

# How might driverless transport transform demand?

ITEANZ Seminar 17 March 2015

# Today, used cars can come well equipped

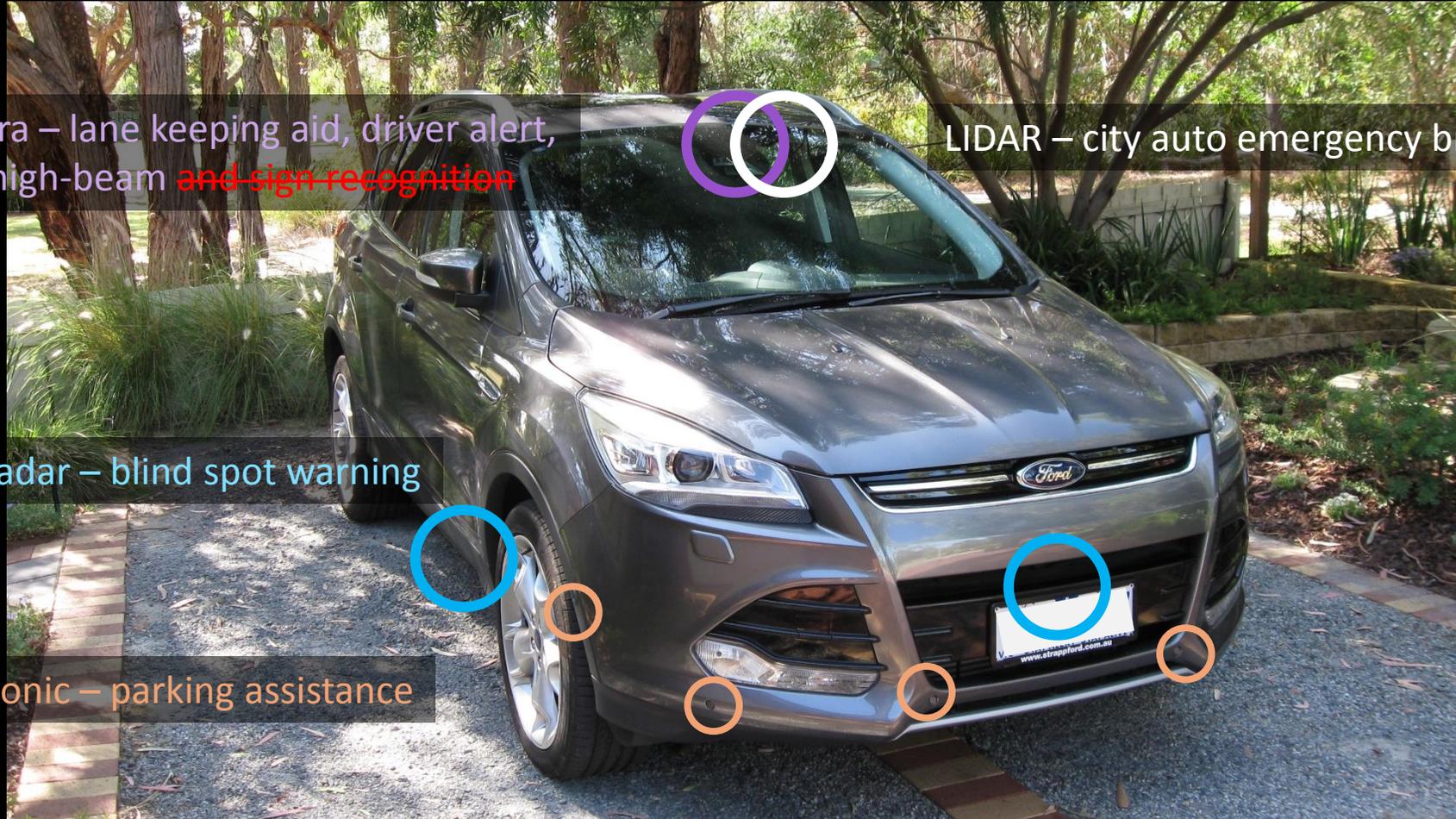
Camera – lane keeping aid, driver alert, auto high-beam ~~and sign recognition~~

