The Actuarial Profession
making financial sense of the future

Current issues in general insurance
Pete Lee, Tony Lovick

Insurance Telematics
Understanding risk with technology

12th May 2011

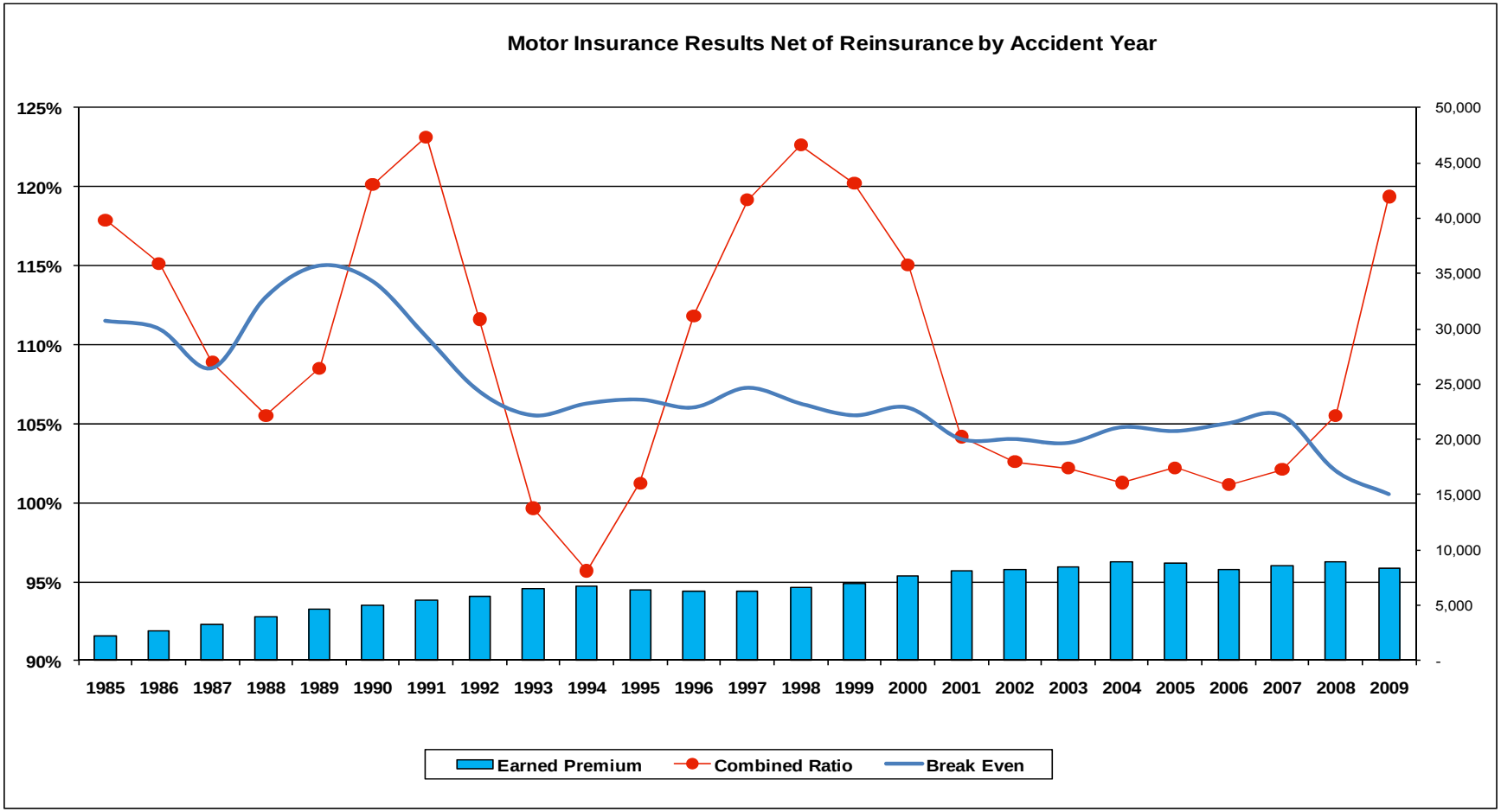
Agenda

- Motor Insurers Market
- What is Usage Based Insurance
- Benefits
- Technology Developments
- Transforming Technology to Data to Profits
- Collecting Data
- Conclusions

Motor Insurers Market

Motor Insurance Market

- Some would question why motor insurers persist?



Motor Insurance Market

- Rapidly escalating third party claims cost
- Underwriting factor veracity in internet distribution

- Increased commodisation
  - Consumers like price comparison sites
  - Cashback culture
  - Discount, save money messaging
  - Little contact with customers – claim, renewal
  - Reduced loyalty

Motor Insurance Market

Can Telematics help young female drivers?

UK insurance sector fears EU gender directive

LONDON, UK - The UK government looks set to endorse a controversial gender directive from the European Commission that will make it illegal for insurance companies to take into account differences in sex when setting insurance premiums, according to This is London.

http://www.moneynews.co.uk/79/uk-insurance-sector-fears-eu-gender-directive/

February 28, 2011

Gender Directive could require UK insurers to raise almost £1bn

The European Court of Justice's ruling on the Gender Directive, due 1st March, could mean that the UK insurance industry will need to raise nearly £1 billion in additional capital.

Taking motor insurance as an example, Open Europe estimates that, on average, a 17-year-old female driver would have to pay an extra £4,300 in insurance premiums by the time she is 26, as a consequence of an unfavourable ruling.

The body's research director, Stephen Booth, says: "This is a perfect illustration of how giving ever greater powers to unaccountable EU judges does not only come with a democratic cost, but can also have massive economic costs for individual consumers and the wider UK economy."

http://www.insurancedaily.co.uk/2011/02/28/gender-directive-could-require-uk-insurers-to-raise-almost-1bn/

What is Usage Based Insurance

What is telematics?

"The technology of sending, receiving and storing information via telecommunication devices in conjunction with effecting control on remote objects" *

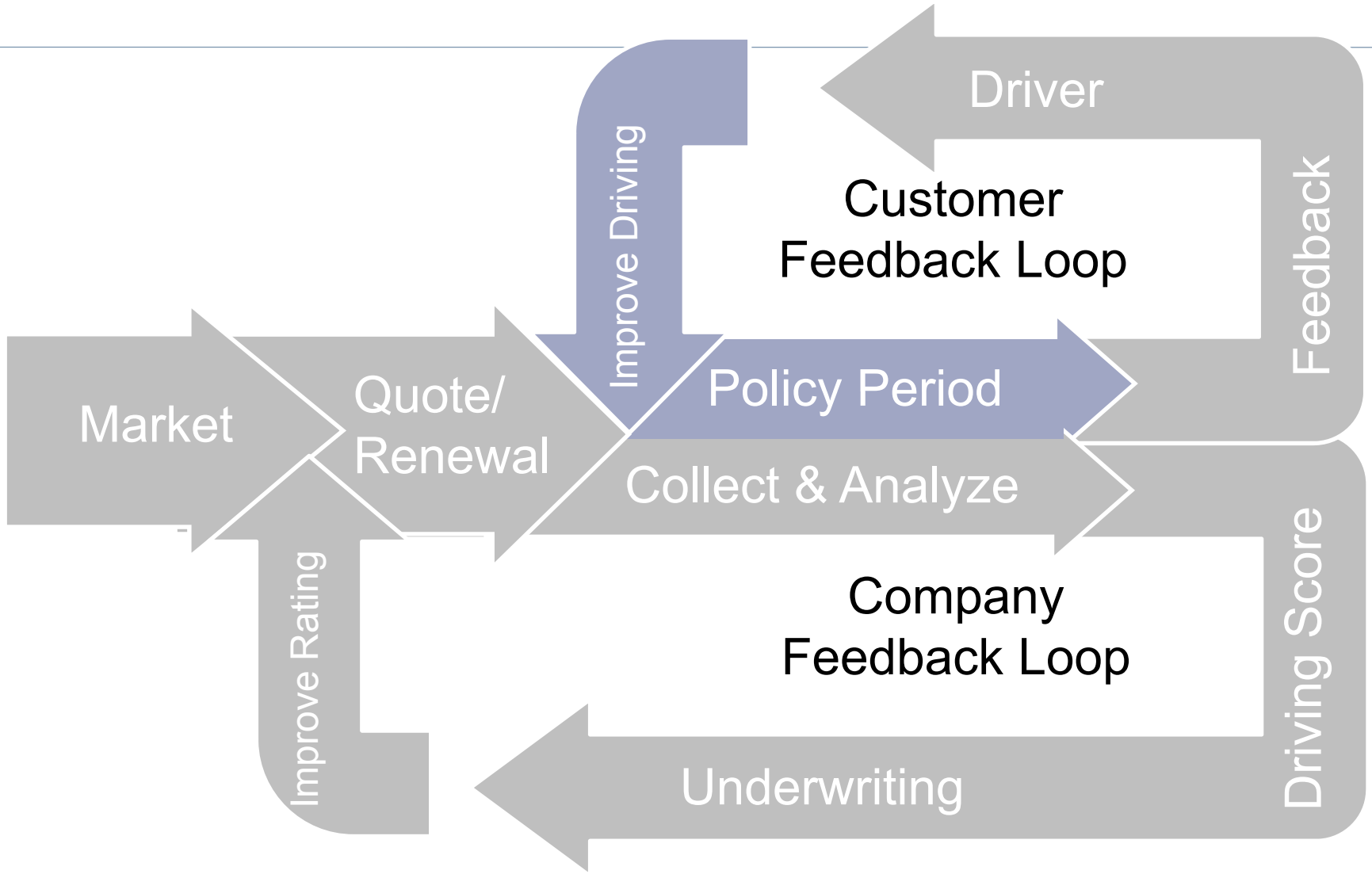
- Term has involved to refer more specifically to the use of GPS systems in vehicles

to provide remote diagnostics

- GM's OnStar was the first widespread application
  - Focused mainly on emergency response
  - Standard on most vehicles beginning in 2007
- The emerging market includes tracking services, web portals, fleet management and *insurance pricing in personal and commercial auto*
  - *Considered a "hot topic" for insurance pricing since 2004*
- Alternative names: usage based insurance (UBI); pay as you drive (PAYD); pay how you drive (PHYD); pay as you go (PAYG)

** Wikipedia, The Free Encyclopedia, Telematics*

How does UBI work?



