arity®

The Impact of Shifts in Mobility on Insurers

CAS RPM March 2019

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Agenda

- A real use case
- Ecosystem overview
- Insurer roadmap

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The evolution of individualized insurance

Past

- Who's driving?
- What are they driving?

Emerging

- Evaluating driving behavior from all angles
- Impacts on individual premiums

Future

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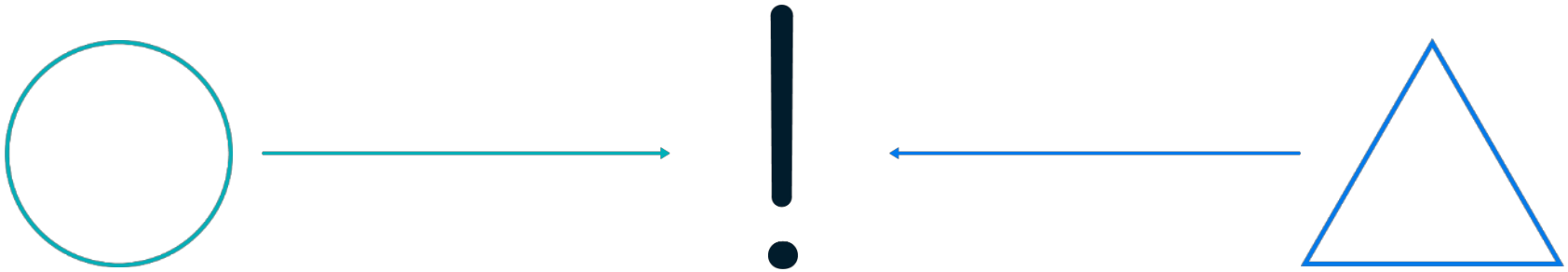
Traditionally, our products are based on who and what.



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Meet Katie and Heidi.

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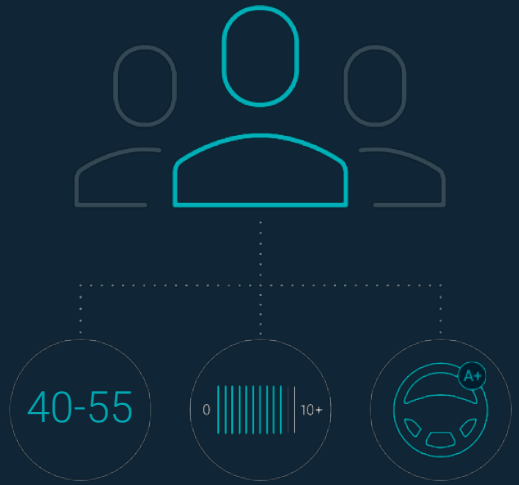
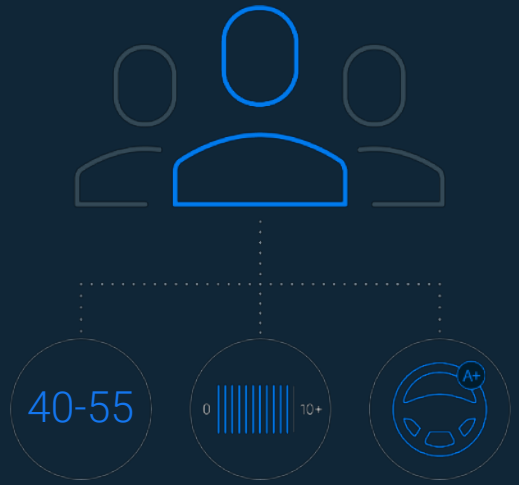
Who they are

	Katie	Heidi
Age	Adult	Adult
Gender	Female	Female
Household status	Married, kids are good students	Married, kids are good students
Years licensed range	2—10+	1—10+
Age of oldest driver	40—55	40—55
Excluded driver	None	None





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Who they are

	Katie	Heidi
Homeowners	Yes	Yes
Location	Garage at residence	Garage at residence
Zip code /address	604XX	604XX
Financial responsibility	Yes, Pay in Full, EFT	Yes, Pay in Full, EFT
Persistency	5 years	7 years
Number of eligible vehicles	3	3
Other pols	Home, small toys	Home, small toys

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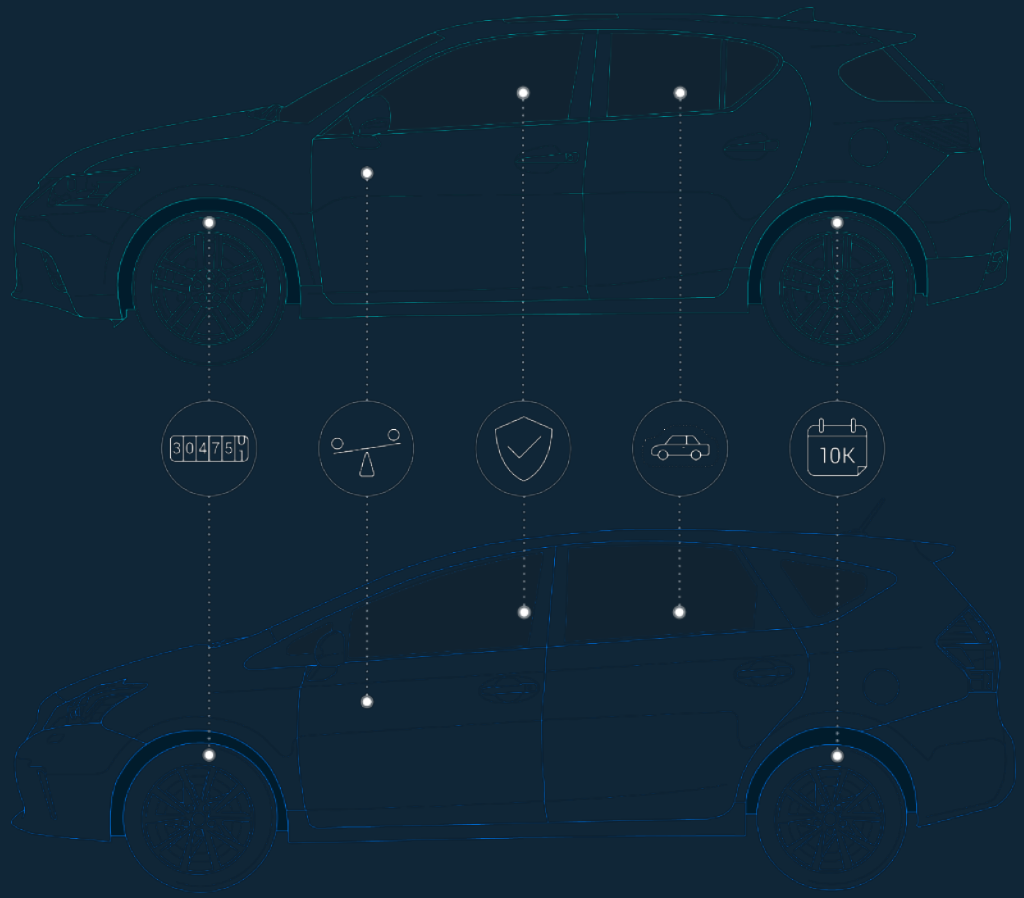
What they drive

	Katie	Heidi
Vehicle type & mileage	2014 CT 200H; 30k	2015 Prius V; 20k
Vehicle ACV	$17,000	$18,000
Vehicle stability control	Yes	Yes
Basic safety systems	Airbags, anti-lock brakes, no motorized seat belts	Airbags, anti-lock brakes, no motorized seat belts
Coverage amounts	100/300, $1000 Ded, Rental/towing	100/300, $1000 Ded, Rental/towing
Annual mileage	10,000	10,000
Vehicle use	Pleasure	Pleasure



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	Katie	Heidi
Zip code/address	604XX	604XX
Homeowners	Yes	Yes
Age	Adult	Adult
Gender	Female	Female
Household driving record	No convictions; No accidents	No convictions; 1 fender bender not submitted
Household status	Married, kids are good students	Married, kids are good students
Location	Garage at residence	Garage at residence
Number of eligible vehicles	3	3
Years licensed range	1—10+	2—10+
Age of oldest driver	40—55	40—55
Excluded driver	None	None
Financial responsibility	Yes, Pay in Full, EFT	Yes, Pay in Full, EFT
Persistency	7 years	5 years
Other pols	Home, small toys	Home, small toys
Vehicle type & mileage	2014 CT 200H; 30k	2015 Prius V; 20k
Vehicle ACV	$17,000	$18,000
Vehicle stability control	Yes	Yes
Basic safety systems	Airbags, anti-lock brakes, no motorized seat belts	Airbags, anti-lock brakes, no motorized seat belts
Coverage amounts	100/300, $1000 Ded, Rental/towing	100/300, $1000 Ded, Rental/towing
Annual mileage	10,000	10,000
Vehicle use	Pleasure	Pleasure

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Two drivers look alike on paper, so we offer similar products and price.