LIDAR – city auto emergency braking

Side radar – blind spot warning

Ultrasonic – parking assistance

Front radar – adaptive cruise control, forward collision warning



...but not self-driving



# Limited self-driving is become available

- ▶ Starting to become available, growth likely to accelerate
- ▶ NHTSA L3 self-driving (also SAE L3)
  - ▶ Can self-drive in some conditions
  - ▶ May require driver to remain attentive and be able to resume control
- ▶ Traffic jam assistance
  - ▶ Lower speeds, stop/start traffic, may require intervention each time to move
- ▶ Highway pilot
  - ▶ “Super cruise” for hands-off driving
- ▶ Driverless valet parking
  - ▶ Low speed application without a driver in the vehicle

# Level 4 (no driver required) is where it gets really serious for the future of transport

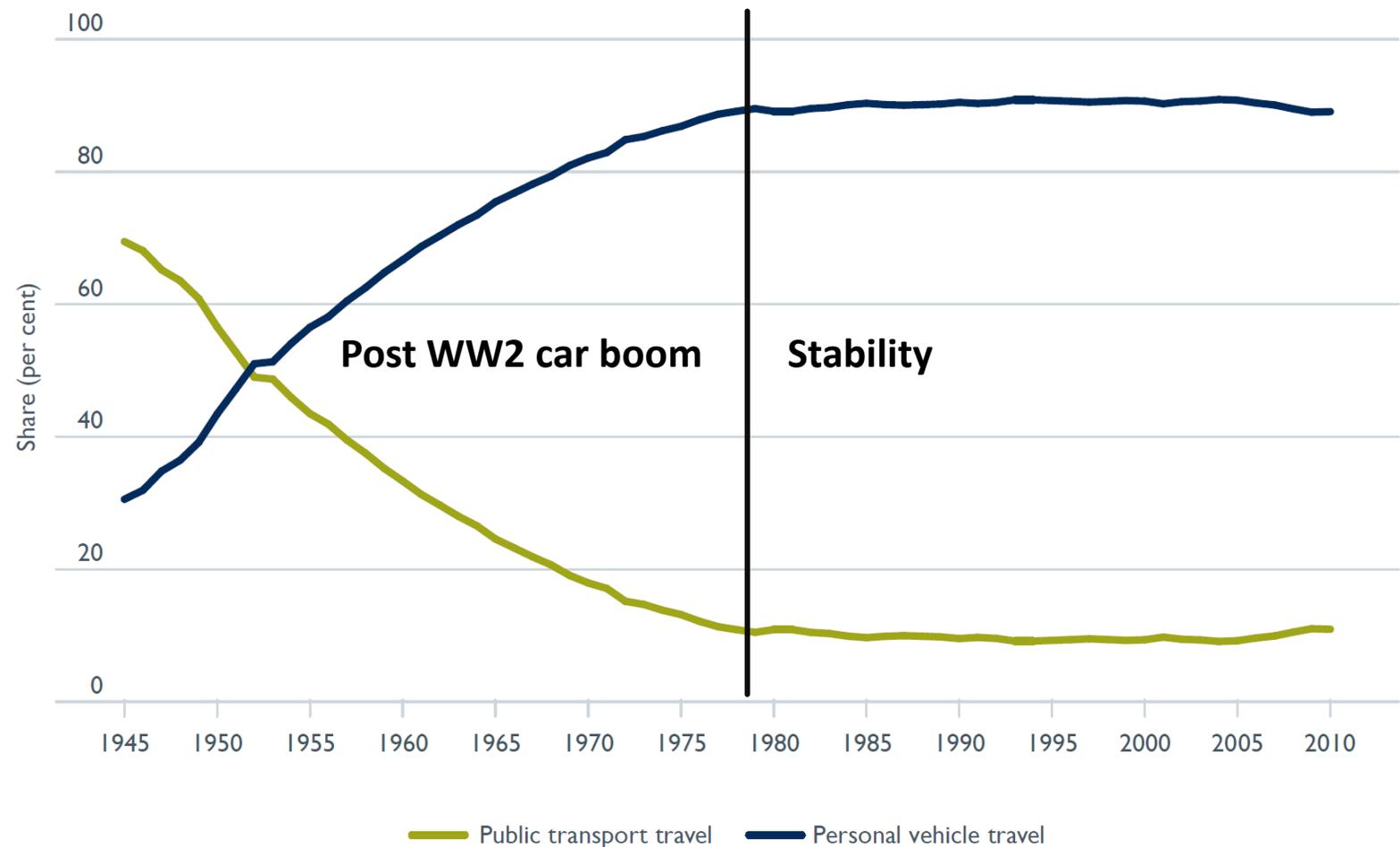
- ▶ Smarter vehicles will provide safety, mobility and environmental benefits well in advance of becoming self-driving
  - ▶ There will be some implications of increased automation that road agencies and traffic engineers will need to work through
- ▶ Taking the driver out of the equation has the potential to transform transport
  - ▶ Even once the technology is ready, the legal and regulatory, liability and insurance, security and human interaction dimensions will take a lot of work
  - ▶ Forecasts are for these vehicles to become available from 2020 and more common and affordable by 2025

