



UBI Data

International Congress of Actuaries

Robin Harbage, FCAS, MAAA

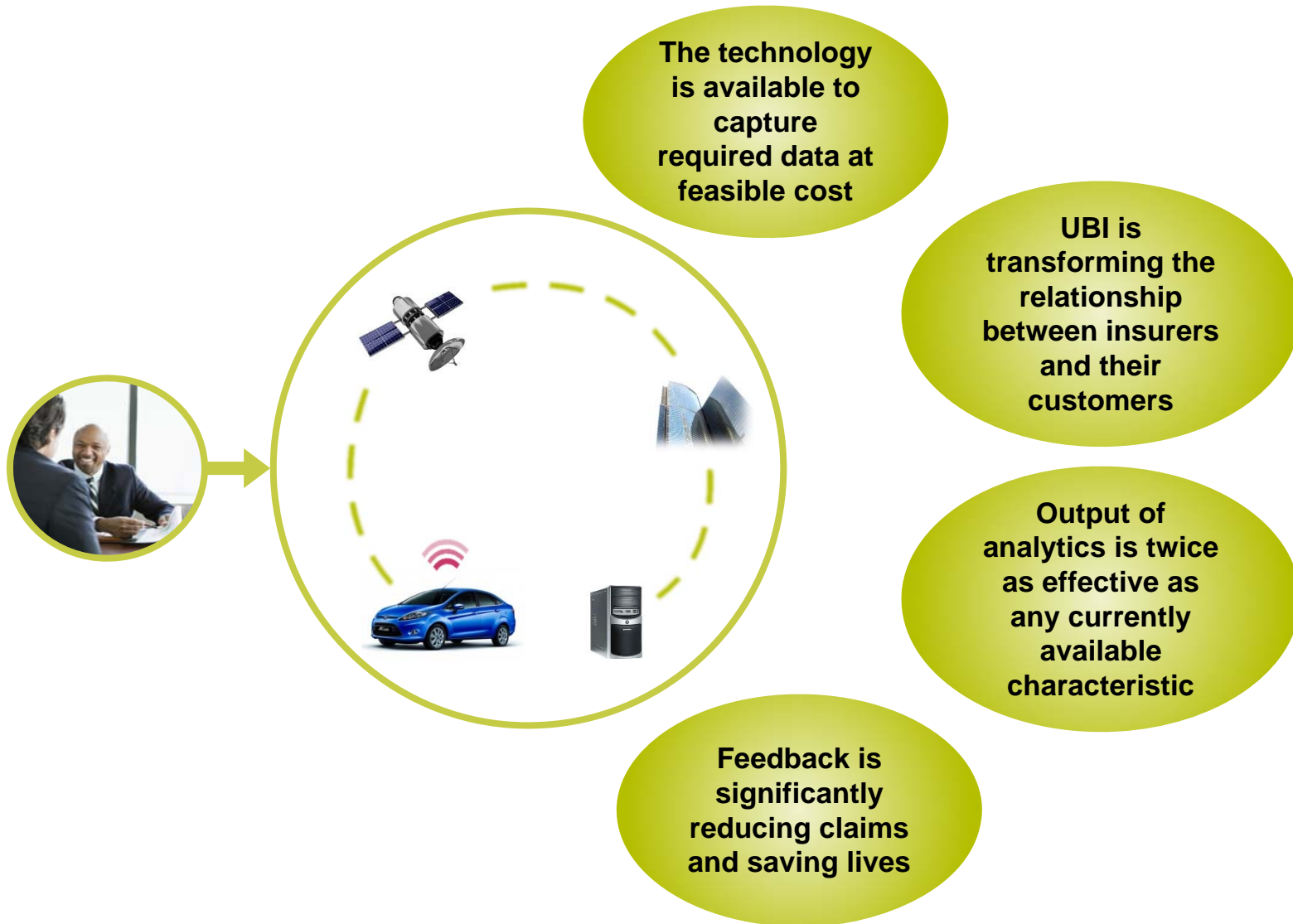
April 2, 2014

TOWERS WATSON 

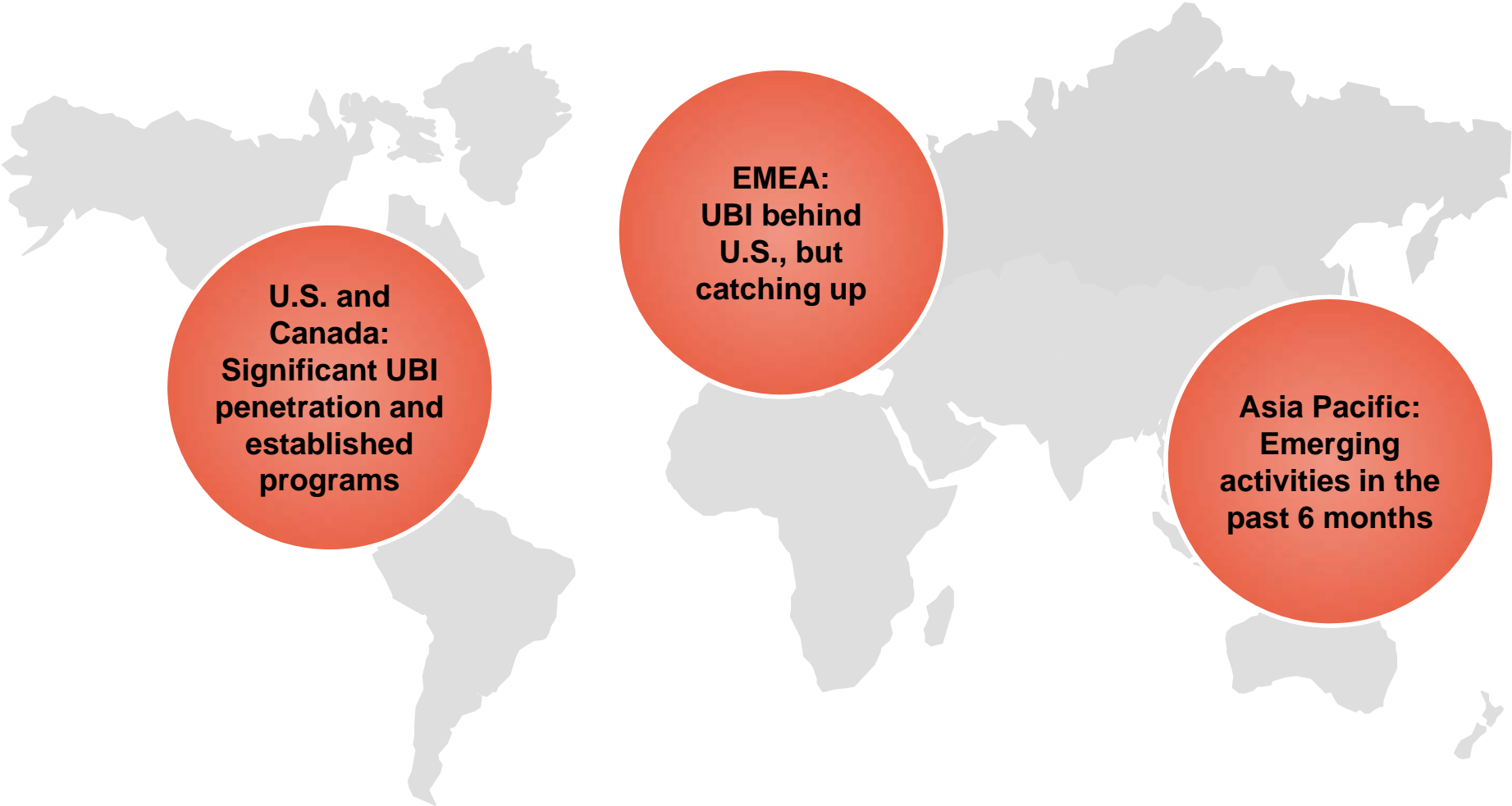
The background is a solid red color with a complex pattern of overlapping, thin, light-colored lines. These lines form a dense, web-like structure with various curves and straight segments. A prominent feature is a dashed white circle on the left side, which appears to be part of a larger geometric design. The overall effect is a textured, geometric pattern.

UBI matters

UBI is here to stay



Widespread development under way on a global basis; Pace of development varies by region



Notable global developments

United States

- Progressive continues to lead the U.S. market in 45 states and D.C.
 - Countrywide TBYB
 - Added audible beep on device
- Allstate DriveWise expands into 22 states
- Nationwide SmartRide in eight states
- esurance in 17 states
 - Introducing CellControl to block cell use while the car is in motion
- Smartphone app testing
- Oregon and Massachusetts testing options to migrate to mileage tax from fuel tax

Canada

- Desjardins launched Ajusto in Quebec & Ontario, expected to enter Alberta
- SGI announced a motorcycle program implementation

U.K.

- Focus on smartphones — new vendors and developers entered the market
- Comparative rater sites have added UBI programs to their panel of insurers

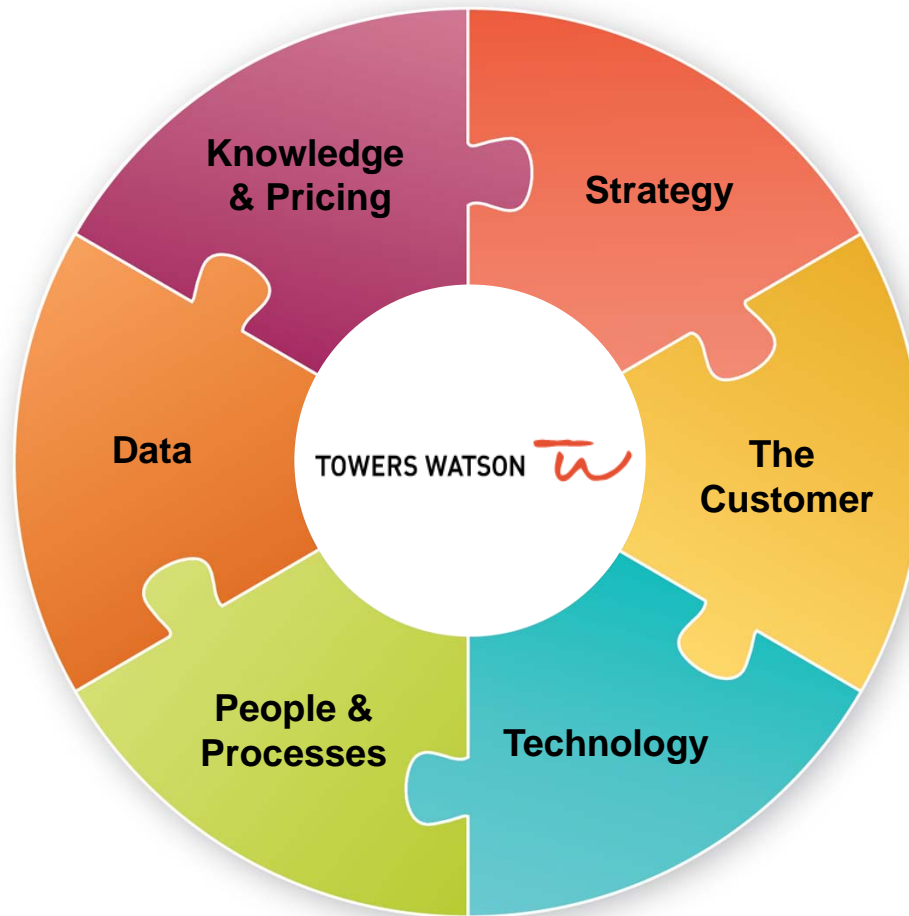
“The name of the game is the quantity of data and the quality of analysis and insight. We’ve got a 15-year, five billion-mile head start on other insurers, and we’ll only extend our lead as more drivers try Snapshot.”

— Richard Hutchinson, Snapshot General Manager

The background of the slide is a solid red color. Overlaid on this is a dense, intricate network of white lines. These lines are of two types: solid and dashed. They form a complex web of connections, with many lines radiating from a central point on the left side, creating a fan-like or star-like pattern. The lines cross each other in various directions, creating a sense of depth and complexity. The overall effect is that of a highly interconnected and somewhat chaotic system, which visually represents the concept of a 'complicated process' mentioned in the text.

