/11, 1:02 PM	1.0 second	21 to 12 mph
● Speeding	08/02/11, 1:05 PM	5.0 seconds	Max. speed = 75.8 mph
● Speeding	08/02/11, 1:10 PM	1.8 minutes	Max. speed = 83.3 mph
● Braking	08/02/11, 1:21 PM	1.0 second	14 to 7 mph
● Braking	08/02/11, 1:47 PM	1.0 second	33 to 25 mph
▶ Trip 2	08/02/11, 3:43 PM	1.2 hours	33.6 miles
▶ Trip 3	08/04/11, 4:25 PM	25.4 minutes	1.8 miles

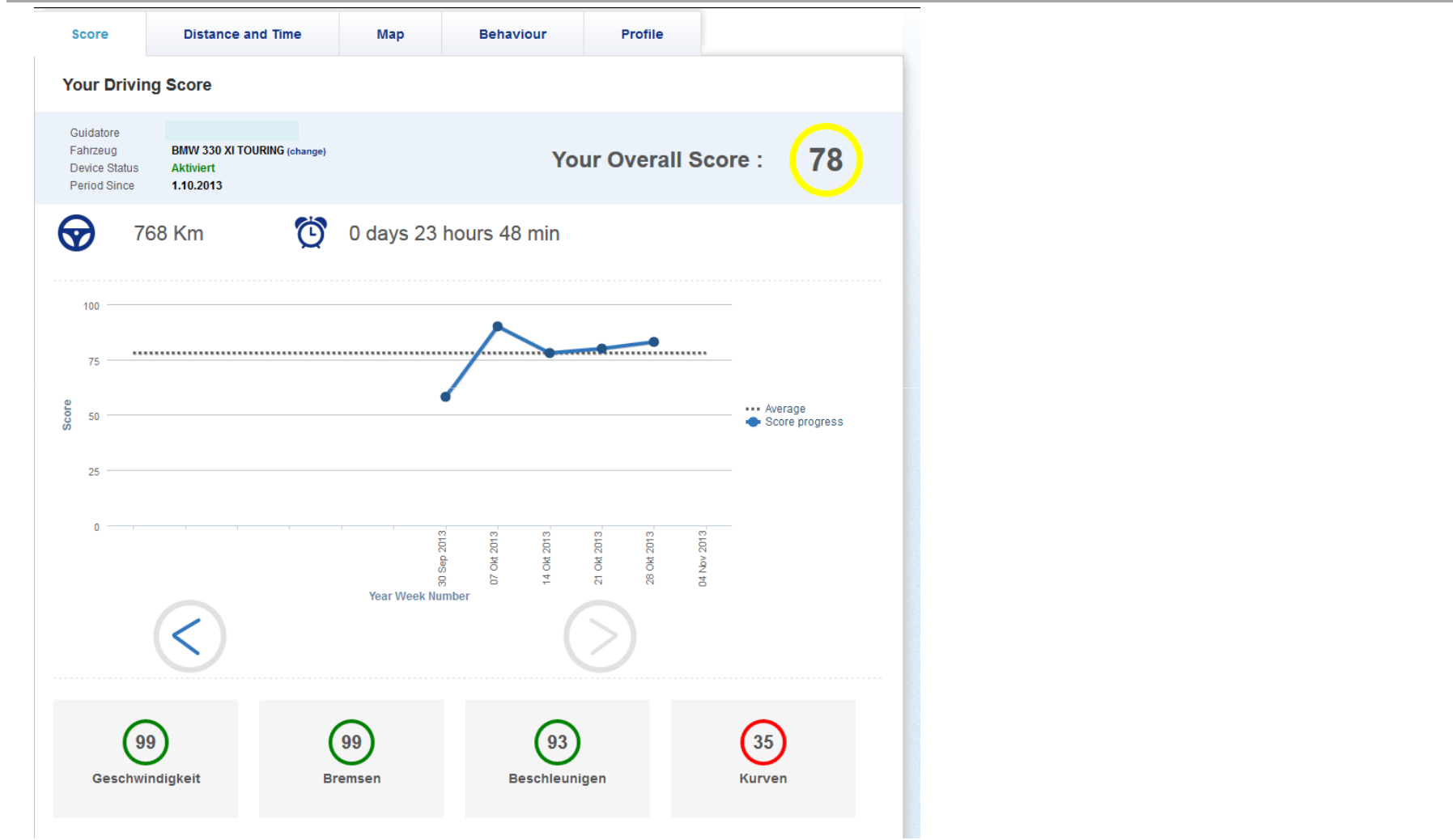
Events

Additional trips

Events

Journey

Example of Customer data layout - Scoring

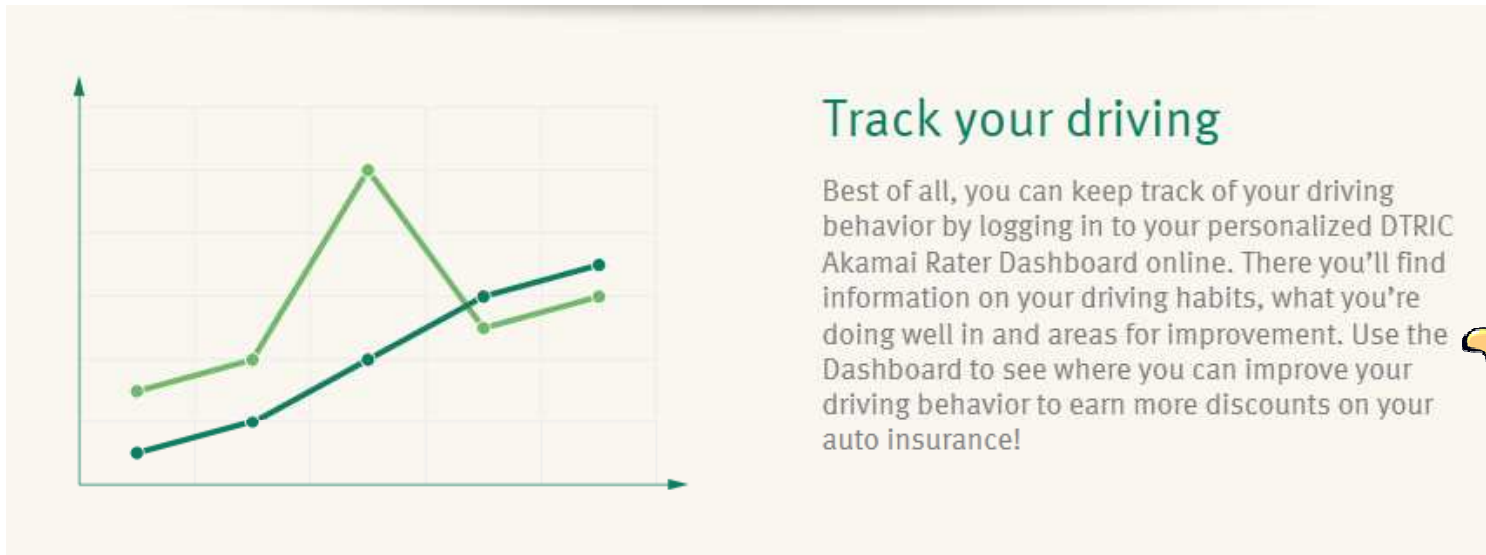




REFERENCE PROJECTS

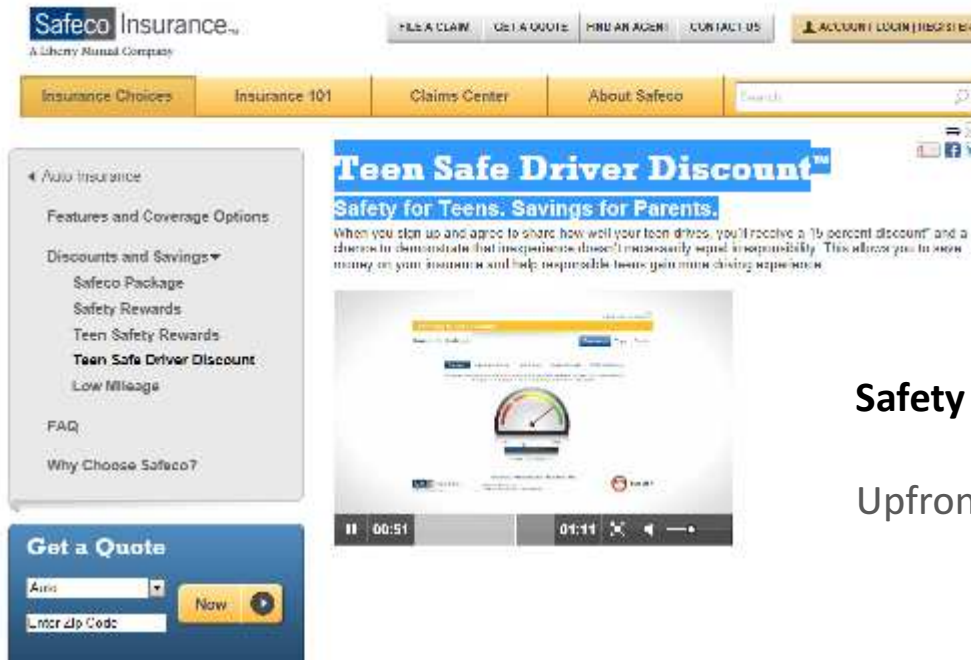
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DTRIC's Akamai Rater Program