Katie's 2016
Semi-annual Premium

$452

Age: Adult

Gender: Female

Zip code: 604XX

Coverage: 100/300/100

Heidi's 2016
Semi-annual Premium

$465

Age: Adult

Gender: Female

Zip code: 604XX

Coverage: 100/300/100

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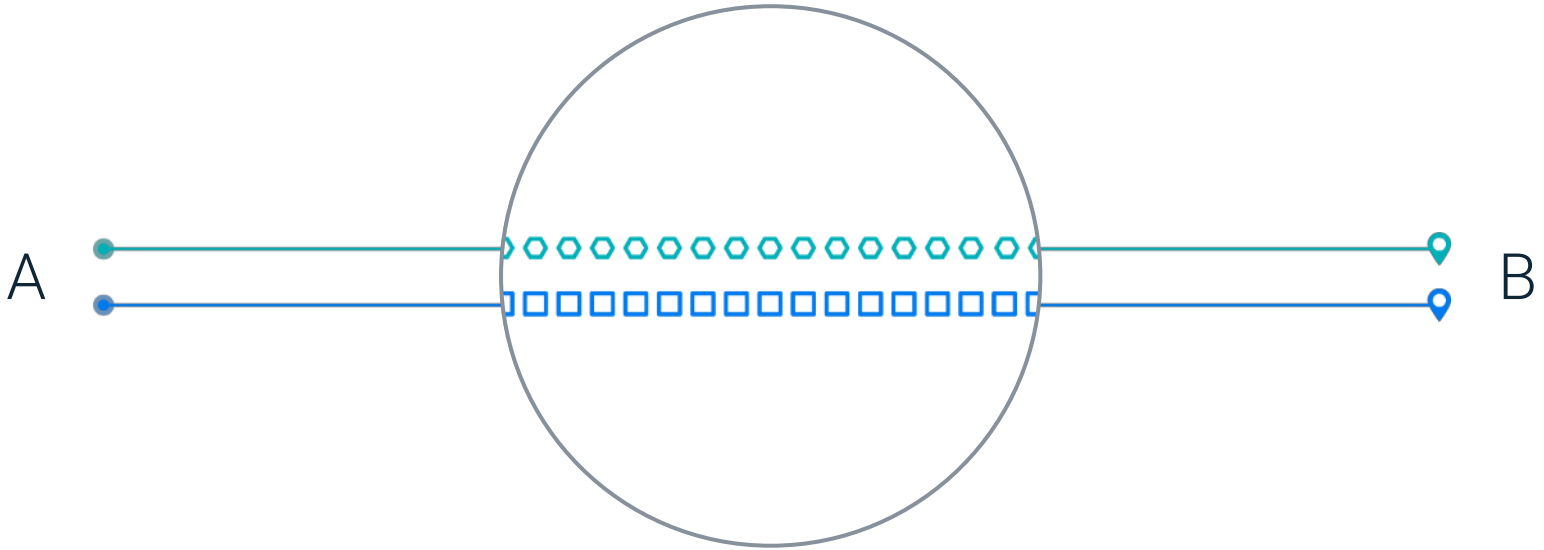
But we weren't looking hard enough. How do drivers actually drive?



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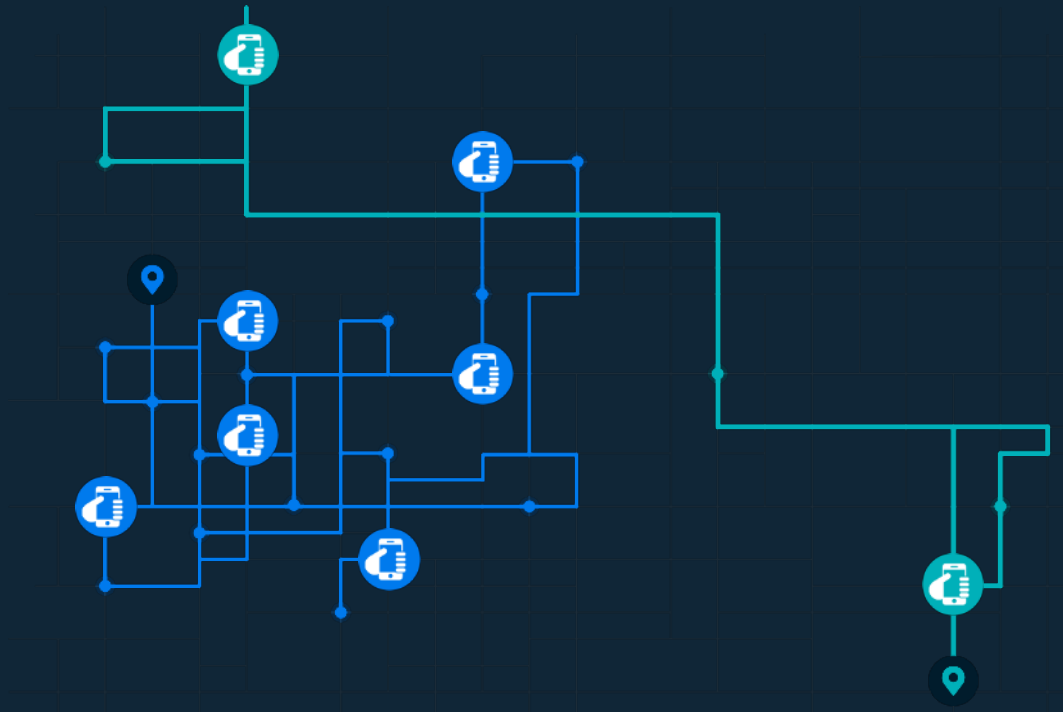
Telematics data gives us unprecedented insight into individual driving behavior…

	Katie	Heidi
Type of driving	Minimal, Highways	Daily, Suburban roads
Average number of trips/week	6	24
Average length of trip	32	8
Time of day	Off peak	Rush hours, school hours
Road type	Uncongested freeway	Local, busy, congested streets, parking lots
Driving condition	Cruise control + podcast	Noisy, distracting
Distracted driving	2 per trip	6 per trip