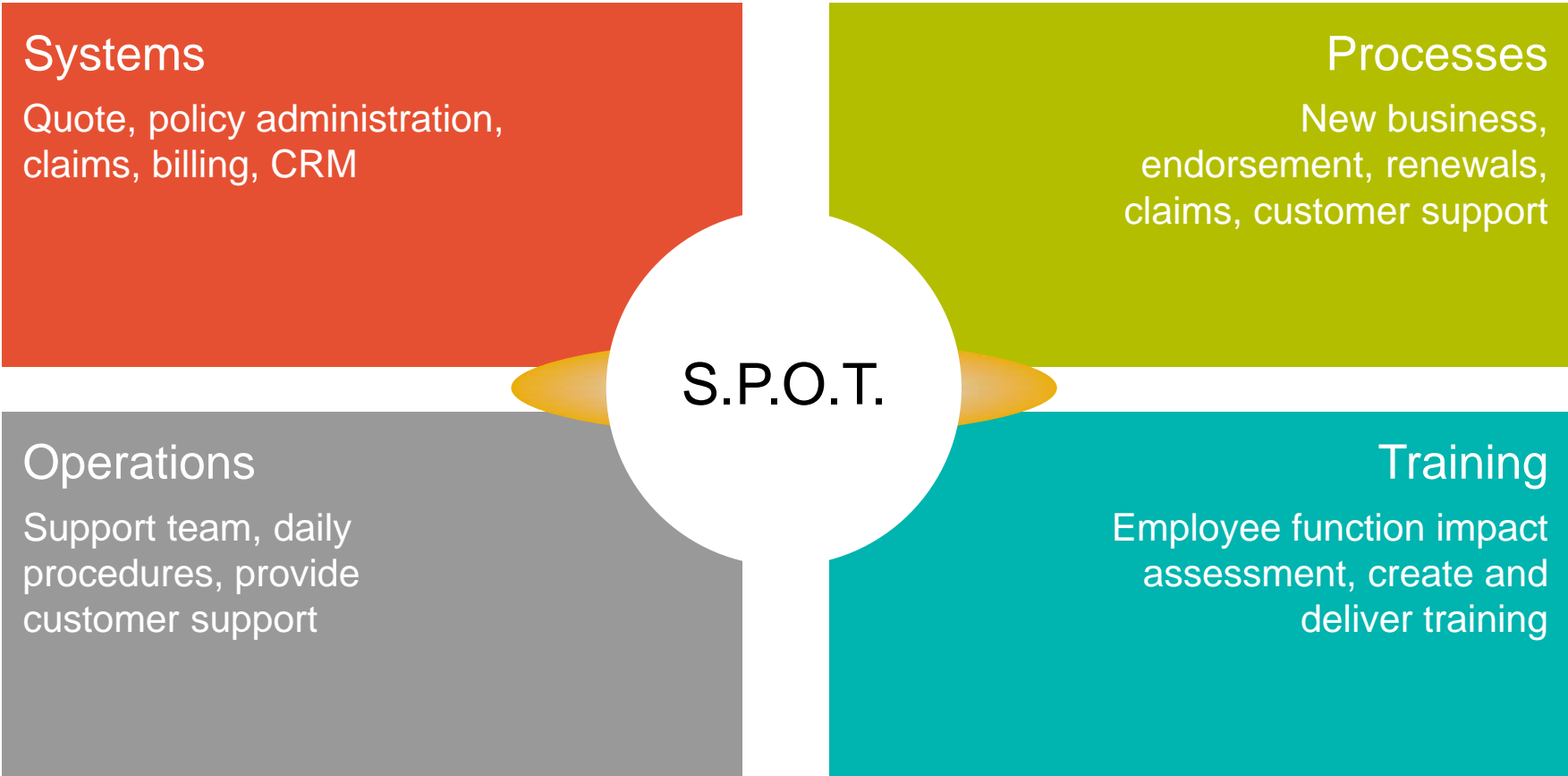
A complicated process

Getting it right, a comprehensive view to success

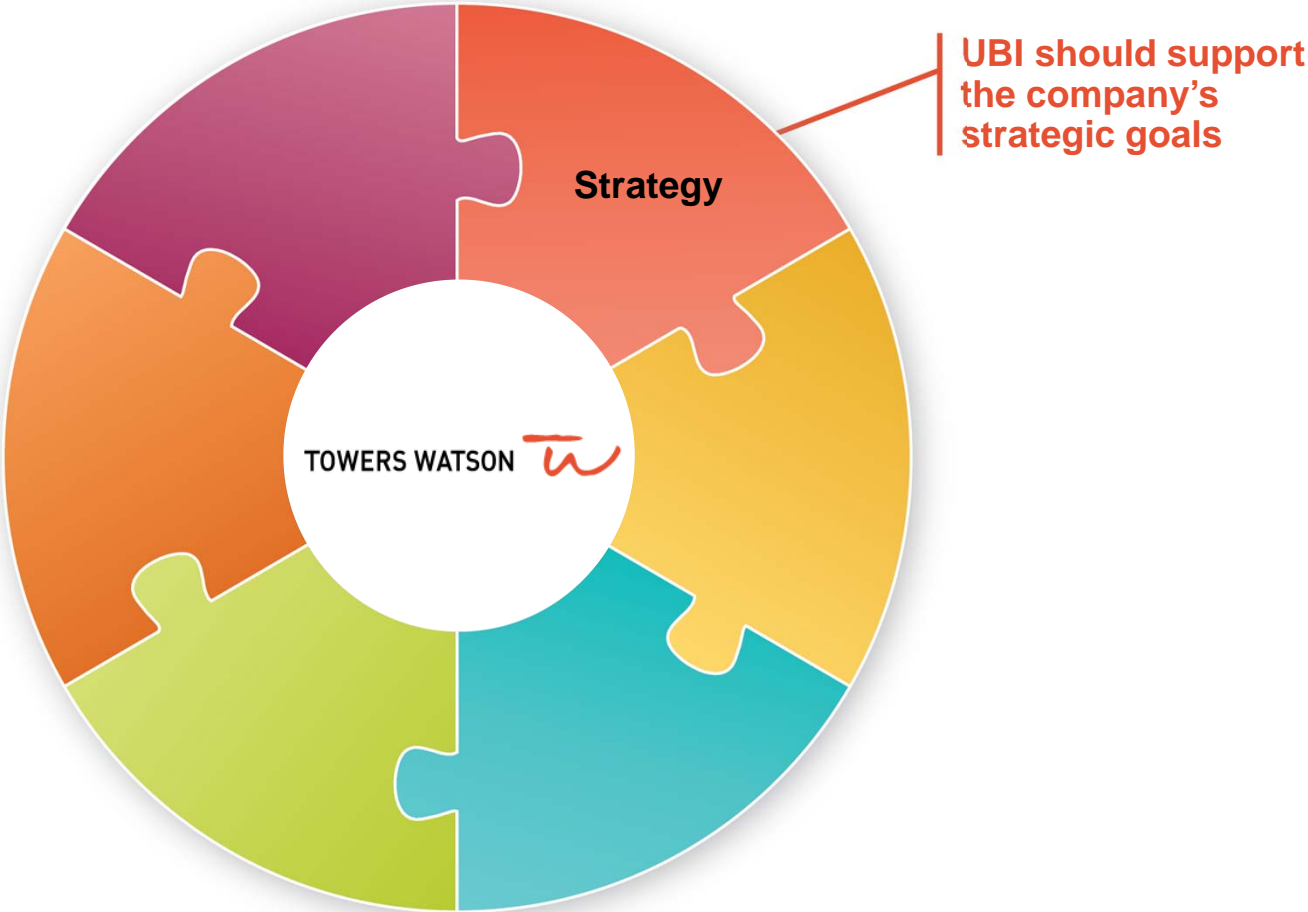


People & Processes – Prepare internal operations to support UBI

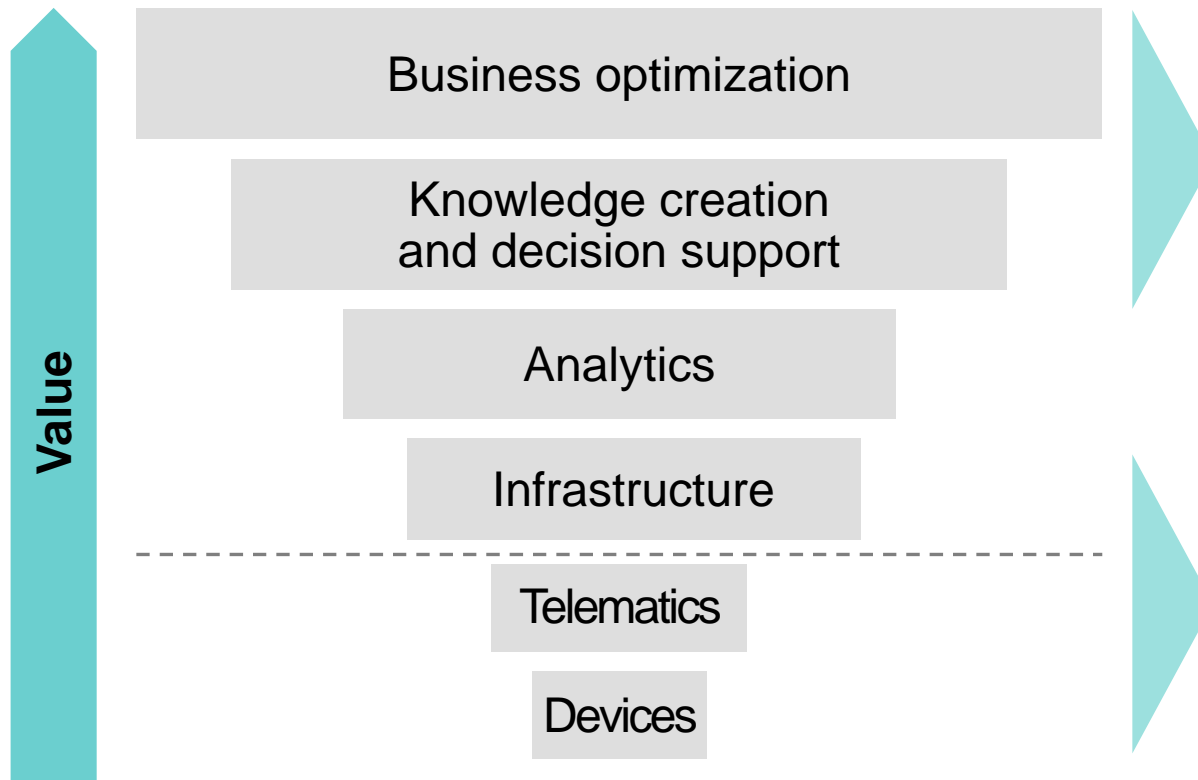
UBI is a big project that touches all areas of the company



What does success look like?



Strategy - Imperative to determine the strategy first



- Too often, the initial focus is on the device
 - While important, this is a tactical aspect of the broader project
 - Distracts management and delays time to market
 - Exposes obsolescence risk
- Determine how can telematics optimize business performance
 - Why is UBI being considered? Do we want to be considered as an innovative leader in the market place?
 - Do we want to focus on new business or improving retention?
 - Who is our target customer segment?

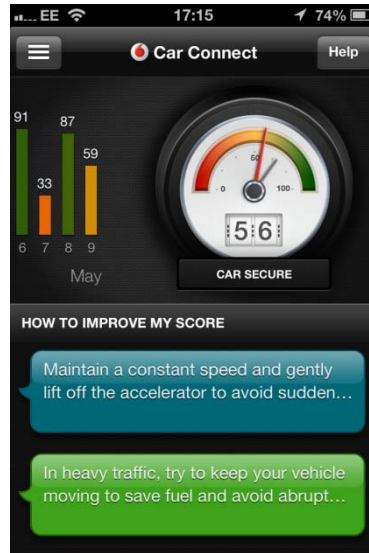
Some example benefits

Self-selection



15-30%
 Average discounts: 12% – 25%
 Maximum discounts: 30% – 50%

Pricing



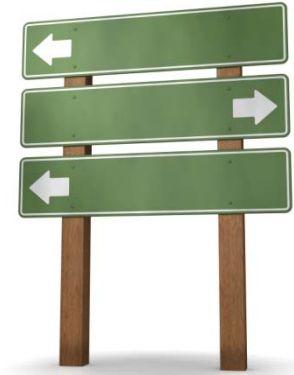
10x
 Differential in loss ratio
 from TW DriveAbility score

Retention



40%
 Improvement in retention
 cited by Progressive
http://media.corporate-ir.net/media_files/IROL/81/81824/clip-415391-dl_aud-en.mp3

Behaviour change

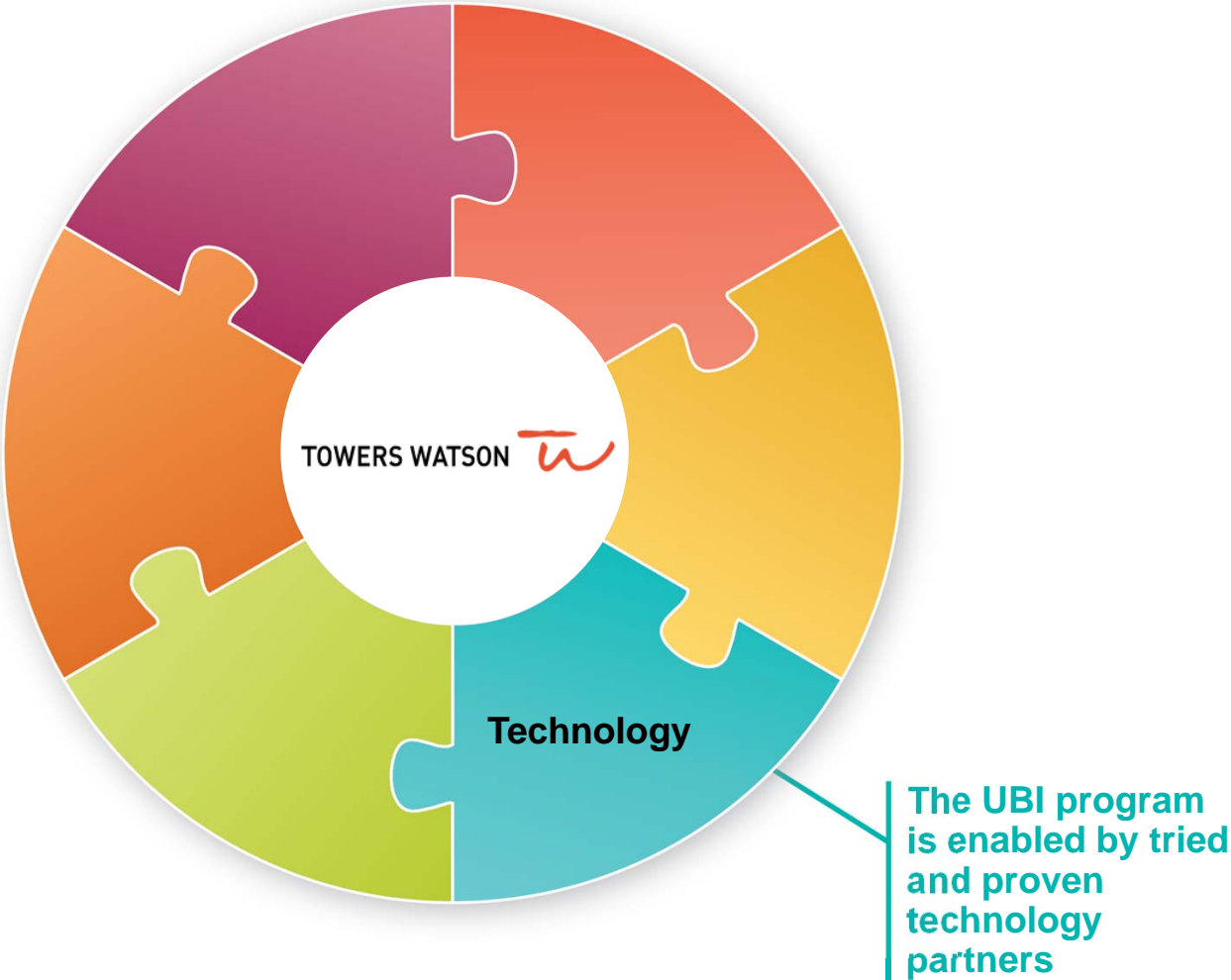


30+%
 Reduction in claims costs
 Young driver: 30% – 40%
 Commercial fleet : 54% – 93%



Telematics technology

What does success look like?



