Telematics

MyDrive 2012

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What does MyDrive Solutions do?

To enable the insurer to assess the actual risk presented by an individual driver, based on driving behaviour and driving patterns within the road context; and price that risk accordingly

What makes MyDrive different?

We understand and make simple the complex science of driver behaviour

- Driving capability is a complex mix of cognitive and individual personality elements as well as skill and competence
- MyDrive combines the expertise from three different disciplines and organisations resulting in the development of our profiling engine
- MyDrive delivers calibrated, contextualised outputs which add real value

What is Black-Box technology?

- Also known as telematics and telemetrics
- Phrase comes from aircraft data recorder and shares similar technology
- Not always considered as a positive in the consumer context
- Installed in road vehicles for fleet management for over 20 years
- Costs are coming down so new markets are opening
- The box simply captures location, speed data and the acceleration forces on the vehicle.
- Some solutions simply record the data in the car, some send the data to a service provider for analysis.
- There are many different types of telematics unit, each with advantages…
  - Professionally installed
  - Windscreen mounted with camera – self-install
  - OBDII “dongle” connected into the vehicle diagnostic port – self install
  - Smartphone app…

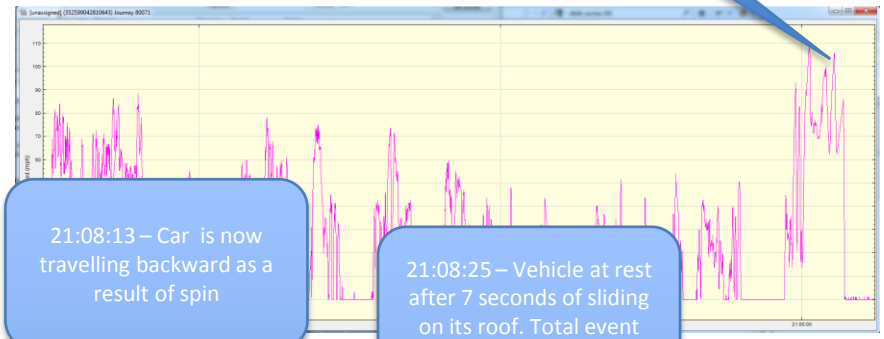
What is telematics used for?

- In the fleet management markets:
  - Tracking of assets
  - Routing efficiency
  - Vehicle idling times
  - Basic driver behavior
  - Stolen vehicle
  - Driver / loan worker safety
  - Fuel efficiency management
- In the consumer markets:
  - Stolen vehicle
  - Assistance services
  - Local search
- Insurance is a new market for telematics…
  - Crash notification (FNOL)
  - Crash data analysis
  - Driver behavior profiling
  - Anti fraud
  - Driver feedback to help encourage safer driving

Telematics Crash Data Analysis

Scenario - How did Robert Smith age 19 crash? Robert blames mechanical failure. His three young passengers survive!

How fast? – speed time plot



CONTEXT
21:08:09 Car is travelling at 110mph

21:08:13 – Car is now travelling backward as a result of spin

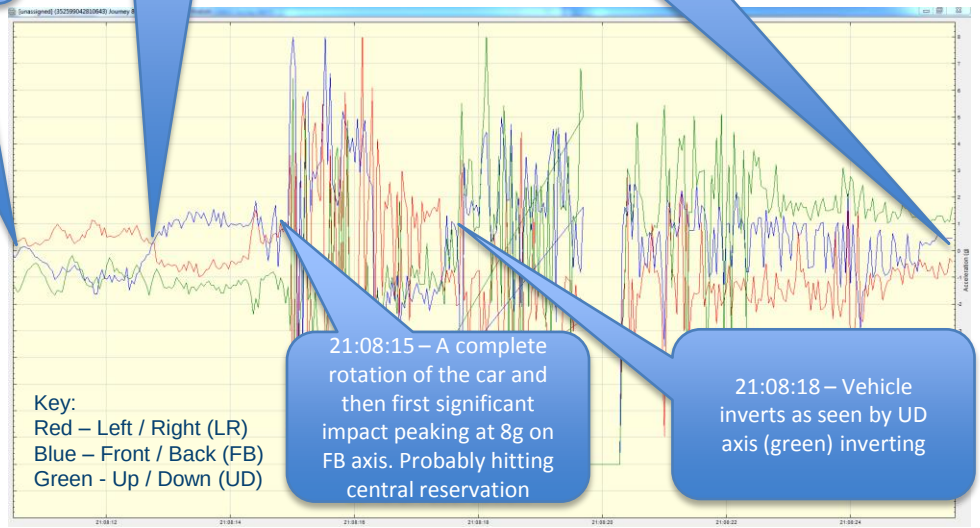
21:08:25 – Vehicle at rest after 7 seconds of sliding on its roof. Total event lasted 15 seconds.

Where and when?

Heading SE on the E20 near Bunratty West, Ireland. Sweeping corner. Time of impact event 21:08:15 (FNOL event triggered)

21:08:10 – Car starts to spin horizontally because FB and LR accelertomer axis swap.

The detail – accelerometer plot



Key:
Red – Left / Right (LR)
Blue – Front / Back (FB)
Green - Up / Down (UD)

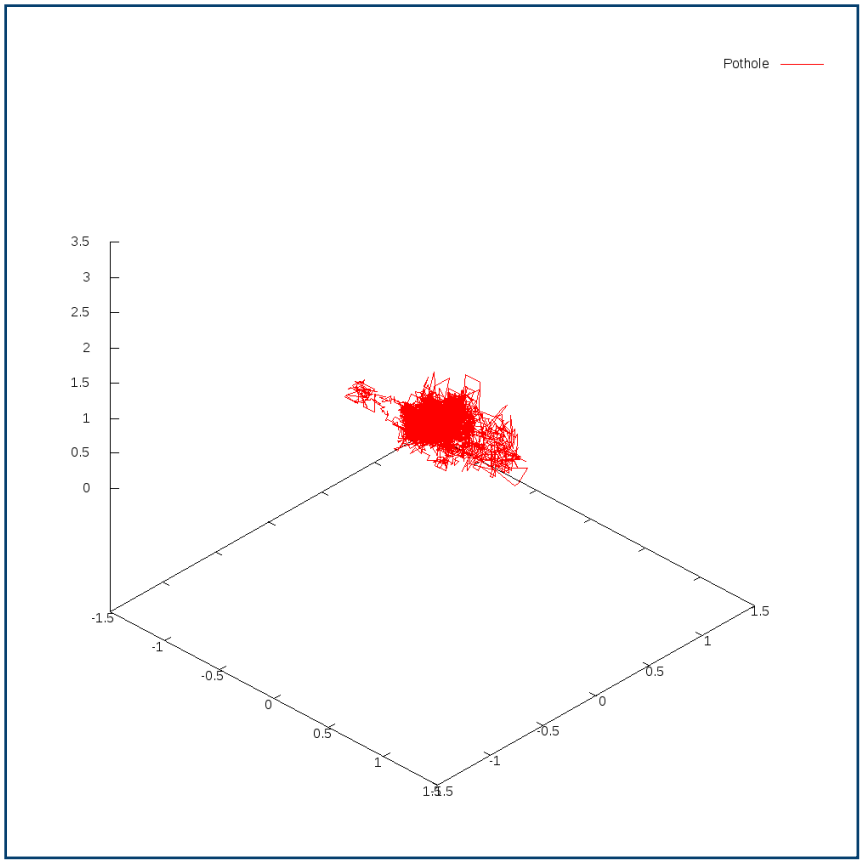
21:08:15 – A complete rotation of the car and then first significant impact peaking at 8g on FB axis. Probably hitting central reservation