Benefits

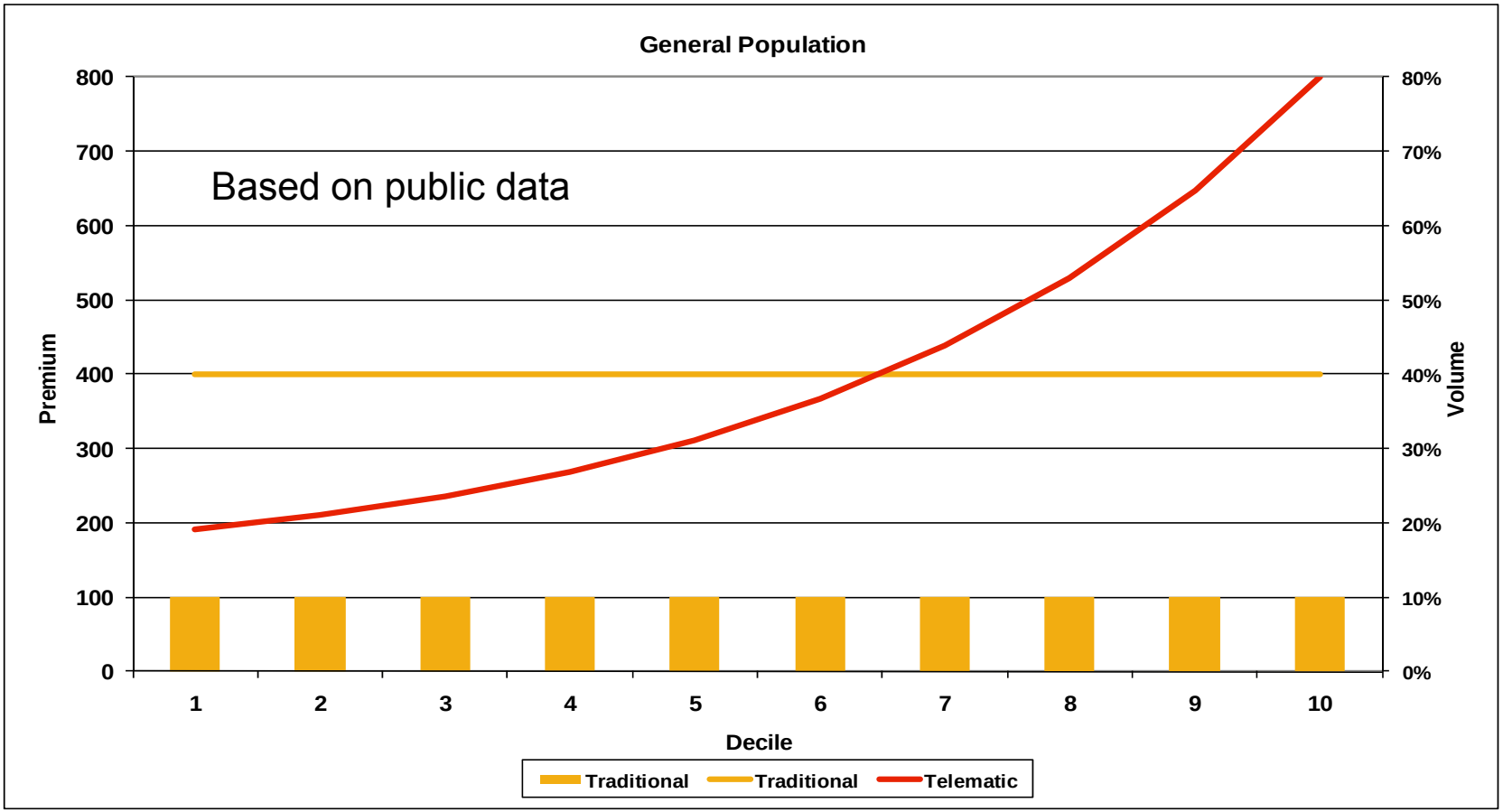
What if...

- ...you found a variable that could segment your current book such that 1/5 of your vehicles had a loss ratio 5 times lower than the highest 1/5?
- ...you introduced a product drivers self identified themselves as having longer retention and a loss ratio 15% better than average by the mere fact they asked for your product?
- ...you implemented a process that reduced the loss ratio by more than 20%?
- ...you could development a proposition to actually engage with your customers?

- **Would you use it?**

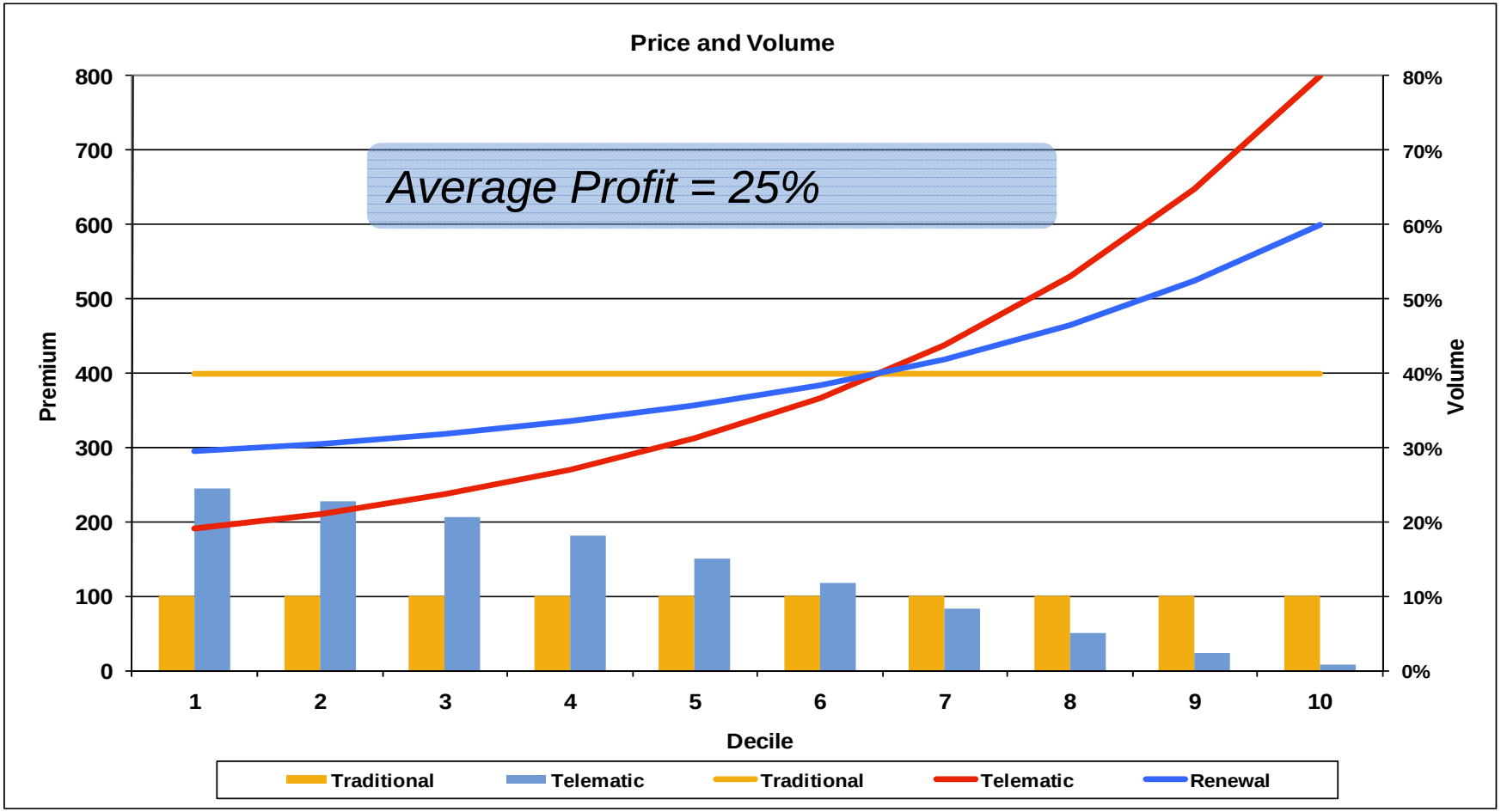
Telematics Predictive Power

Using detailed telematics data can generate a factor of this size compared to the traditional model