Usage-based auto insurance

What it is

- A device collects **real-time driving data**
 - Date and time, trip duration, speed, turning forces, and even location (optional)
 - Additional data can be merged including weather, traffic, and more
- Data is sent to the insurance company who uses it to **rate the driver on actual driving behaviors**

What it offers insurers

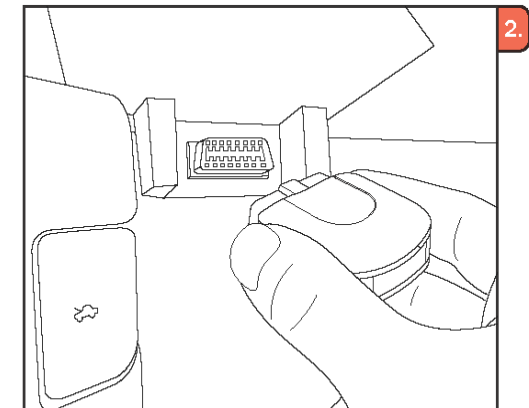
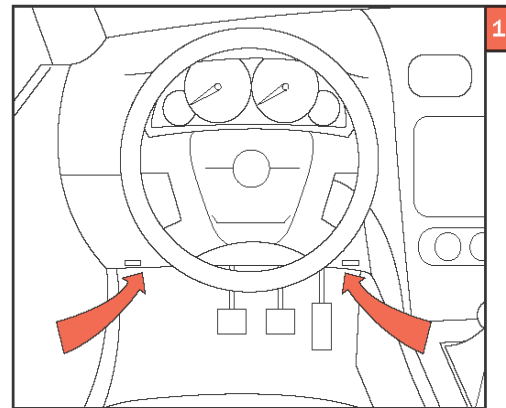
- Enhanced risk **segmentation** & improved **pricing accuracy**
- Reduced loss costs & **reduction in claims**
- Increased **consumer retention** & satisfaction
- Product differentiation & brand awareness

The Hardware

- Hard installed – requires the insured to get the vehicle fitted with a device by professional installers
- Self installed – device plugs into OBD-II port of the vehicle
- Smartphone – when it's in a vehicle, it could be used to record and transmit how the vehicle is being driven

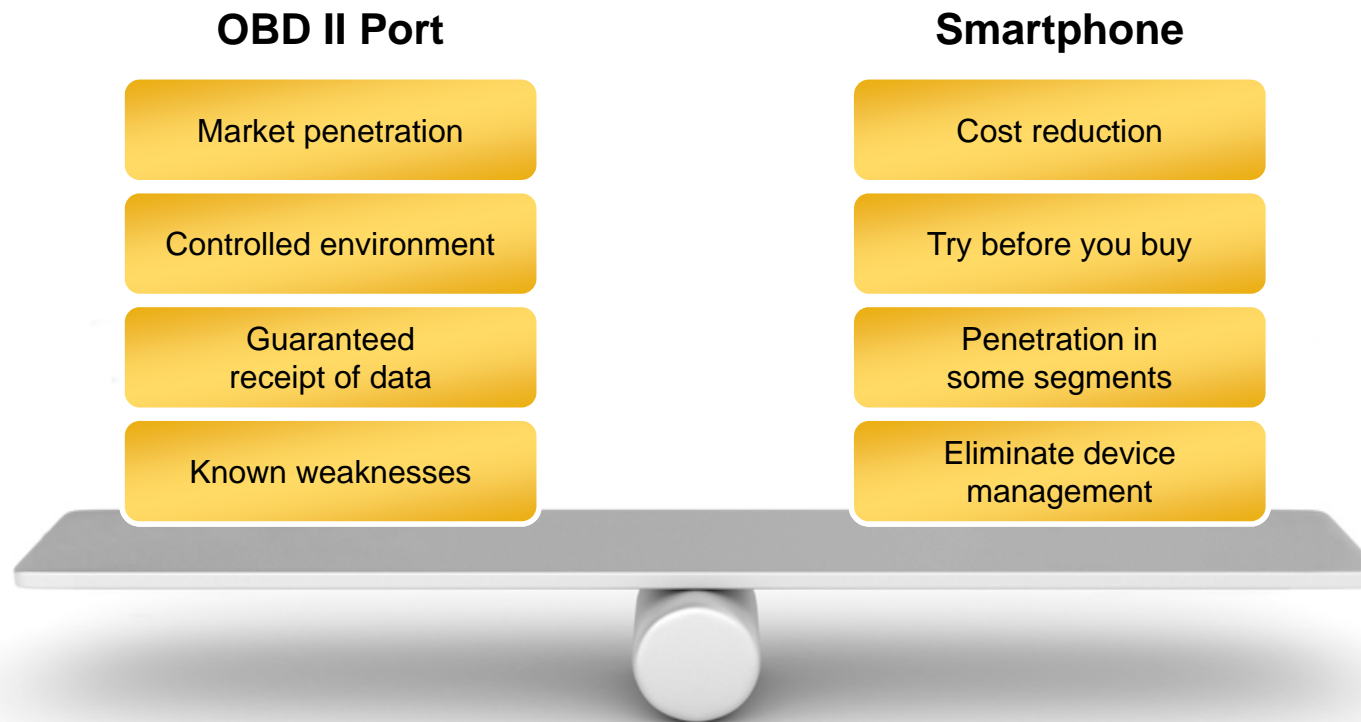


Customer Installation Experience



Insurers often ask customers to explicitly opt-in by signing Terms and Conditions. The voluntary act of plugging in devices is an unusual level of participation and acceptance in insurance.

Smartphones vs. OBD dongle



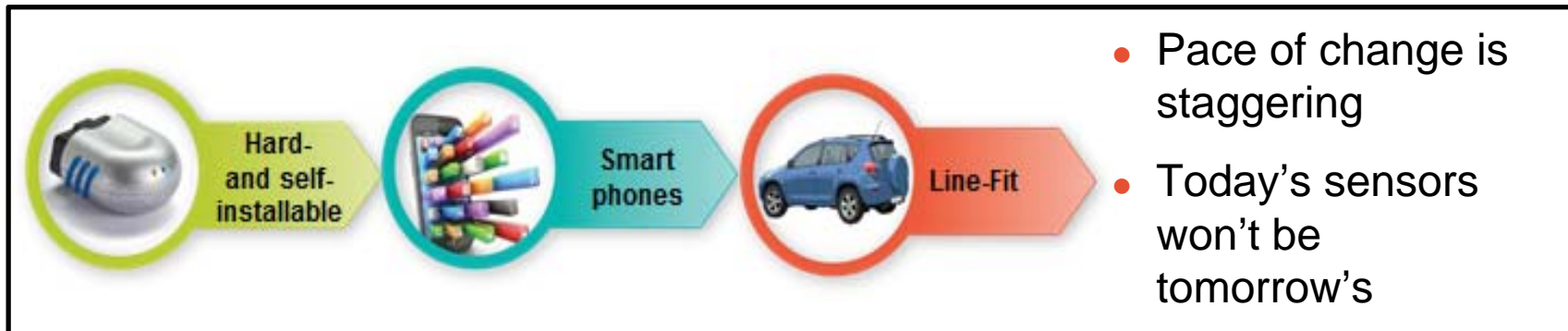
- None of the ~26 unique programs in the U.S. PL market use the smartphone as the primary source to collect data
 - Allstate and State Farm provide access to the portal via app
 - State Farm RightLane offers voluntary, open pilot to test the use of smartphone

Smartphones for UBI — User feedback

- Drains battery
- Consumes data plan
- Constant reminder of monitoring
- Trips and scores inconsistent due to phone movement or positioning
- “Complete nuisance” to start and stop recording trips



Technology - Must find partner to support short- and long-run goals



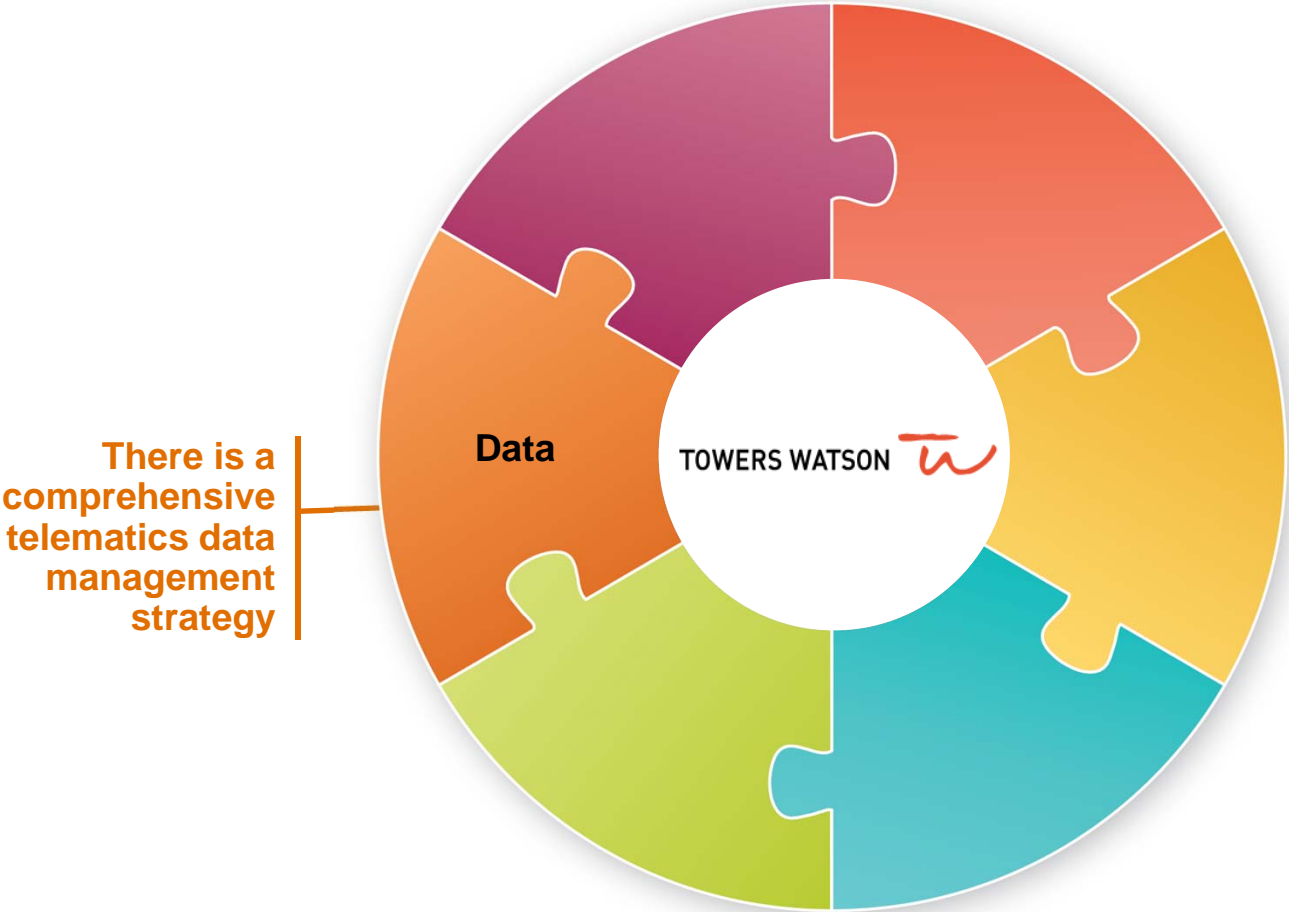
The key is to find the right technology partner

- Proven market experience
- Scalable infrastructure, customer support, and automated processes
- High-quality sensors that captures granular data with precision today
- Strong track record of “future-proofing”

The background is a solid red color with a complex pattern of overlapping lines in a lighter shade of red. These lines include straight lines, dashed lines, and curved lines, creating a dense, web-like or network-like structure. A white rectangular box is positioned in the lower-left quadrant of the image, containing the text 'UBI data' in a bold, red, sans-serif font.

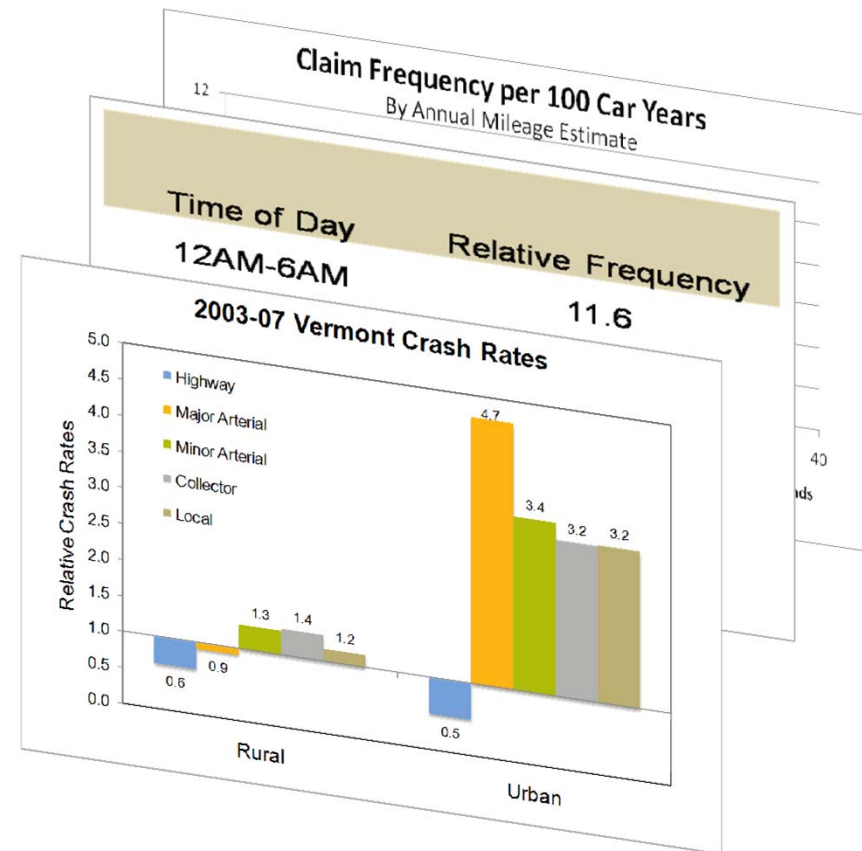
UBI data

What does success look like?



UBI benefits - enhanced pricing accuracy

- Today rates vary largely based on characteristics correlated with risk rather than cause risk
 - Not all 75 year old drivers are risky drivers
 - People in the same neighborhood do not all drive the same places
- How, when, and where a vehicle is operated causes risk
- Publicly available studies have confirmed the potential power of even the most basic information



“We believed that driving behavior was the most predictive rating factor - but didn’t expect the difference to be this dramatic. Actual driving behavior predicts a driver’s risk more than twice as strongly as any other factor.”

- Glenn Renwick Progressive CEO

Simple example UBI data for 2½ minute trip

TRIP:	1													
DATE:	12-Jun													
Time	MPH	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			
0:00:12	7	0:00:37	14	0:01:02	5	0:01:27	19	0:01:53	11	0:02:18	30			
0:00:13	7	0:00:38	15	0:01:03	5	0:01:28	17	0:01:54	12	0:02:19	28			
0:00:14	7	0:00:39	14	0:01:04	4	0:01:29	15	0:01:55	13	0:02:20	24			
0:00:15	7	0:00:40	12	0:01:05	4	0:01:30	14	0:01:56	13	0:02:21	21			
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			
0:00:20	13	0:00:45	7	0:01:10	2	0:01:35	0	0:02:01	18	0:02:26	5			
0:00:21	14	0:00:46	7	0:01:11	2	0:01:36	0	0:02:02	20	0:02:27	3			
0:00:22	15	0:00:47	6	0:01:12	3	0:01:37	0	0:02:03	23	0:02:28	0			
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			

UBI data is different...

- Consider a typical commuter
 - 20 minute commute

1,200 records of data

- Twice daily commute, 5 days a week, one year

500,000 records of data

That's just one vehicle!

Knowledge & Pricing- Telematics data is unlike typical actuarial data and requires different infrastructure, cleansing, and analytical techniques

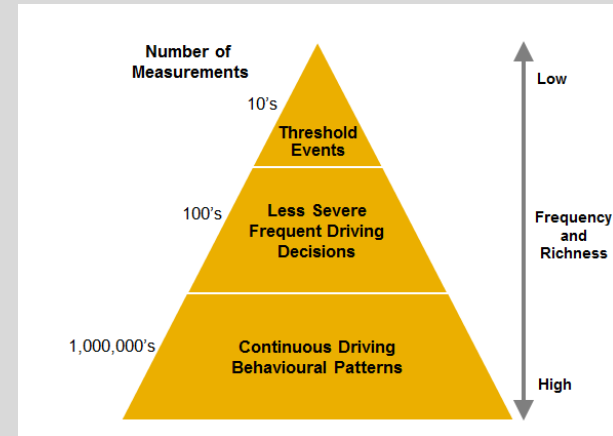
“Historically, data quantity, management, and mining have been the keys to effective segmentation and real-time usage data will be no different, but the amplification of each is not for the faint of heart. The data sets are huge, requiring storage, access, and mining techniques that challenge those that only months ago seemed state-of-the-art.” – Progressive Annual Report 2011

- Data is different than standard insurance data
 - One 20 minute commute generates 1,000+ records
- Brings new challenges
 - What infrastructure do you need to host the data?
 - How do you analyze it?