21:08:18 – Vehicle inverts as seen by UD axis (green) inverting

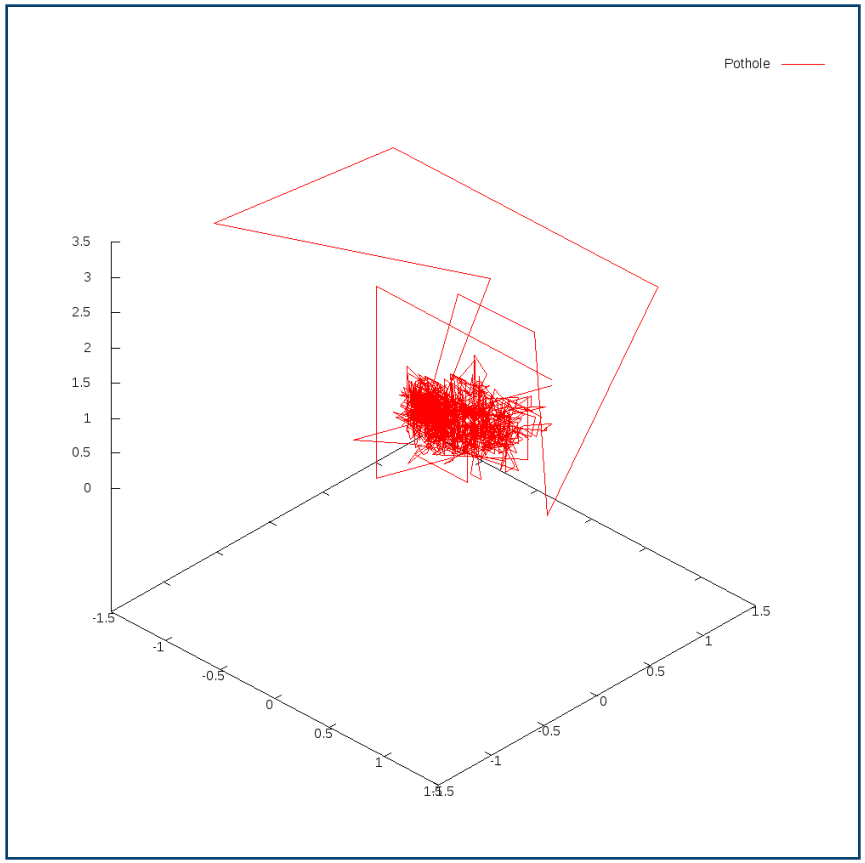
Data replay…

Crash and bump - automated classification

Using 3 axis accelerometer, record 30s rolling buffer, identify important events, compress data, upload, then classify event on server. Archive for claims management. Link to MyDrive replay.

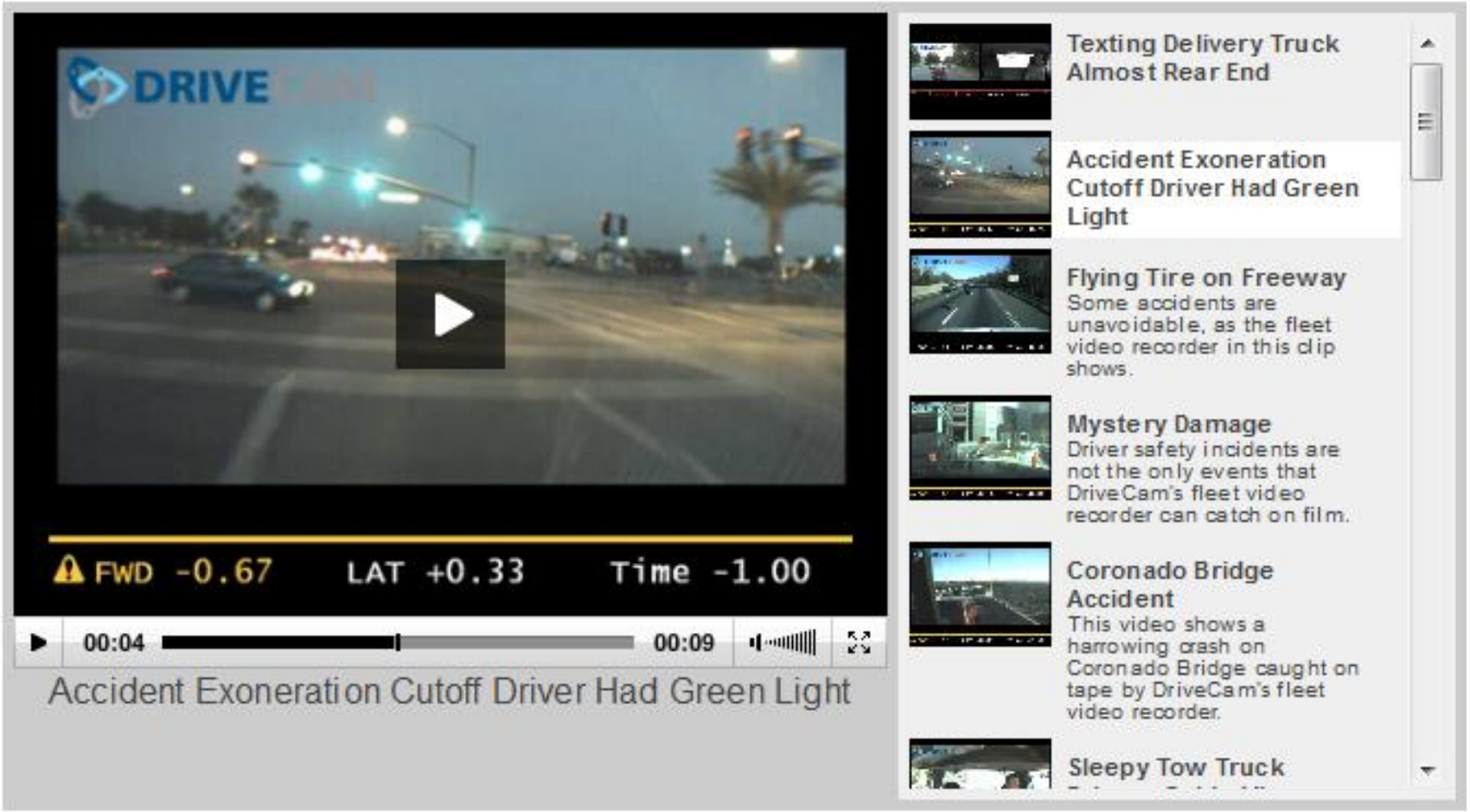


Normal driving



Pothole strike

Camera supported telematics (©DriveCam)



- In the future, camera based solutions will include lane departure and headway measurements

What are the components of accident risk?

