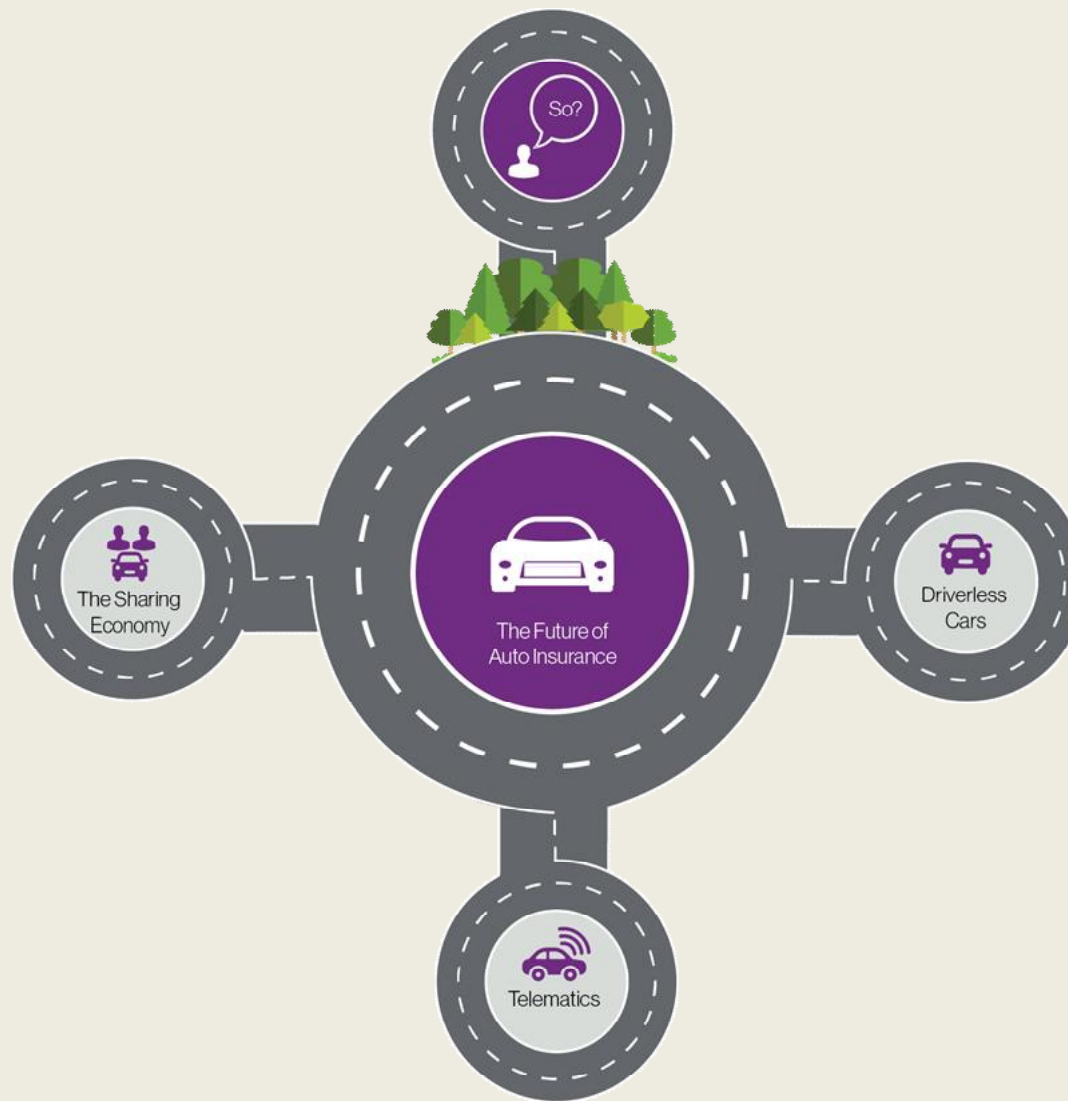


An aerial photograph of a modern building's atrium. The floor is a light-colored, tiled surface. Several groups of people are gathered in small circles, some sitting on the floor. The atrium is multi-level, with glass railings and white structural columns visible. The lighting is warm and yellow. There are several white rectangular redaction boxes of varying sizes placed over the image: one in the top right, one in the middle right, one in the bottom right, one in the bottom center, one in the middle left, and one in the bottom left.