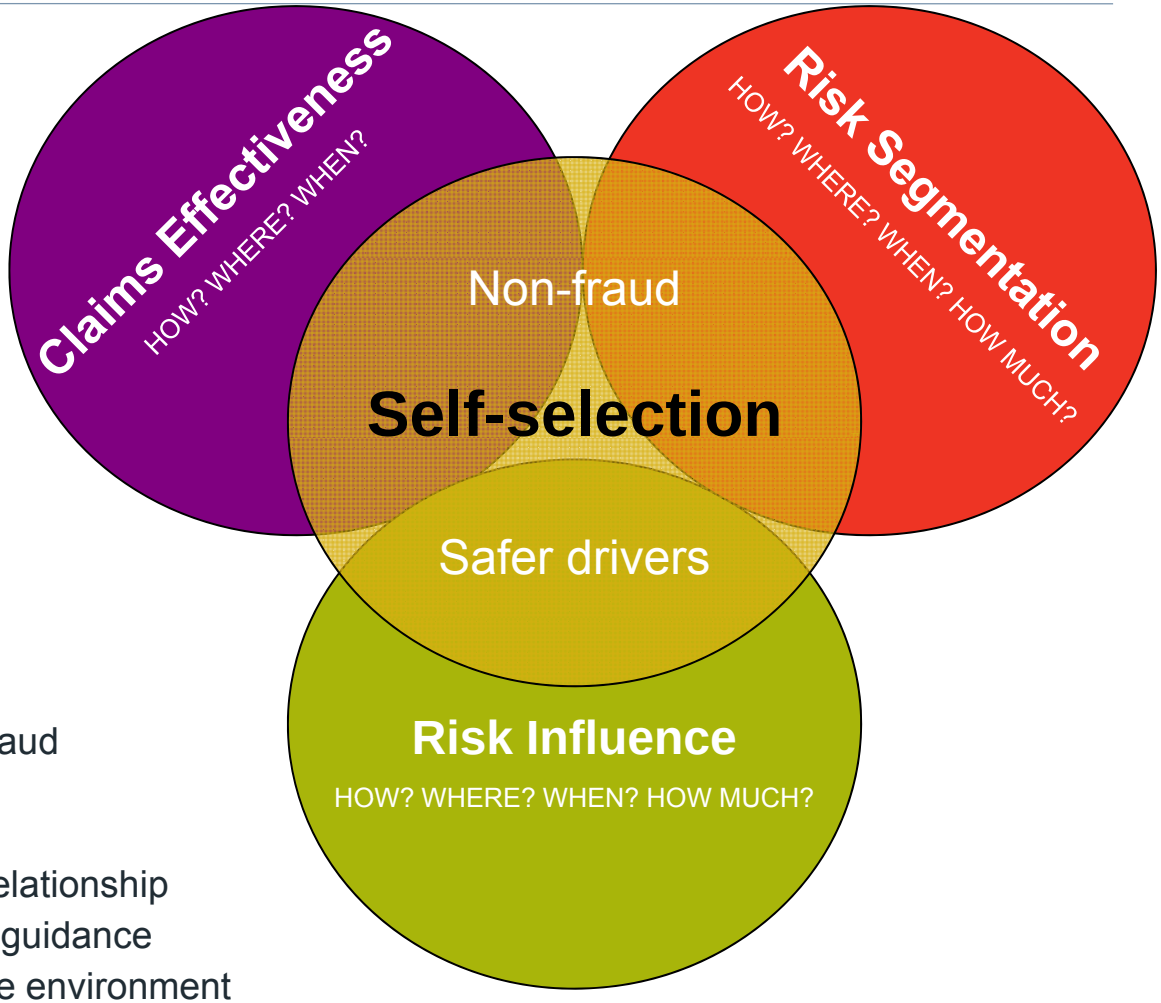
Telematics Predictive Power

Discounting safe drivers improves volumes where profitable



Benefits from Telematics

- **Risk Segmentation**
  - Deriving risk factors from the data, and applying loadings / discounts to customers to enhance selection
- **Risk Influence**
  - Customer feedback on behaviours
  - Reducing Vehicle usage overall, and especially higher risk miles
- **Claims Effectiveness**
  - Informing the claims process
  - Use of telematic data as evidence
- **Self Selection**
  - Reducing underwriting and claims fraud
- **Customer /society**
  - Step change in potential customer relationship
  - 'Fair' pricing proposition and driving guidance
  - Shows commitment to safety and the environment



Added Value Services

Emergency Call

- Use 3D-Accelerometer and OBD speed to detect significant impacts
- Use Cellular connection to post an SMS with details
- Require a back-end real-time service to pick up event and dispatch help

Breakdown Service

- Ability to trigger a “Where am I” SMS message from the server, to assist a customer breakdown call

Limited Phone capability

- To pre-defined numbers for call centre support

Satellite Navigation

- If linked to a PND screen in car

Business Trip Log

- Identify business / personal trips

Subscription services could help subsidise the costs

Added Value Services

Theft Service

- Detect motion without ignition start up
- Tracking and call for help, (in extreme implementations, disable the car)

Remote Safe mode activation

- Activates Geo-fence and other driving thresholds via an SMS message

Geo-fence Service

- Detect location outside boundary zone
- Trigger notification, (in extreme implementations, disable the car)
- Notification of driving exceeding other thresholds (speed, braking)

Driver Feedback

- Real-time buzzer in car facility
- Reports and mapping in customer portal website

Subscription services could help subsidise the costs

Why now?

Push

- Anti-discrimination laws
- Veracity of conventional rating factor declaration on the web
- Rapidly escalating claims costs
- New business premiums increased by around 40%
- Political issues around availability and affordability

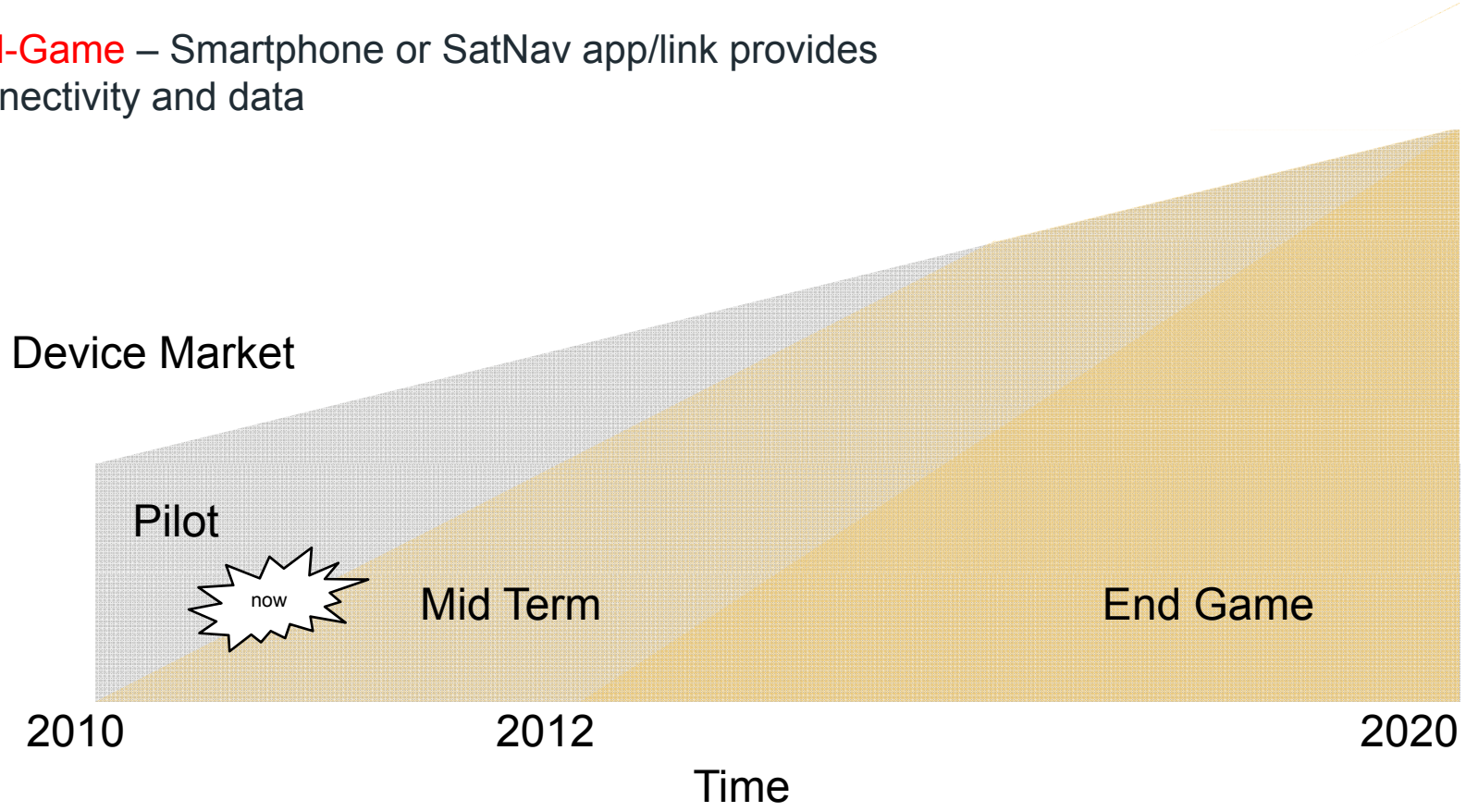
Pull

- Momentum to a more technology driven society
- Reducing technology costs
- Be ready for inevitable UBI viability
  - Gain learning to develop full launch proposition
- Build portfolio of customers with known driving scores

Technology Developments

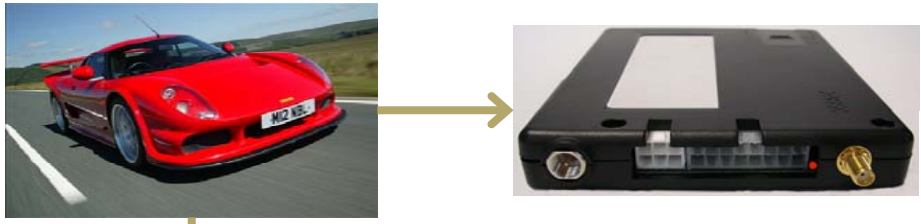
Device Evolution

- Pilot – Standalone self install devices required
- Mid-Term – OBD Bluetooth add-on required
- End-Game – Smartphone or SatNav app/link provides connectivity and data



Present Options

- Sometimes we see standalone duplication, to achieve connectivity



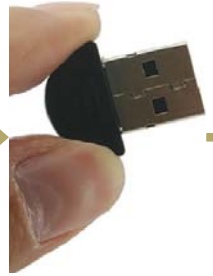

OBD Port

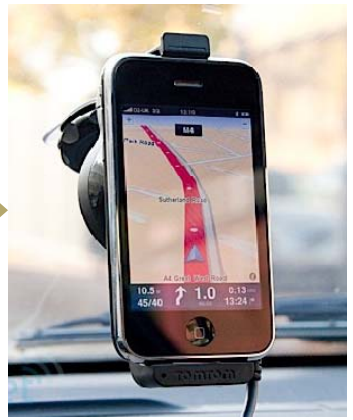
Connectivity Evolution

- Car manufacturers move to provide Bluetooth.
  Mid-term this can be retrofitted.

