Is Telematics the future in a sexless world?

Tony Lovick

Towers Watson
UK Motor Insurance Market

- Some would question why motor insurers persist?

Motor Insurance Results Net of Reinsurance by Accident Year

- Earned Premium
- Combined Ratio
- Break Even

© 2011 Towers Watson. All rights reserved. Used with permission by The Actuarial Society of South Africa
UK 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
UK 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.

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/

http://www.moneynews.co.uk/79/uk-insurance-sector-fears-eu-gender-directive/
Telematics in the personal motor market

- Geographic activity

**Canada**
- AVIVA

**USA**
- Allstate
- Am. Family
- CSAA
- Esurance
- GMAC
- Liberty Mutual

**Europe**
- Royal & Sun
- Coverbox
- Cooperative
- Insure the Box
- AXA
- Polis Direct
- MAPFRE
- AVIVA
- WGV
- Uniqua

**South Africa**
- Hollard
- MiWay
- Santam

**Japan**
- AIOI

**Australia**
- Real Insurance

© 2011 Towers Watson. All rights reserved. Used with permission by The Actuarial Society of South Africa
UK: Co-operative Launch March 2011

Motoring News

Co-op Insurance Launches Black Box Scheme For Young Drivers

The Co-operative Insurance has today launched a new Young Driver motor insurance product, which calculates premiums based on the driving behaviours of 17 - 25 year olds.

Young drivers will be rewarded for safer driving. ‘Pay How You Drive’ will be on average £328 cheaper than competitor prices, and over three quarters (82%) of young drivers could make a saving.

The launch comes as young drivers face higher motor insurance premiums, due to accident management and credit hire scams and the recent European Court of Justice (ECJ) ruling that banned companies from using gender to set insurance premiums.

David Neave, Director of General Insurance at The Co-operative Insurance, said: "It is a fact that many young people are simply being priced out of owning a car due to the escalating cost of motor insurance for young drivers. To ensure we do not end up with an entire generation priced out of car ownership we are giving them a chance to prove themselves as responsible drivers, and dispel the assumption that all young drivers will drive badly and have accidents."

Similar to Insurethebox, it uses data transmitted from a Smartbox, fitted into the policyholder's car, via satellite technology, the following behaviours can be used to calculate premiums:

- Braking and Acceleration
- Cornering
- Speed
- Time of driving (e.g. day time, night time etc.)
Q. What measures might you take to reduce the increasing cost of your car insurance?

- Do more shopping around for a lower price: 77%
- Change vehicle for a lower rated make or model: 25%
- Increase the amount of the voluntary policy excess to reduce the cost of the insurance: 22%
- Install data device to allow insurers to tailor policy cost to you: 48%
- Reduce level of cover: 12%
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 Usage Based Insurance work?

- Market
  - Quote/Renewal
    - Collect & Analyze
      - Customer Feedback Loop
        - Improve Driving
      - Underwriting
        - Improve Rating
- Company Feedback Loop
  - Driving Score
- African Actuary in a Global Village
- 2011 CONVENTION 8 – 9 NOVEMBER
Telematics Predictive Power

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

Based on public data.
Telematics Predictive Power

- Discounting safe drivers improves volumes where profitable

Average Profit = 25%
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 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

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 cases, disable the car)

Remote Safe mode activation
- Activates Geo-fence and other driving thresholds via an SMS

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

2 years
Plan | Build/Pilot | Full launch
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

Device Market

Pilot  now  Mid Term  End Game

2010  2012  2020

© 2011 Towers Watson. All rights reserved. Used with permission by The Actuarial Society of South Africa
Present Options

- Sometimes we see standalone duplication, to achieve connectivity
Connectivity Evolution

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

• GPS Data Logger

GPS Dongle: Data Logger GPS Receiver (USB, Data Logger with Google Earth Integration)

Available from these sellers.

1 new from £29.99

Micro Bluetooth USB Dongle EDR Version 2.0

Price: £1.63

In stock.
Dispatched from and sold by 7dayshop.
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
Transforming Technology to Data to Profits
Telematics Infrastructure

- Targeting
- Retention
- Guarantees
- Messaging
- Discounts
- Billing
- Sales
- Customer
- Install
- Mapping
- Device
- Install
- Mileage Check
- Storage
- Scoring
- Analytics
- Benefit Case
- Crash Data
- Servicing
Example Infrastructure – Metered Mileage
Example Infrastructure – Realtime Feedback
Example Infrastructure – Low Cost Scoring