# In Focus: Session 12 • Preparing for Disruptive Change. The Age of Autonomous Vehicles?

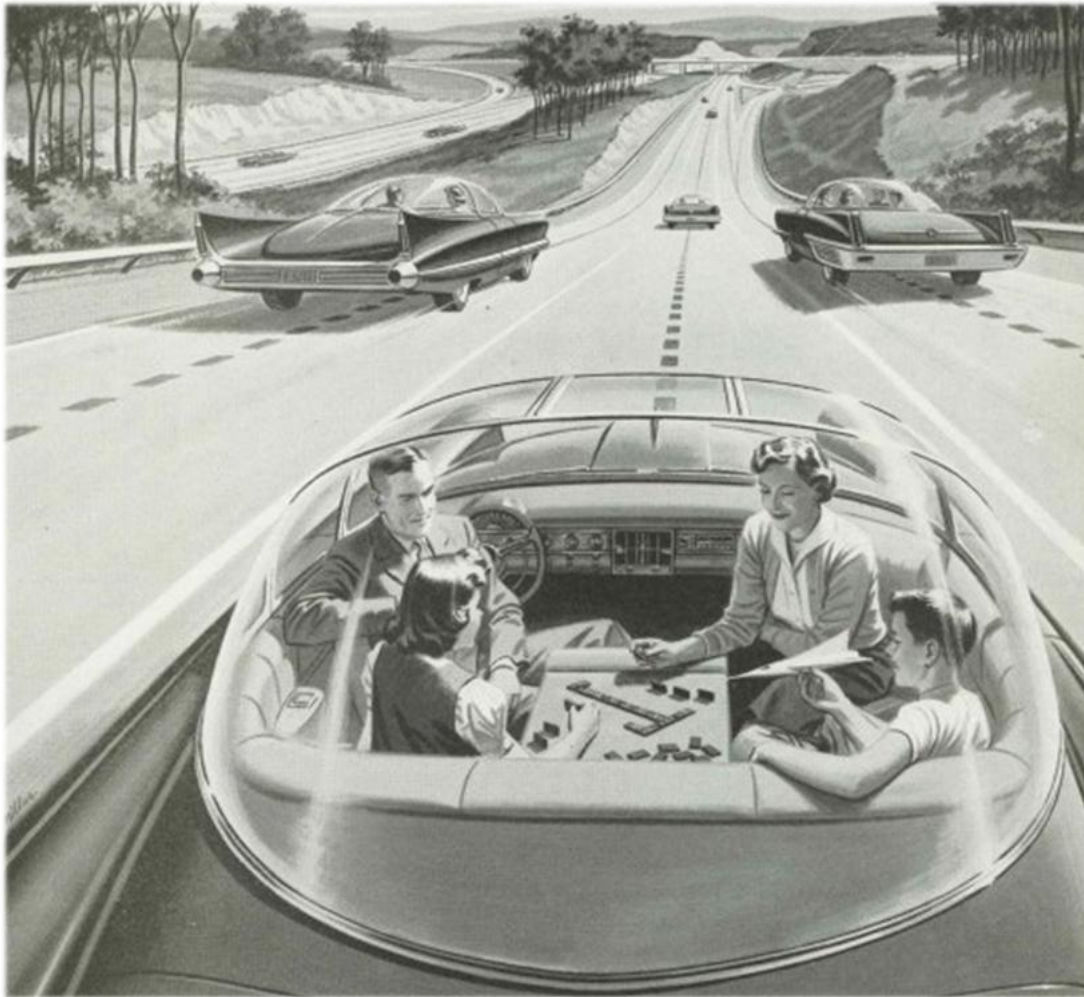
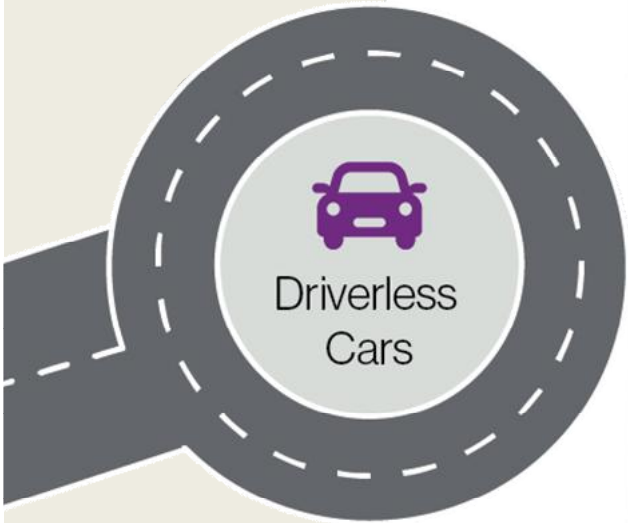
Robin Harbage, FCAS, MAAA