OBD Port

Bluetooth®





Mid-Term Solutions

- OBD Bluetooth, linked to Smartphone app

Collect Identity from OBD, and tether to phone
optionally augment with GPS logging from phone

Car Connectivity Consortium

TERMINAL MODE

Consortium vision is to create open and common solutions how a Smartphone and an IVI system can work better together.

The Beginning of the End-Game

The New York Times
Wednesday, April 20, 2011

March 30, 2011, 6:00 AM

Nokia Wants a Standard for In-Car Telematics

By STEPHEN WILLIAMS

While Terminal Mode may sound like a death-ray setting in a bad science-fiction novel, its aims are far less dastardly. It is the name of a unified standard that would connect drivers and their smartphones to the swirling proliferation of in-car infotainment systems.

The idea was introduced about a year ago by Nokia, the mobile-device manufacturer, to be an open-standard technology that would eliminate the confusion and inefficiency of multiple, incompatible telematics systems. Such a standard, Nokia argued, would also make in-car components that control calling, texting, music and navigation content more universally intuitive to use.

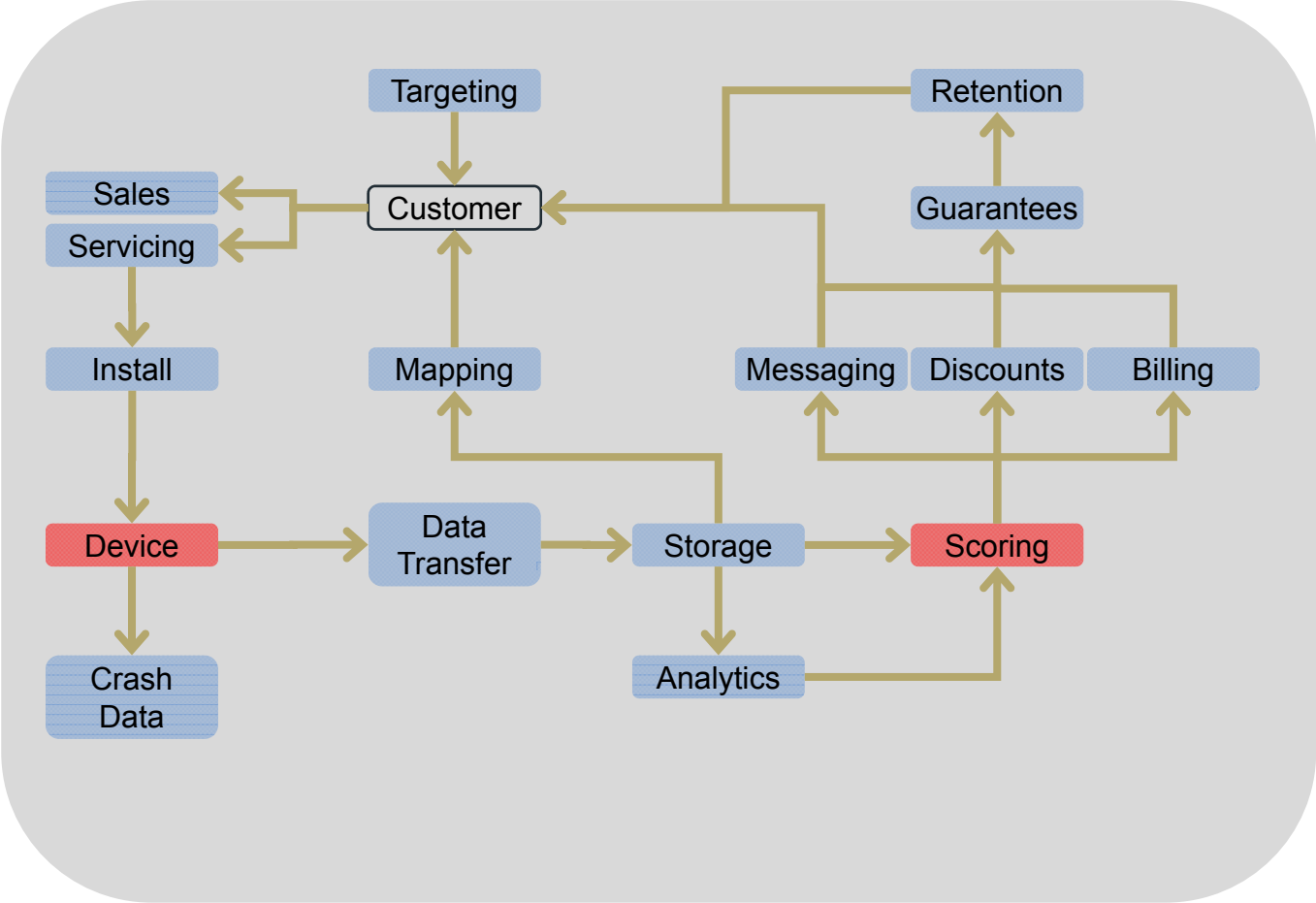
The concept took a step forward earlier this month, when Daimler, General Motors, Honda, Hyundai, Toyota and Volkswagen signed up to the Car Connectivity Consortium. The membership also includes the electronics companies LG and Samsung, Alpine and its charter member, Nokia.

Represents :
60% of vehicles sold 2009
50% of mobiles sold 2010

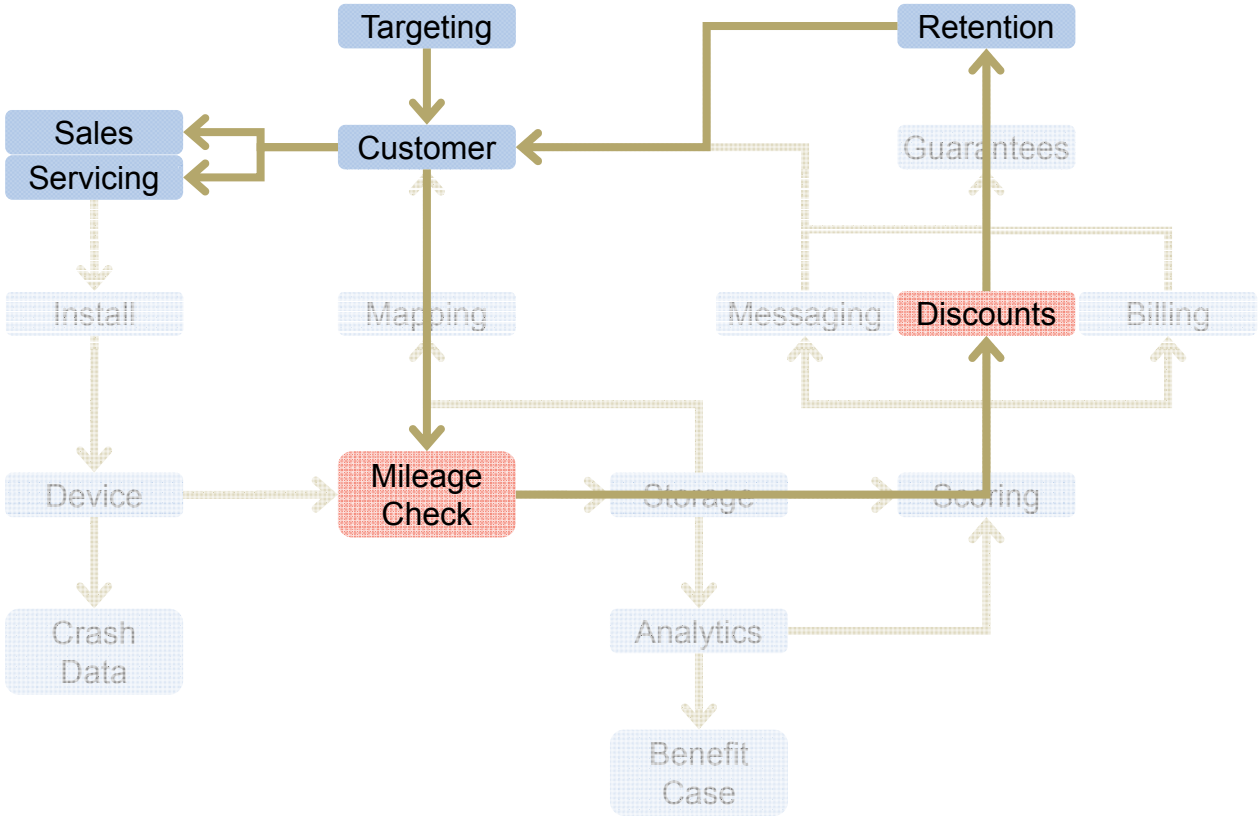
Seamless, safe, effortless and delightful user experience when using a Smartphone in a car