Sales Servicing

Install

Customer

Targeting

Retention

Guarantees

Discounts

Billing

Device

Data Transfer

Storage

Scoring

Mapping

Messaging

Analytics

Benefit Case

Crash Data

Tutorial - Low Cost Scoring
Example Infrastructure – Risk Analytics

- Targeting
  - Customer
  - Install
  - Device
  - Data Transfer
  - Storage
  - Scoring
  - Analytics
  - Benefit Case
- Retention
  - Guarantees
  - Messaging
  - Discounts
  - Billing
- Sales Servicing
  - Install
  - Device
  - Crash Data
- Customer
  - Mapping
  - Data Transfer
  - Analytics
- © 2011 Towers Watson. All rights reserved. Used with permission by The Actuarial Society of South Africa
Example customer propositions

- Mass Market
  - Anti-Fraud
  - Pay for Your Mileage
  - Classic Car

- Niche Market
  - Motorway Business Driver
  - Adverse Experience
  - Young Driver Pay How You Drive
  - Young Driver Parental Support

- Volume
  - Safe Driver
  - Earn discounts
  - Bundled Services
  - Green Driving
  - High Vehicle Group

- Level of detail in telematics data
  - Aggregated
  - Granular
Collecting Data
Delivering Clean Data

- Location alone is insufficient
Simple example data for 2 ½ minute trip

| TRIP:  | 1 |
| DATE:  | 12-Jun |

<table>
<thead>
<tr>
<th>Time</th>
<th>MPH</th>
<th>Time</th>
<th>MPH</th>
<th>Time</th>
<th>MPH</th>
<th>Time</th>
<th>MPH</th>
<th>Time</th>
<th>MPH</th>
<th>Time</th>
<th>MPH</th>
</tr>
</thead>
<tbody>
<tr>
<td>0:00:00</td>
<td>2</td>
<td>0:00:25</td>
<td>12</td>
<td>0:00:50</td>
<td>9</td>
<td>0:01:15</td>
<td>2</td>
<td>0:01:40</td>
<td>0</td>
<td>0:02:06</td>
<td>30</td>
</tr>
<tr>
<td>0:00:01</td>
<td>2</td>
<td>0:00:26</td>
<td>11</td>
<td>0:00:51</td>
<td>12</td>
<td>0:01:16</td>
<td>0</td>
<td>0:01:41</td>
<td>0</td>
<td>0:02:07</td>
<td>32</td>
</tr>
<tr>
<td>0:00:02</td>
<td>0</td>
<td>0:00:27</td>
<td>10</td>
<td>0:00:52</td>
<td>14</td>
<td>0:01:17</td>
<td>2</td>
<td>0:01:42</td>
<td>0</td>
<td>0:02:08</td>
<td>32</td>
</tr>
<tr>
<td>0:00:03</td>
<td>0</td>
<td>0:00:28</td>
<td>9</td>
<td>0:00:53</td>
<td>15</td>
<td>0:01:18</td>
<td>5</td>
<td>0:01:43</td>
<td>0</td>
<td>0:02:09</td>
<td>33</td>
</tr>
<tr>
<td>0:00:04</td>
<td>0</td>
<td>0:00:29</td>
<td>9</td>
<td>0:00:54</td>
<td>14</td>
<td>0:01:19</td>
<td>7</td>
<td>0:01:44</td>
<td>0</td>
<td>0:02:10</td>
<td>33</td>
</tr>
<tr>
<td>0:00:05</td>
<td>2</td>
<td>0:00:30</td>
<td>9</td>
<td>0:00:55</td>
<td>12</td>
<td>0:01:20</td>
<td>9</td>
<td>0:01:46</td>
<td>0</td>
<td>0:02:11</td>
<td>34</td>
</tr>
<tr>
<td>0:00:06</td>
<td>6</td>
<td>0:00:31</td>
<td>9</td>
<td>0:00:56</td>
<td>12</td>
<td>0:01:21</td>
<td>11</td>
<td>0:01:47</td>
<td>0</td>
<td>0:02:12</td>
<td>35</td>
</tr>
<tr>
<td>0:00:07</td>
<td>7</td>
<td>0:00:32</td>
<td>10</td>
<td>0:00:57</td>
<td>11</td>
<td>0:01:22</td>
<td>13</td>
<td>0:01:48</td>
<td>0</td>
<td>0:02:13</td>
<td>35</td>
</tr>
<tr>
<td>0:00:08</td>
<td>9</td>
<td>0:00:33</td>
<td>11</td>
<td>0:00:58</td>
<td>9</td>
<td>0:01:23</td>
<td>15</td>
