



University of
Southampton

Introduction to the University of Southampton and the Institute of Sound and Vibration Research (ISVR)

Professor Philip Nelson

2nd March 2023

Where is the ISVR?



Tizard Building



The University of Southampton

- Founded in 1902 (Univ. College), 1952 (University).
- Member of the ‘Russell Group’ of UK Universities.
- 5,000 staff, including 2,300 academic & research staff.
- 25,180 students (53% female, 47% male)
- 17,535 undergraduate students; 7,650 postgraduates
- 7% of students from the EU, 22% international students (from outside the EU).



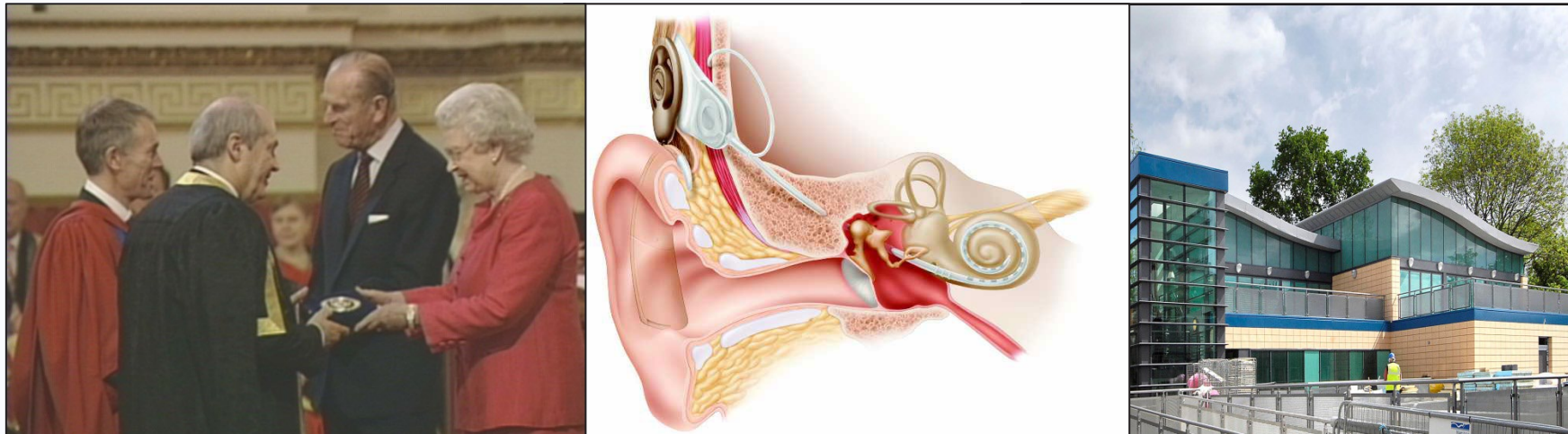
A Short History of the ISVR

- 1963, founded as a postgraduate research institute with an initial focus on noise and vibration in the aeronautics industry.
- 1965, undergraduate programme in Sound and Vibration Engineering introduced.
- 1968, Wolfson industrial Noise Consultancy unit formed and Rayleigh laboratories built.