# Most of us have never experienced a transport revolution

An engineer who entered the workforce in 1980 has only ever known a relatively stable environment

(BITRE Report 129, 2013)

**Figure 2.10** Passenger transport share (per cent), personal vehicle travel and public transport travel, all capital cities, 1945–2010

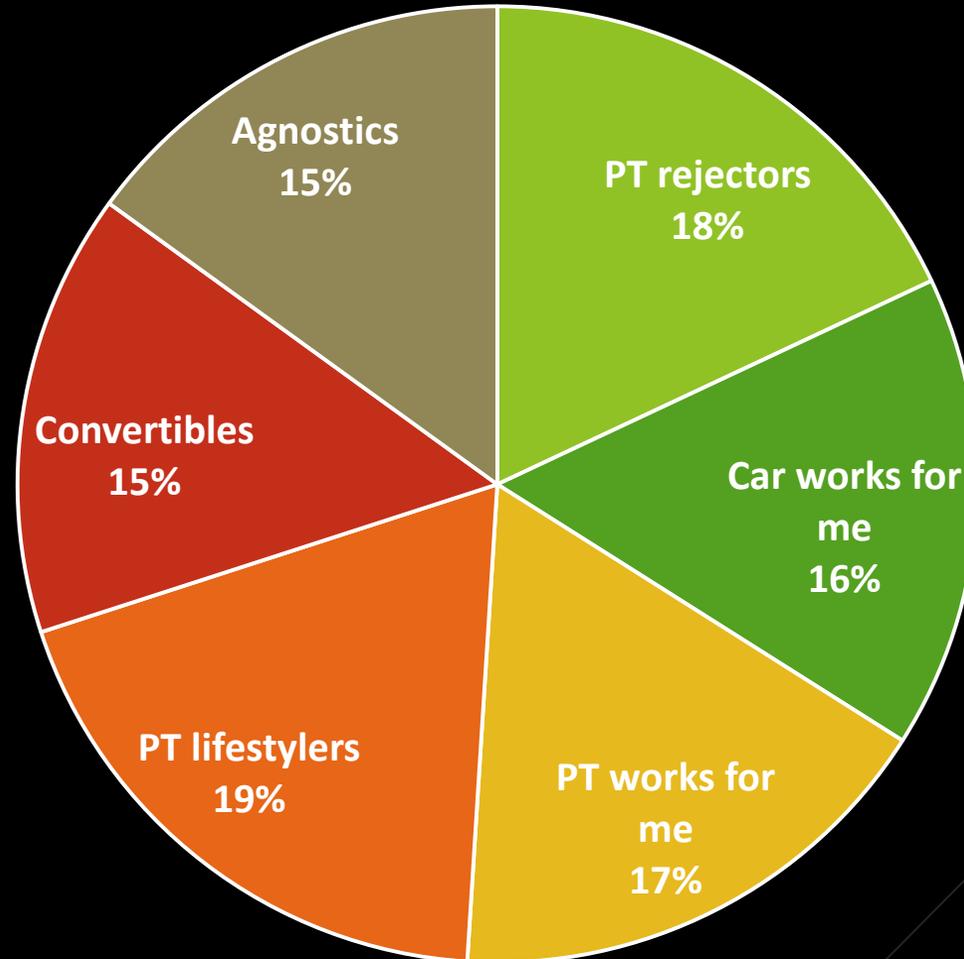


# Self-driving transport expands service options

- ▶ Active transport
- ▶ Private transport
- ▶ Personal transport
- ▶ Shared demand-responsive transport
- ▶ Shared mass transport
  
- ▶ There is also freight transport to consider

# Self-driving transport expands service options

- ▶ Market segmentation research highlights that there is not one universal transport solution to meet customer needs and wants



# Self-driving transport expands service options

- ▶ Active transport
- ▶ Private transport
- ▶ Personal transport
- ▶ Shared demand-responsive transport
- ▶ Shared mass transport
  
- ▶ Exploring these different service options appears to be the best way to look at how transport demands might change

# Private self-driving transport

- ▶ I need to keep stuff in my car
- ▶ My car is mine, I choose who travels in it
- ▶ Sometimes I want to drive, other times I just want to get there
- ▶ My car is a symbol of my success or my personality
- ▶ I like not having to pay for expensive city parking
- ▶ I don't drop my kids at school, my car does



Mercedes-Benz F015

# Personal self-driving transport

- ▶ I just want to get from A to B as quickly as possible
- ▶ I don't really want to share with strangers
- ▶ Owning a (second) car is a waste of money or unaffordable



Chevrolet EN-V

# Shared self-driving transport

- ▶ I want to travel as cheaply as possible, but still quickly
- ▶ I want to be comfortable, but I don't mind sharing
- ▶ I want to get to places that private/personal vehicles are not allowed to travel



Induct Technology Navia

# Companies are betting on a change

- ▶ There has been big private investment in marketplaces to manage demand-responsive transport