27 October 2016

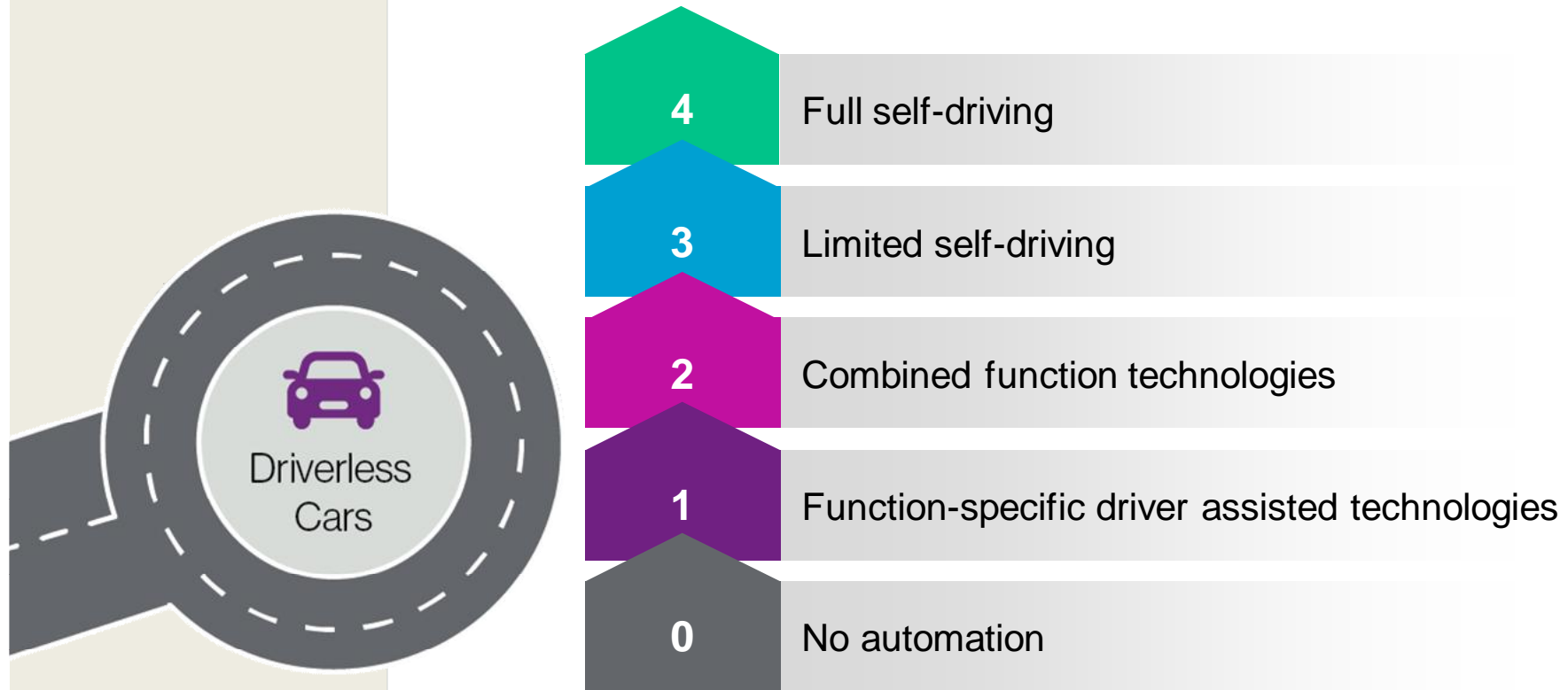


# Meet the Mercedes F 015

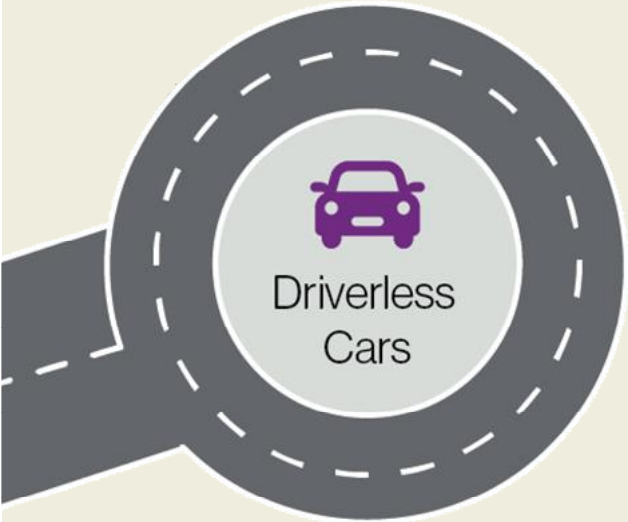




## Levels of vehicle automation (NHTSA)



# Autonomous car features



Self-driving

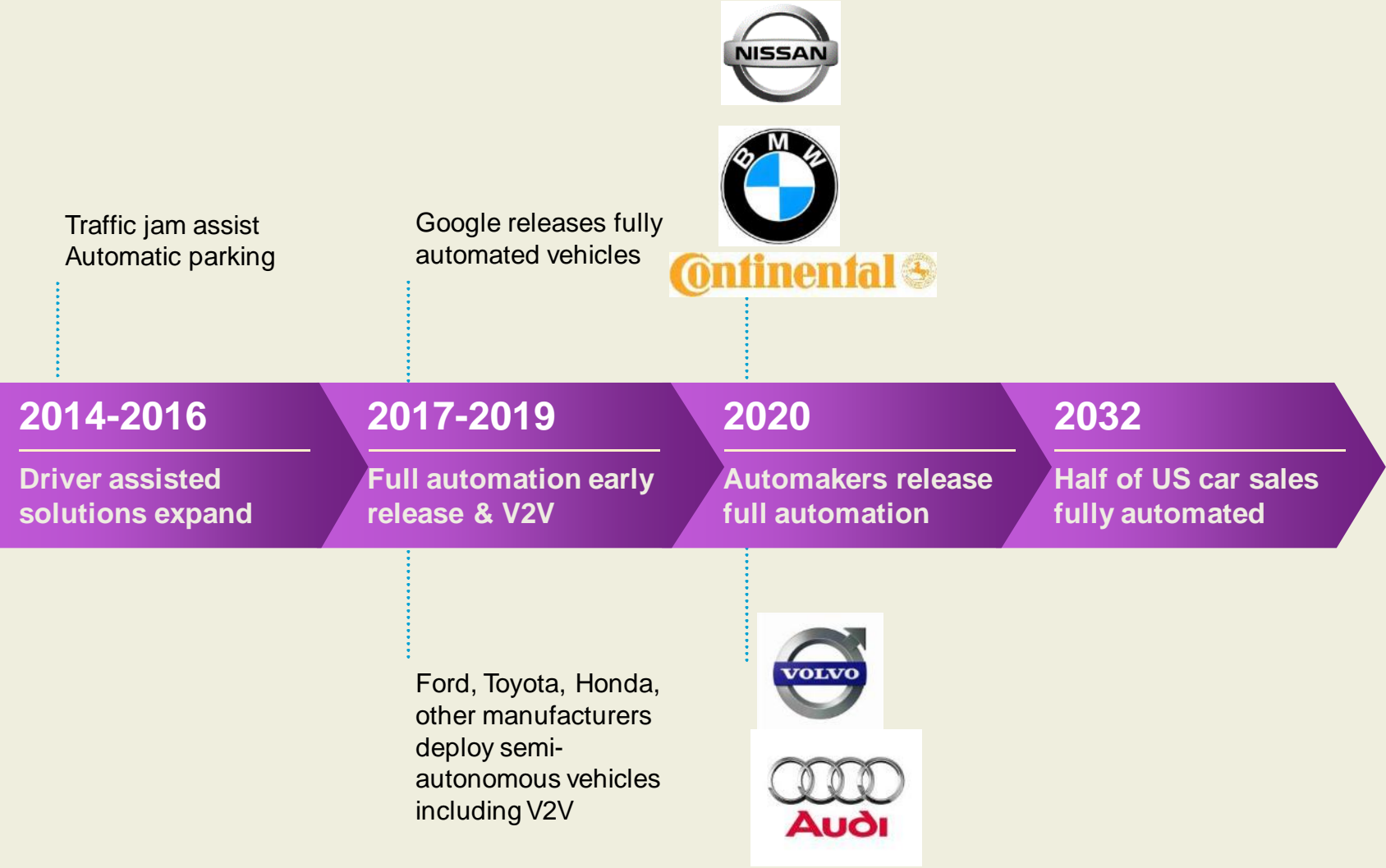
Connected

Shared



Driverless  
Cars

# Predictions

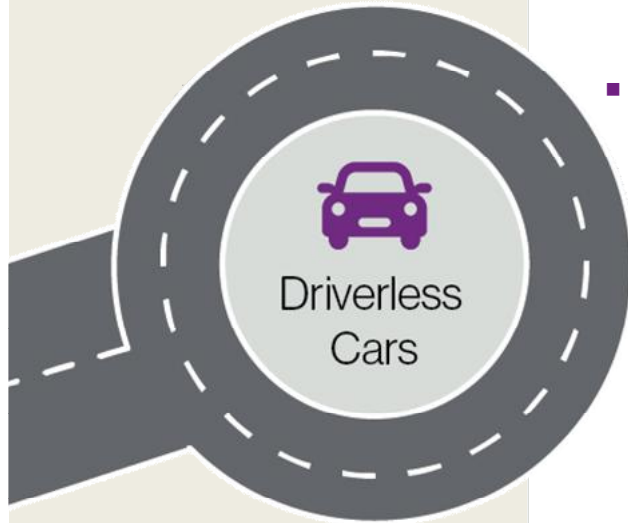




Insurance implications: Introduces new insurance needs / fragmentation

- Shift from personal liability to product liability
- Other parties now involved
  - OEMs
  - Traditional suppliers
  - New suppliers e.g.
    - Software providers (Cyber crime)
    - Map providers
  - Telecoms