Transforming Technology to Data to Profits

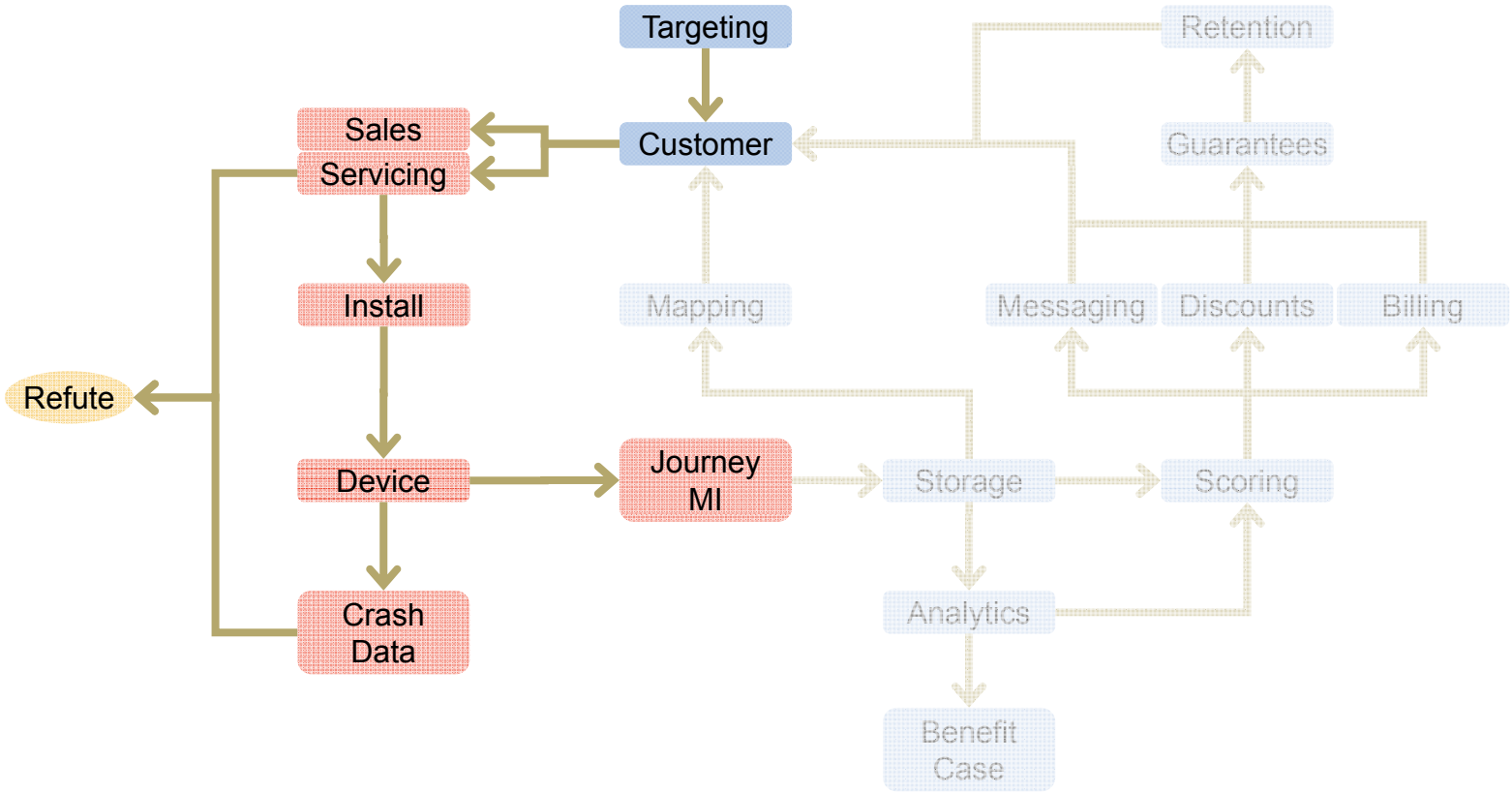
Telematics: Infrastructure



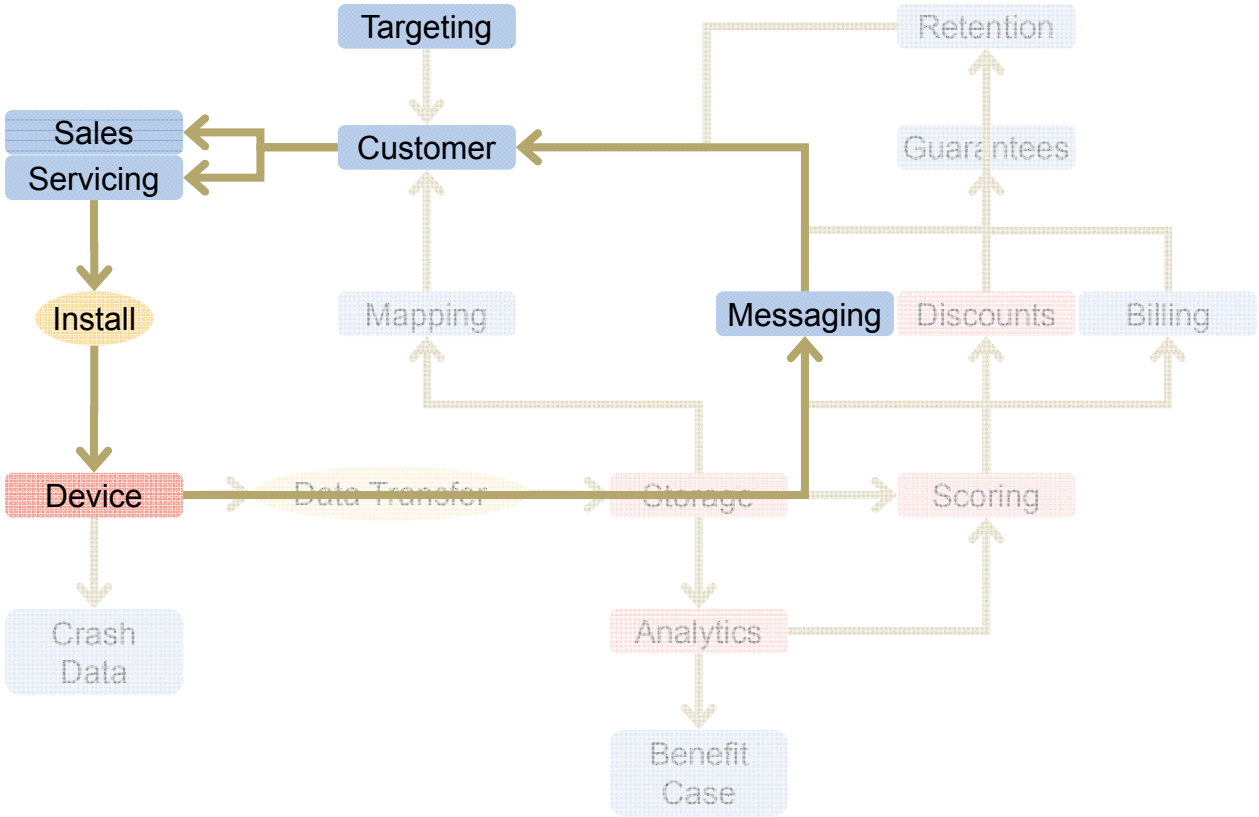
Example Infrastructure – Metered Mileage