- Target: all
- Initial signup discount of 20%. After 90 days, the customer's driving data is assessed which could result in a discount of up to 40%
- <http://www.youtube.com/watch?v=g1vvKN1Zdoc&NR=1&feature=endscreen>
- <http://www.youtube.com/watch?v=0Y0eU64NvCA&feature=related>

Teen Safe Driver Discount™



Safety for Teens. Savings for Parents.

Upfront discount up to 15%; **Target: 17-25 & parents**

■ When you sign up and agree to share how well your teen drives, you'll receive a 15 percent discount and a chance to demonstrate that inexperience doesn't necessarily equal irresponsibility. This allows you to save money on your insurance and help responsible teens gain more driving experience.

■ <http://www.safeco.com/auto-insurance/discounts/teen-safe-driver-discount>

Rewind program

Redo. Recover. **Rewind**[®]

"Uh-oh."

If you're normally a good driver, why should your insurance company treat you like a repeat offender? Get a second chance with Rewind.

ABOUT REWIND **HOW IT WORKS** **HOW TO ENROLL** **FEEDBACK | CONTACT**

Tickets and accidents don't just happen to bad drivers. Most insurance companies will charge you more after a driving setback, but we think responsible drivers deserve a second chance to prove they don't deserve higher rates. That's why we created Rewind, a program that forgives tickets and accidents for drivers who are willing to share how they drive with us.

Most accident forgiveness programs apply to future driving setbacks and may charge you for forgiveness or require several years of claims-free history before you become eligible. Rewind offers several key advantages over these other programs:

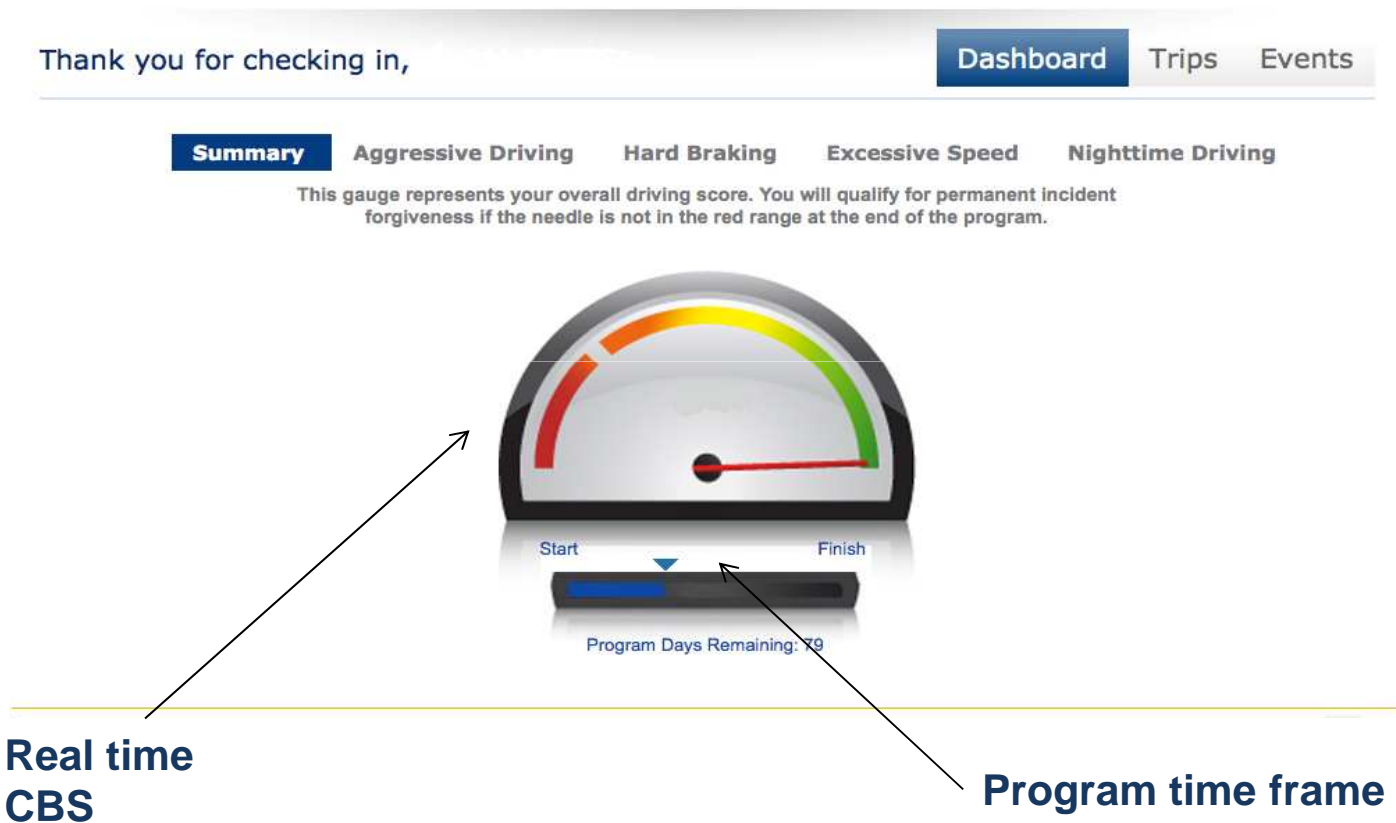
- **Immediate** forgiveness.
- Applies to **existing** speeding tickets, minor violations, or at-fault accidents.
- **No** extra charges or hidden fees.

Target: the whole portfolio
Goal: post crash monitoring to protect NCB (No Claim Bonus);

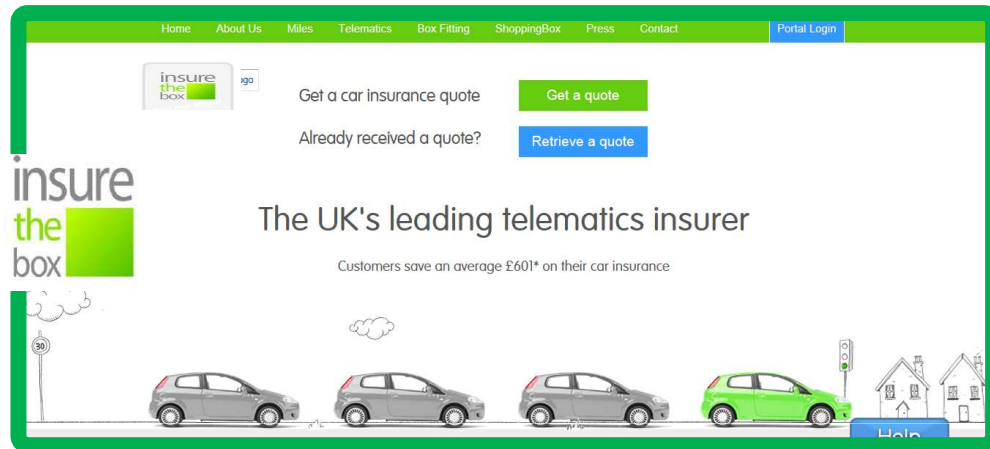
■ The Rewind device helps you prove that you are a responsible driver by collecting information on how well you drive. You can access your driving data and monitor your progress online via a secure website.

Rewind program

Example of Rewind Data Layout



Insure the box : is the First telematics-only insurance in the world!