- Ride sharing, liability shifted to the entire infrastructure





### Insurance implications:

- Safer, reduces risk. Shift to loss prevention
- Reduces frequency, with catastrophic loss
- Severity uncertain, with likely increase in physical damage
- Co-existence of technologies for some time



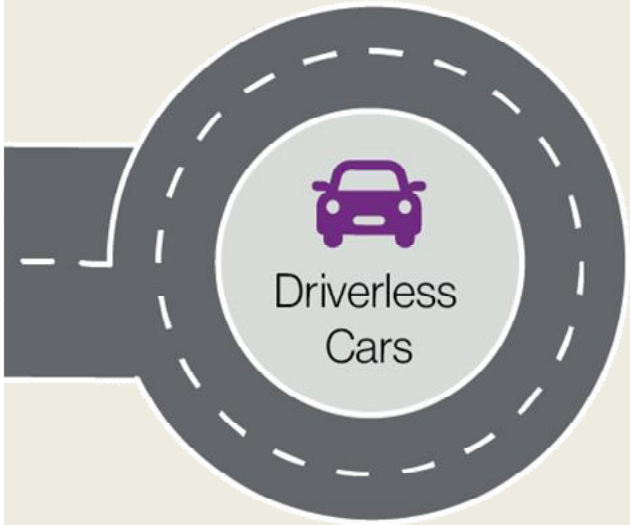


### Volvo “City Safe” automated braking system

- Introduced on certain models beginning in 2010
- Activate brakes if needed to avoid front end collisions
- Can completely mitigate claims at speeds <30mph
- If all cars equipped, >1/6 of **all** physical damage and >1/5 of **all** injury claims eliminated (HLDI estimate)