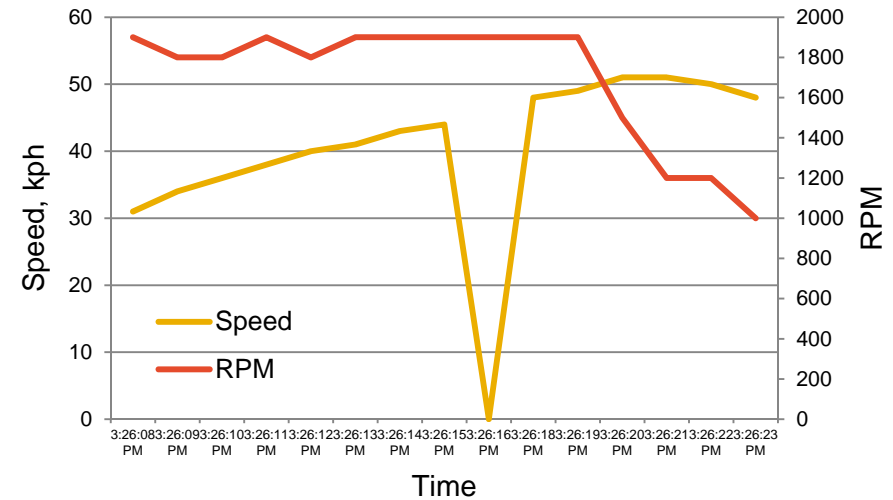
	Without UBI	With UBI
Update frequency	Semi-annual	Second-by-second
Data quality	Renewal UW	Daily scrubbing
Variables	Dozens	Hundreds
Records per policy	Dozens	Millions
File size per 1000 vehicles	Kilobytes	Terabytes (per day)

Data - Getting the right data is critical

- Danger of wasting time and money if wrong data is gathered. Granular data is imperative
 - Facilitates data cleansing to avoid garbage in, garbage out
 - Doesn't limit analysis
 - Enables ongoing analysis without waiting
 - Get the data you need, not the data you're given

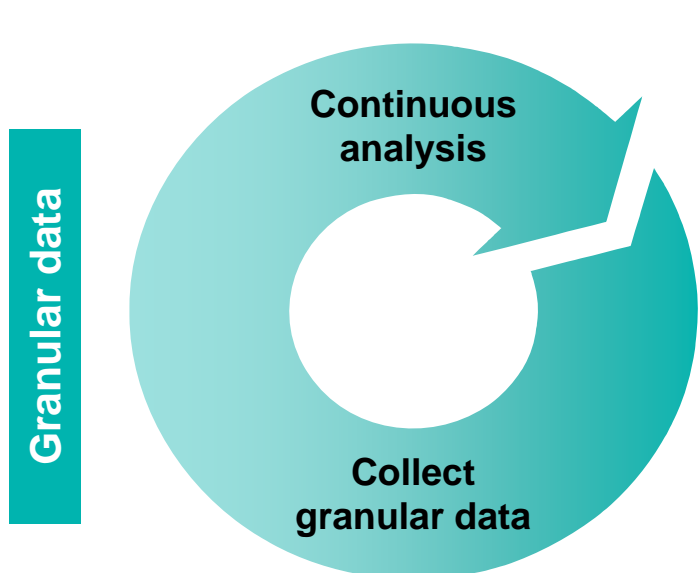
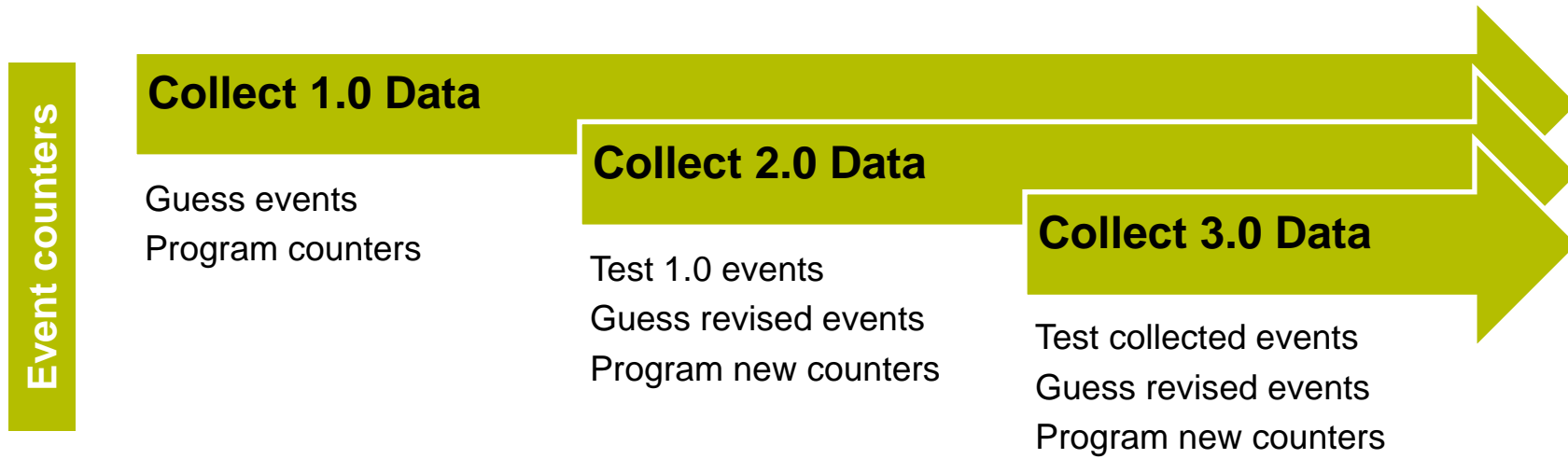


Granular data facilitates data cleansing



- Telematics data, like all data, must be scrubbed
 - Our experience is that telematics data, while okay for fleet management, typically has more errors than is acceptable for pricing purposes
 - Critical to clean the data prior to the analysis to eliminate garbage in, garbage out
 - With granular data, possible to run scrubbing routines to minimize errors and ensure proper conclusions

Granular data results in a better score faster



- Event-counter-based analysis is a linear process that can span years to “get it right”
- Granular data facilitates continuous trial and improvement cycle that significantly reduces time to effective scoring

Use results, collect data, continually refine

Granular data enables powerful new contextual rating factors



- Effectiveness depends on granularity and timing of data
- Per-second data significantly increase effectiveness:
 - Driving behavior cannot be observed effectively in minute/hourly intervals
 - “Average” driving over policy quarter/year does not pinpoint risky behavior
 - Risk factors can be created from raw journey data in context

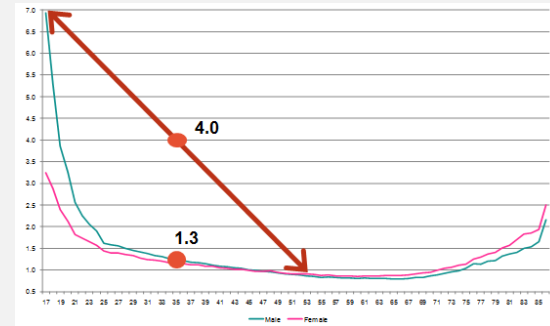
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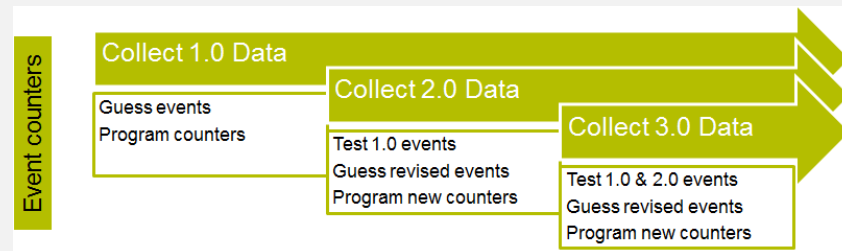
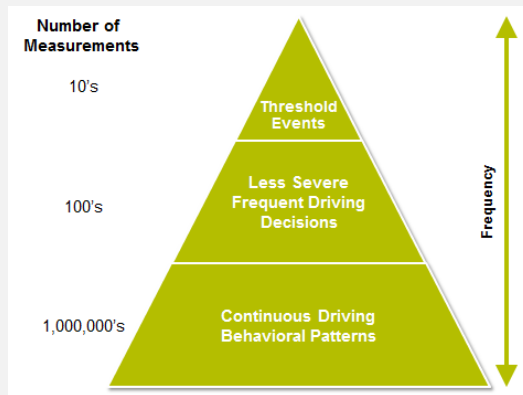
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The problem with averages and event counters...

- Averages are misleading
 - Vehicles operated for half the policy period by 53 and 17 year old drivers respectively aren't charged the 35 yr old rate
 - Likewise, driving ½ mile at 50MPH and ½ mile at 70MPH, isn't the same as driving 1 mile at 60MPH

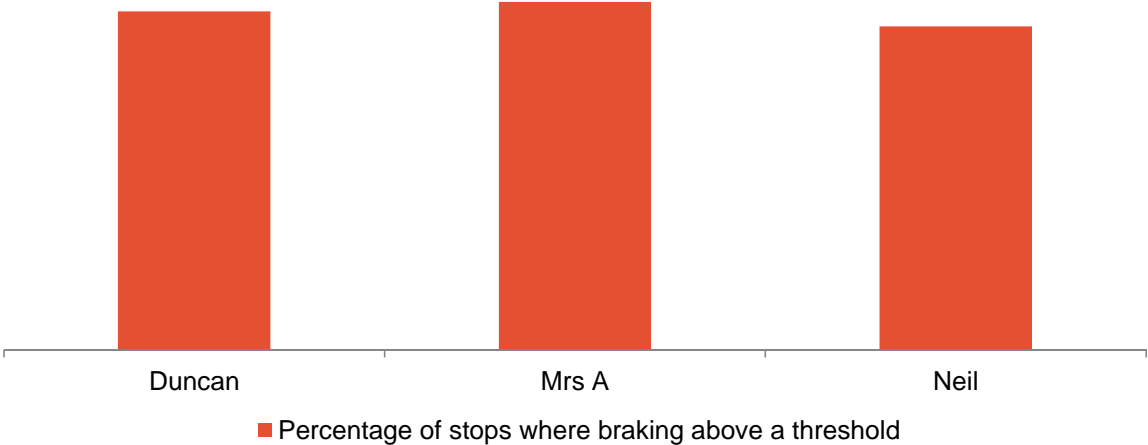
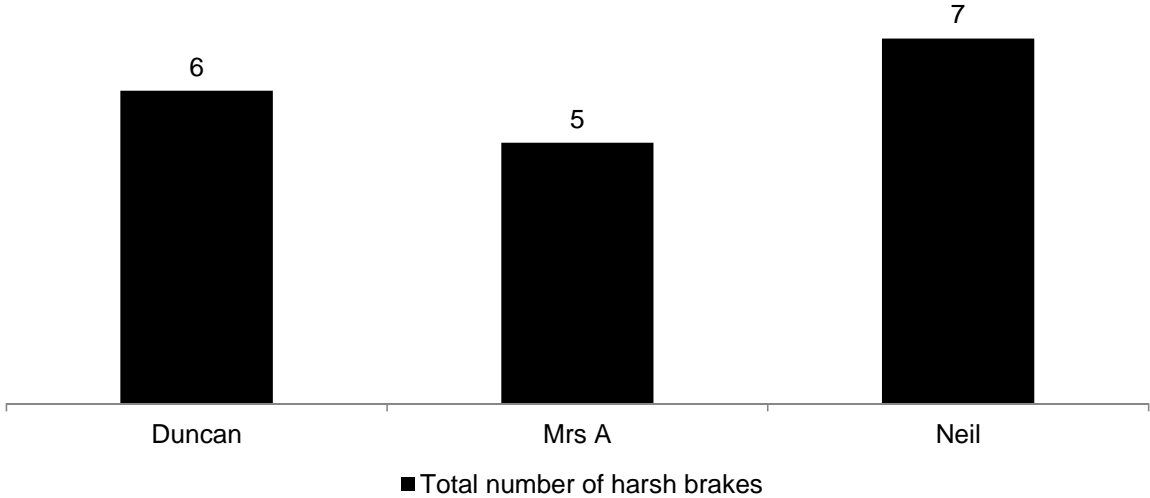


- Counters focus on rare events and discard valuable information
 - A 0.5G braking event threshold misses over 99.9% of braking events



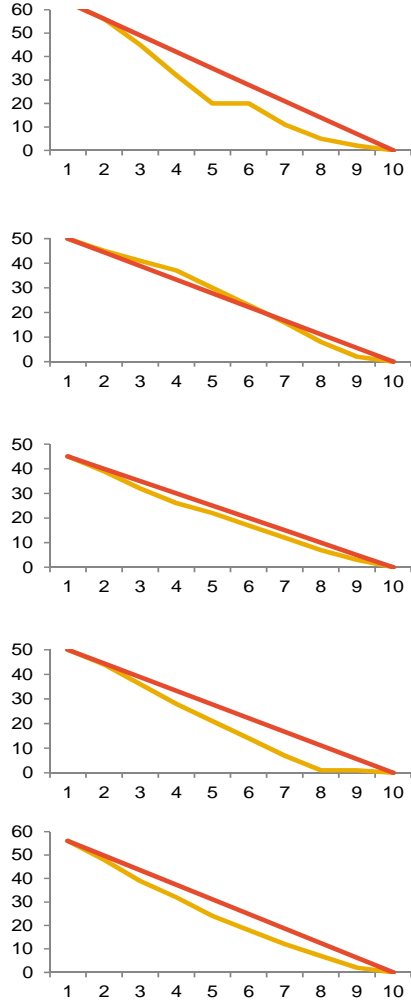
- Time to market is a key consideration for companies implementing programs
 - Event counters result in a linear guess/collect/test process that spans years
 - Granular data allows full testing at any time after sufficient volume is collected

Simple braking metrics

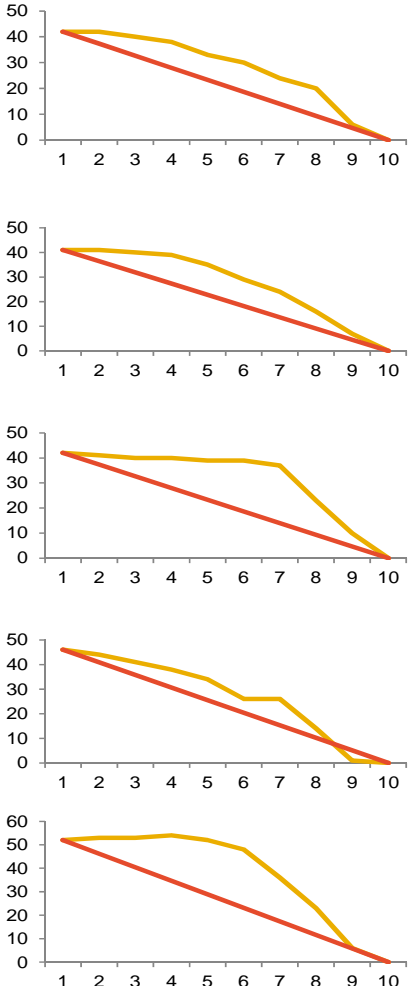


A deeper look at braking...