  - ▶ Uber \$3bn (and Google possibly creating a rival)
  - ▶ GrabTaxi \$334m
  - ▶ Lyft \$250m
  - ▶ BlaBlaCar \$100m
- ▶ Ford Smart Mobility plan includes 25 mobility experiments
  - ▶ Yet one car sharing car removes 9-13 cars from the fleet

# So what does this all mean?

- ▶ Self-driving will redefine the service offering for three types of transport
  - ▶ Private transport
  - ▶ Personal demand-responsive transport
    - ▶ What's happened so far with Uber may just be the start
  - ▶ Shared demand-responsive transport
- ▶ Convenience will change and cost will change
  - ▶ The change will not be a linear projection of current trends
- ▶ ...so how can we change our demand forecasts?
- ▶ ...what feedback effects will demand changes have on land use patterns
- ▶ ...what impacts will there be for related industries?

# Lots of questions, fewer answers

- ▶ Will total road use demand (VKT) decrease or increase?
- ▶ Will automation increase or reduce capacity?
  - ▶ Many forecasts assume reduced headways, yet current AV operation is understood to be highly conservative (increased headways)
- ▶ Will time lost to congestion still be “lost”?
- ▶ Will we still need expensive city car parks?
- ▶ Will we need dedicated lanes for automated vehicles for some interim period?
- ▶ How will transport be priced?

# Lots of questions, fewer answers

- ▶ We are at the point where it is clear that disruptive change is highly likely
- ▶ We know that change is coming, so we must plan for the change
- ▶ ...however we do not know what that change will look like
  
- ▶ To cope with the disruptive change, we can:
  1. Use scenario approaches in forecasting to explore a range of different possible futures
  2. Build capability and the relationships needed to work in the changed environment by starting to work with automated vehicles

# What does scenario planning look like?

- ▶ EU CityMobil project is currently exploring the implications of different scenarios for four different land use patterns