### IIHS 2009 study of Advanced Collision Avoidance (ACA) systems

- 3 primary ACA features
- Forward collision mitigation, Side view assistance and Lane departure prevention
- Could reduce **all** crashes by 30%





**Self-selection**

\$1,000 \$1,000 \$1,000 \$1,000

**20+%**

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

**Pricing**

**10x**

Differential in loss ratio from TW DriveAbility score

**Retention**

**40%**

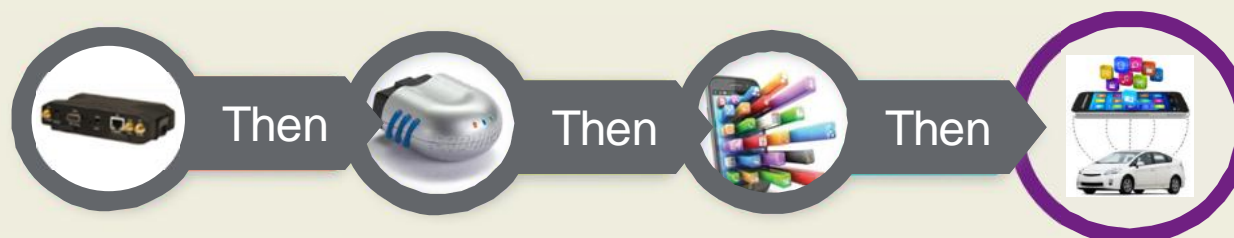
Improvement in retention cited by Progressive