Customer propositions:

Pay per mile' mainstream approach

6k and 8k miles products; Drive Like a Girl

Immediate discount plus reward programme

Crash management and theft tracker

Young drivers in the ITB view education rather than penalties innovative ways to encourage good driving, including extra miles as a reward for responsible motoring

Key Facts:

- Launched in June 2010
- Sold 120,000 policies
- >6,500 new customers pm
- >75% of new telematics UK motor insurance policies

Insure the box

Claims Forum London 2013

Mike Brockman (Insure the Box CEO) declared the use of telematics to encourage better driving had reduced young driver accidents by as much 40%

Insure the Box claims telematics cut young driver accidents by 40%

The use of telematics to encourage better driving had reduced young driver accidents by as much 40%, according to Insure the Box after an analysis of more than 300 million miles of driving data.



Insure the Box claims that its research takes into account the likelihood that people who buy telematics policies are more careful drivers in the first place, as well as the improvement that takes place naturally as young motorists learn from experience.

After taking these factors into account, Insure the Box analysts worked out that the incentives for better driving provided by telematics account for a 35% - 40% reduction in the likelihood of a young motorist being involved in an accident for which they are at least partly responsible.

The company's data shows a greatly reduced likelihood of causing an accident between the first month after customers buy their policies and the final month of their

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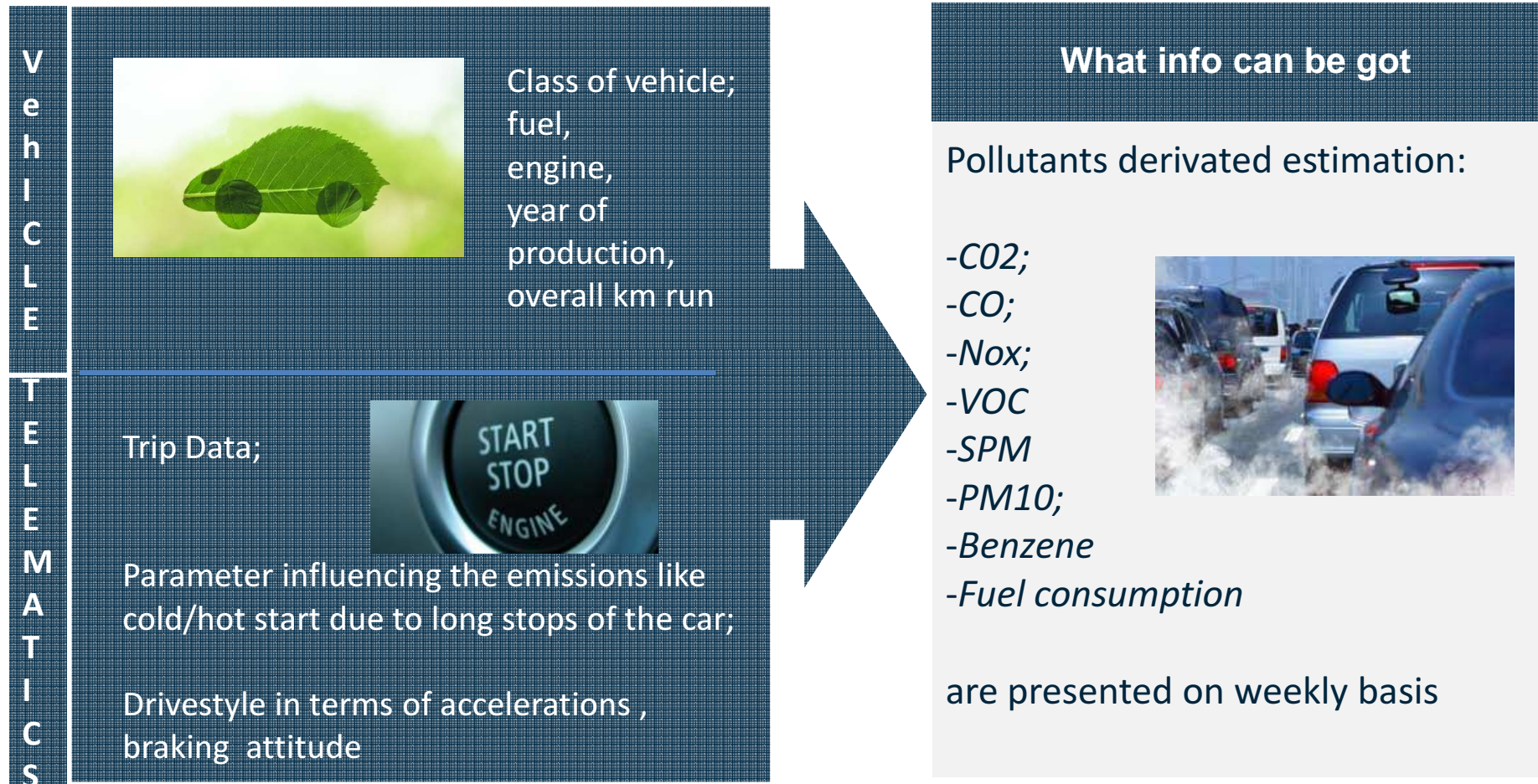
ECO PROGRAM