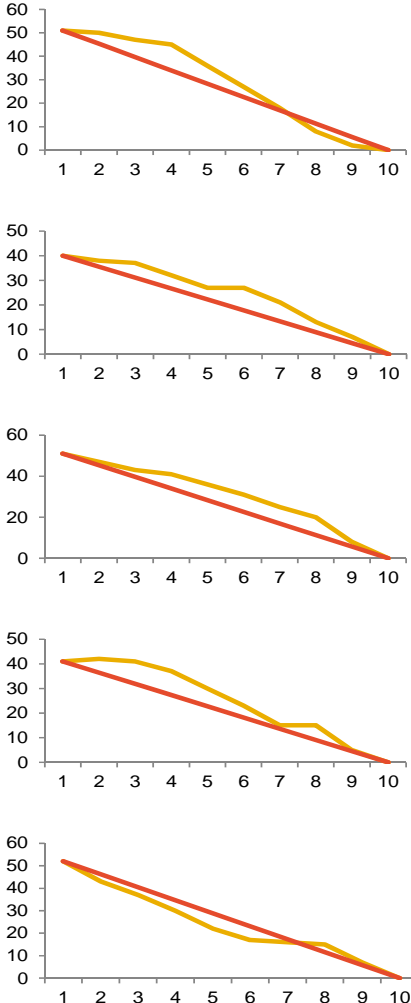
Duncan



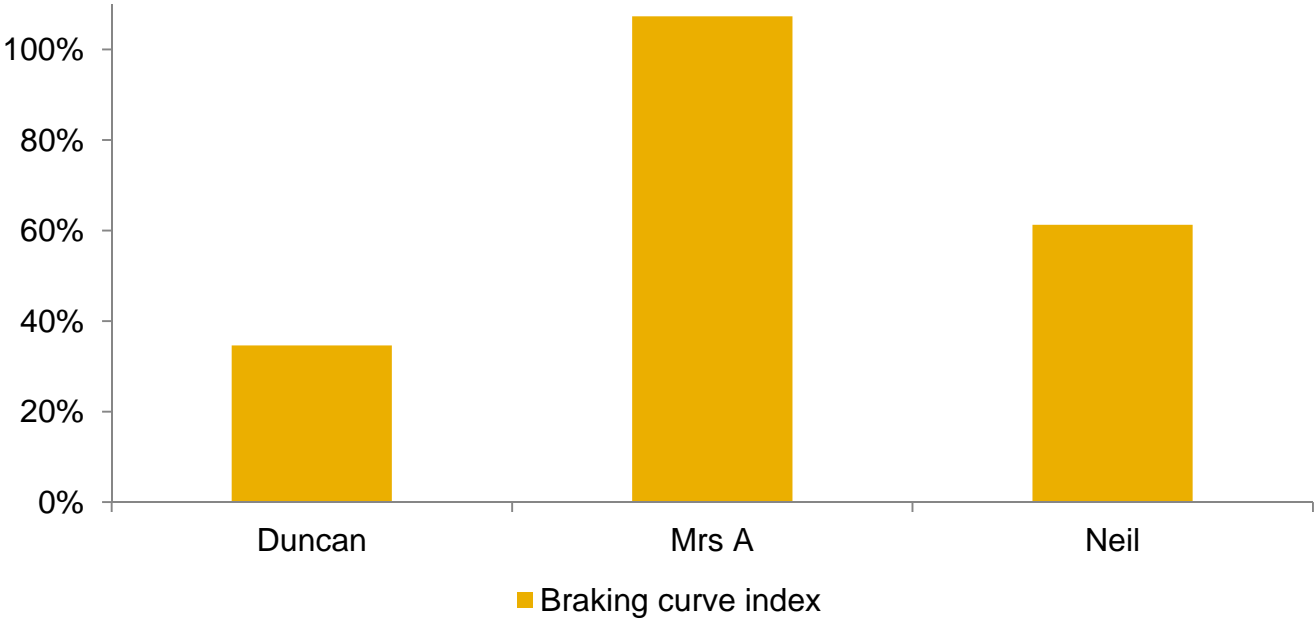
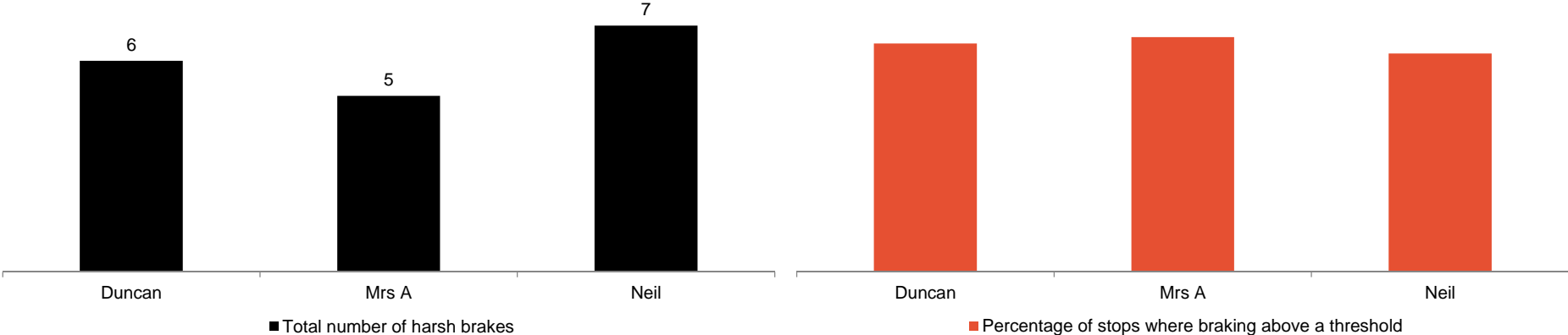
Mrs A



Neil



So, are they all really the same?



Granular data enables powerful new contextual rating factors



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Granular data example

Example: data collected every kilometre



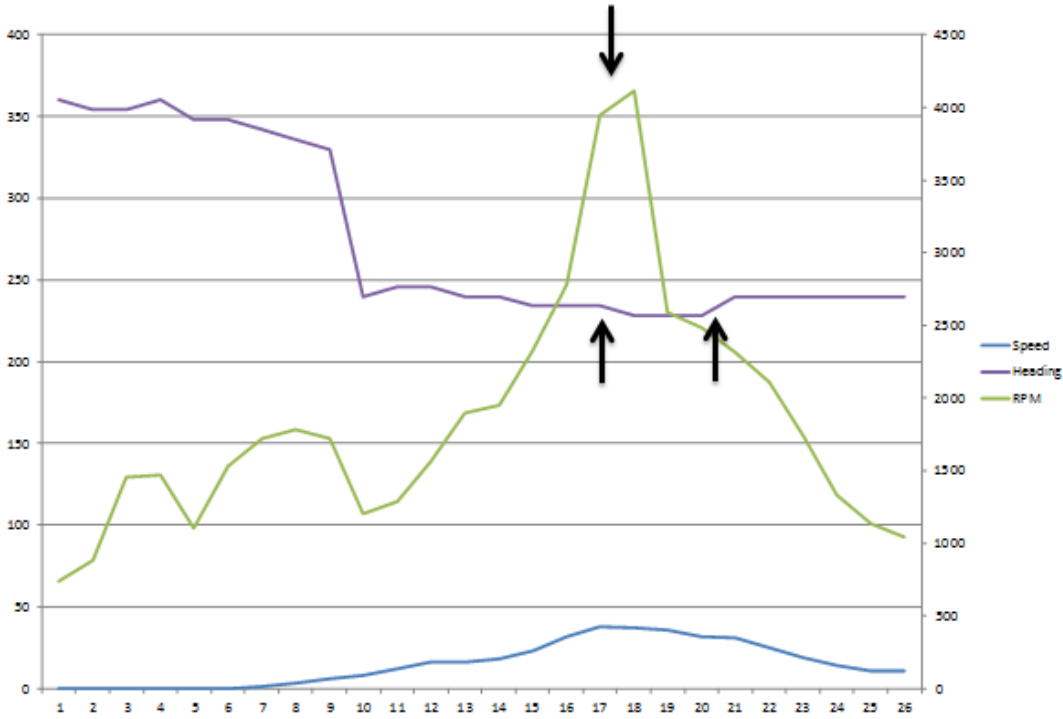
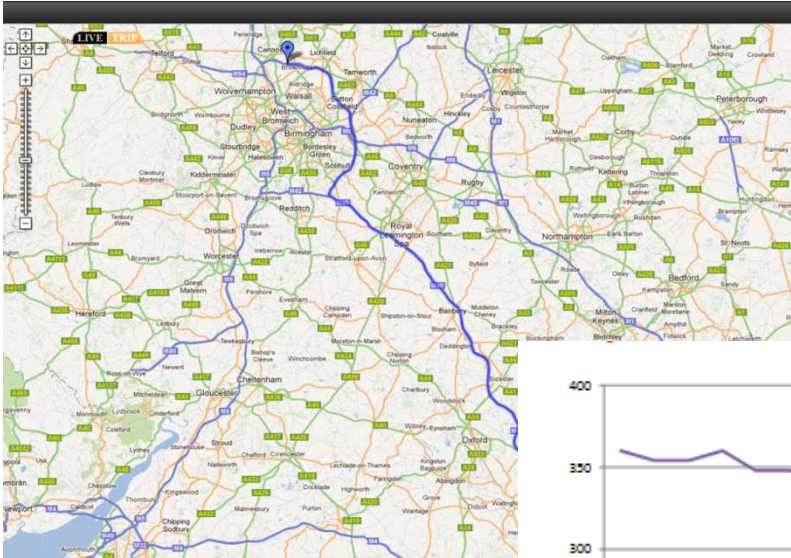
- Companies will try to supplement this type of information
 - Event counters
 - Averages

- Collecting data snapshots can provide some useful information, but it misses a lot too
 - Which roads were traveled?
 - Where were the turns?
 - How did they handle the on-ramp?

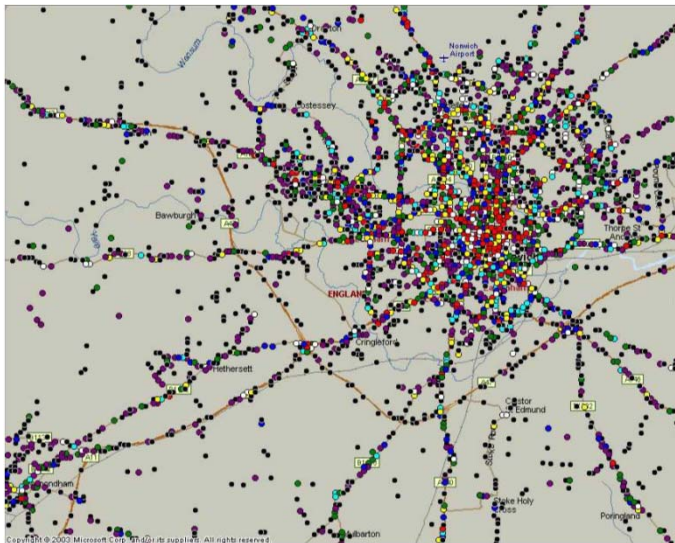
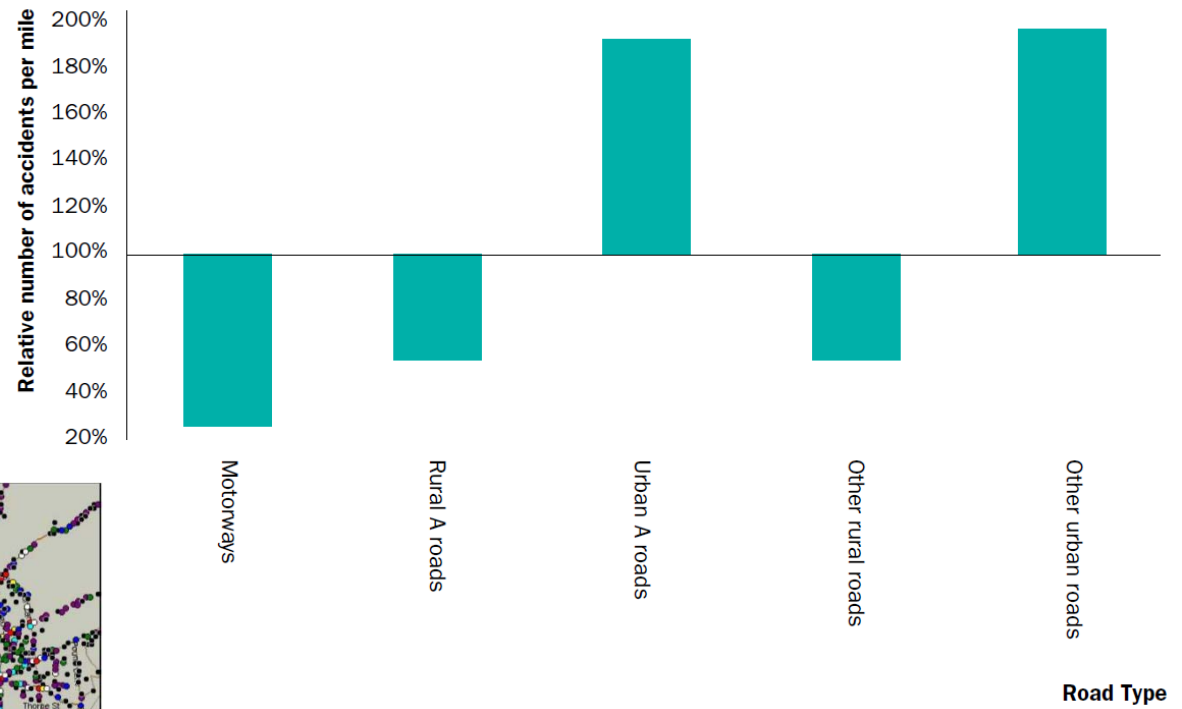
Example: data collected every second



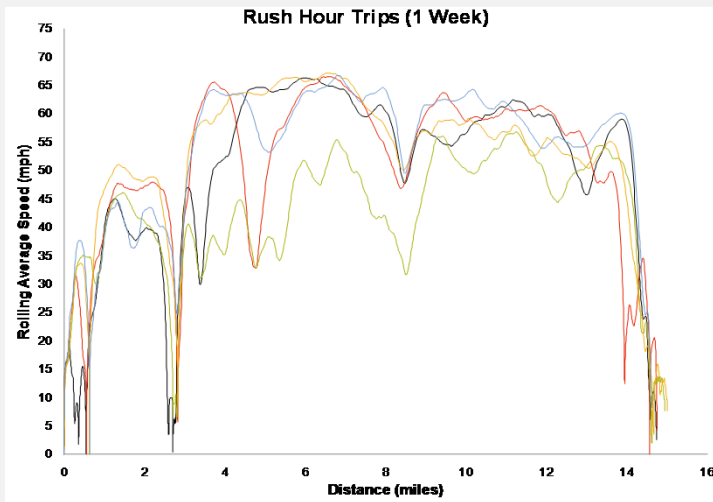
Example trip - based on actual journey and real data



Road type



External and insurance data enhance effectiveness



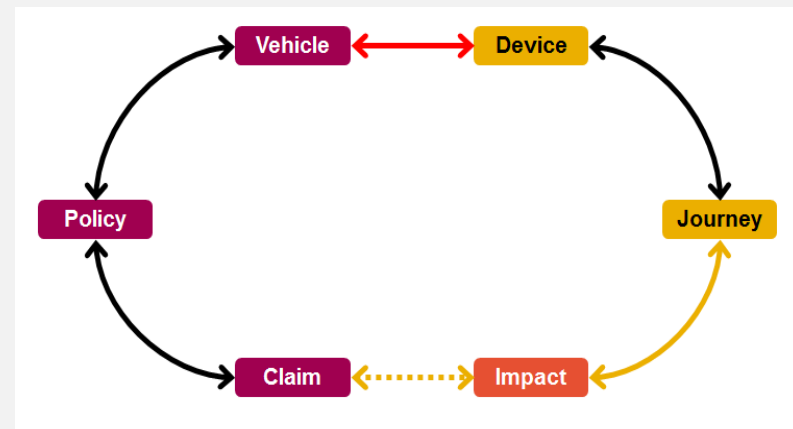
- External data puts behaviors into context



- Road type?
- Weather?
- Traffic?