**Behaviour change**

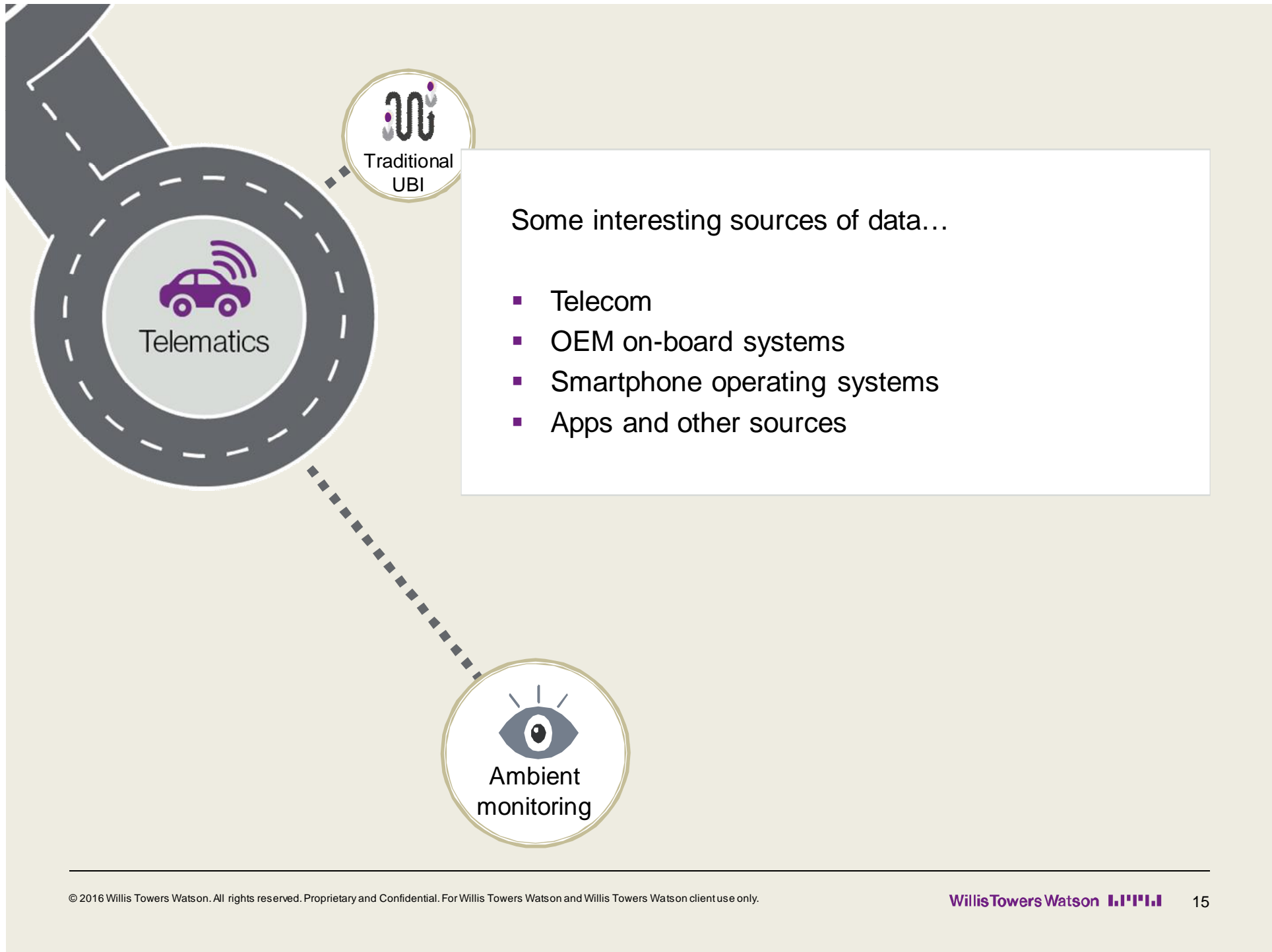
**30+%**

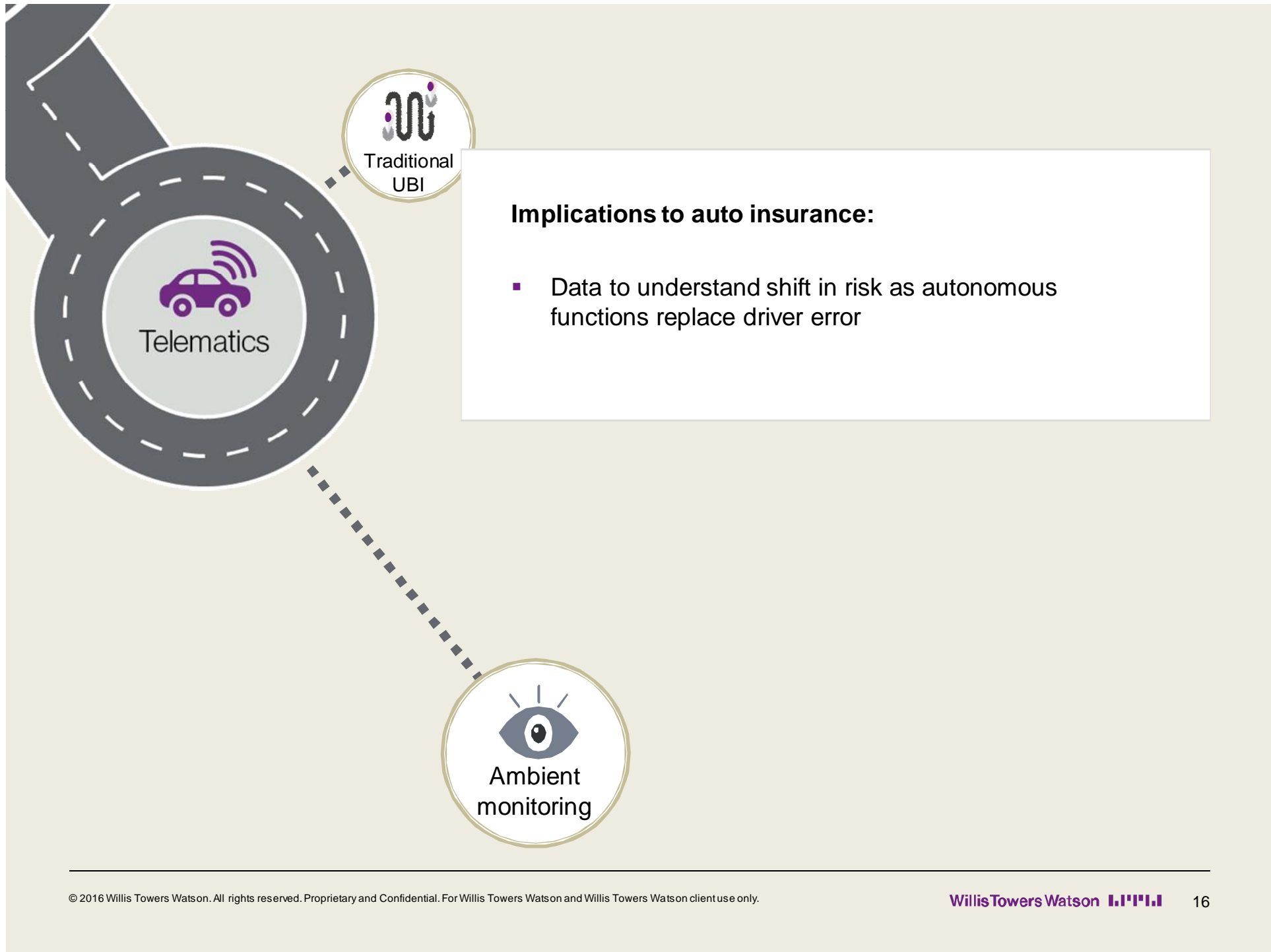
Reduction in claims costs  
Young driver: 30% - 40%  
Commercial fleet: 54% - 93%