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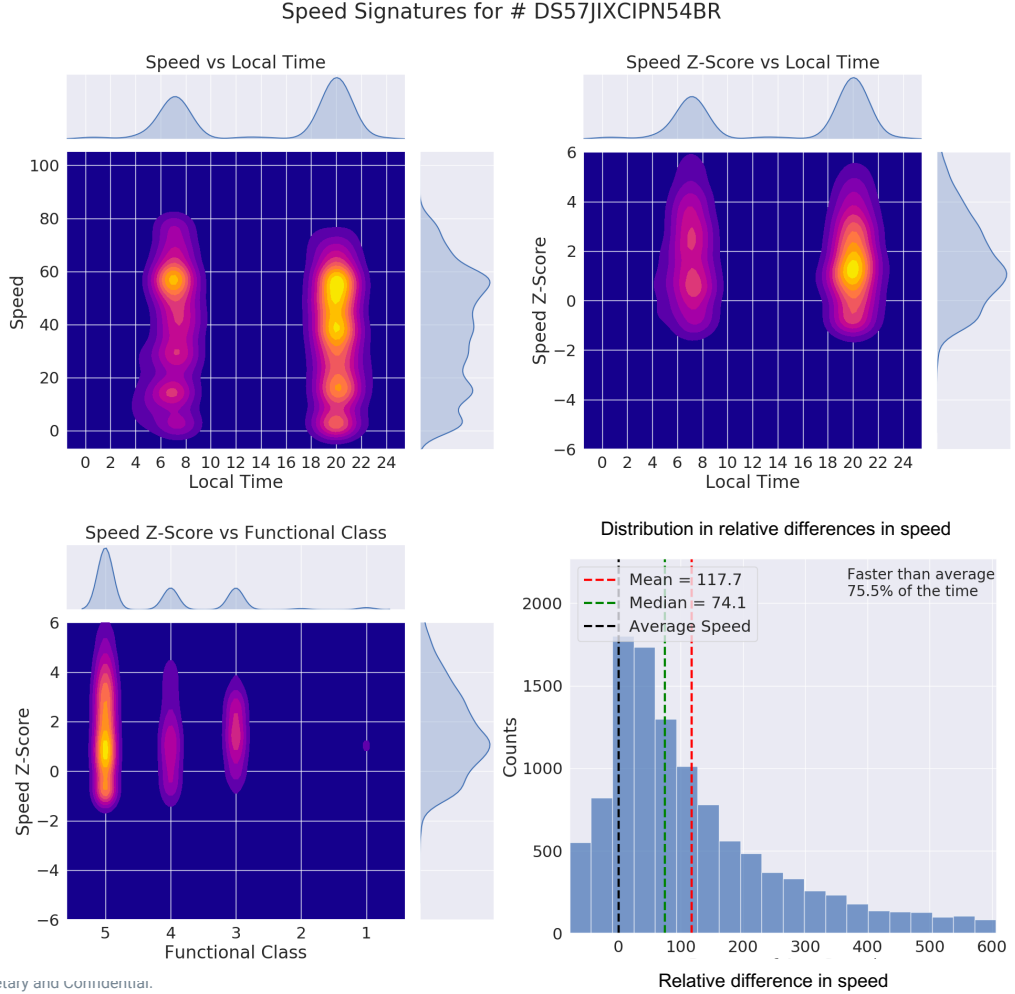
Heidi



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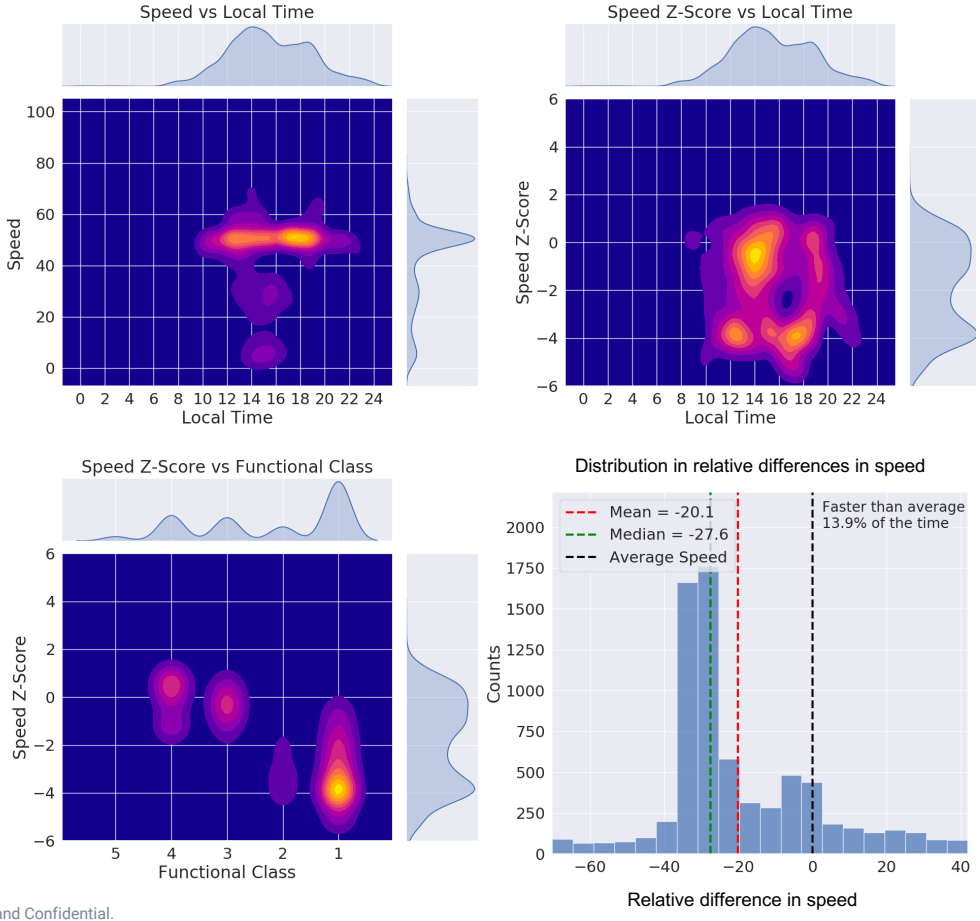
Katie

Speed Signatures for # OUR8GAPM1S4BN1A



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Things aren't always as they appear.

Katie's 2016
Semi-annual Premium

$371

~~$452~~

Age: Adult | Gender: Female

Zip Code: 604XX | Driving Score: 93

Distracted Driving: 92 | Time of Day: 98

High Speed: 86 | Hard Braking: 97

Heidi's 2016
Semi-annual Premium

$465

Age: Adult | Gender: Female

Zip Code: 604XX | Driving Score: 64

Distracted Driving: 63 | Time of Day: 62

High Speed: 72 | Hard Braking: 60

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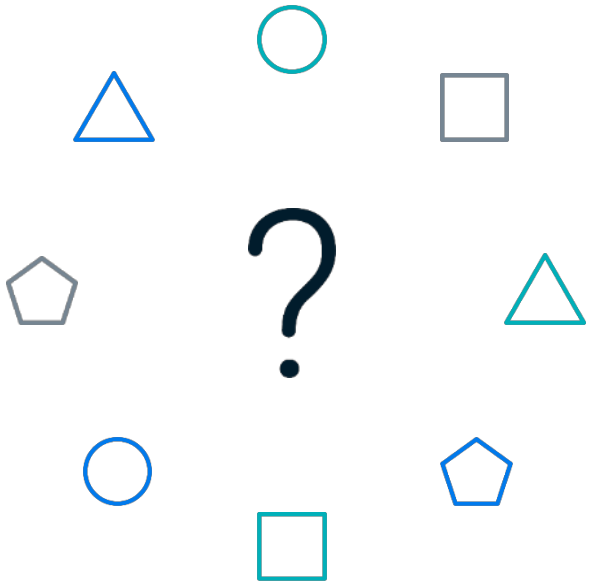
What should we be considering tomorrow?