- **Driving Style**

  Combination of personality traits and skill (situational awareness, ability to manage space, visual acuity, experience, Journey mission, attention & distractions, familiarity)

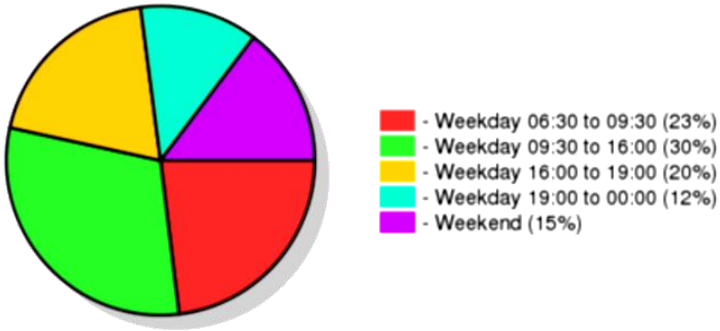
- **Road Context**

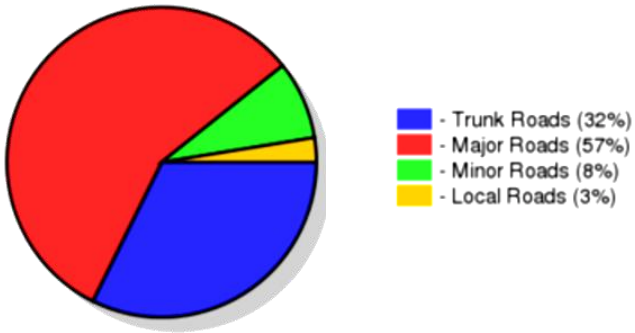
  Road types – generic road types and specific cases

  Hazards - bends, junctions, road controls (signs etc)

- **Conditions and Environment**

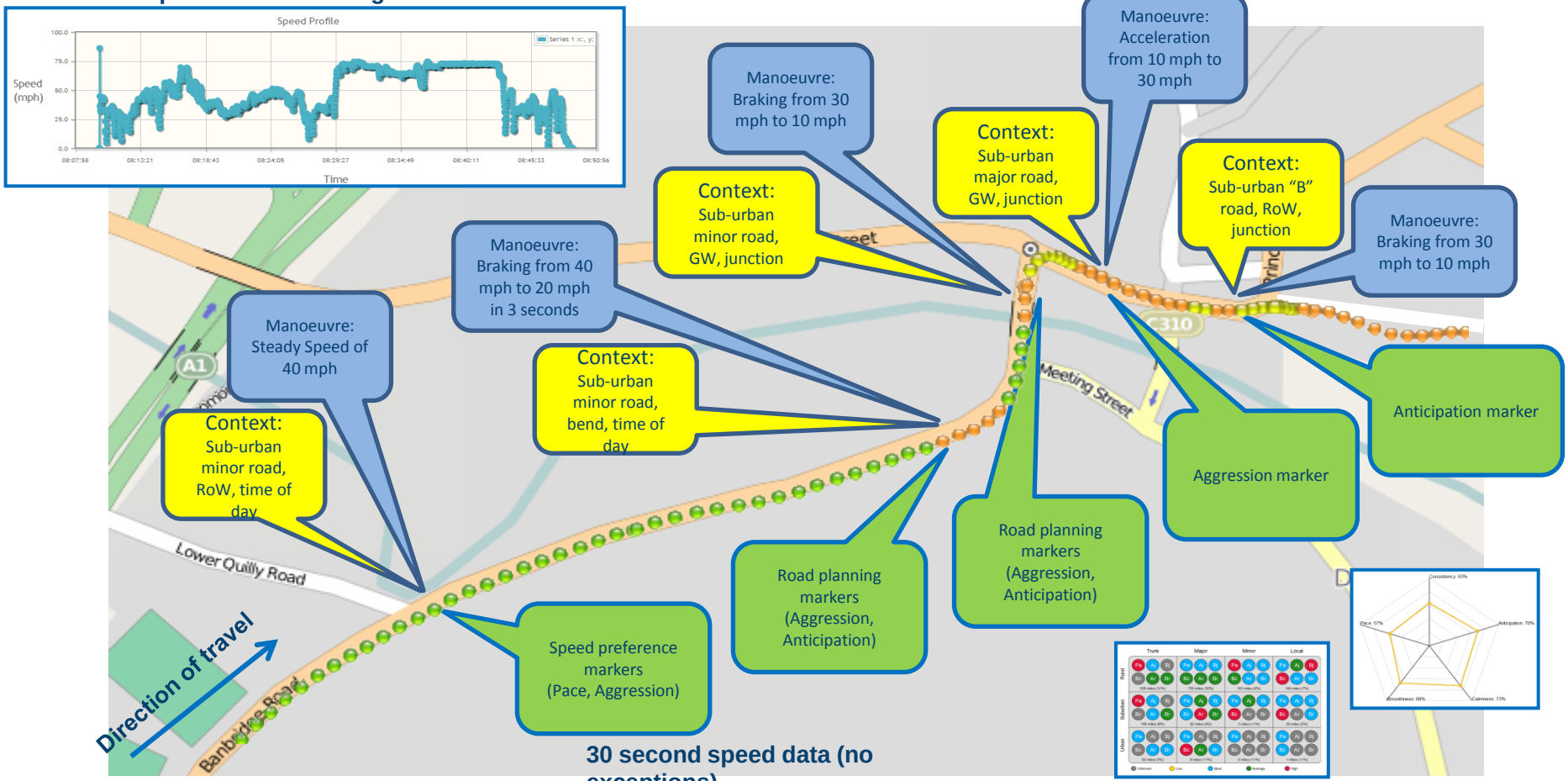
  Darkness, congestion, weather, setting, time, season





Driver profiling – what is safe driving?

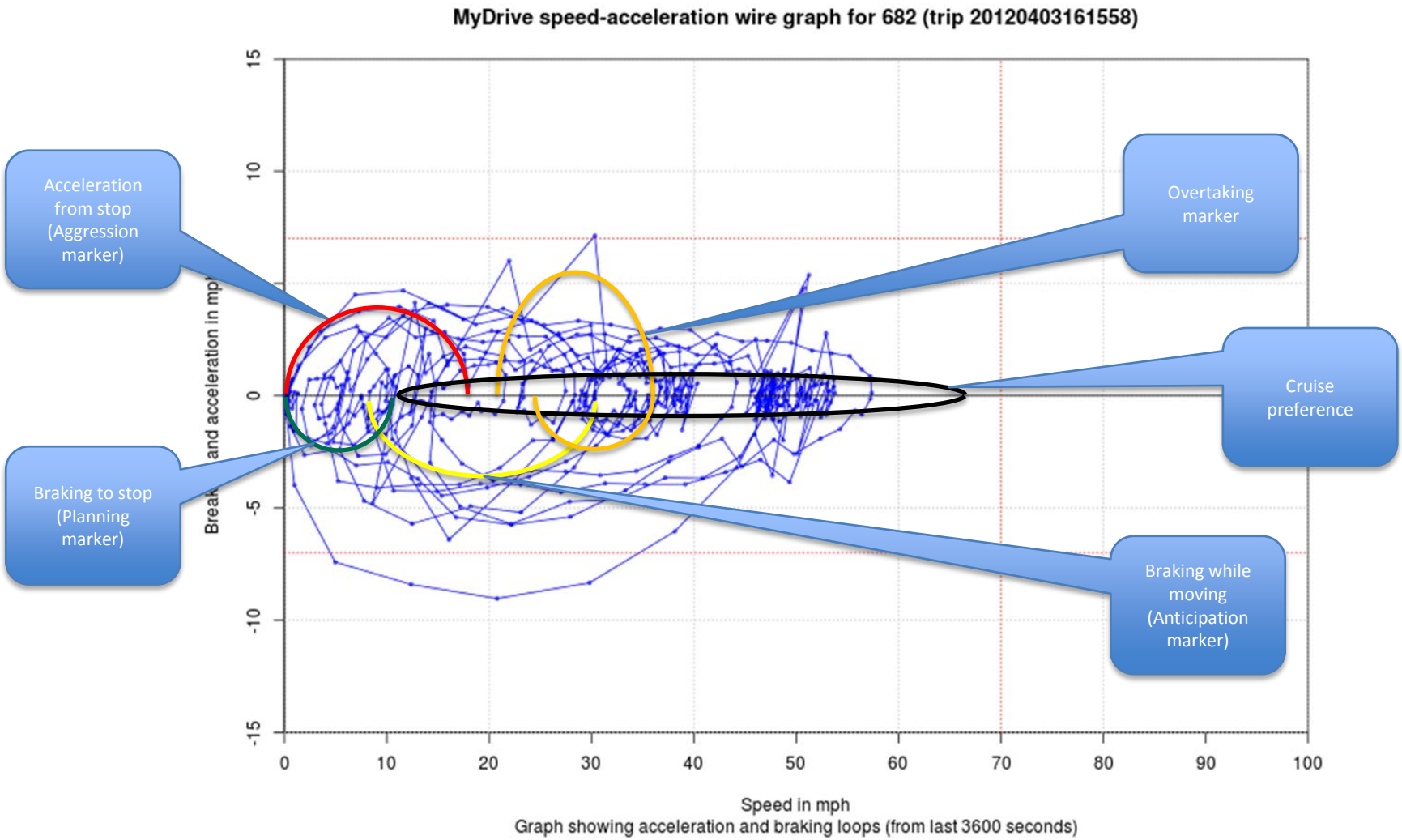
1 Second speeds + location = geocoded manoeuvres