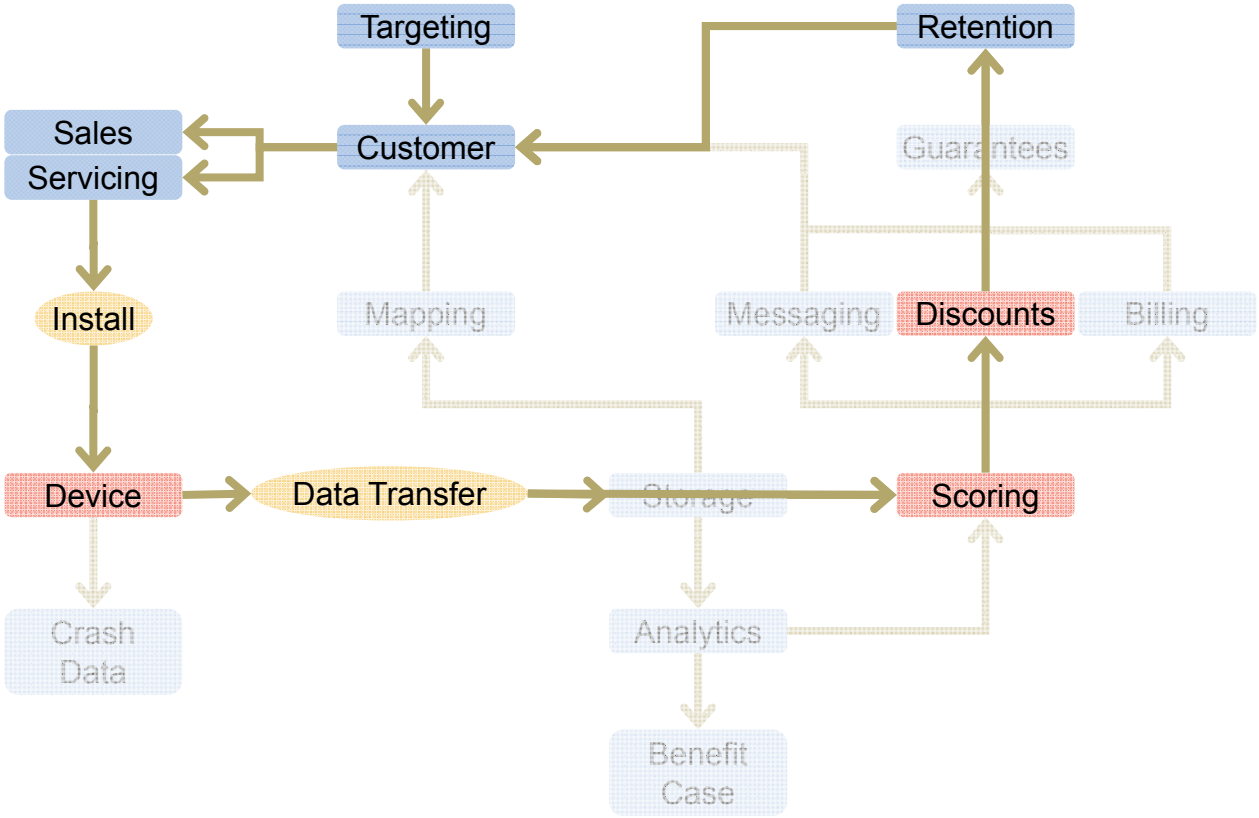
Example Infrastructure – Crash Data



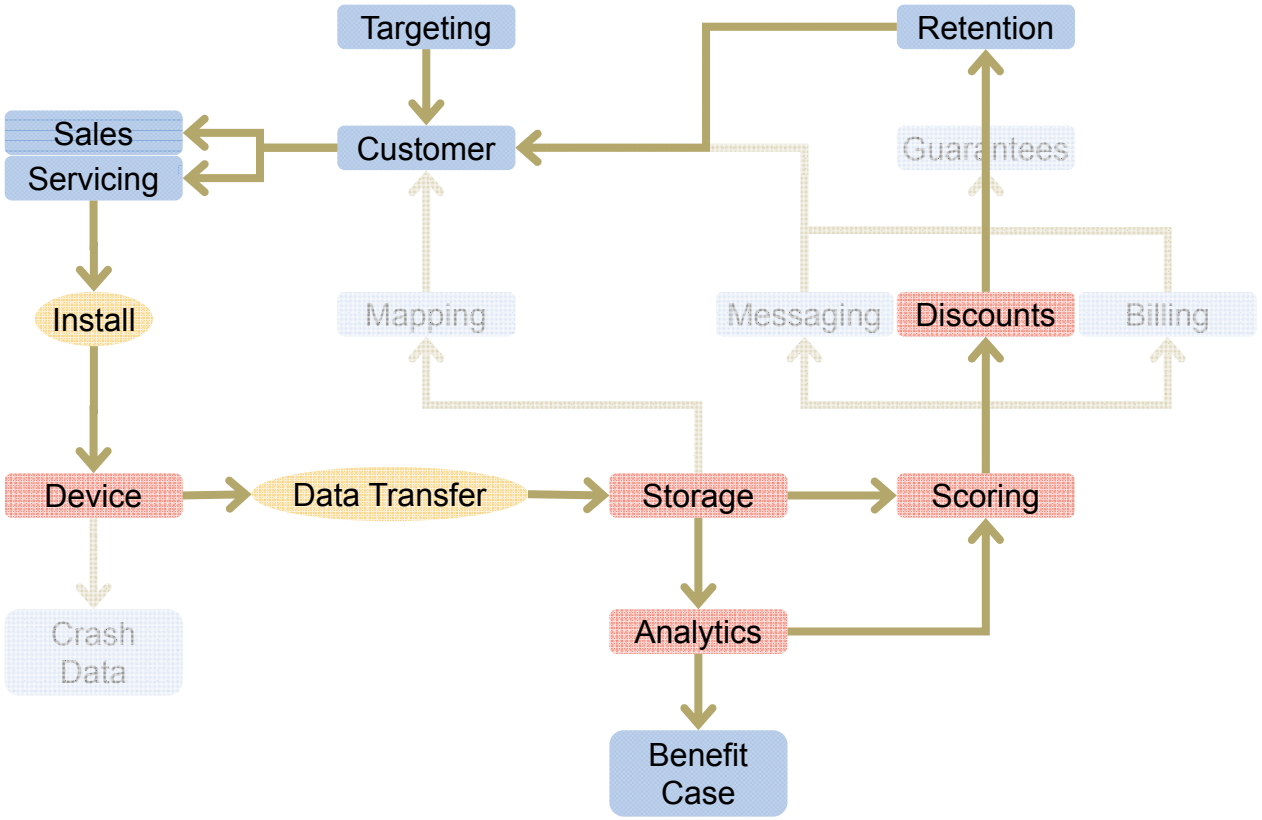
Example Infrastructure – Realtime Feedback



Example Infrastructure – Low Cost Scoring



Example Infrastructure – Risk Analytics

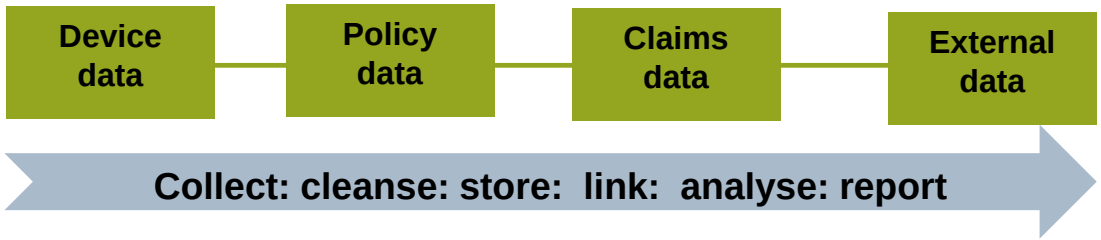


Challenges to overcome – data, data, data

- The sheer volume of data is an obvious challenge – pressure to reduce volumes

- Case for granular data:
  - Data always needs cleansing; granular data allows more effective cleaning
  - Driving behaviour cannot be observed effectively in minute/hourly intervals
  - “Average” driving over policy year does not pinpoint risky behaviour
  - Beware pre-defined event counters that need calibration

- Data transmission costs can be reduced by deployment of a compression algorithm
- Data storage and effective analytics can be achieved by an appropriate logical data model
- Automated & secure processes with exception reporting can be set up



Example:
5,000 policies, ***per second*** data,
2 year period
10 ***Billion*** journey points