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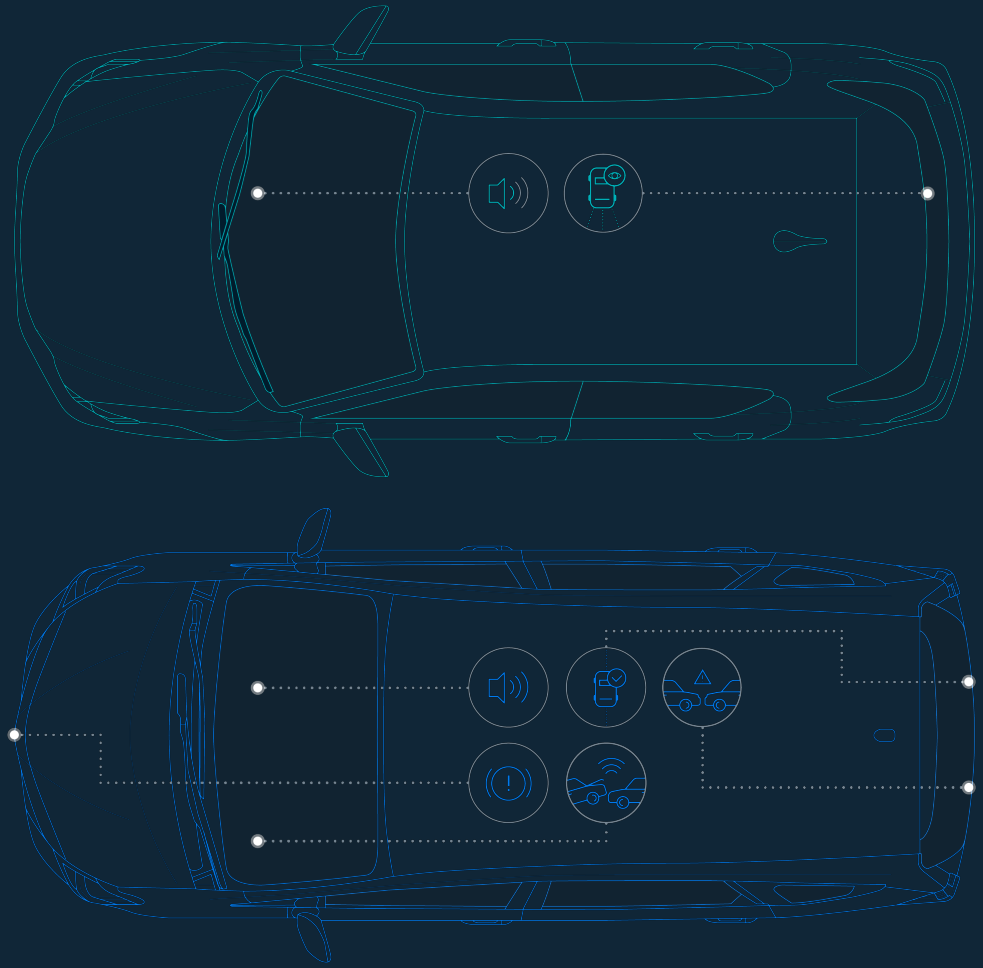
Smart vehicle features in use.

	Katie	Heidi
ADAS	Rear view camera	Pre-Collision Safety System Adaptive Cruise Control Post Collision Safety System Stolen Vehicle
Inactive systems	None	Safety System Lane Departure Warning Adaptive Cruise Control
Radio volume	Soft	Loud



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Biometrics can revolutionize how we understand drivers.

	Katie	Heidi
Brainwaves	Less attentive	Very alert
Eye movement & gaze	Nav to street	All around the vehicle
Blinking	Excessive	Normal
Heart rate	High	Normal
Voice modulation	Quiet	Noisy
Blood alcohol content	–	–
Medical devices	–	–
Sensor data (Rideshare)	–	–

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As mobility behaviors change, so does individualized risk.

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Predicting future losses requires an understanding of how drivers actually move—both at time of quote and renewal.

Katie's **2018**
Semi-annual Premium

▼ $316

~~$452~~

Age: Adult

Gender: Female

Zip code: 606XX

Driving Score: 98

Mobility fingerprint: urban commuter

Heidi's **2018**
Semi-annual Premium

▲ $535

~~$465~~

Age: Adult

Gender: Female

Zip code: 604XX

Driving Score: 64

Mobility fingerprint: suburban family management

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Agenda

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- Insurer roadmap

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Mobility options on the rise

1%

Rideshare VMT in US in 2017

30%

All travel behavior related to social activities

32-43%

of Americans have used rideshare in the last 12 months

67%

of consumers expect to increase their use of mobility services in the next 2 years

60M

growth expected of the global car share market to grow by 2022

$19 B

Lyft valuation

Multiple sources: McKinsey, Berg Insights, as of 3/19, Lyft's valuation is $19B.

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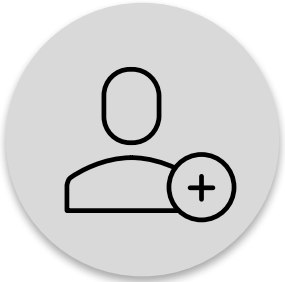
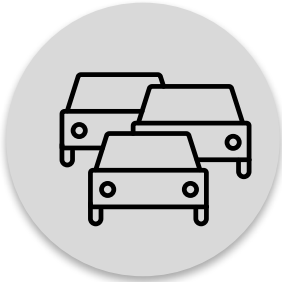
Shared Mobility Hurdles



Acquire and retain drivers

Compel consumers
to shed cars



Risk management

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OEMs are accelerating their global strategies for embedded connectivity and connected services business models

225M

cars with embedded connectivity will be sold in the next 5 years

84%

of cars sold will have screen duplication solutions

66%

of cars sold will have OTA update capability

Source: SBD Automotive

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OLD SLIDE

Testing Shared Mobility

MAVEN

moovel

Ford

FORD SMART MOBILITY

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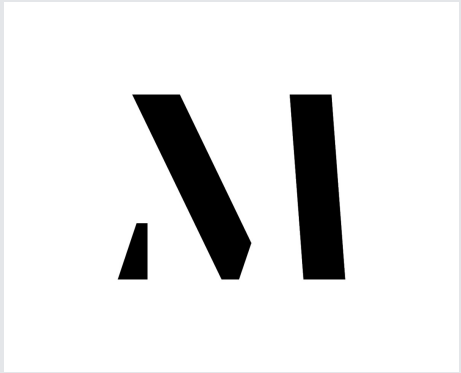
Testing Shared Mobility



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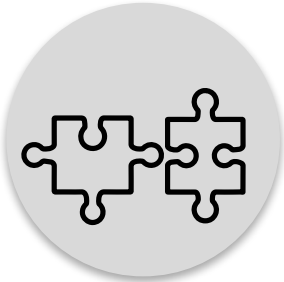
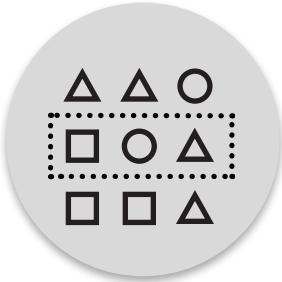
Automotive Hurdles

Penetration and consistency



Retrofitting complex solutions



Agility

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Consumer Expectations

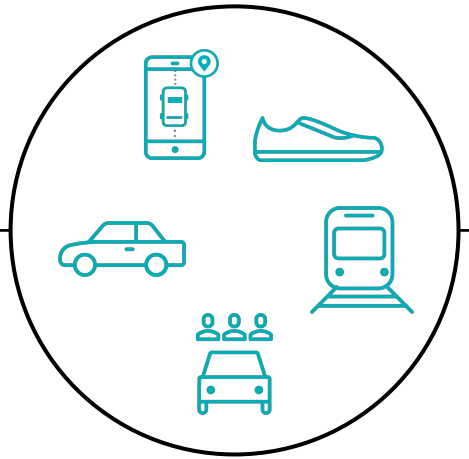
Mobility services will need to expand beyond individual, discreet transactions to real-time efficiency of the entire eco-system.

Experience

"I want all of my commuting needs solved with **one app**."

"I want the best itinerary, price and a single payment system when I use more than one form of transportation."

"I want transportation service that is **safe**, available and reliable."



Expectations

Seamless Experience
Comfort & Safety
Speed & Price
Access to information
Multi-modal transportation
Reliability of Service & information
One app
Assurance and protection
Personalized service

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Consumer Opportunities

Clarity in coverages

Platform migration

Personalization

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The world of mobility is evolving.
How should we?