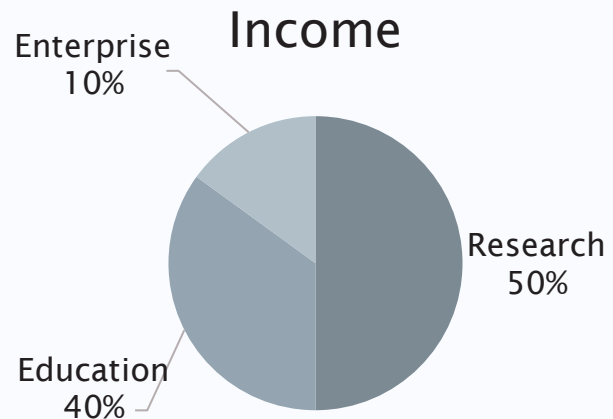
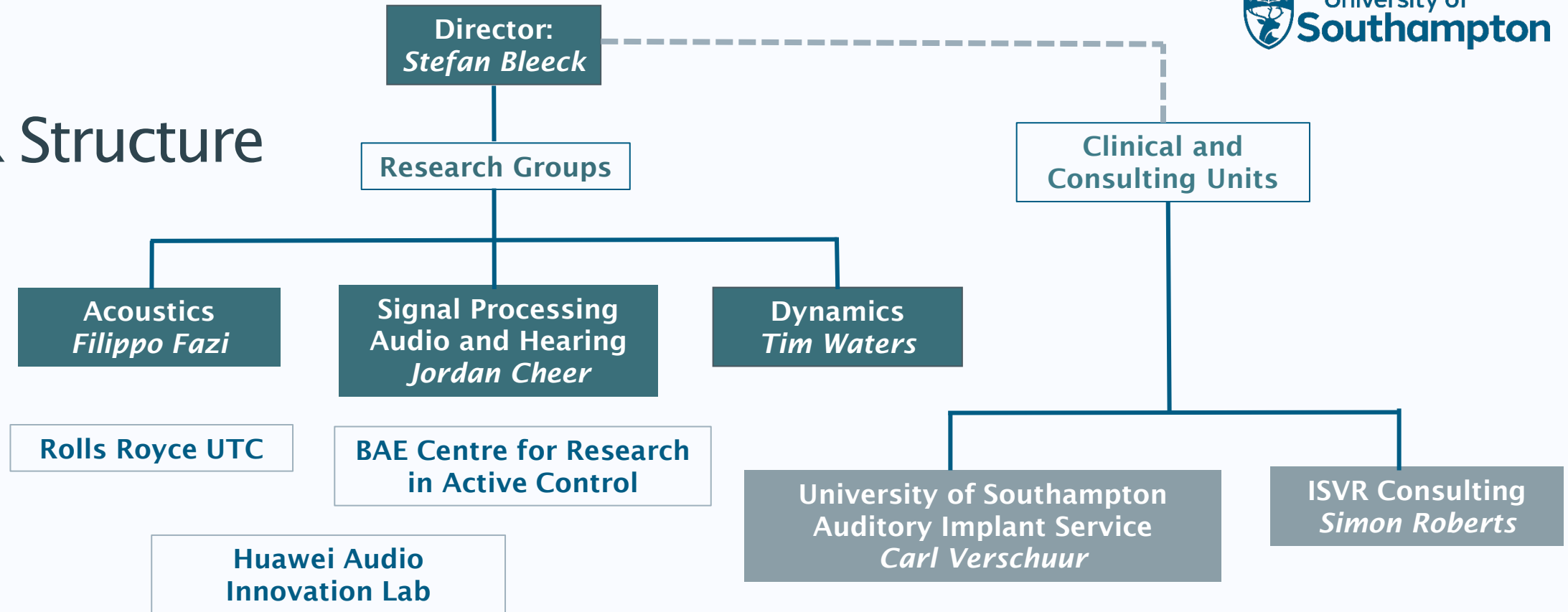


A Short History of the ISVR

- 1990, South of England Cochlear Implant Centre founded within the institute (now Uni. Southampton Auditory Implant Service).
- 2004, Undergraduate programme in Audiology starts.
- 2005, ISVR wins Queen's Anniversary Prize for Higher Education
- 2008, USAIS and human factors housed in new purpose-built premises



ISVR Structure



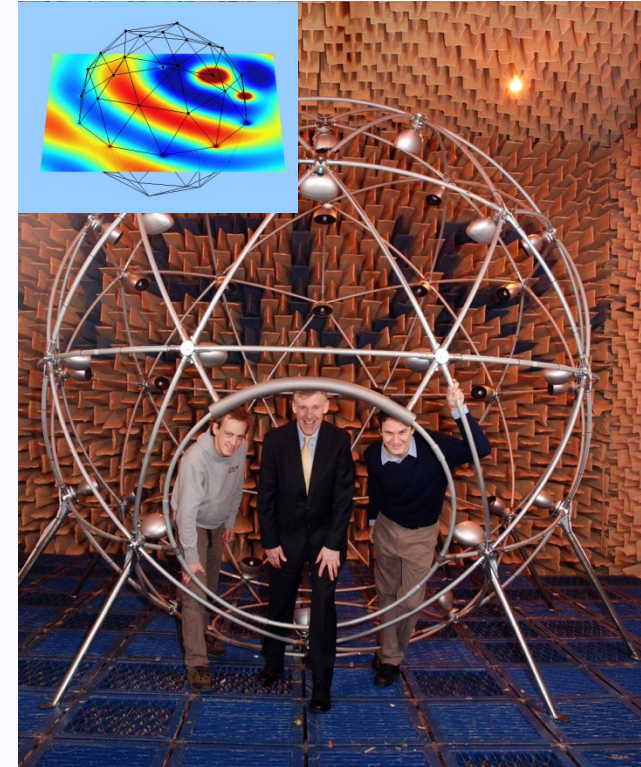
- 35 Academic staff
- 18 Research staff
- 30 Consulting and Clinical
- ~55 PhD researchers
- ~30 MSc
- ~100 Undergraduate
- ~250 UG Harbin