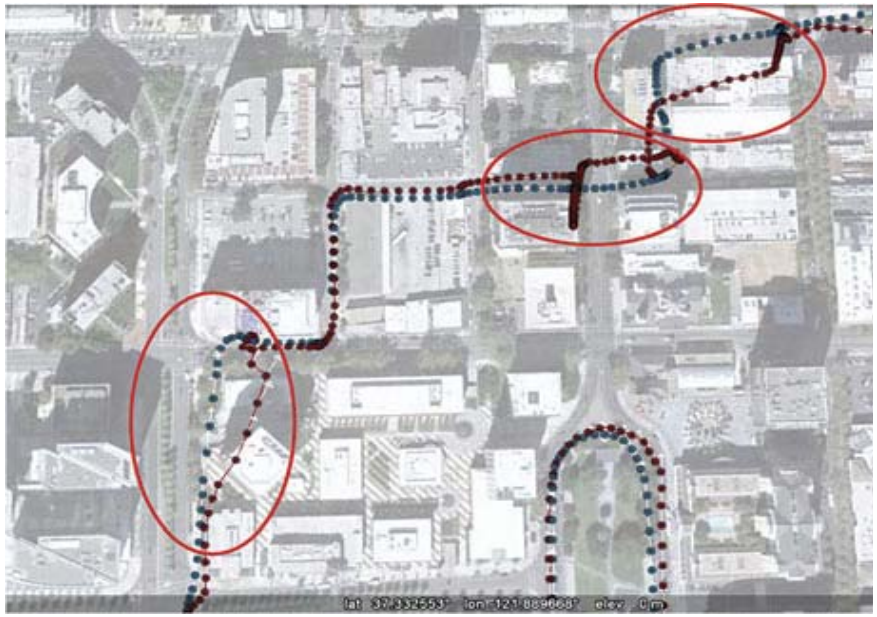
Data is unlike typical actuarial data

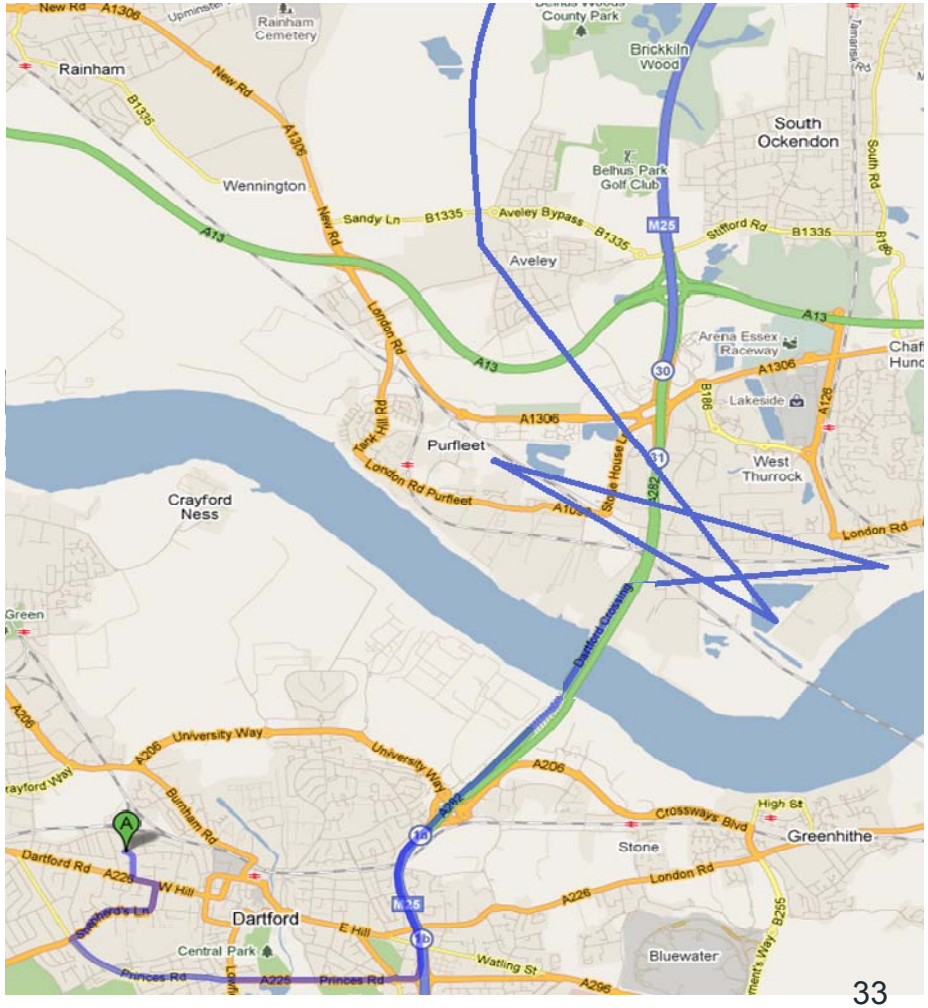
	Without Telematics	With Telematics
Update frequency	Annual	Real time, trip, daily
Data quality	Renewal UW	Daily scrubbing
Variables	Pre Defined	Manufactured
Records per policy	Few	A Million per Year
Data size	Gigabytes	Terabytes (when Uncompressed)

Collecting Data

Delivering Clean Data

- Location alone is insufficient





Simple example data for 2 ½ minute trip

TRIP:	1														
DATE:	12-Jun														
Time	MPH		Time	MPH		Time	MPH		Time	MPH		Time	MPH		Time	MPH
0:00:00	2		0:00:25	12		0:00:50	9		0:01:15	2		0:01:40	0		0:02:06	30
0:00:01	2		0:00:26	11		0:00:51	12		0:01:16	0		0:01:41	0		0:02:07	32
0:00:02	0		0:00:27	10		0:00:52	14		0:01:17	2		0:01:42	0		0:02:08	32
0:00:03	0		0:00:28	9		0:00:53	15		0:01:18	5		0:01:43	0		0:02:09	33
0:00:04	0		0:00:29	9		0:00:54	14		0:01:19	7		0:01:44	0		0:02:10	33
0:00:05	2		0:00:30	9		0:00:55	12		0:01:20	9		0:01:46	0		0:02:11	34
0:00:06	6		0:00:31	9		0:00:56	12		0:01:21	11		0:01:47	0		0:02:12	35
0:00:07	7		0:00:32	10		0:00:57	11		0:01:22	13		0:01:48	0		0:02:13	35
0:00:08	9		0:00:33	11		0:00:58	9		0:01:23	15		0:01:49	0		0:02:14	35
0:00:09	9		0:00:34	12		0:00:59	8		0:01:24	17		0:01:50	0		0:02:15	35
0:00:10	8		0:00:35	12		0:01:00	6		0:01:25	18		0:01:51	1		0:02:16	35
0:00:11	8		0:00:36	14		0:01:01	5		0:01:26	19		0:01:52	7		0:02:17	33
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0:00:16	7		0:00:41	11		0:01:06	4		0:01:31	13		0:01:57	12		0:02:22	17
0:00:17	8		0:00:42	10		0:01:07	4		0:01:32	11		0:01:58	12		0:02:23	14
0:00:18	9		0:00:43	10		0:01:08	4		0:01:33	7		0:01:59	13		0:02:24	11
0:00:19	12		0:00:44	9		0:01:09	4		0:01:34	3		0:02:00	15		0:02:25	7
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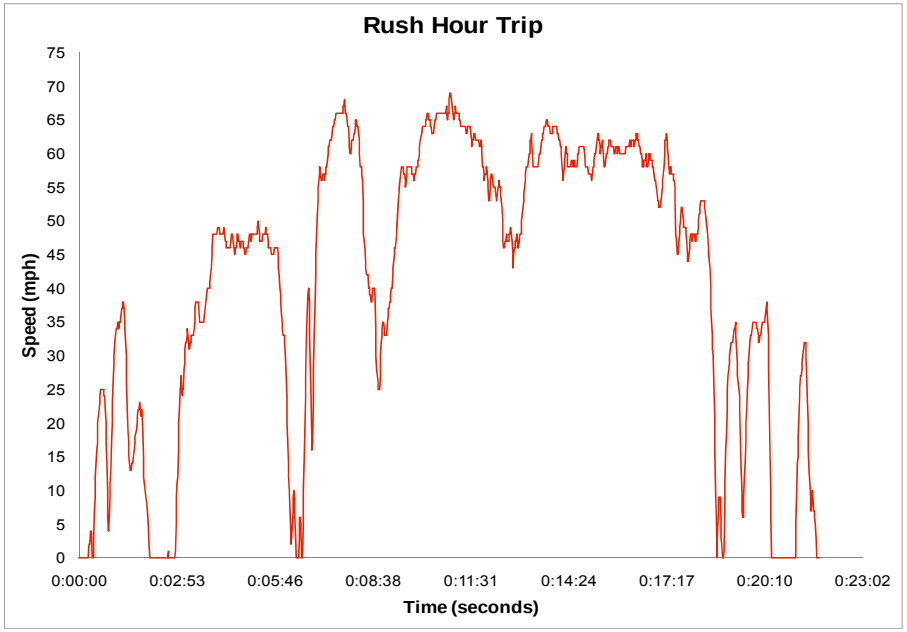
0:00:23	15		0:00:48	6		0:01:13	4		0:01:38	0		0:02:04	26		0:02:29	0
0:00:24	14		0:00:49	7		0:01:14	5		0:01:39	0		0:02:05	28		0:02:30	0

Collecting Data

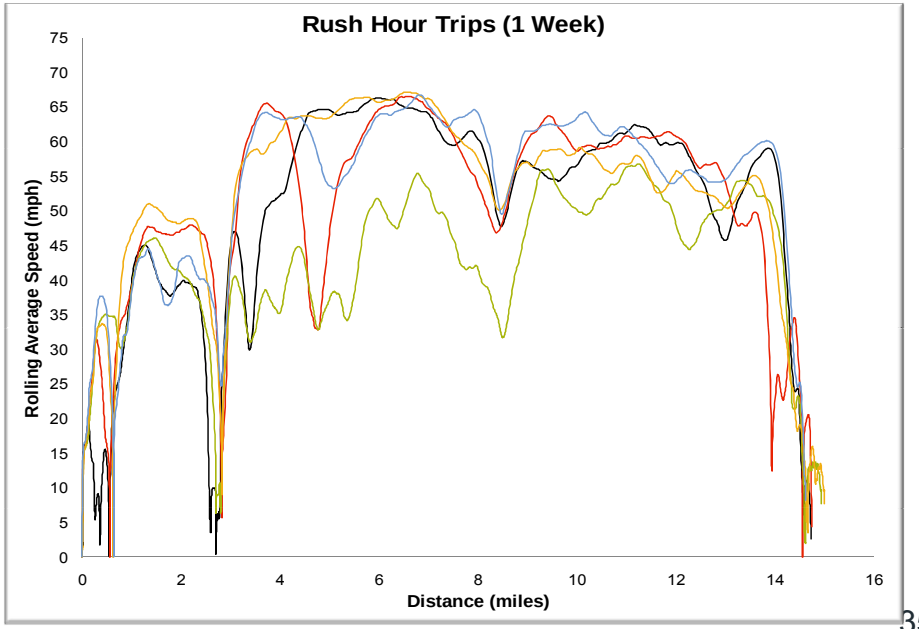
- Even the simplest devices can provide significant detail