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OCTO Model for the emissions estimation

- Octo algorithm for the emissions estimation is based on a well know European model, world wide considered as a reference for vehicle pollutants estimation, known as COPERT (COmputer Programme to calculate Emissions from Road Traffic).
- This model defines the relations between the pollutants issued from motor and the parameters influencing more related to the class of vehicle.
- To improve the estimation, mainly for the CO2 emission and the for the fuel consumption, the model implemented by Octo takes into account some additional parameters depending on the kinematics of the vehicle and of the drive style

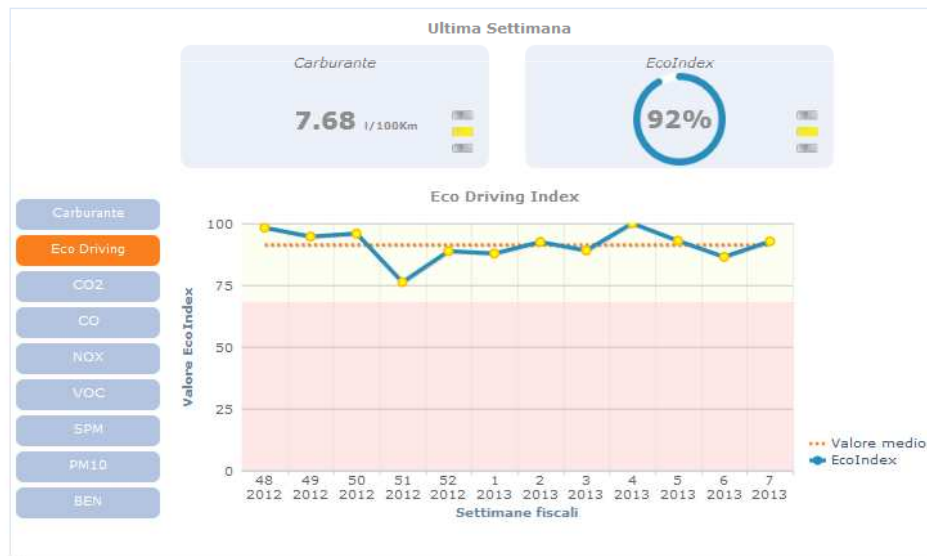
How it works



Eco scoring – Green has a marketing appeal



Consumi ed Emissioni



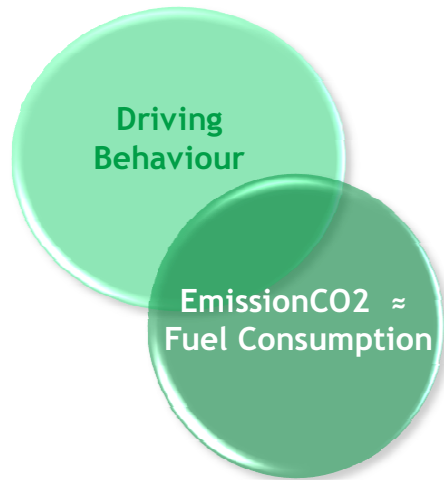
Goal

- Green concepts create a positive sentiment
- Green driving is by definition a “safe” style
- Reduced CO2 impact on environment also allows to save money on fuel consumption
- It can be included in the global score calculation



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Ecoindex



The **Ecoindex** is a synthetic index, used as a parameter to classify the driving behaviour

$$\text{EcoIndex} = \frac{\text{Minimum ideal consumption}}{\text{Measured consumption}}$$

The **Ecoindex** is a score that indicates the percentage of fuel that would be spared



ECO DRIVING...



ECO DRIVING

The ECO DRIVING rules, allow to reduce the fuel consumption up to 10 %

ECO Driving style:

- ❖ Feedback on customer behaviour
- ❖ Tips on how reduce fuel consumption