- As the score will be used for insurance purposes, it should be built using insurance policy and claim information to maximize benefit
 - Claims information needed to ensure score predicts expected losses and helps identify “causal” events, instead of just correlated ones
 - Policy information puts scores in the context of the policy and ensures score is tailored to the insurance application

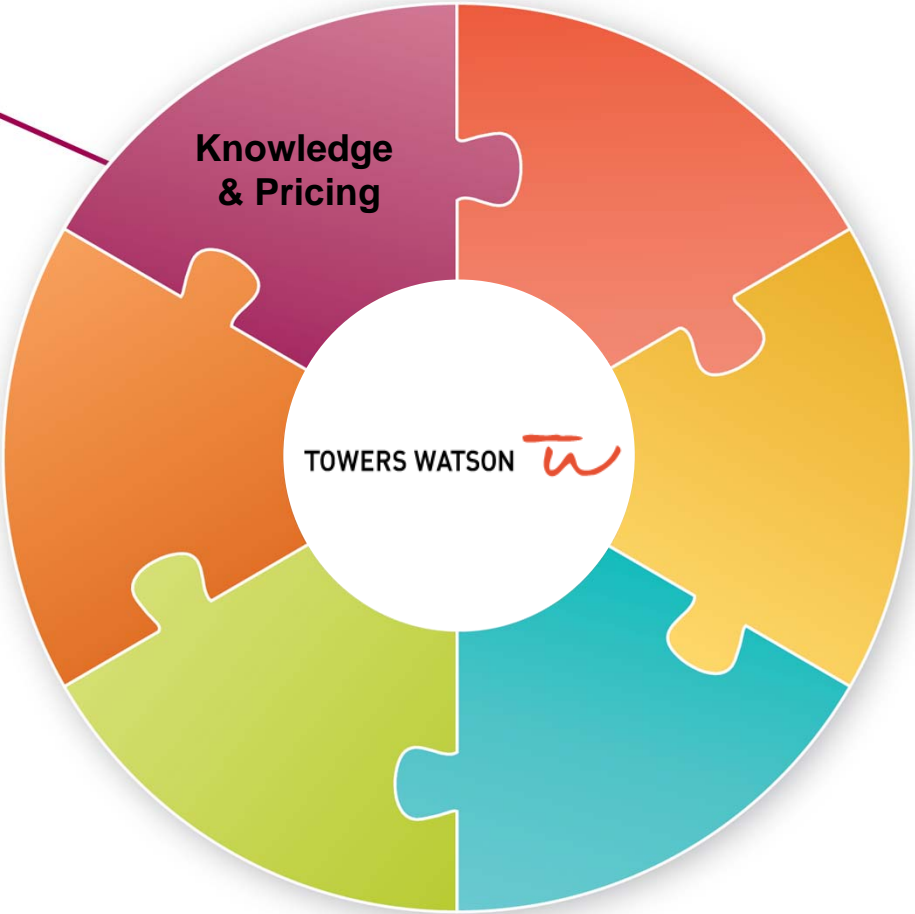


The background is a solid red color with a complex pattern of overlapping, light-colored lines. These lines include straight lines, dashed lines, and curved lines, creating a dense, web-like or geometric pattern. A white rectangular box is positioned in the lower-left quadrant, containing the word "Scoring" in a bold, red, sans-serif font.

Scoring

What does success look like?

The insurer is able to utilize telematics data to enhance long term profitability for the business



Desjardins — Ajusto through iMetrik Solutions

- Available in Ontario and Quebec, expect to launch in Alberta
- Free and voluntary for current and new policyholders
- OBD plug-in wireless telematics for 1998 or later model years
- Initial discount of 5% and renewal discount up to 25%
- Measures:
 - Distance travelled, which can contribute up to 10% discount
 - Frequency of hard braking and acceleration, accounting for up to 10%
 - Time of day driven, contributing up to 5% rate decrease

SAVE 5%
JUST FOR SIGNING UP
FOR AJUSTO

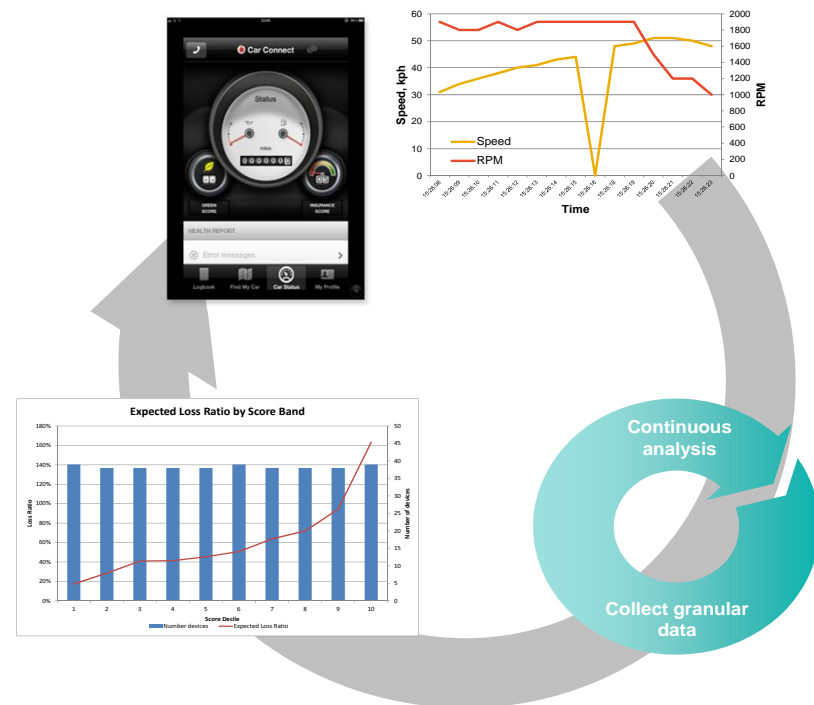


Source: Canadian Underwriter, 13 May 2013.

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What is needed for proper score development?

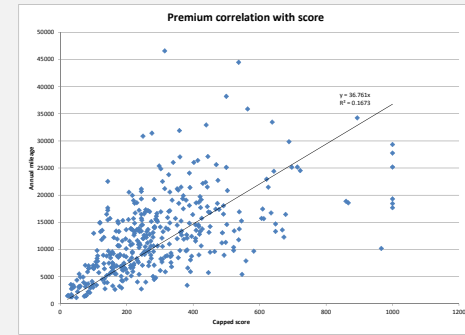
- Collecting granular data
- Appending external data to put driving behavior in the proper context
- Obtaining insurance policy and claim information to tailor score to insurance context and find causal behaviors.
- Using multivariate techniques to determine effective factors, avoid double-counting, and to calibrate appropriately
- Sufficient data to provide meaningful results
 - Race to collect data: Progressive at +6 billion miles, Allstate announced 1 billion mark



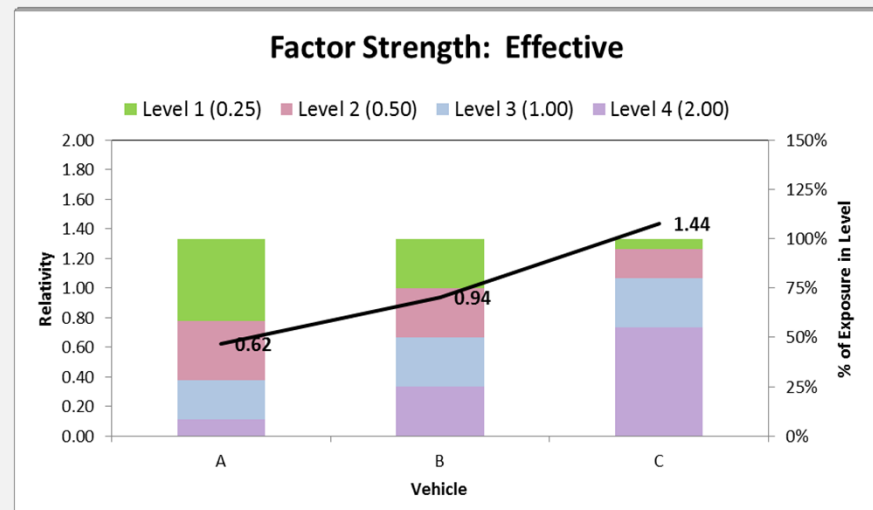
The importance of multivariate analysis

- Getting complete data is only the first part of the solution
- The score should be built using multivariate analysis techniques. By doing so, the score
 - Won't cause double-counting
 - Will have maximum predictive power
 - Will be tailored to the insurance use

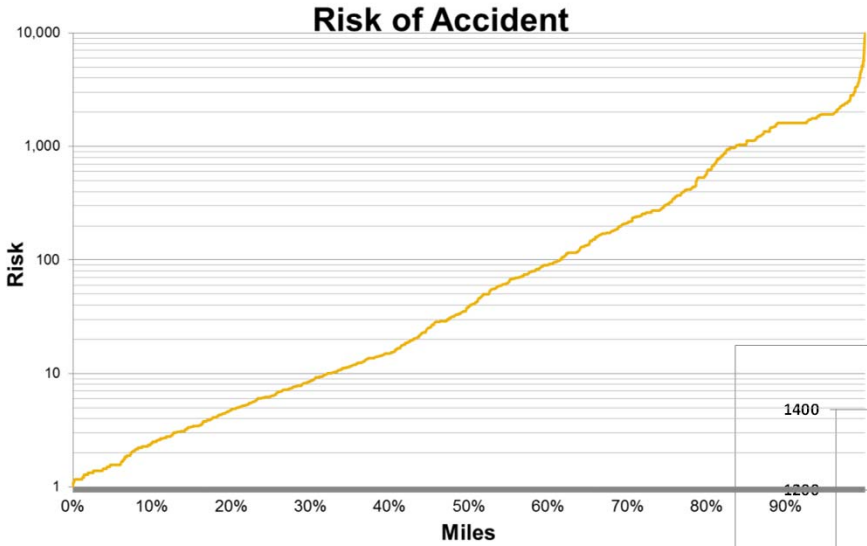
- Eliminates double-counting
 - Are multiple items within the score counting the same thing?
 - Is there overlap between the score and other characteristics already tracked (e.g., accidents)?



- Potency of the factors can be tested with policy and claims info
- For a factor to be really strong, **all** of these things must be true
 - Behavior must differentiate risk
 - Risky behavior should be more than an extremely rare event
 - Event not done equally for vehicles