Acoustics Group

- Aircraft Noise – Rolls Royce UTC
- Virtual Acoustics
- Ultrasound
- Underwater Acoustics

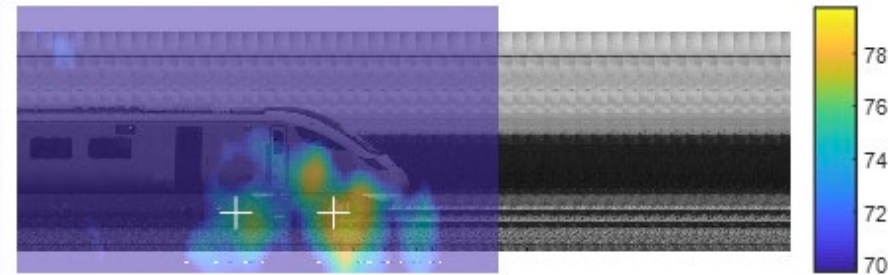


AUDIOSCENIC



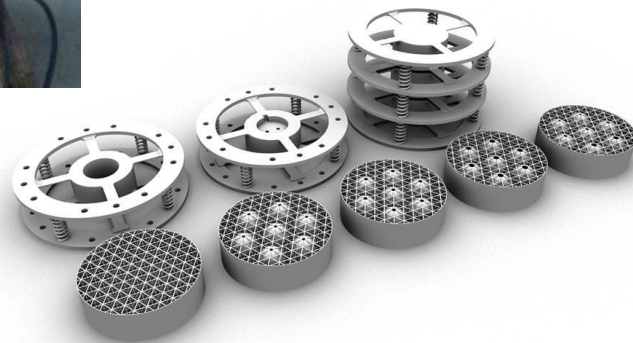
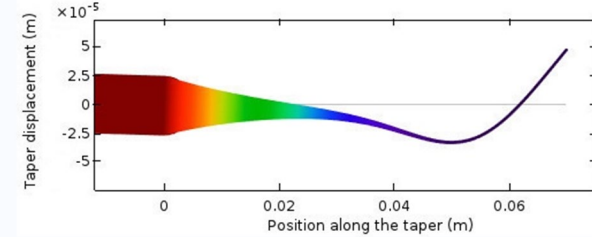
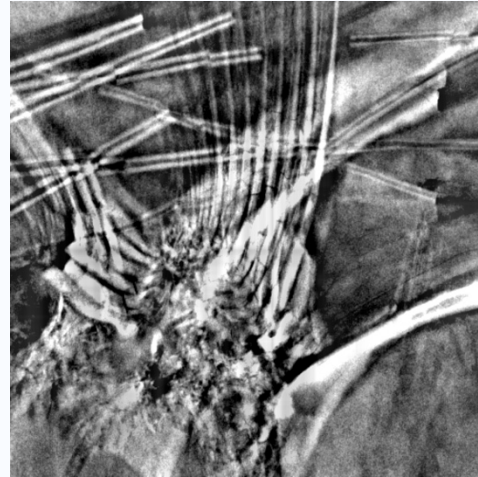
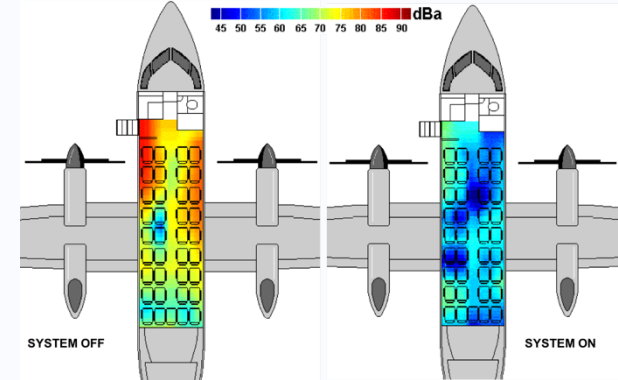
Dynamics Group

- Rail vibration
- Energy harvesting
- Smart structures
- Automotive noise and vibration
- Mapping the Underworld