## Evolution of technology



Technology	Description
Hard install device	After-market 'black-box' device - requires professional installation. Installation varies from simple to invasive.
On-Board Diagnostics (OBD) device	After-market device plugs into the vehicle's OBD port by the customer.
Smartphone app	A smartphone application which captures driving data. It is not connected to the car.
Smartphone with tethering	A smartphone application tethered (often via Bluetooth) to a device





**Implications to auto insurance:**

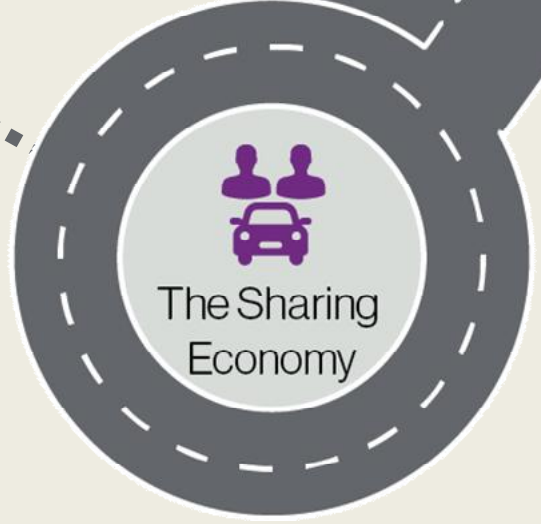
- Data to understand shift in risk as autonomous functions replace driver error







Value ~ \$50bn  
Revenue ~\$10bn pa  
Operating in 55 countries  
8m users



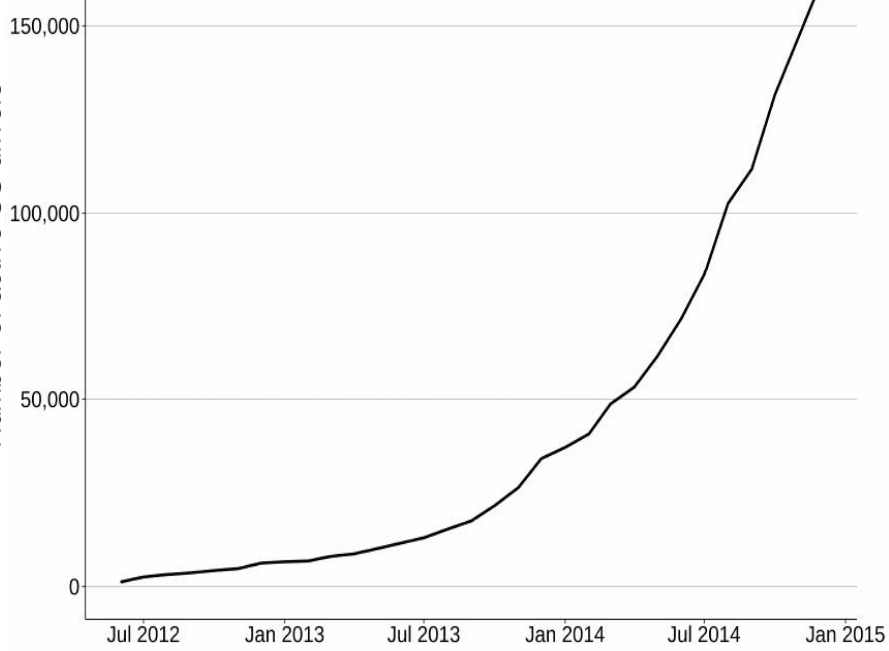
Value ~\$2bn  
Secured over \$330m  
in funding since  
2007



Raised \$35m  
recently including  
support from  
Richard Branson



Number of active US drivers



Source: An analysis of the labor market for Uber's driver-partners in the US, Hall & Krueger 22/1/15



- Pittsburgh
- Volvo XC90s
- 100 vehicles by end of 2016
- Drivers in cars



- **nuTonomy**
- **Singapore**
- **Beat Uber to market**
- **Renault Zoe and Mitsubishi i-MiEV**
- **12 vehicles by end of 2016**
- **Drivers in cars**

Doug Parker, nuTonomy's chief operating officer, said autonomous taxis could ultimately reduce the number of cars on Singapore's roads from 900,000 to 300,000.