30 second speed data (no exceptions)

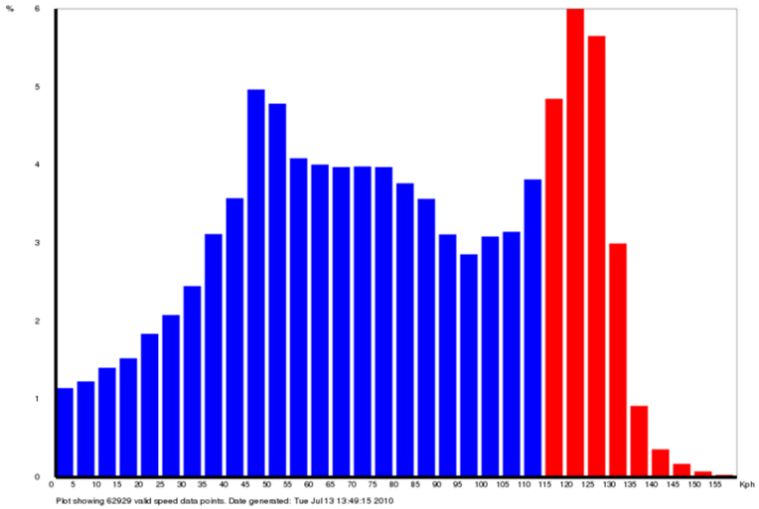
Key: 0-20 mph | 20-30 mph | 30-40 mph | 40-50 mph | 50-60 mph | 60-70 mph | 70+ mph

Speed Acceleration analysis

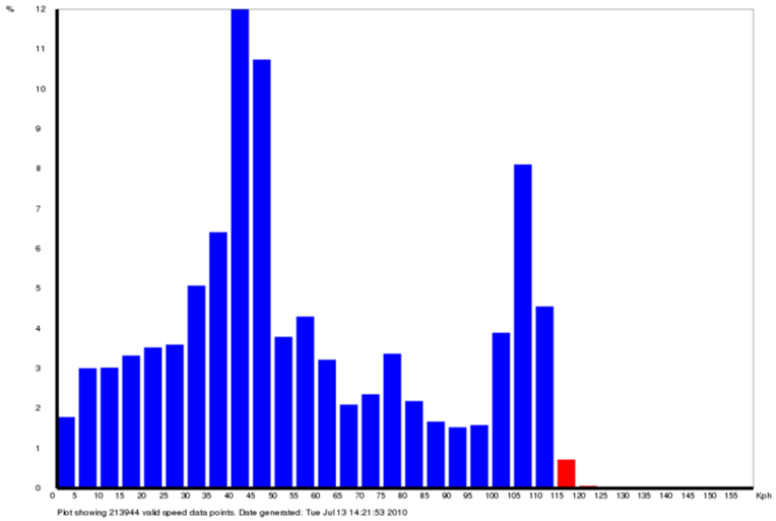


Speed frequency comparison

Driver A



Driver B

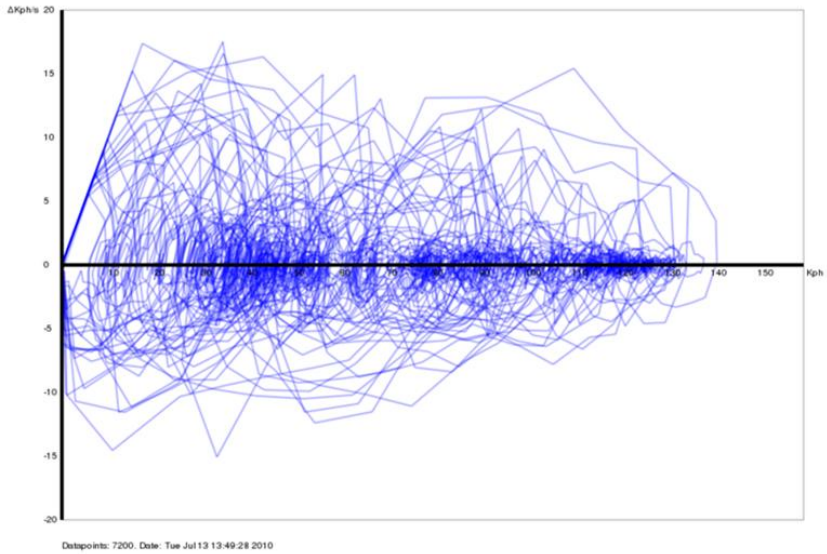


Driver A – Is happy to drive well above the national speed limit. Mostly in free-flow conditions because of relative low time spent at very low speeds.
Does not stick to speed limits because of wide distribution of speeds particularly at high speeds

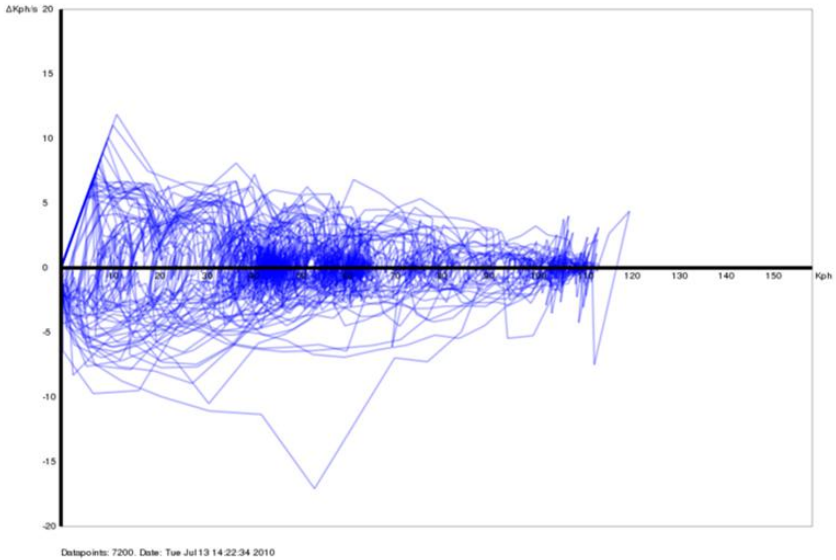
Driver B – Drives at a constant and moderate high speed (peak on right). They also drive at close to the speed limit because of the peaks at various speed limits. Driver is more deliberate and consistent . They also don't habitually travel at over the speed national limit