Signal Processing Audio and Hearing Group

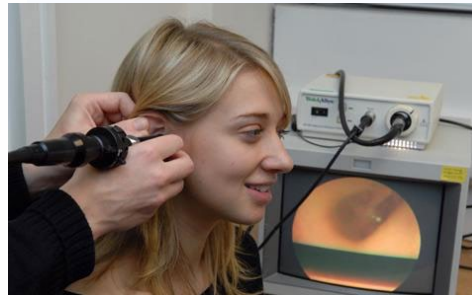
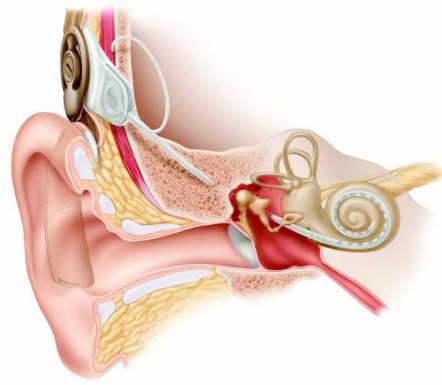
- Active control
- Metamaterials
- Signal processing
- Image processing



ClanTect
V3s

Signal Processing Audio and Hearing Group

- Audiology
- Hearing Science
- Human response to vibration



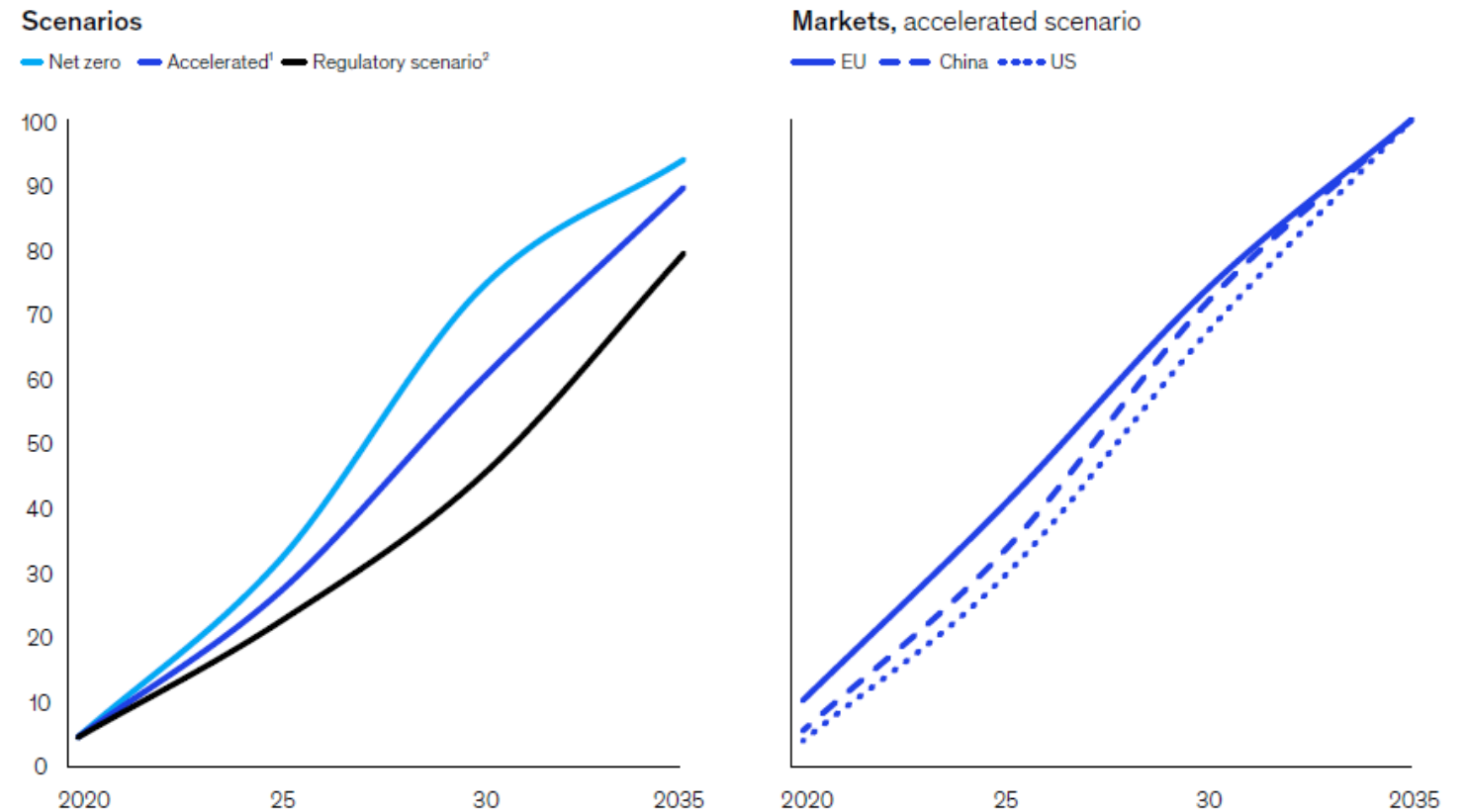
Introduction to the Workshop on the Acoustics of Automotive Interiors