…let’s make some progress

Agenda

- A real use case
- Ecosystem overview
- Insurer roadmap

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Insurer Roadmap

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Let’s crawl

Know your customer

Telematics isn’t emergent – it’s emerged.

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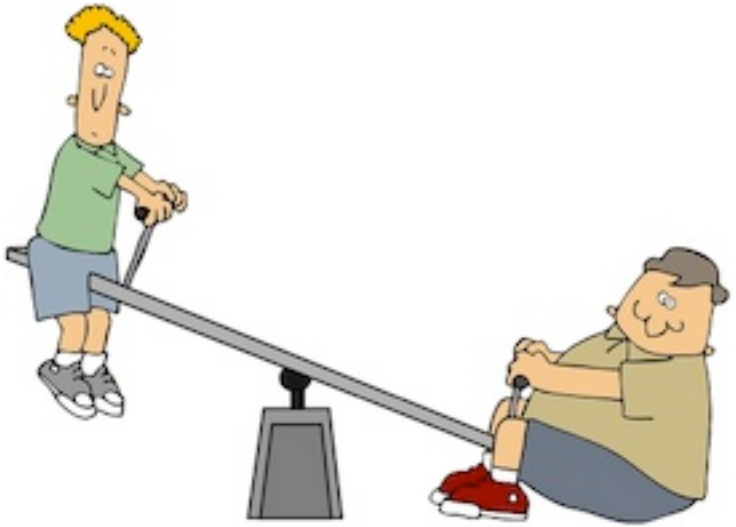
Asymmetry of Information



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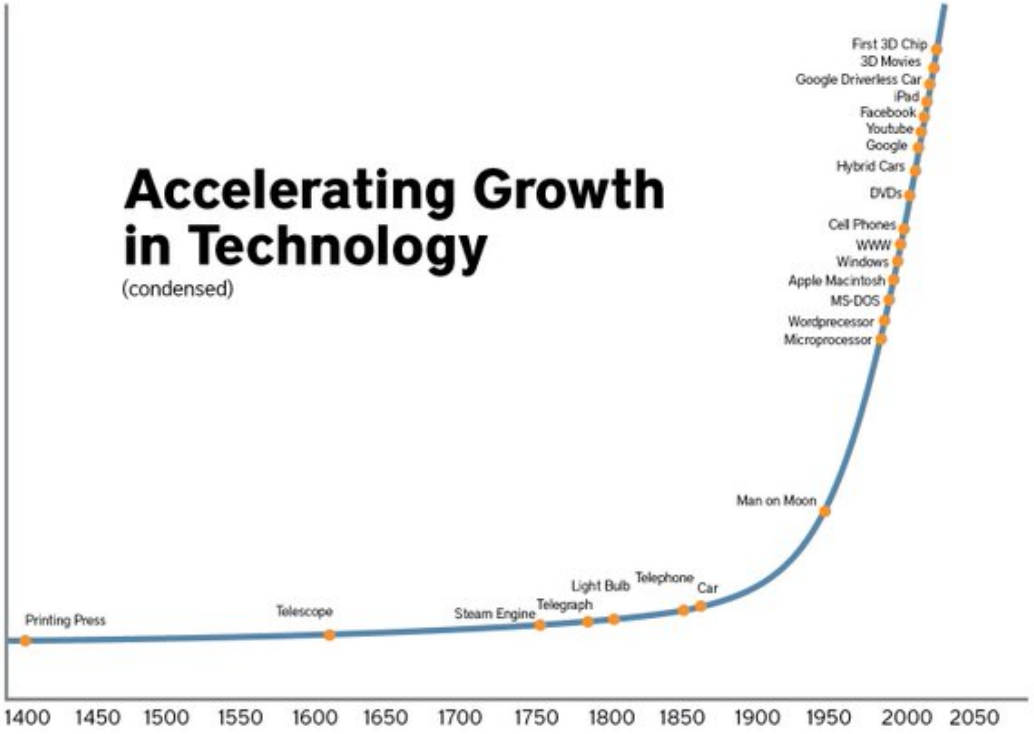
Pace of Change



Source: Milford

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Insurance Industry Overview

94%

of survey respondents said disruptive technologies will create business opportunities.

15%

of insurance consumers are satisfied with their insurer's digital experience

Source: West Monroe Partners

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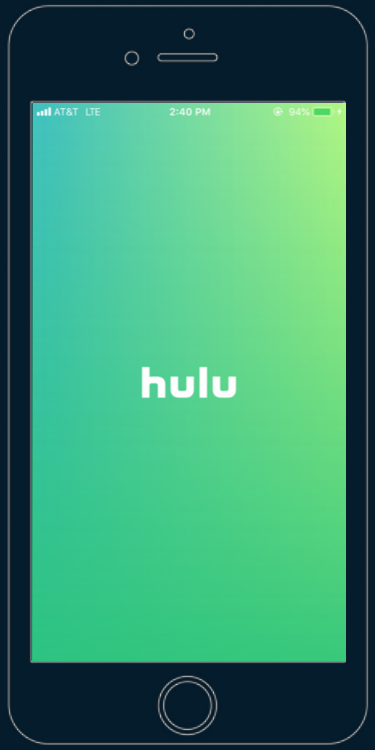
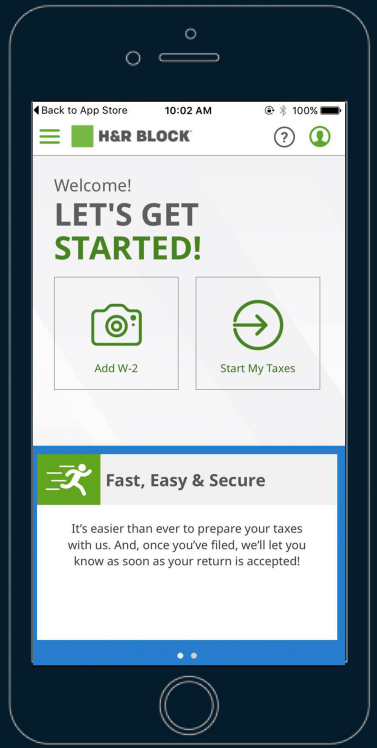
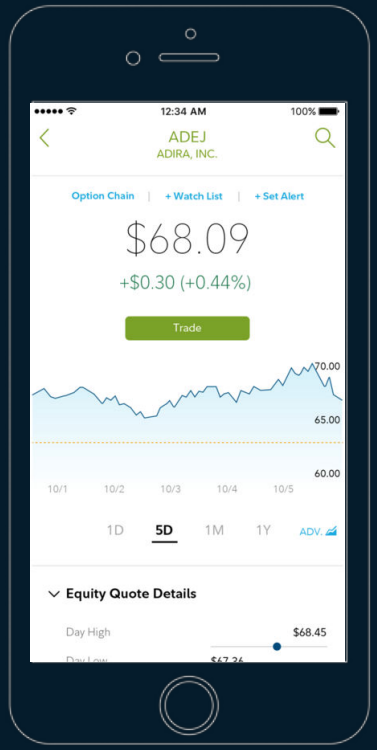
There’s an app for that