Speed Acceleration analysis comparison

Driver A



Driver B

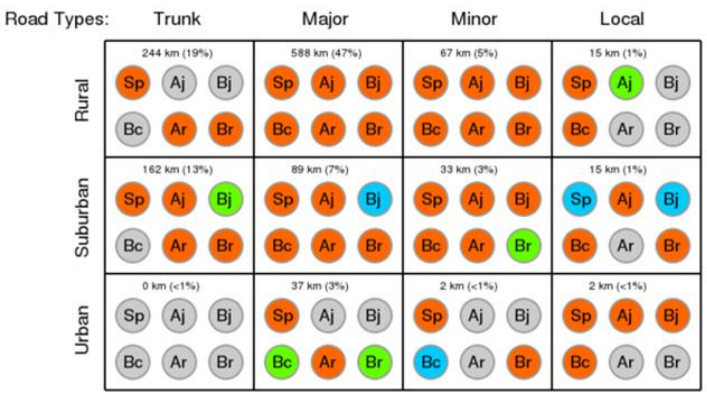


Driver A can be seen accelerating hard from low and high speeds. High speed harsh accelerations indicate overtaking manoeuvres

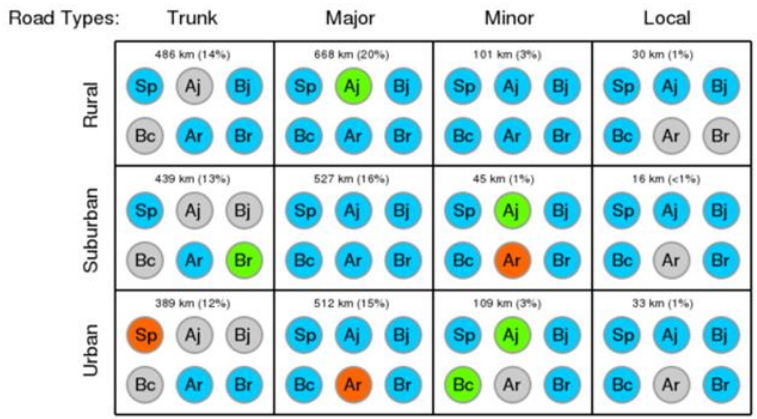
Driver B is very moderate when accelerating at high speeds. The large lower braking loop is probably an emergency stop

Driver performance matrix comparisons

Driver A



Driver B



The plots above shows part of the MyDrive driver profile as a series of colour markers. The results are broken down by road type and road setting and in each cell there are six colour icons representing the results of six key manoeuvre tests. An all-blue profile means the driver is excellent in all respects

Colour key:

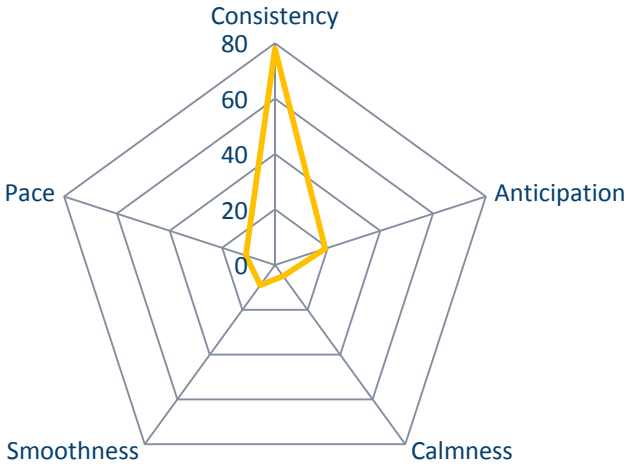
Grey –	no data
Blue –	ideal result
Green –	average
Red –	extreme
Yellow –	below ideal

Icon key:

Sp -	Appropriate speed
Bc -	Braking when cornering
Aj -	Acceleration at junctions
Ar -	Acceleration on roads
Bj -	Braking to junctions
Br -	Braking on roads

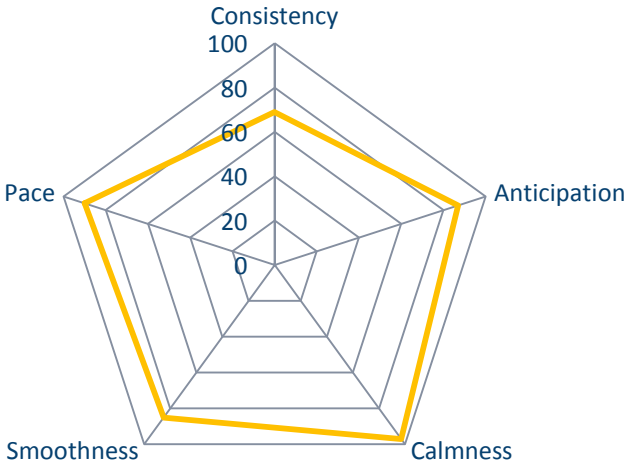
Driver score

Driver A



Expert Driver Score: 19

Driver B



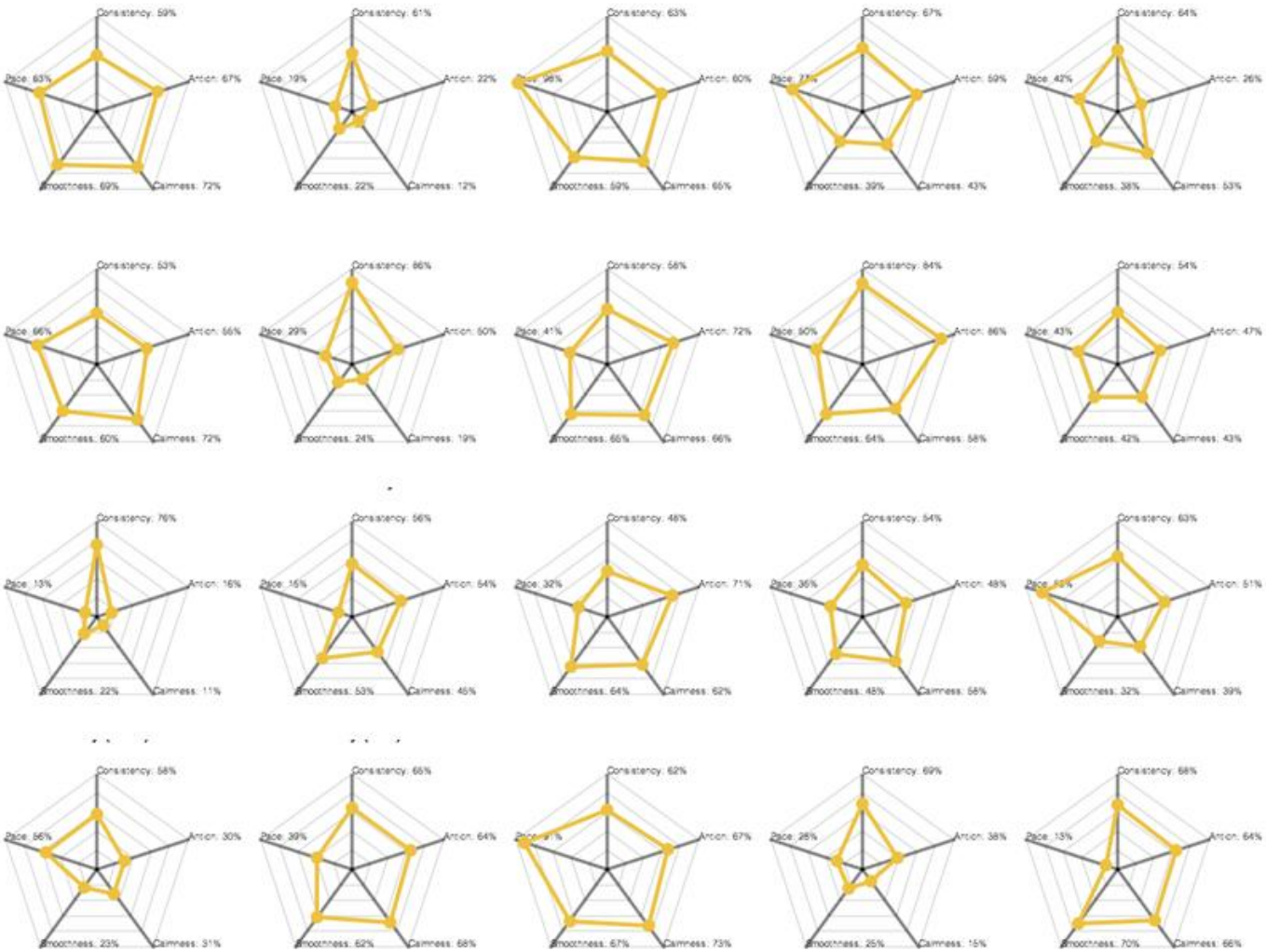
Expert Driver Score: 89

These spider charts show the final driver skills score for the two example drivers. Higher scores are better