Fifth Avenue, New York City, Easter Parade 1900-1913



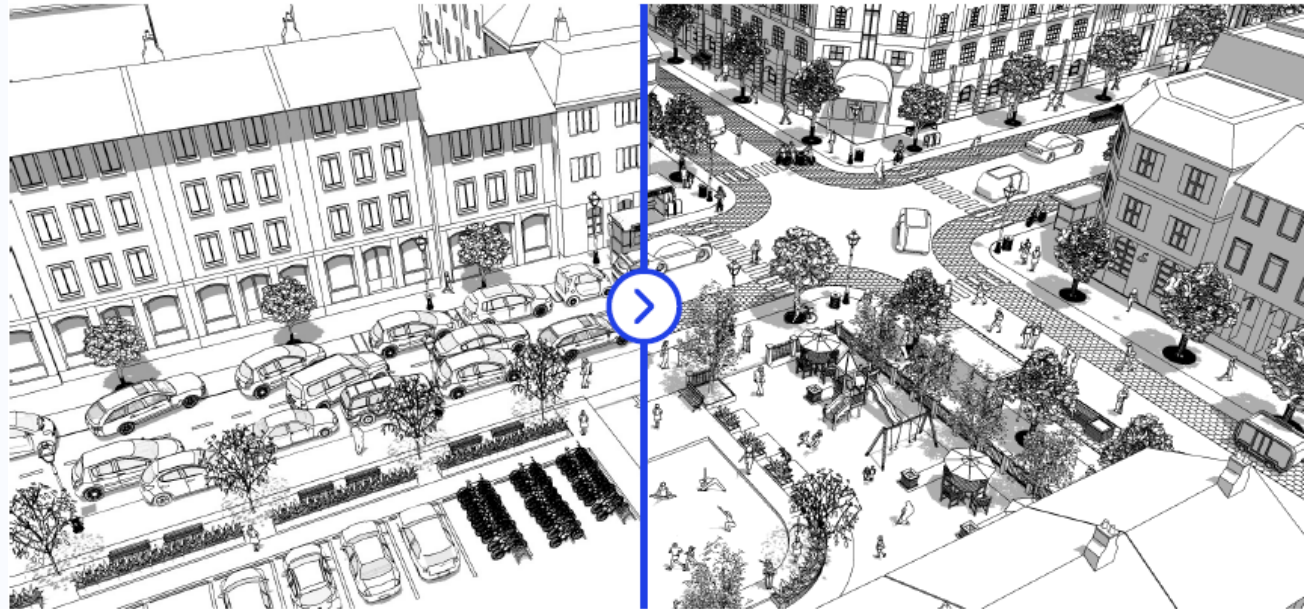
“By 2035 the largest automotive markets (EU,US, China) will be fully electric”

- EV (BEV, FCEV, PHEV) sales in percent of new passenger vehicle sales
- From McKinsey 2021 “Why the automotive future is electric”



“Cities suffer from emissions, congestion and safety...which is set to change with the arrival of new mobility solutions”

- From McKinsey 2021 “Why the automotive future is electric”



Electrification is one of the key enablers for new integrated mobility across vehicle segments, e.g.,



Scooters

Paris recently granted a 2-year contract for the implementation of 5,000 e-scooters