<td>0:01:49</td>
<td>0</td>
<td>0:02:14</td>
<td>35</td>
</tr>
<tr>
<td>0:00:09</td>
<td>9</td>
<td>0:00:34</td>
<td>12</td>
<td>0:00:59</td>
<td>8</td>
<td>0:01:24</td>
<td>17</td>
<td>0:01:50</td>
<td>0</td>
<td>0:02:15</td>
<td>35</td>
</tr>
<tr>
<td>0:00:10</td>
<td>8</td>
<td>0:00:35</td>
<td>12</td>
<td>0:01:00</td>
<td>6</td>
<td>0:01:25</td>
<td>18</td>
<td>0:01:51</td>
<td>1</td>
<td>0:02:16</td>
<td>35</td>
</tr>
<tr>
<td>0:00:11</td>
<td>8</td>
<td>0:00:36</td>
<td>14</td>
<td>0:01:01</td>
<td>5</td>
<td>0:01:26</td>
<td>19</td>
<td>0:01:52</td>
<td>7</td>
<td>0:02:17</td>
<td>33</td>
</tr>
<tr>
<td>0:00:12</td>
<td>7</td>
<td>0:00:37</td>
<td>14</td>
<td>0:01:02</td>
<td>5</td>
<td>0:01:27</td>
<td>19</td>
<td>0:01:53</td>
<td>11</td>
<td>0:02:18</td>
<td>30</td>
</tr>
<tr>
<td>0:00:13</td>
<td>7</td>
<td>0:00:38</td>
<td>15</td>
<td>0:01:03</td>
<td>5</td>
<td>0:01:28</td>
<td>17</td>
<td>0:01:54</td>
<td>12</td>
<td>0:02:19</td>
<td>28</td>
</tr>
<tr>
<td>0:00:14</td>
<td>7</td>
<td>0:00:39</td>
<td>14</td>
<td>0:01:04</td>
<td>4</td>
<td>0:01:29</td>
<td>15</td>
<td>0:01:55</td>
<td>13</td>
<td>0:02:20</td>
<td>24</td>
</tr>
<tr>
<td>0:00:15</td>
<td>7</td>
<td>0:00:40</td>
<td>12</td>
<td>0:01:05</td>
<td>4</td>
<td>0:01:30</td>
<td>14</td>
<td>0:01:56</td>
<td>13</td>
<td>0:02:21</td>
<td>21</td>
</tr>
<tr>
<td>0:00:16</td>
<td>7</td>
<td>0:00:41</td>
<td>11</td>
<td>0:01:06</td>
<td>4</td>
<td>0:01:31</td>
<td>13</td>
<td>0:01:57</td>
<td>12</td>
<td>0:02:22</td>
<td>17</td>
</tr>
<tr>
<td>0:00:17</td>
<td>8</td>
<td>0:00:42</td>
<td>10</td>
<td>0:01:07</td>
<td>4</td>
<td>0:01:32</td>
<td>11</td>
<td>0:01:58</td>
<td>12</td>
<td>0:02:23</td>
<td>14</td>
</tr>
<tr>
<td>0:00:18</td>
<td>9</td>
<td>0:00:43</td>
<td>10</td>
<td>0:01:08</td>
<td>4</td>
<td>0:01:33</td>
<td>7</td>
<td>0:01:59</td>
<td>13</td>
<td>0:02:24</td>
<td>11</td>
</tr>
<tr>
<td>0:00:19</td>
<td>12</td>
<td>0:00:44</td>
<td>9</td>
<td>0:01:09</td>
<td>4</td>
<td>0:01:34</td>
<td>3</td>
<td>0:02:00</td>
<td>15</td>
<td>0:02:25</td>
<td>7</td>
</tr>
<tr>
<td>0:00:20</td>
<td>13</td>
<td>0:00:45</td>
<td>7</td>
<td>0:01:10</td>
<td>2</td>
<td>0:01:35</td>
<td>0</td>
<td>0:02:01</td>
<td>18</td>
<td>0:02:26</td>
<td>5</td>
</tr>
<tr>
<td>0:00:21</td>
<td>14</td>
<td>0:00:46</td>
<td>7</td>
<td>0:01:11</td>
<td>2</td>
<td>0:01:36</td>
<td>0</td>
<td>0:02:02</td>
<td>20</td>
<td>0:02:27</td>
<td>3</td>
</tr>
<tr>
<td>0:00:22</td>
<td>15</td>
<td>0:00:47</td>
<td>6</td>
<td>0:01:12</td>
<td>3</td>
<td>0:01:37</td>
<td>0</td>
<td>0:02:03</td>
<td>23</td>
<td>0:02:28</td>
<td>0</td>
</tr>
<tr>
<td>0:00:23</td>
<td>15</td>
<td>0:00:48</td>
<td>6</td>
<td>0:01:13</td>
<td>4</td>
<td>0:01:38</td>
<td>0</td>
<td>0:02:04</td>
<td>26</td>
<td>0:02:29</td>
<td>0</td>
</tr>
<tr>
<td>0:00:24</td>
<td>14</td>
<td>0:00:49</td>
<td>7</td>
<td>0:01:14</td>
<td>5</td>
<td>0:01:39</td>
<td>0</td>
<td>0:02:05</td>
<td>28</td>
<td>0:02:30</td>
<td>0</td>
</tr>
</tbody>
</table>
Collecting Data