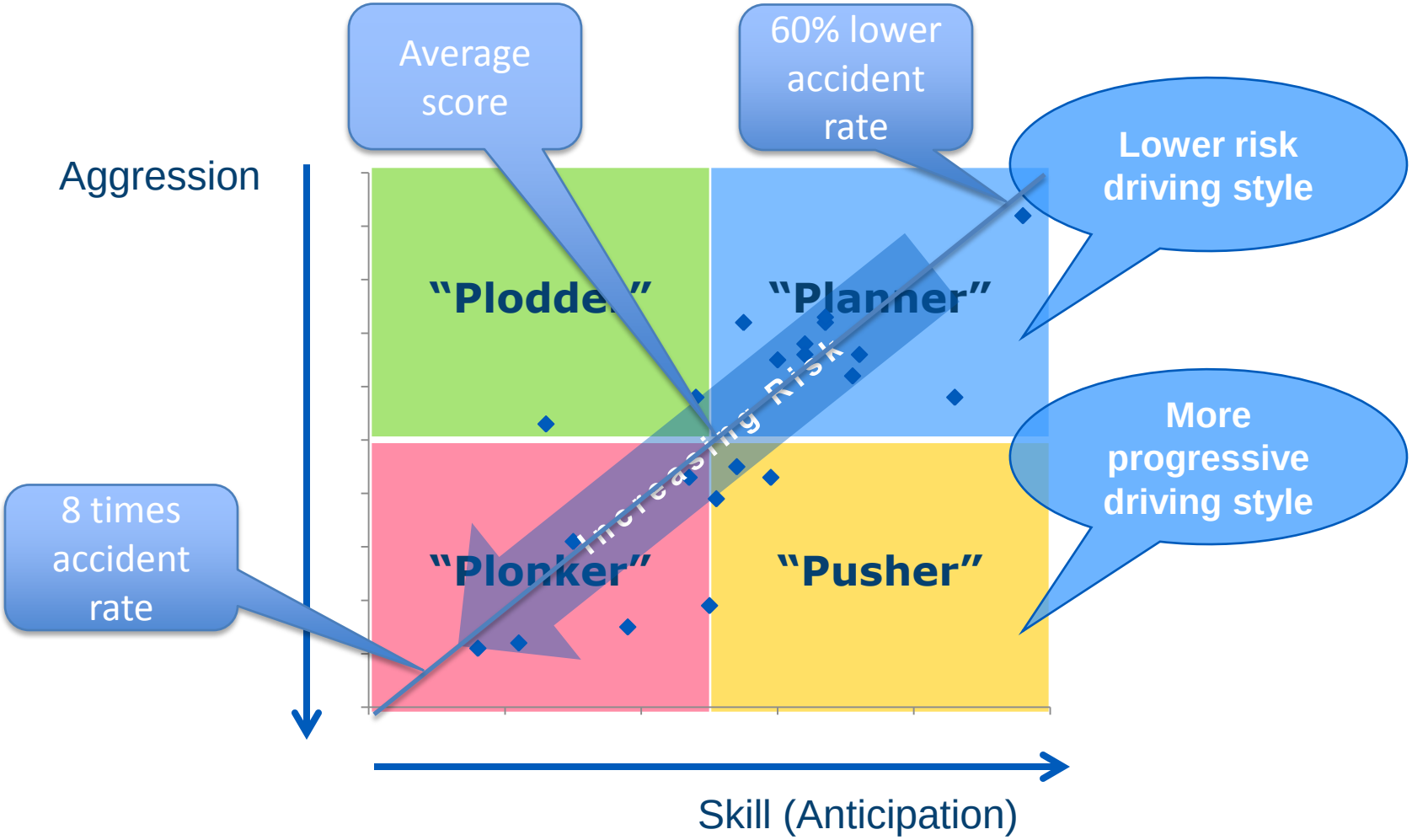
Primary Driver Scores:
Expert driver score – how closely the driver is behaving compared to professionally trained drivers.

Secondary Driver Behaviour Scores:
Pace score – use of appropriate speed
Calmness – (opposite to aggression)
Anticipation – how well the driver is anticipating road hazards
Smoothness – based on the frequency and magnitude of braking and acceleration events.

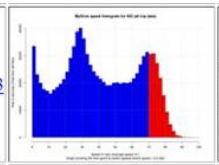
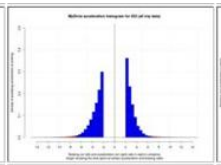
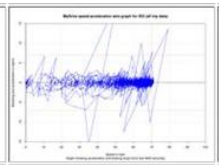
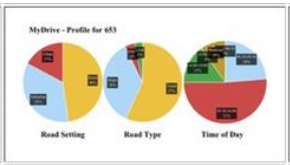
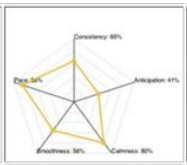
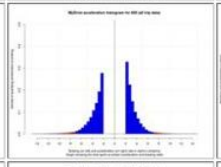
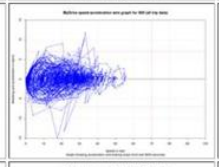
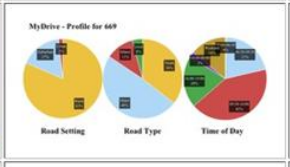
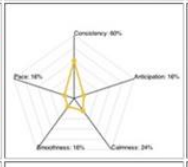
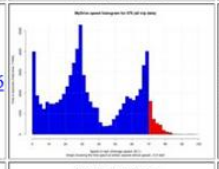
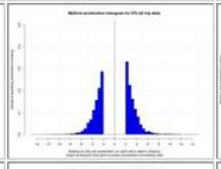
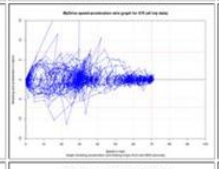
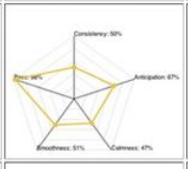
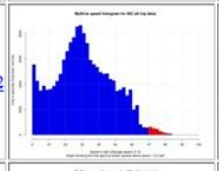
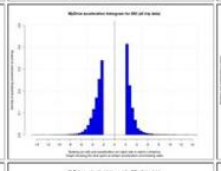
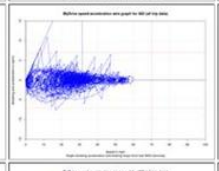
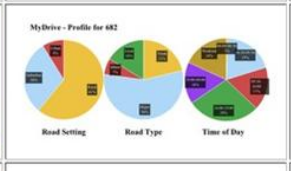
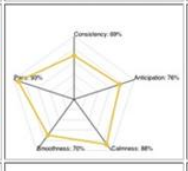
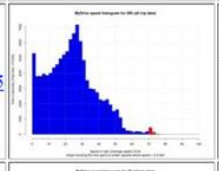
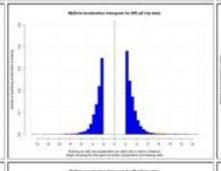
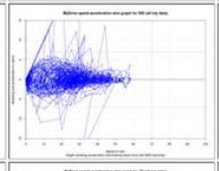
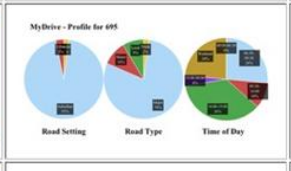
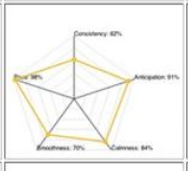
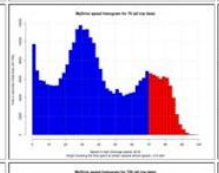
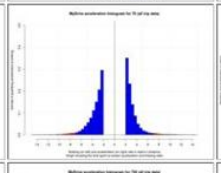
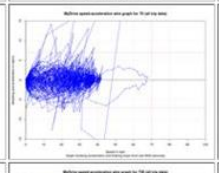
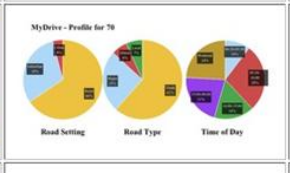
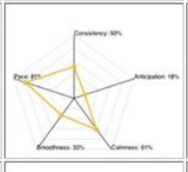
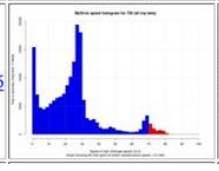
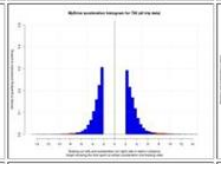
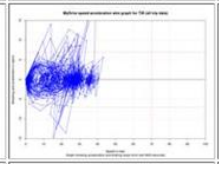
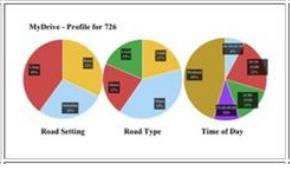
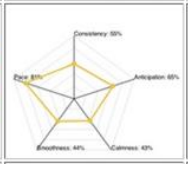
Calibrated scores for Consistency, Pace, Smoothness, Calmness & Anticipation