Distance

Time of day

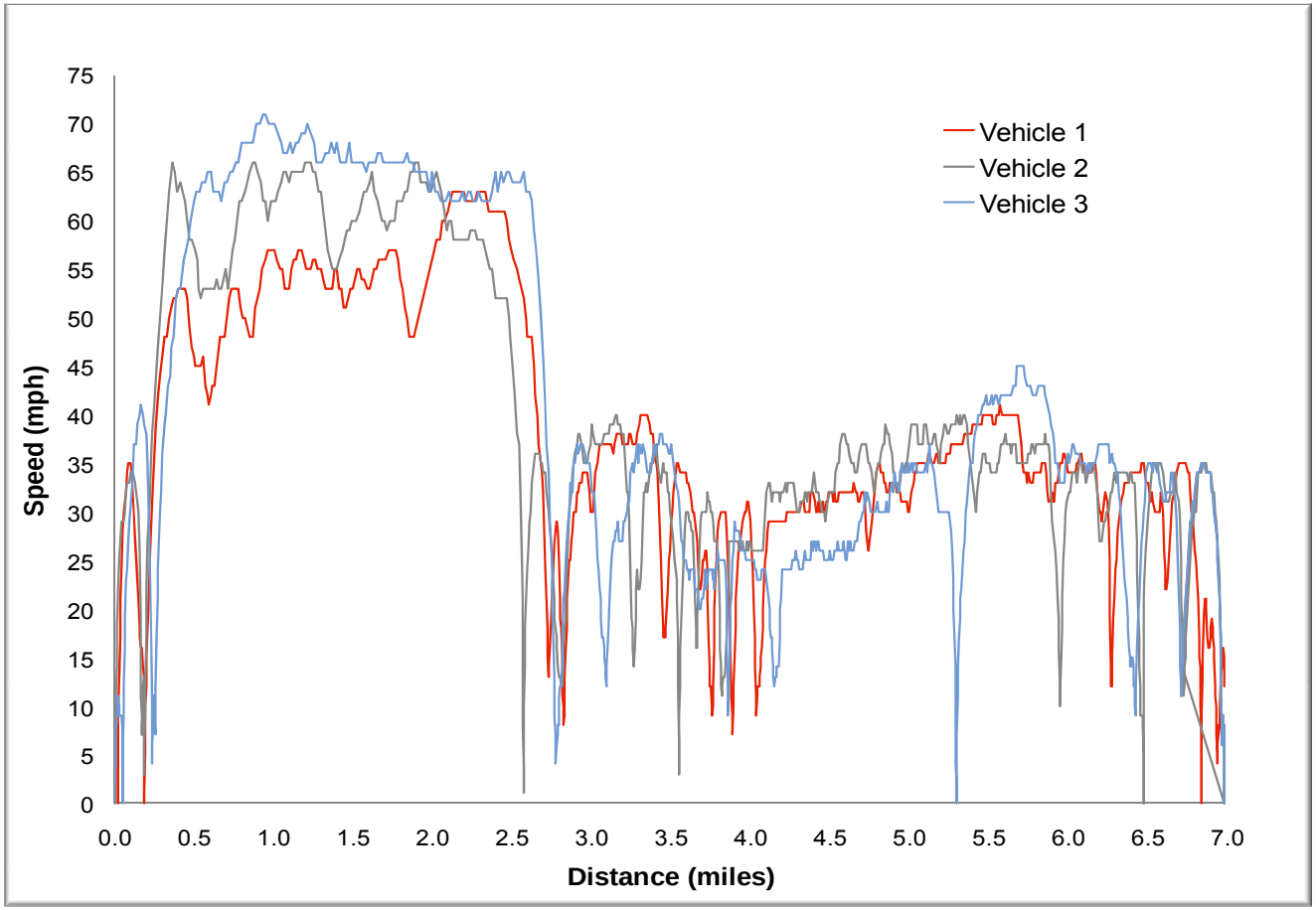
Speed



- Other info can be inferred

Collecting Data

- Roads, driver behaviour and traffic all impact on the patterns



Collecting Data

The value is in the detail, not a few predefined event counters

- GPS
  - Time
  - Location
  - Motion
  - Quality
- OBD
  - VIN Number
  - Time
  - Speed
- Accelerometer
  - 3-Axis G-force readings

Conclusions

Conclusions

- Essential to have a contingency plan today to address the emerging telematics market
- As benefits tip the balance over costs, using telematics will become a ‘no brainer’

Benefits

Risk Selection

✓ Claims Savings proven

✓ Shared with customer

Customer Relationship

✓ Retention Benefits

✓ Social benefits

Decommoditisation

✓ In an increasingly commoditised market

Challenges

Device

✓ Technical specification

✓ Data capability

✓ Operating options

✓ Distribution

Data

✓ Requirements for rating

✓ Granularity

✓ Volume

✓ Storage

Costs

Device

✓ Rapidly becoming cheaper

Installation

✓ Self install options -

Communications

✓ Customer Upload free

✓ Compression reduces data volume

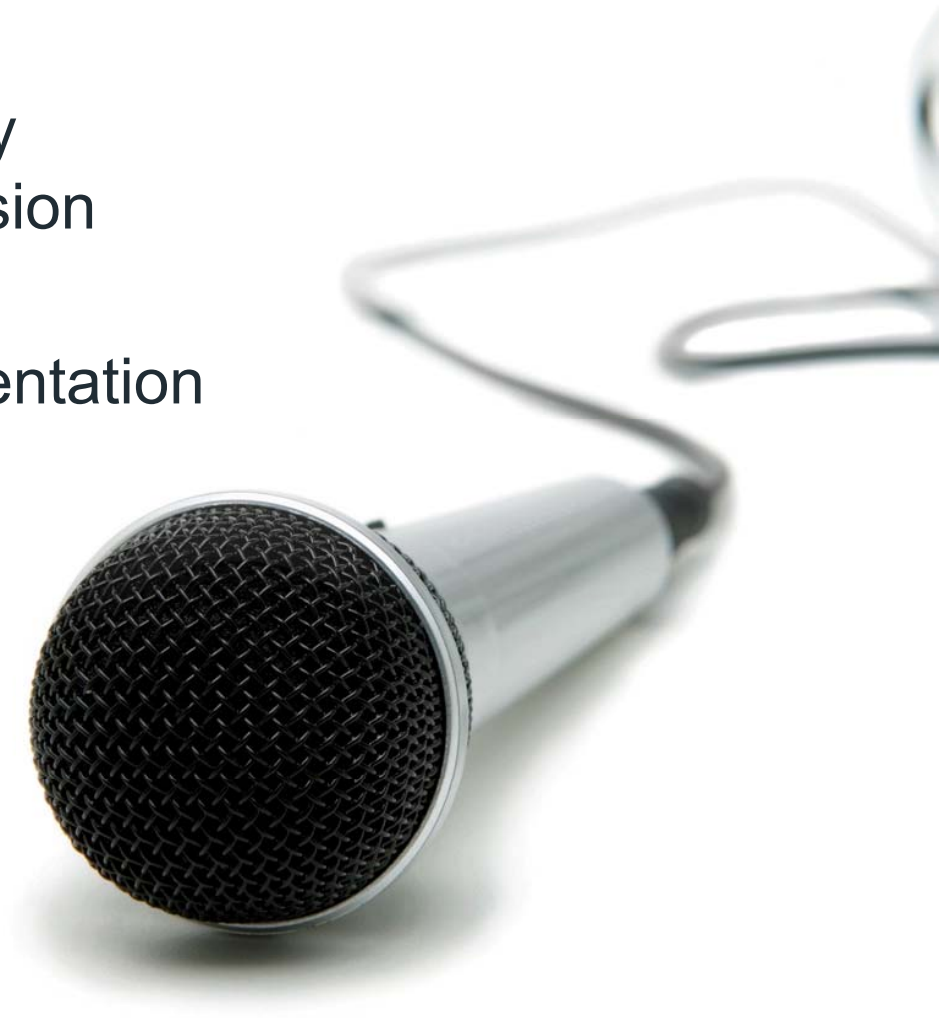
Admin. system integration

✗ IT budget “Bear Traps”

Questions or comments?

Expressions of individual views by members of The Actuarial Profession and its staff are encouraged.

The views expressed in this presentation are those of the presenter.



Tony Lovick, MA FIA
Pricing Actuary, EMEA

- Tony graduated in Mathematics from Oxford University in 1987, and qualified as a Fellow of the Institute of Actuaries in 1994. He spent twenty one years with Aviva Group, before joining EMB as a Senior Consultant.
- Tony undertook a number of roles within Aviva, most recently as Price Optimisation Actuary, “Pay as you drive” Actuary and Head of Statistics and Development, in the Personal Lines Pricing Division of Norwich Union.*
- Tony is interested in innovative actuarial research and its delivery through pragmatic systems development. As Price Optimisation Actuary he undertook the client side pricing and architecture design, concluding in a successful Motor Renewal pilot.
- As the actuary leading the research for Pay as you drive, he helped inspire the analysis, build of the data warehouse systems**, and launch of the product to market. As part of this project Aviva prepared two patents with Tony listed as the inventor, one of which is now granted***.
- As Head of Statistics he led the implementation of full postcode risk cost models for motor and home insurance, pioneering the introduction of external data to Aviva rating systems.

* http://www.linkedin.com/in/anthonylovick
** http://www.silicon.com/financialservices/0,3800010322,39169285,00.htm
*** http://v3.espacenet.com/textdoc?DB=EPODOC&IDX=GB2436880&F=0

Peter Lee FIA
Director

- Peter Lee is a Director at Towers Watson and global lead in pricing innovation with over twenty years experience in non-life insurance. Prior to joining EMB Peter worked at Allianz UK as the Personal Lines Actuary.

- Whilst at EMB, Peter worked for a large number of insurers throughout the world in different regulatory regimes, advising over a broad spectrum of areas and products ranging from claims reserving to pricing and the design of management information. Throughout his career Peter has been at the forefront of innovation, being one of the pioneers of the application of statistical modelling to personal lines pricing and then extending these techniques to commercial lines.

- More recently Peter developed EMB's price optimisation solution which has now been implemented in many of the largest general insurers in the world. Much of Peter's work involves embedding technical analysis and demand-based pricing into a wider pricing process, allowing these enhanced capabilities to be more effectively leveraged. Peter is now working with clients to link pricing and marketing to provide an enhanced framework for managing customer value.

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