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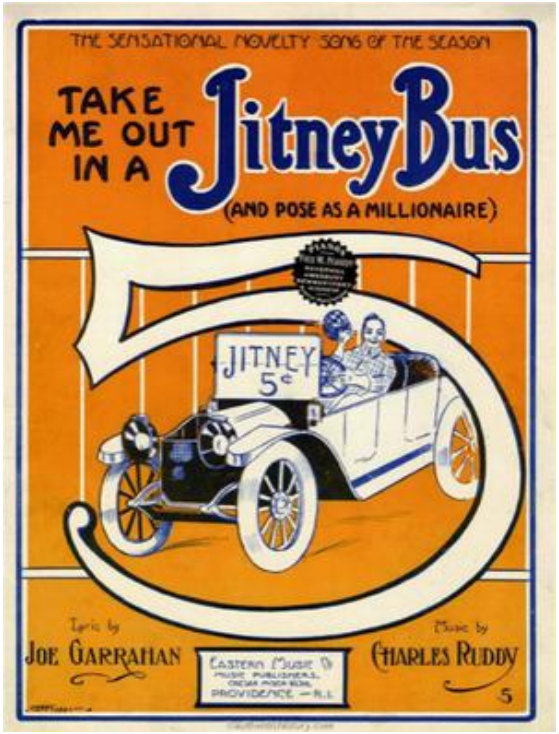
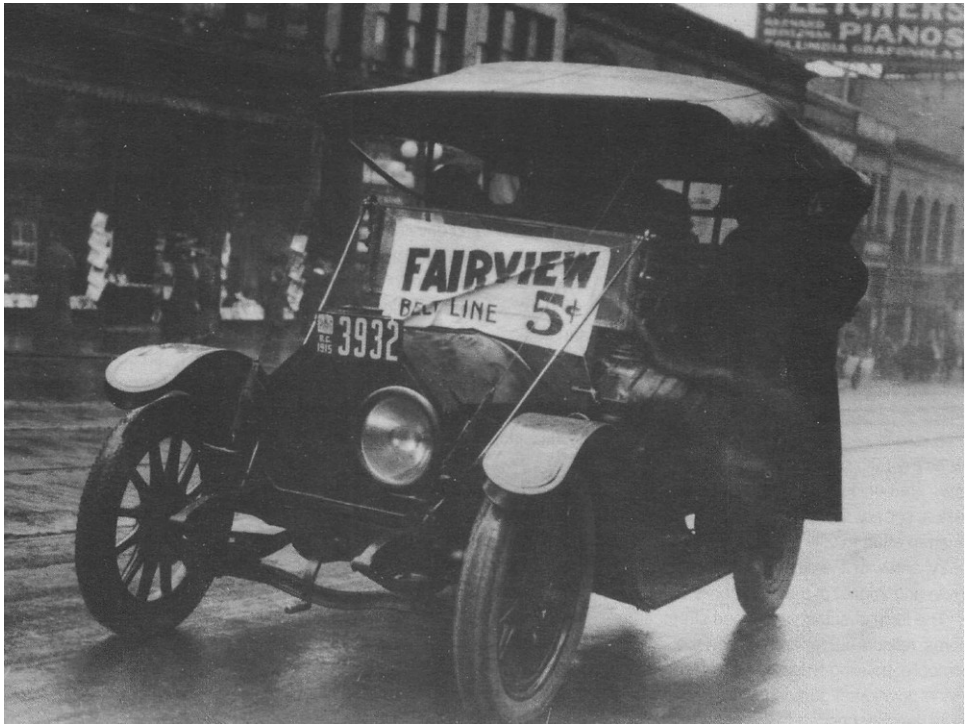
Rideshare isn't new





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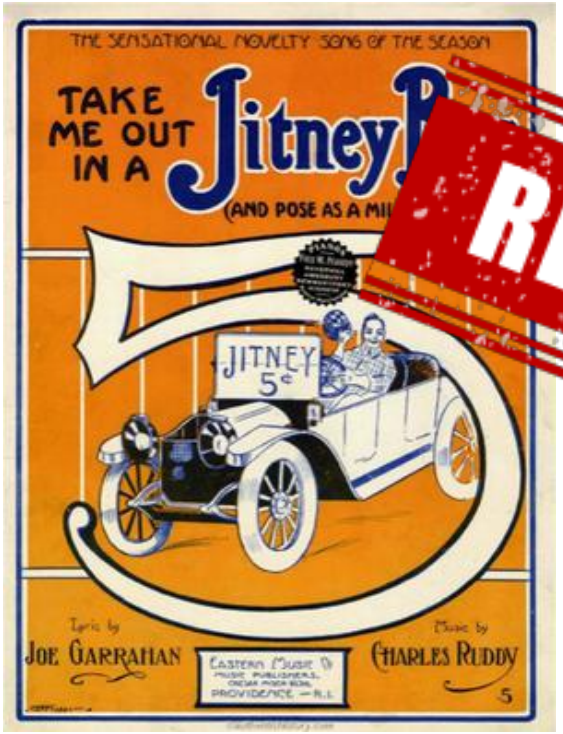
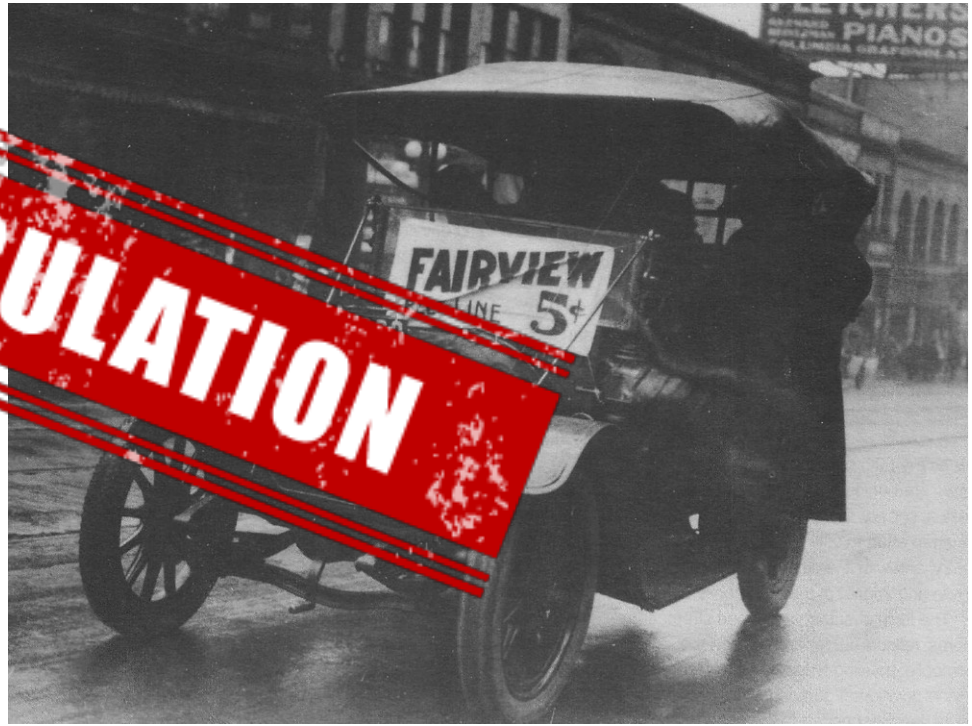
Rideshare isn't new





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What’s an insurer to do?

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From “buff” to “-ologist”

Biologist | bī'äləjəst | noun
is a scientist who has specialized knowledge in the field of biology, the scientific study of life.

Sociologist | ˌsōsē'äləjəst | noun
is one who studies society and social behavior by examining the groups, cultures, organizations, social institutions, and processes that people develop.

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Customerologist | noun
one who studies customers and customer behavior by examining the patterns that customers develop through the origination, acquisition, and analysis of data

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Customer Scientist | noun
a person engaging in a systematic activity to acquire knowledge that describes and predicts customer behavior

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Data = Value

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Insurer Roadmap

: Get connected

: Acquire & analyze data

: Examine patterns of customer behavior

: Understand the customer

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Let’s walk

Use the tech

Sensor capability

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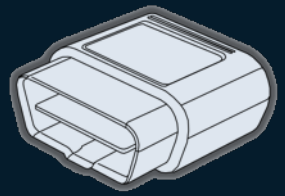
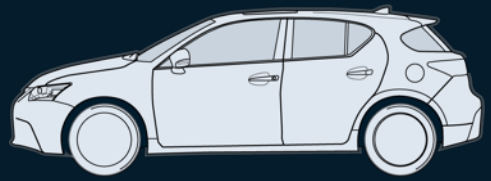
How is mobility data collected from vehicles?