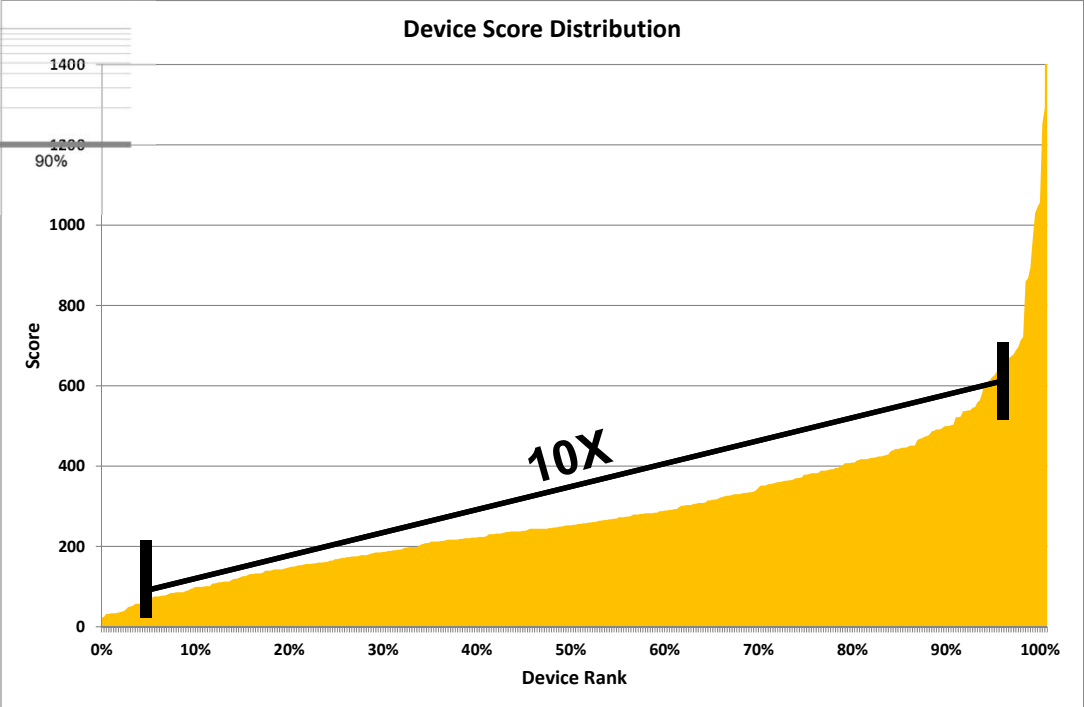


Towers Watson DriveAbility score

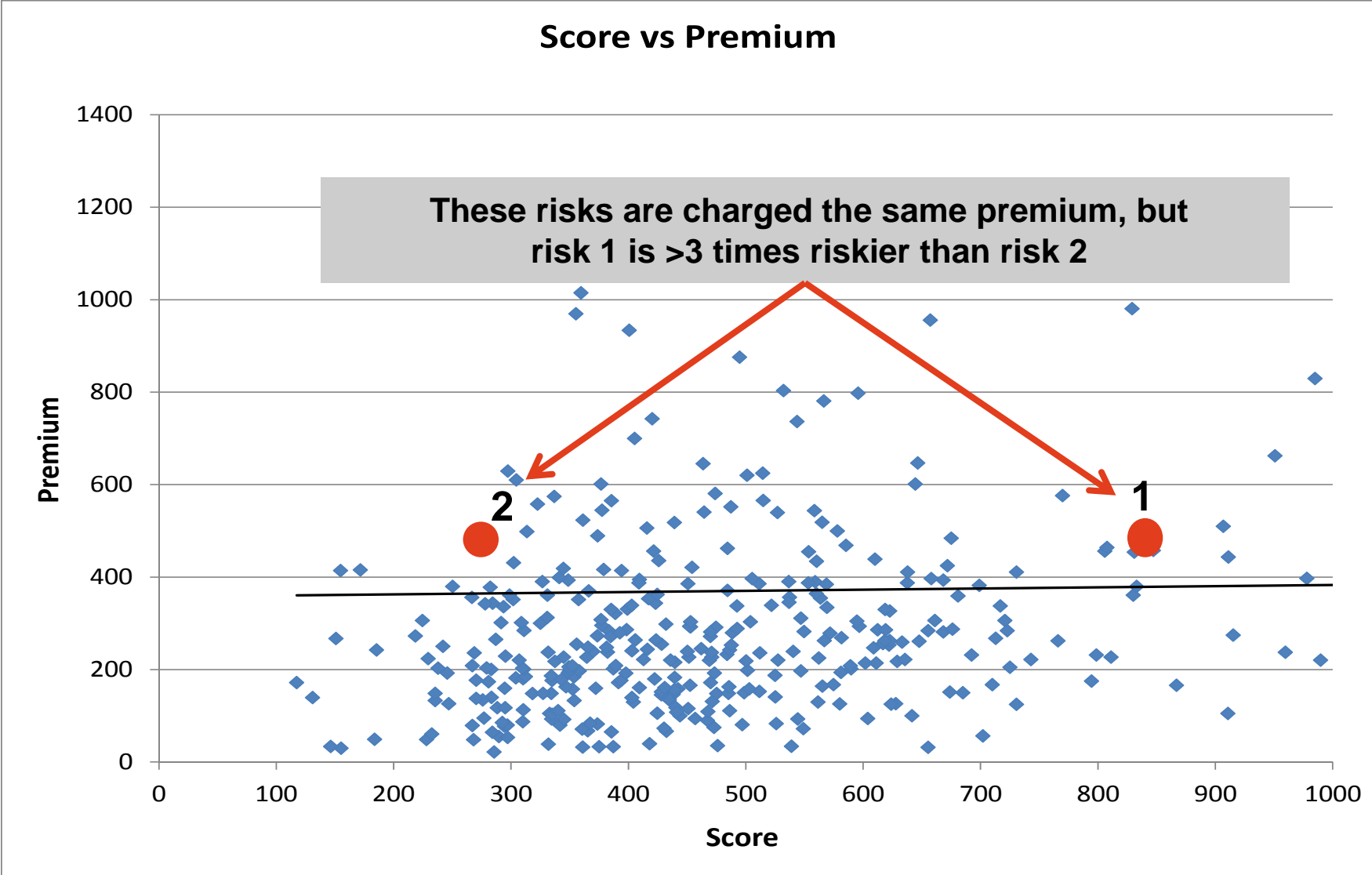


- Using the DriveAbility pooled data, our algorithm identifies certain miles as being 10,000 time riskier than others

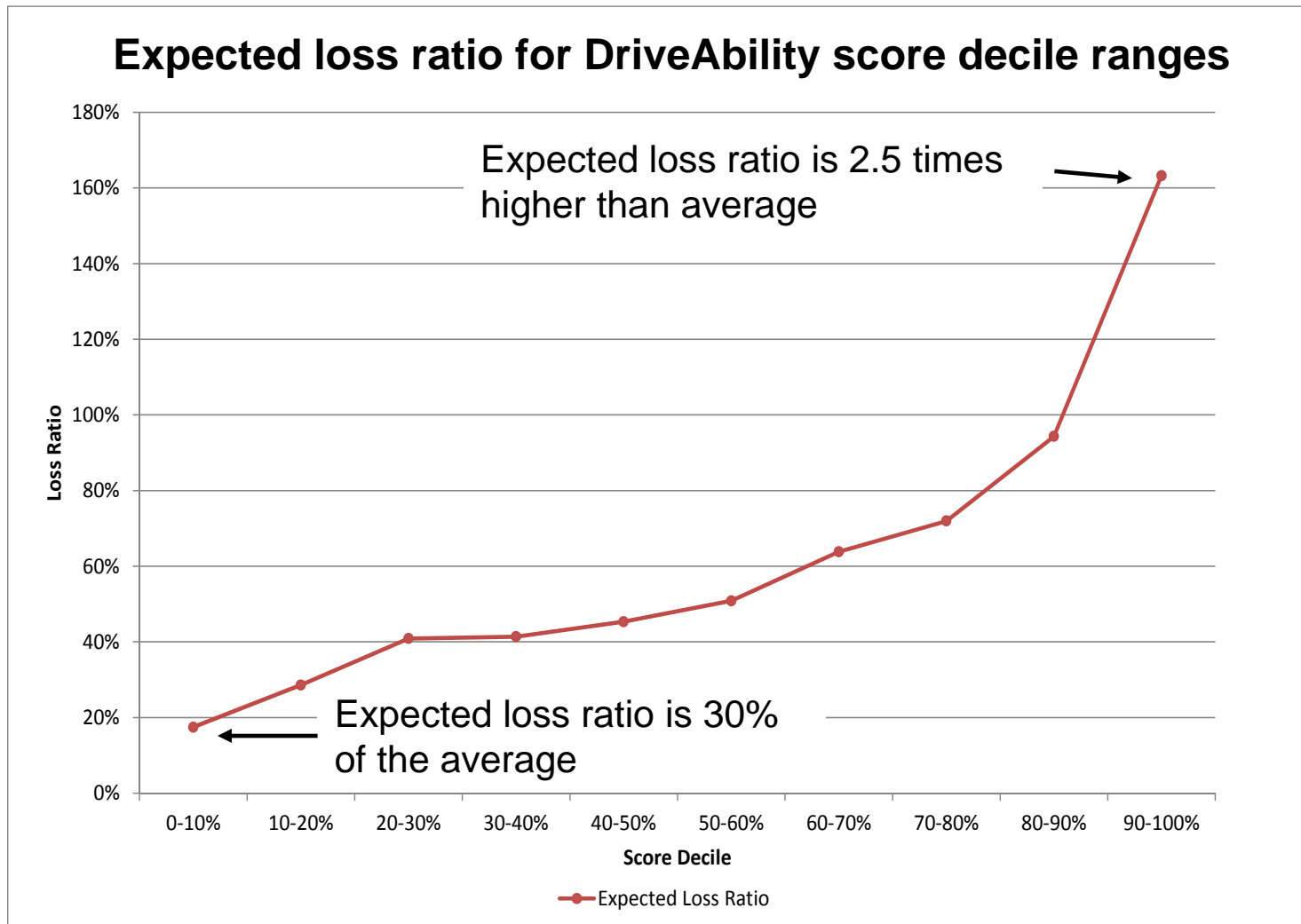
- Aggregating miles at the vehicle level results in the shown scores
 - The highest decile of vehicles has an expected cost 10 times higher than that of the best decile



DriveAbility: above and beyond traditional factors



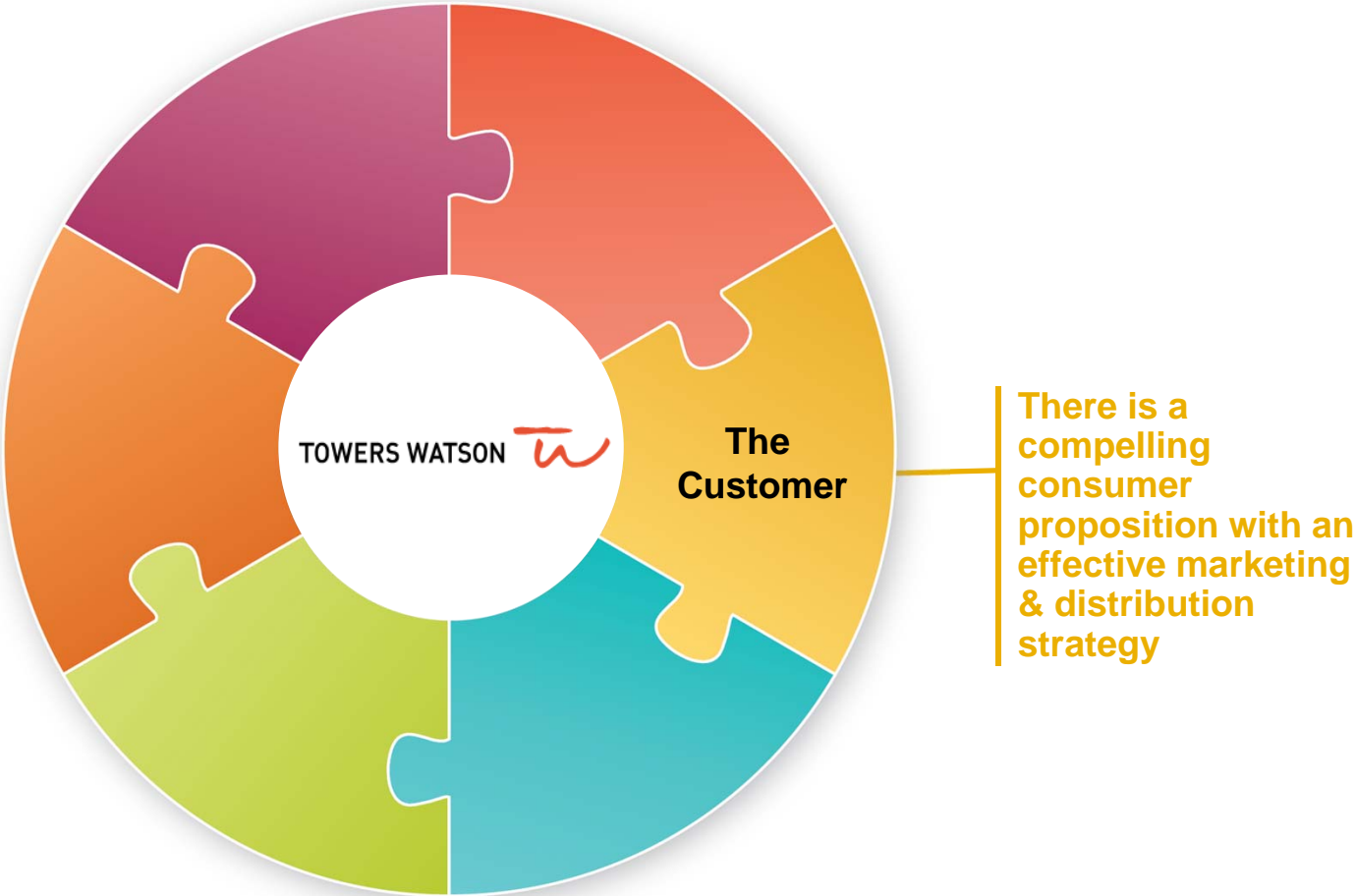
Expected loss ratio



The background is a vibrant red color with a complex, abstract pattern of overlapping lines. These lines include solid, dashed, and dotted styles, creating a sense of depth and movement. A white rectangular box is positioned in the lower-left quadrant, containing the text 'Consumer value' in a bold, red, sans-serif font.

Consumer value

What does success look like?



National Security Administration and Verizon

- NSA collected phone records of millions of Verizon customers
- Data collected for three months
- Data included phone numbers of both parties, location, call duration, and time
 - Contents of conversations were not covered
- Debate over governmental authority in domestic surveillance
- Not UBI related, but an example of why data privacy is a concern



UBI in the social world

- Sharing is becoming the norm
 - Facebook has 1.06 billion monthly active users
 - 680 million of them are mobile users
 - Twitter has 200 million active users
- We already use devices that track our data
 - Phones
 - Cars



Be transparent

Tell consumers:

- What data is collected
- How the data will be used
- With whom the data will be shared



Customer may share their data if the benefits appeal to them

A UBI proposition provides the opportunity to offer customers a **tangible product proposition**, including:

- **Control** — based on transparency of rating factors
- **Options** — based on use of vehicle, driving activity, travel needs and lifestyle
- **Promises** — of service and support when needed
- **Engagement** — no longer based around once a year

with

- **Flexibility** — to swap product, switch on/off, change or upgrade
- **Feedback** — designed to suit target audience interests
- **Features** — not previously available to the motor insurance customer



UBI benefits - improves the customer experience

- Provides opportunity to offer customers a tangible product proposition
 - Control - based on transparency of rating factors
 - Safety - using information to help all drivers be safe
 - Options - based on use of vehicle, driving activity, travel needs and lifestyle
 - Engagement - no longer based around 'once a year'

The image shows a screenshot of the Progressive website. The top navigation bar includes links for Home, Signing Up, How It Works, and Current Participants. The main content area features a promotional banner for Progressive Snapshot. The banner text reads: "You could get an EXTRA 30% OFF our best rate!" and "Sign up for a free, no-obligation trial of Snapshot* to get the savings you deserve for your good driving." A Progressive spokesperson is shown holding a SnapShot device. To the right, there is a "Sign Up in Minutes" section with a "ZIP Code" input field and a "Try It Now" button. Below the button, it says "Or, skip the trial. Quote & get Snapshot today." To the right of the website screenshot is a photograph of a SnapShot device installed in a car. Overlaid on this photo is the text "This can save your child's life..." and "...but you need to pay 15% less on your car insurance".

UBI offers many features



**Pricing Accuracy
Based On Risk**



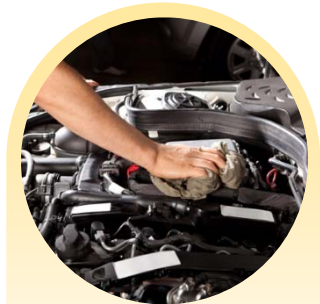
**Behavioral
Modification
Programs**

(teens, mature market, etc.)



**Safety
Features**

Emergency response,
roadside assistance,
stolen vehicle recovery



**Vehicle
Maintenance
Reporting**



**Green Driving and
Fuel Management**



**Concierge
Services**

Door unlock,
navigation, location
assistance



**Safer Roads
and Lives Saved**

Towers Watson UBI Consumer Survey



The marketplace is ready for widespread adoption of UBI

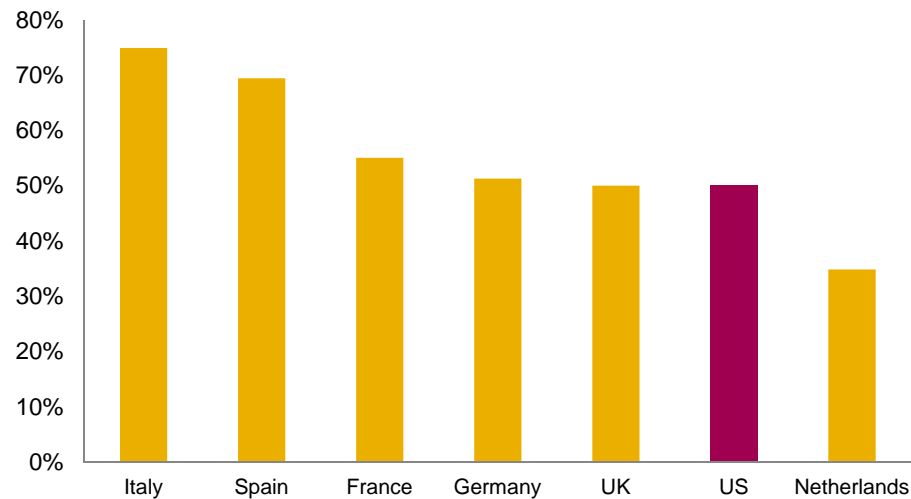
50%

Definitely or probably interested in U.S.