Passenger cars

Oslo reached 66% passenger EV adoption in July 2021

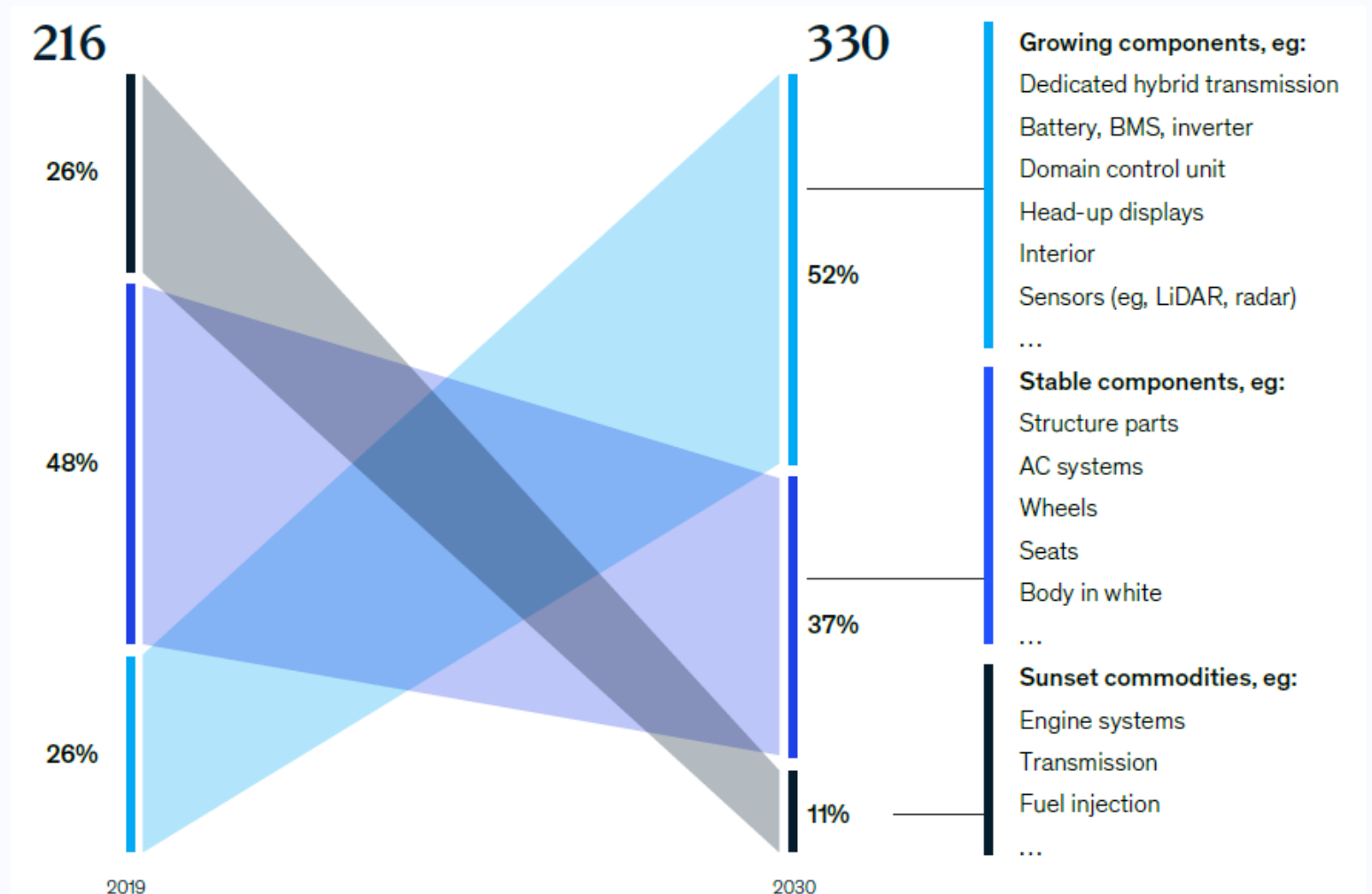


Buses

Shenzhen has already fully electrified its 16,000 unit bus fleet as well as 22,000 taxis