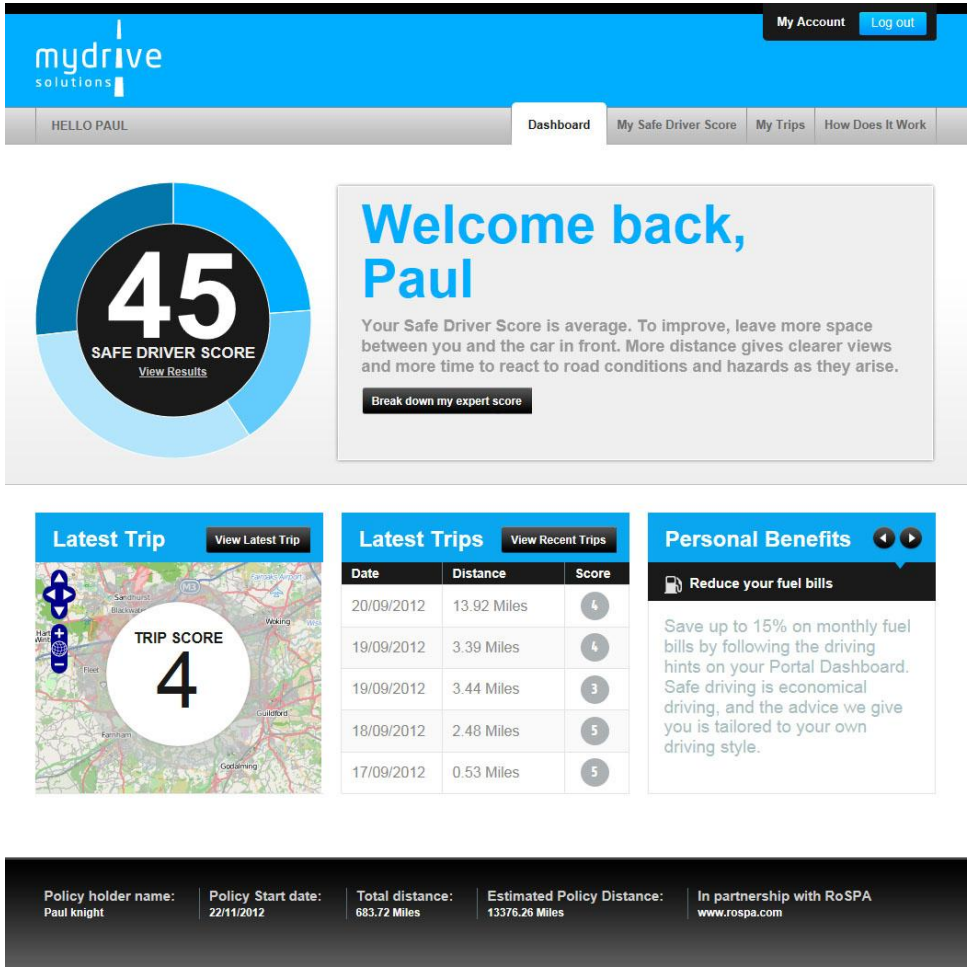
Driver classification

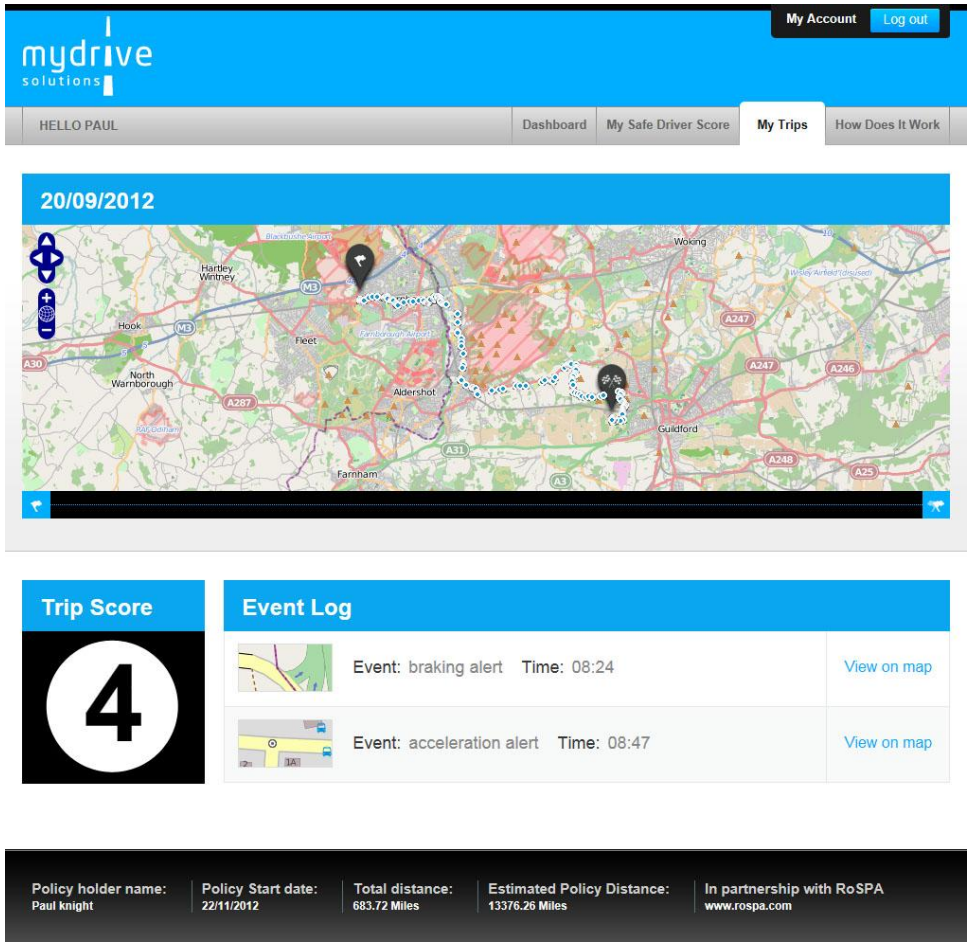


Example MyDrive Driver profiles

Profile 653								Score 55	Driver Score: 55 Completeness: 96% Miles in Profile: 11115 miles Estimated Mileage: 51454 miles/year Familiarity: 15%
Profile 669								Score 16	Driver Score: 16 Completeness: 93% Miles in Profile: 16211 miles Estimated Mileage: 75038 miles/year Familiarity: 27%
Profile 676								Score 69	Driver Score: 69 Completeness: 62% Miles in Profile: 705 miles Estimated Mileage: 7137 miles/year Familiarity: 25%
Profile 682								Score 77	Driver Score: 77 Completeness: 81% Miles in Profile: 1313 miles Estimated Mileage: 10614 miles/year Familiarity: 16%
Profile 695								Score 82	Driver Score: 82 Completeness: 45% Miles in Profile: 688 miles Estimated Mileage: 5003 miles/year Familiarity: 29%
Profile 70								Score 37	Driver Score: 37 Completeness: 83% Miles in Profile: 3232 miles Estimated Mileage: 17397 miles/year Familiarity: 21%
Profile 726								Score 55	Driver Score: 55 Completeness: 83% Miles in Profile: 1109 miles Estimated Mileage: 7204 miles/year Familiarity: 22%

Driver Feedback – consumer portal

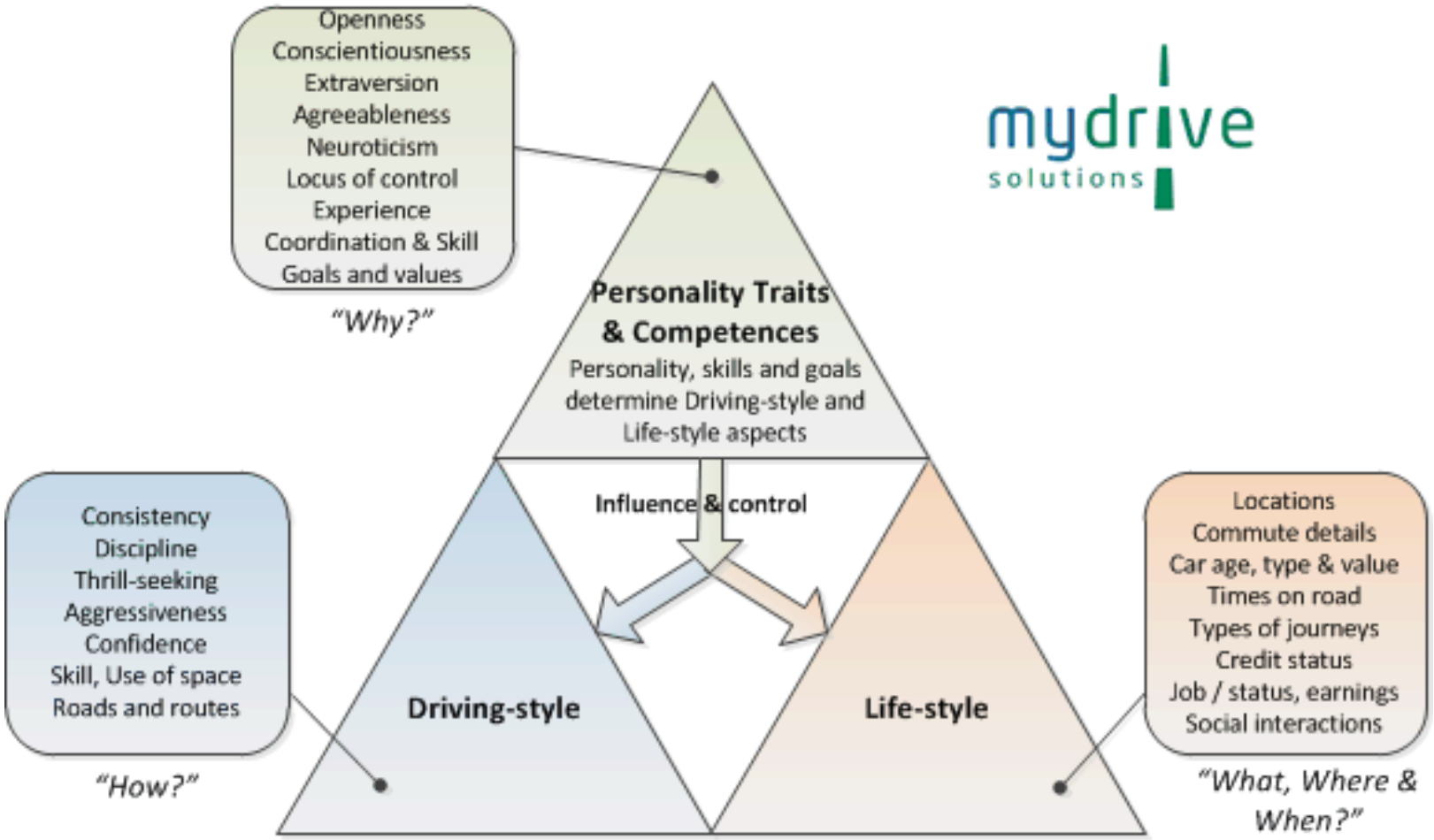




Goals for Driver Education (enhanced GDE Matrix)

GDE Matirx (Goals for Driver Education)	Competencies		
	Knowledge & Skills	Risk increasing factors	Self-evaluation
IV. Personal characteristics, ambitions and competencies. (General Level)	Knowledge and control of general ambition in life, values and norms and personal tendencies which affect driving behaviour •life style •peer group pressure •motives in life •self-control and other characteristics •personal values and norms	Risky tendencies •acceptance of risk •self-value through driving •adapting to social pressure •use of alcohol and drugs •attitude towards society	Self-awareness regarding: •impulse control •risky tendencies •Personal unsafe motives •personal risky characteristics