OBD-II

PROS: Access to CANBUS, fixed and axis-aligned accelerometer, conventional

CONS: Expensive, no access to phone handling or other user behaviors



Embedded systems

Most comprehensive source of vehicle systems and diagnostic information

Reliance on OEMs, scalability relies on multiple partnerships

Mobile application

Cost-effective, quantifies user behaviors, facilitates customer interaction, scalable

See upcoming slide

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What’s in a mobile insurance app?

- Mobile applications are often powered by software development kits (SDKs)
- SDKs perform essential data collection and calculation tasks to power UI, like trip tracking and detailed performance dashboards
- Insurance companies often embed SDKs from specialized telematics service providers (TSPs)

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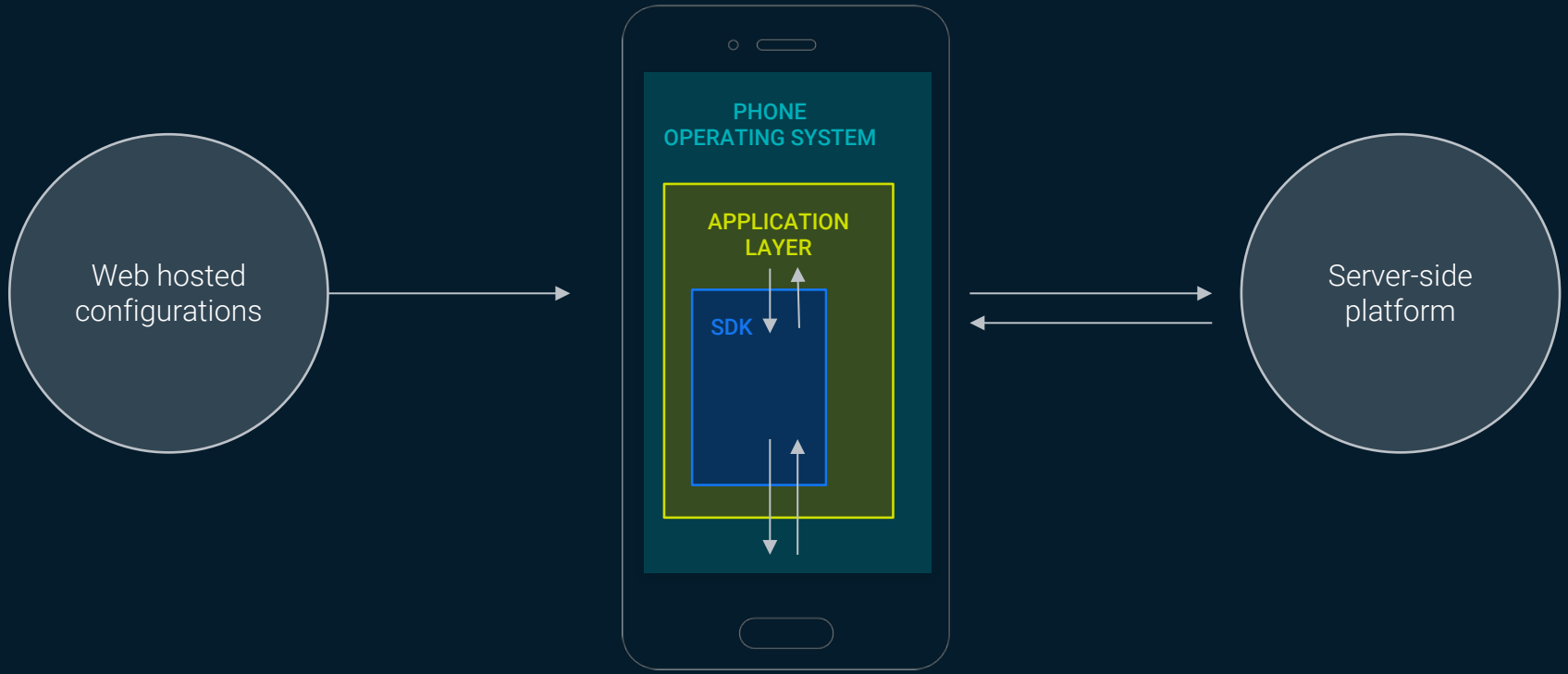
A mobile telematics solution

Core components



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Global Positioning System (GPS)

GPS captures location and speed using communication with a network of satellites

HIGHLIGHTS

Geospatial Analysis

Analyze driving networks to predict more efficient routes, identify garaging fraud, or distinguish between modes of transportation

Route Matching and Data Enrichment

Snap GPS to road segments, allowing enrichment with speed limit and road congestion data

Speed-Derived Features

Identify instances of hard braking and acceleration

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Accelerometer

Measures translational accelerations in the phone's reference frame

HIGHLIGHTS

Braking and Acceleration Detection

Develop more powerful braking, acceleration, and hard turning features

Collision Detection

Detect collisions as rapid spikes in acceleration magnitude

Sensor Fusion

Combine GPS speed and accelerometer to yield purer measurement of true vehicle speed

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Gyroscope

Measures rotational accelerations in the phone's reference frame

HIGHLIGHTS

Distracted Driving

Identify and classify instances of phone handling

Turn Detection

Investigate rotation of the vehicle or the body

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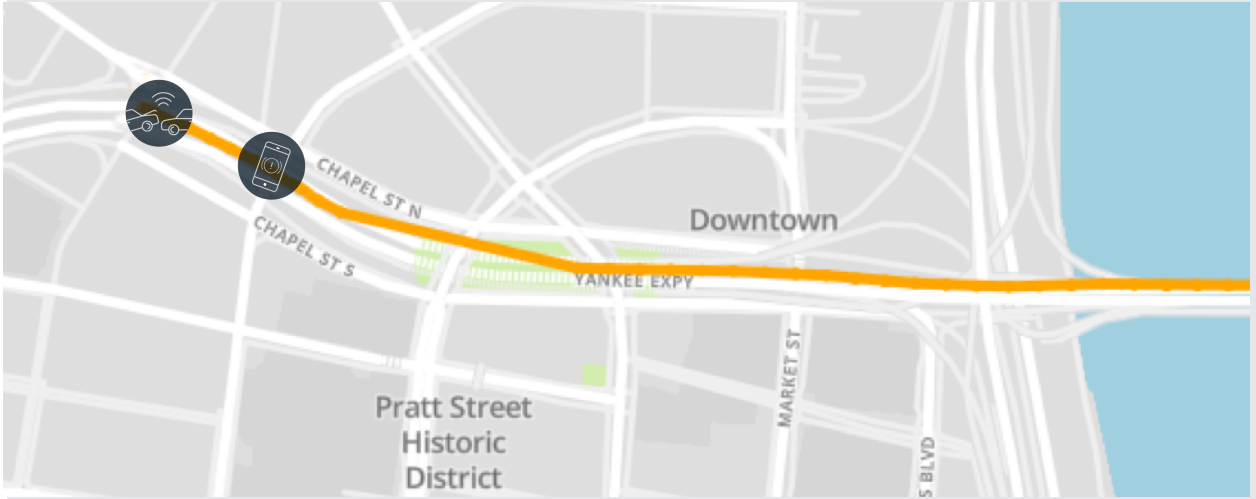
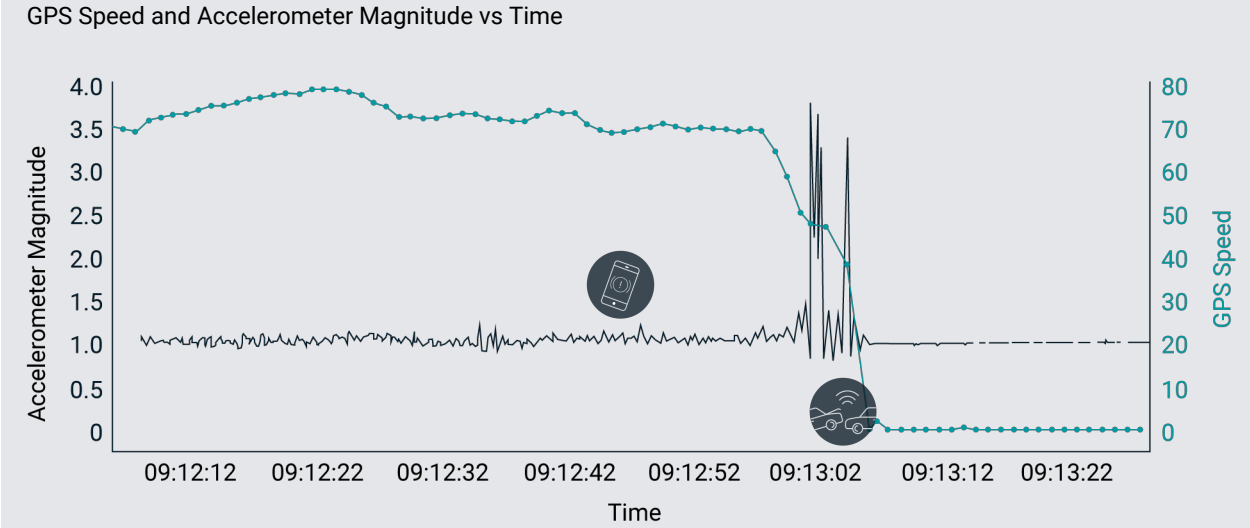
Piecing it together