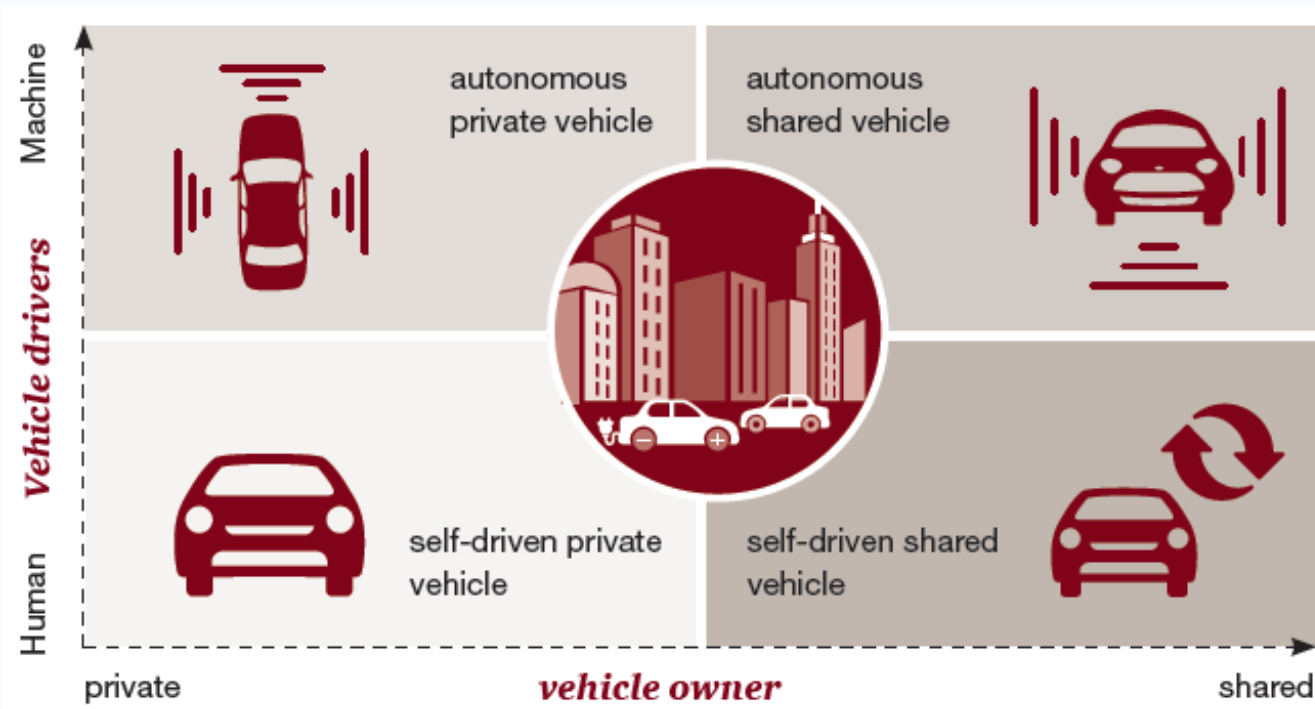
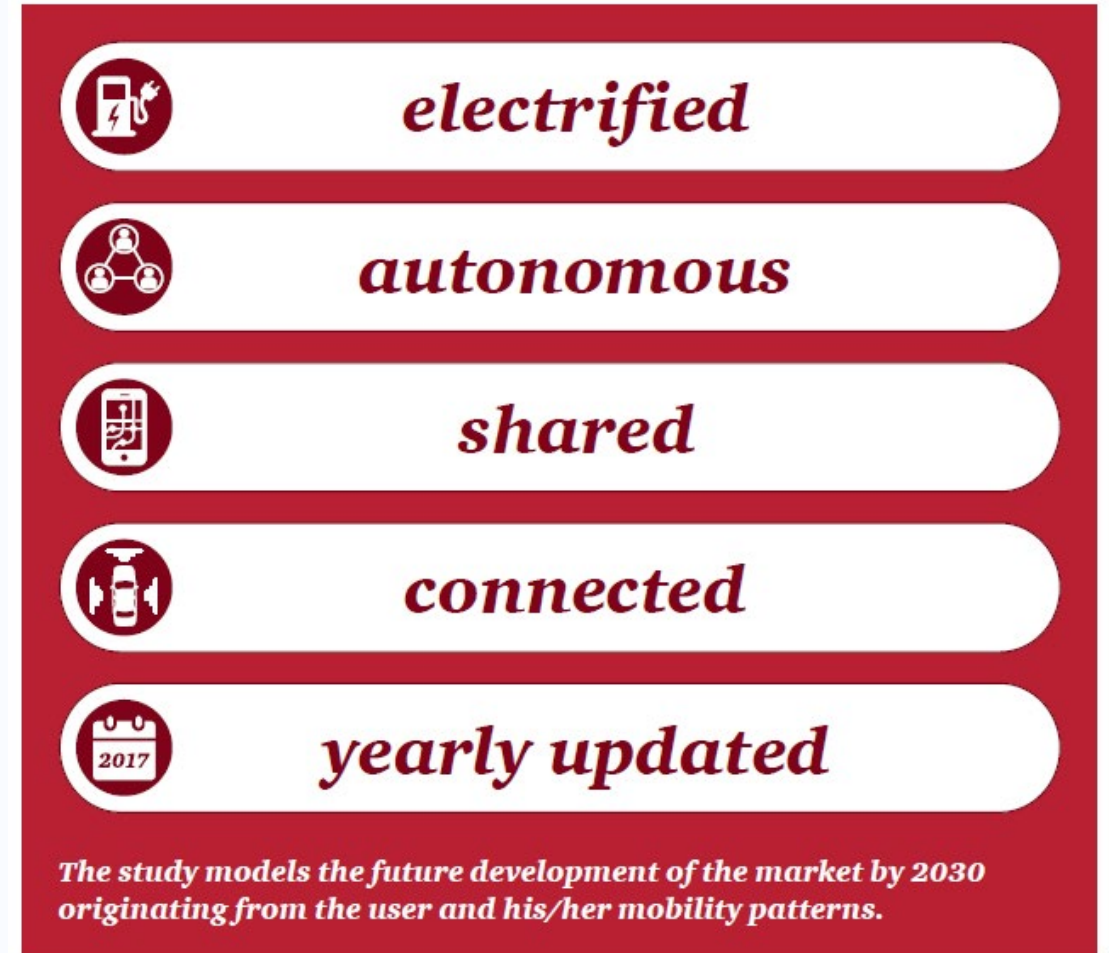
“Electrification will cause a major shift in the entire supply chain”