III. Trip related context and considerations. (Strategic Level)	•choice of route •estimated driving time •effects of social pressure from passengers •estimating urgency of the trip	Risk relating to: •physiological condition of driver •road environment (urban/ rural) •social context and company in vehicle •other motives like competition in traffic	Self-awareness relating to: •personal skill with regard to planning •Typically risky motives when driving
II. Mastery of traffic situations. (Tactical Level)	Knowledge and skill regarding: •traffic rules •observation and use of signals •anticipation •speed adaptation •communication •safety margins	Risk caused by: •poor decision- making •risky driving style (aggressive) •excessive speed •vulnerable road users •breaking traffic rules/ unpredictable behaviour •information overload •difficult road conditions (darkness, bad weather) •insufficient automatisation of basic skills	Self-awareness regarding: •strengths and weaknesses regarding driving skills in traffic •personal driving style •personal safety margins •strengths and weaknesses in dangerous situations •Realistic assessment of own skill
I. Basic vehicle control. (Operational Level)	Knowledge and skills regarding: •control of direction and position of car •surface grip, tyre pressure •dimensions of vehicle •technical aspects of vehicle	Risks related to: •insufficient automatisation of basic skills •difficult (road) conditions (darkness, bad weather) •improper use of seatbelts, headrest, sitting position.	Self-awareness concerning •strengths and weaknesses of basic vehicle control •strengths and weaknesses manoeuvring in dangerous situations •realistic assessment of own skill

What's next in telematics and driver profiling?



Thank You

Any Questions?

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