- Roads, driver behaviour and traffic all impact on the patterns
### UBI Data is unlike typical pricing data

<table>
<thead>
<tr>
<th></th>
<th>Without Telematics</th>
<th>With Telematics</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Update frequency</strong></td>
<td>Annual</td>
<td>Real time, trip, daily</td>
</tr>
<tr>
<td><strong>Data quality</strong></td>
<td>Renewal UW</td>
<td>Daily scrubbing</td>
</tr>
<tr>
<td><strong>Variables</strong></td>
<td>Pre Defined</td>
<td>Manufactured</td>
</tr>
<tr>
<td><strong>Records per policy</strong></td>
<td>Few</td>
<td>A Million per Year</td>
</tr>
<tr>
<td><strong>Data size</strong></td>
<td>Gigabytes</td>
<td>Terabytes (when uncompressed)</td>
</tr>
</tbody>
</table>

*Trip Distribution by Time of Day*
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
Benefits – Rating Factors
Benefits – Simple Device

Driving Behaviour

Static Environment

Dynamic Environment
Benefits – Common Fleet Device / Map Matching

Driving Behaviour

Static Environment

Dynamic Environment
Benefits – Granular Data Pilot Device

Driving Behaviour

Static Environment

Dynamic Environment
Benefits – Granular Data Device / Map Matching

Driving Behaviour

Static Environment

Dynamic Environment
Sample Data

- Speed Kph
- Change of Speed
- Average Trip Length
- Trips per Day
- RPM

© 2011 Towers Watson. All rights reserved. Used with permission by The Actuarial Society of South Africa

2011 CONVENTION 8 – 9 NOVEMBER
Sample Data
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’

<table>
<thead>
<tr>
<th>Benefits</th>
<th>Challenges</th>
<th>Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Risk Selection</td>
<td>Device—Technical specification</td>
<td>Device</td>
</tr>
<tr>
<td></td>
<td>✓ Claims Savings proven</td>
<td>✓ Rapidly becoming cheaper</td>
</tr>
<tr>
<td></td>
<td>✓ Shared with customer</td>
<td></td>
</tr>
<tr>
<td>Customer Relationship</td>
<td>✓ Retention Benefits</td>
<td>Installation</td>
</tr>
<tr>
<td></td>
<td>✓ Social benefits</td>
<td>✓ Self install options -</td>
</tr>
<tr>
<td>Decommoditisation</td>
<td>✓ In an increasingly</td>
<td>Communications</td>
</tr>
<tr>
<td></td>
<td>commoditised market</td>
<td>✓ Customer Upload free</td>
</tr>
<tr>
<td></td>
<td></td>
<td>✓ Compression reduces data volume</td>
</tr>
</tbody>
</table>

**Challenges**

- Data—Requirements for rating
- ✓ Granularity
- ✓ Volume
- ✓ Storage
- Device—Operating options
- Distribution
- communications—Customer Upload free

**Costs**

- Device
- Installation
- ✓ Self install options -
- Communications
- ✓ Customer Upload free
- ✓ Compression reduces data volume
- Admin. System integration
- ✓ IT budget “Bear Traps”
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, now Towers Watson, as a Senior Consultant.(1) Tony is interested in innovative actuarial research and its delivery through pragmatic systems development. Within Towers Watson, Tony is the lead Architect for the Usage Based Insurance project serving a number of insurers. Latest research from Tony improves pricing models with a noise reduction technique to take account of uncertainty.(2) Last year EMB filed a patent application for this innovation.(3) 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. 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(4), 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(5). 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.

(1) http://www.linkedin.com/in/anthonylovick
(2) http://www.actuaries.org.uk/research-and-resources/documents/redefining-deviance-objective-generalised-linear-models
(3) http://www.ipo.gov.uk/types/patent/p-os/p-journal/p-pj/p-pj-ukappfilled.htm?startYear=2011&startMonth=January&startDay=12th+-+6347&endYear=2011&endMonth=January&endDay=12th+-+6347&filter=EMB&perPage=10&sort=Publication+Date
(4) http://www.silicon.com/financialservices/0,3800010322,39169285,00.htm
(5) http://v3.espacenet.com/textdoc?DB=EPODOC&IDX=GB2436880&F=0

The information in this publication is of general interest and guidance. Action should not be taken on the basis of any article without seeking specific advice.