### 4 simple steps to zipcar freedom



1. join



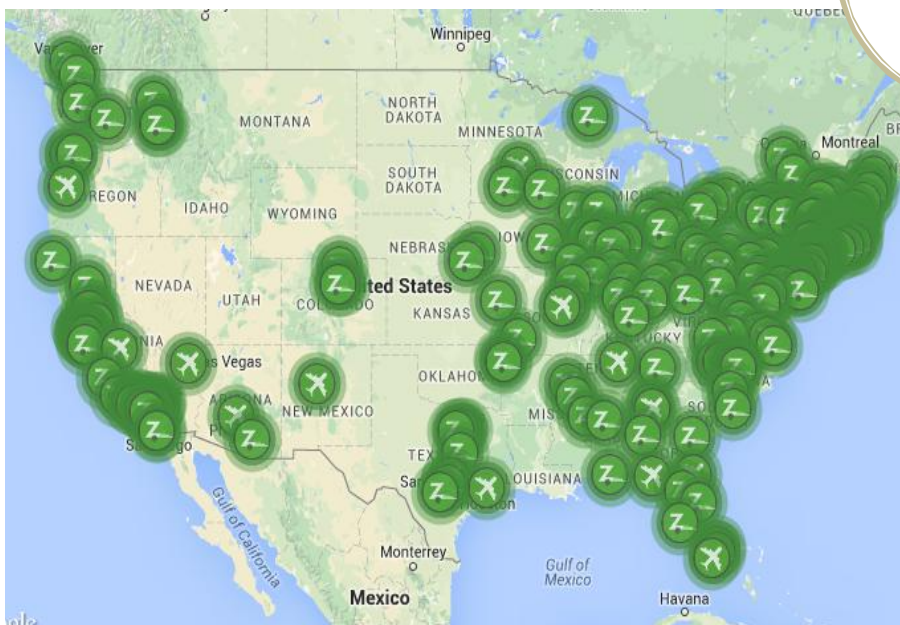
2. reserve



3. unlock



4. drive



Uber et al



Zip car



## 4 simple steps to zipcar freedom



1. join



2. reserve



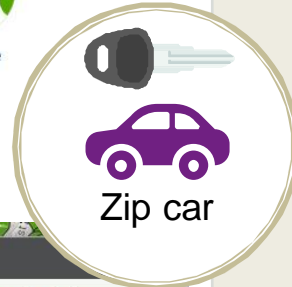
3. unlock



4. drive



Uber et al

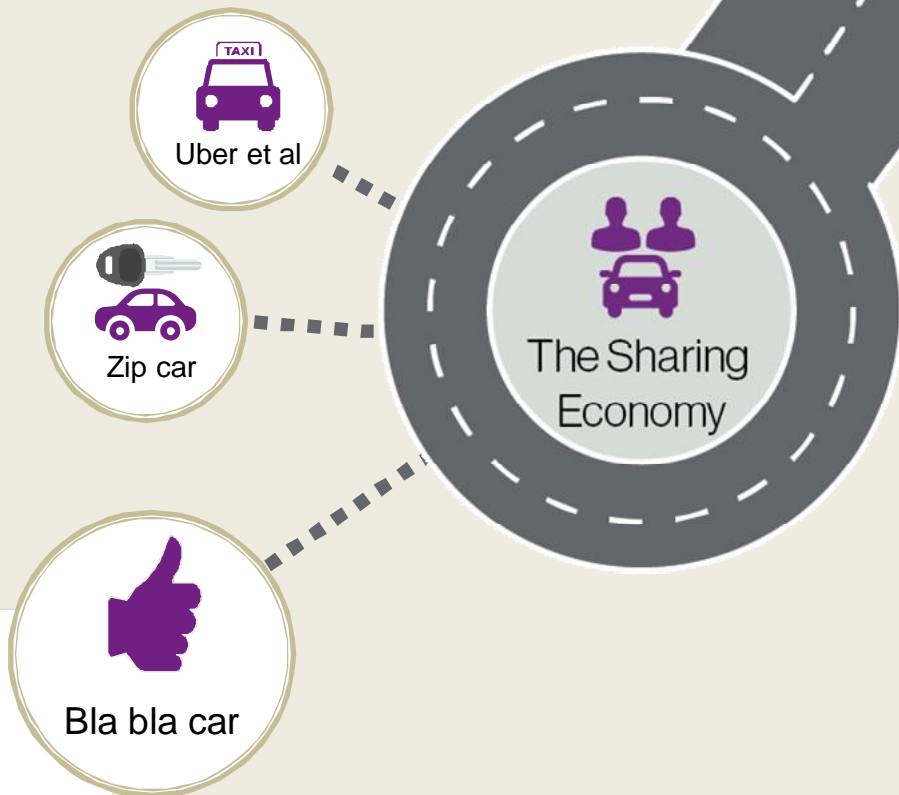


Zip car



**meet the cars**

- Bayswater - Lancaster Gate**  
1 vehicle
- "Macduff" - Volkswagen Golf Auto**  
 Hour: GBP£7  
Day: GBP£64 (base rate)  
[see my profile](#) [join now](#)
- Bayswater - Leinster Tce**  
1 vehicle
- Bayswater - Palace Ct**  
1 vehicle
- Bayswater - Prince's Sq**  
1 vehicle
- Bayswater - Queensborough Tce**  
4 vehicles



- Reduced private car mileage
- New (fragmented) insurance needs
- Faster adoption of autonomous vehicles





- Autonomous Driver Assistance (ADAS) will precede the fully autonomous and have faster penetration
- Frequency reductions likely, but severity uncertain; potential for physical damage severity increase and injury severity decrease
- Telematics data provides a rich source of information regarding the introduction of autonomous and assisted driving functions
- Sharing economy may increase the speed of penetration





**Robin Harbage, FCAS, MAAA**  
**Director**

**Willis Towers Watson**  
**622 Falls Road**  
**Chagrin Falls, OH 44022**

**+1.440.725.6204**

**[Robin.Harbage@willistowerswatson.com](mailto:Robin.Harbage@willistowerswatson.com)**