Distracted driving + collision





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Insurer Roadmap

- Get connected
- Acquire & analyze data
- Examine patterns of customer behavior
- Understand the customer

- Get smarter
- Understand technology
- Leverage sensor ability

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Let’s run

Sensors used to protect and save lives

In practice: distracted driving

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Distracted driving

2x

two second glances doubles the likelihood of a crash[1]

5x

less likely to notice and engage with pedestrians[2]

[1] Klauer et al., 2006
[2] Hyman et al., 2008

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Two factors working against us

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1: Our own mind

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2: Others using our mind against us

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1: Our own mind

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Cognitive phenomena

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Impaired scanning

Inattention blindness

Multi-tasking

Switching costs

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Full field of vision

Peripheral vision lost

Source: Strayer et al., 2011

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Impaired scanning

Inattention blindness

Multi-tasking

Switching costs

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Full attention to surroundings

Inattention to signs, pedestrians, and objects in front of car

Source: Strayer et al., 2011

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Impaired scanning

Inattention blindness

Multi-tasking

Switching costs

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Impaired scanning

Inattention blindness

Multi-tasking

Switching costs

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Stanford Marshmallow Experiment

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2: Others using our mind against us

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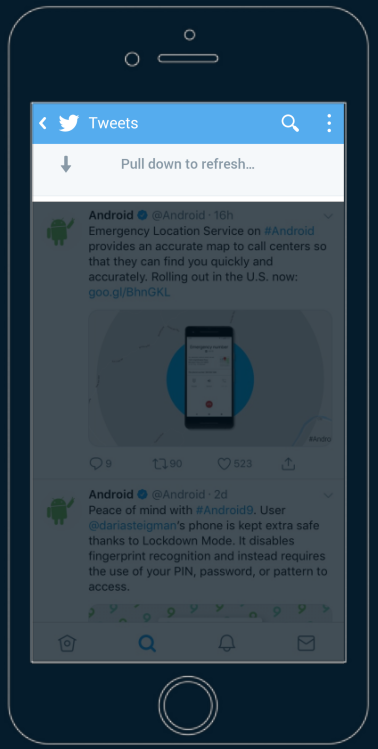

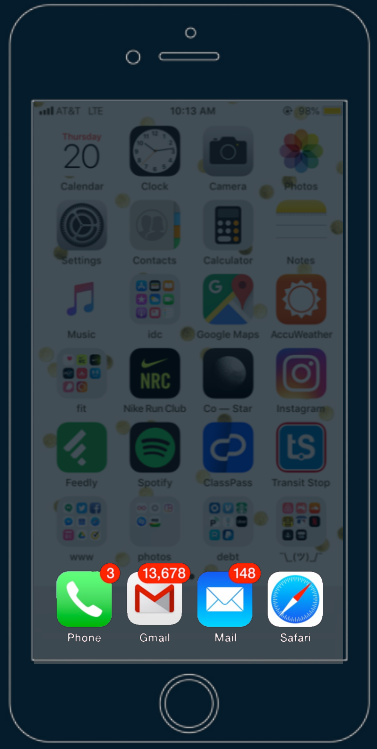

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Impact to insurance industry

3x

increase in estimated auto losses attributed to distracted driving since 2011

90%

top 50 carriers have distracted driving initiatives

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Naturalistic distracted driving

How do we do this?

Capture distracted driving data in a naturalistic setting

Leverage video data as a reliable source of truth

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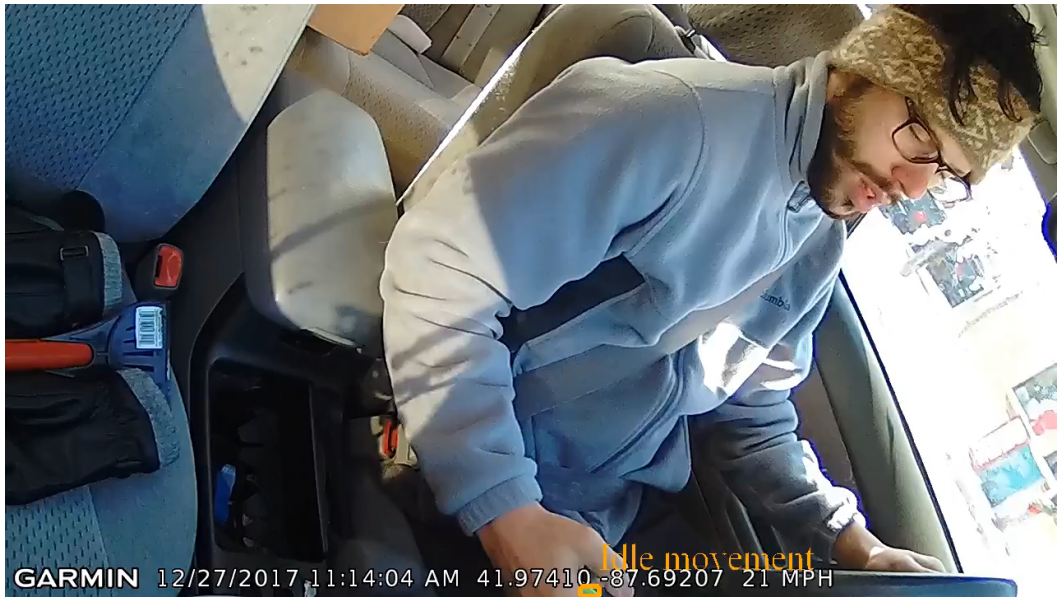
Naturalistic distracted driving

How do we do this?



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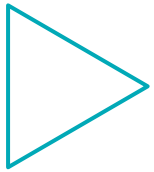
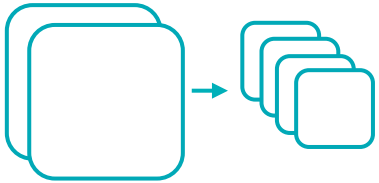
Naturalistic distracted driving

A scalable solution

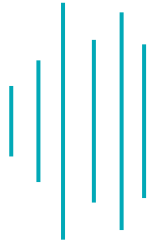


Video data collection



Autonomous labeling

Manual confirmation



Telematics model development

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Insurer Roadmap

- Get connected
- Acquire & analyze data
- Examine patterns of customer behavior
- Understand the customer

- Get smarter
- Refine engagement
- Connect to platforms

- Advanced sensor technology
- Machine learning
- New relationship paradigm

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Thank you.

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