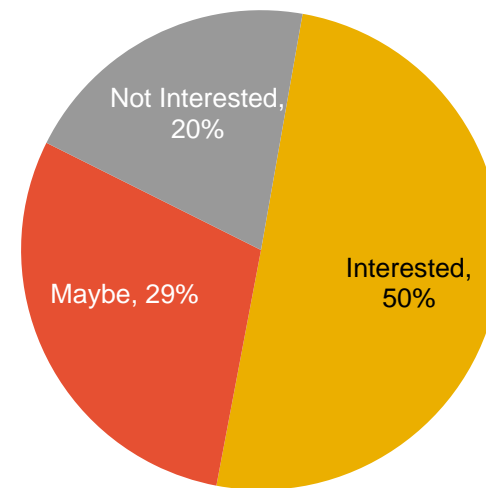
79%

Would be open to UBI in the U.S.

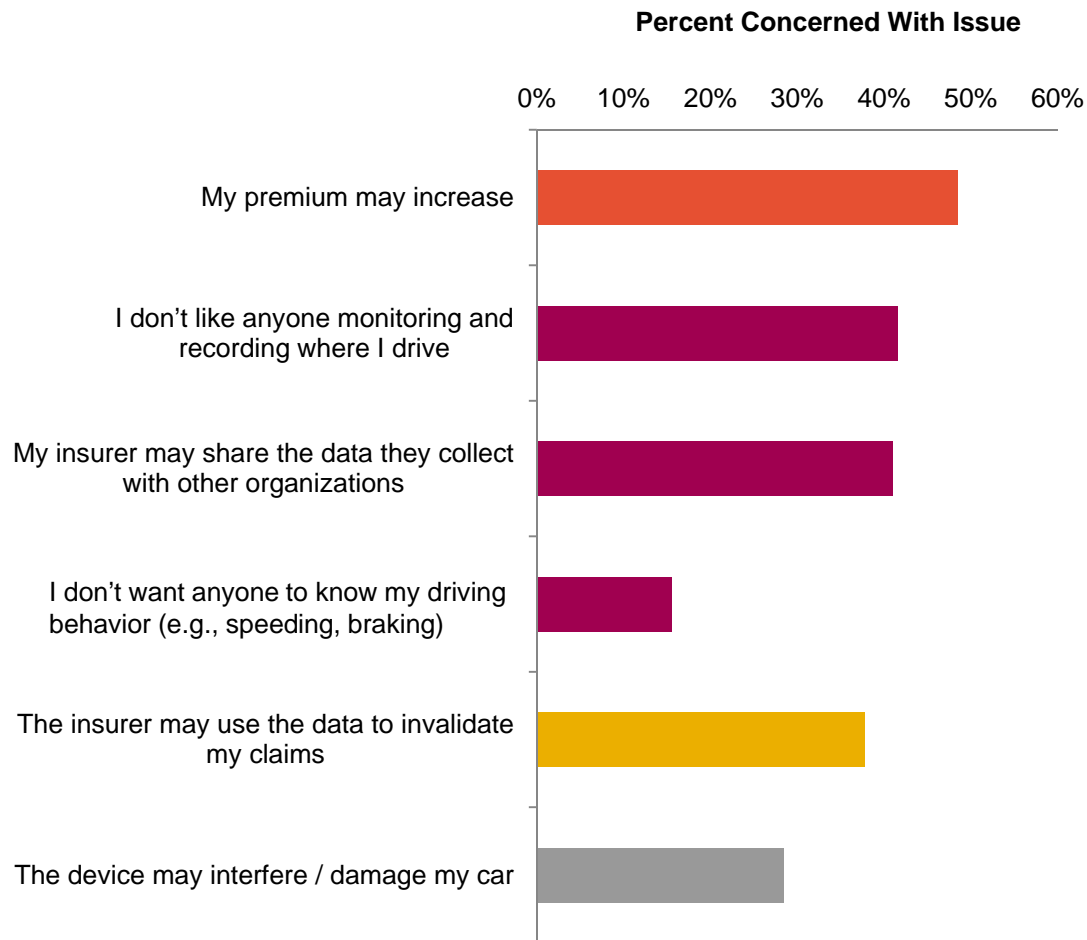
Percent interested in UBI, by Country



U.S. Interest in UBI



What are insureds' main concerns with UBI?



Money

49% worried that premium will increase

Privacy

~40% worried about sharing their data

Claims

38% worried claims will be invalidated

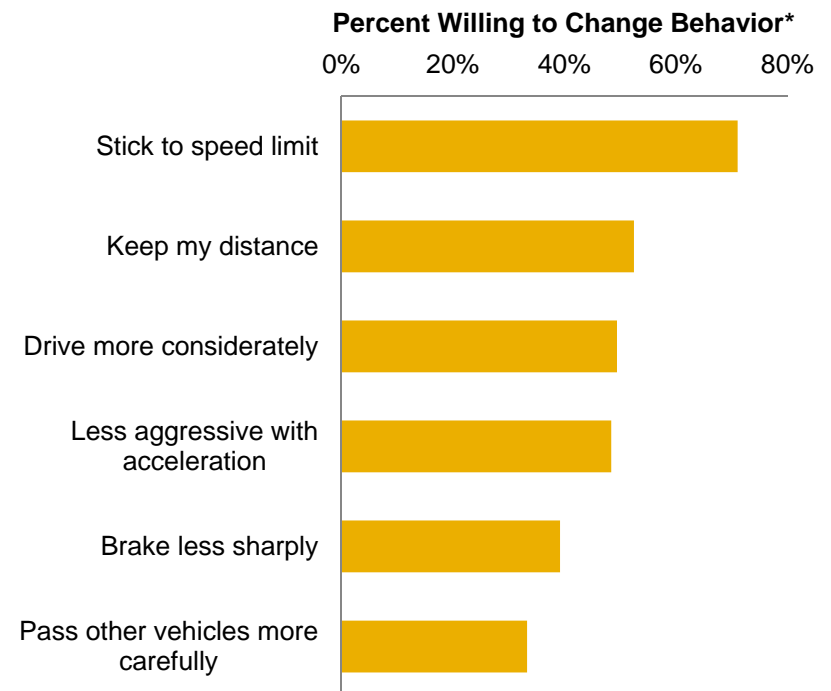
There is a large appetite for behavioral change features

60%

of those interested in UBI are willing to change their driving behavior

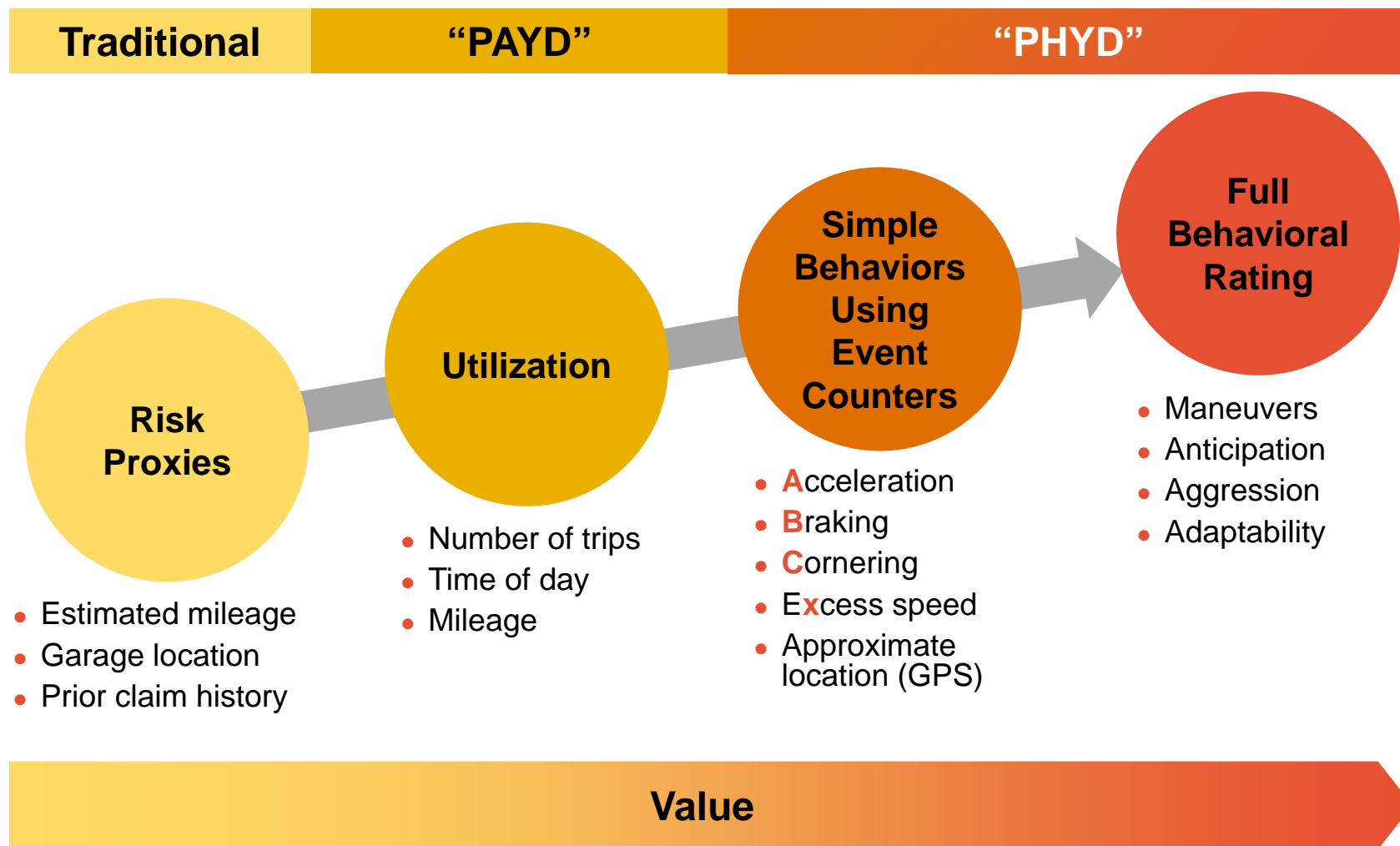
- Sticking to speed limit
 - keeping distance
 - driving more considerately
- are top three behaviors people are willing to change

Behaviors Willing to Change



*Percentage taken of those that indicated they are willing to change behavior (i.e. ignores those that are not willing to change behavior).

Data granularity and the consumer proposition



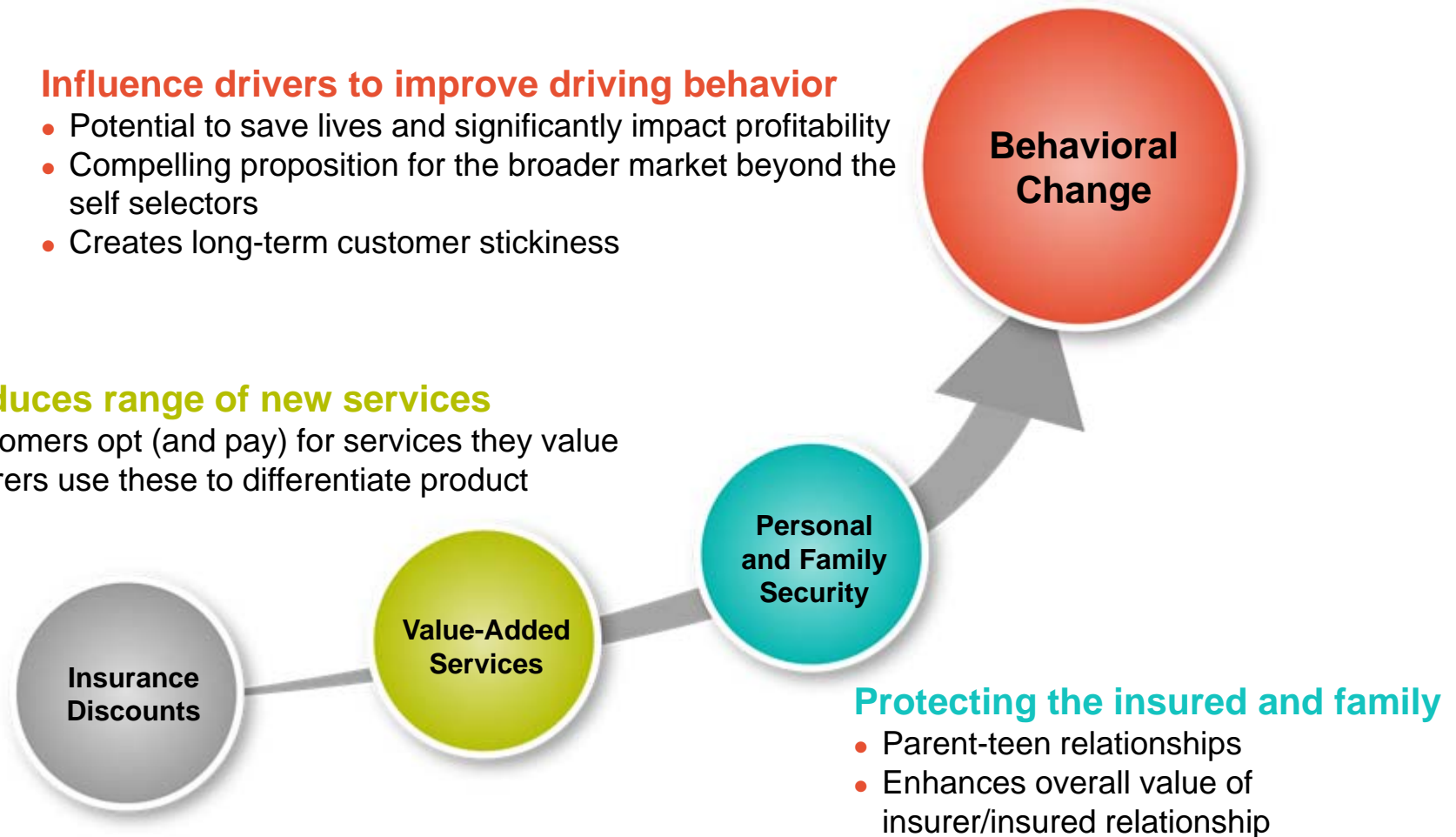
The Customer - Determine the right customer value proposition for your company

Influence drivers to improve driving behavior

- Potential to save lives and significantly impact profitability
- Compelling proposition for the broader market beyond the self selectors
- Creates long-term customer stickiness

Introduces range of new services

- Customers opt (and pay) for services they value
- Insurers use these to differentiate product



Simple rating based programs

- Discount driven, relying on self-selection
- Targets high profit customers as they are



Questions?

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