- Market size development
€ Billions
- From McKinsey 2021
“Why the automotive future is electric”



“Welcome to the age of radical change in the automotive industry”

- From PWC 2018 “Five trends transforming the automotive industry”

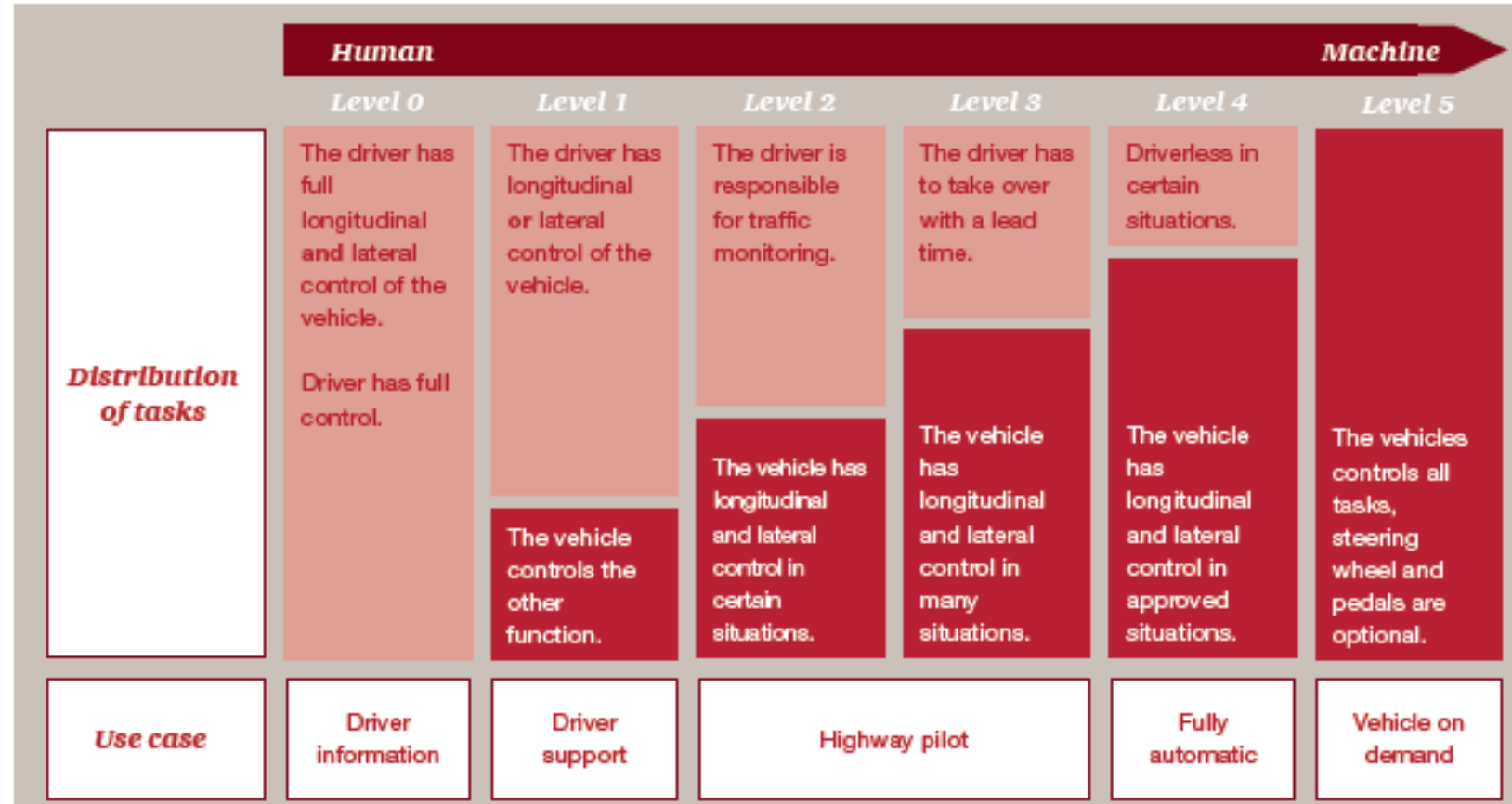



-  ***electrified***
-  ***autonomous***
-  ***shared***
-  ***connected***
-  ***yearly updated***

The study models the future development of the market by 2030 originating from the user and his/her mobility patterns.

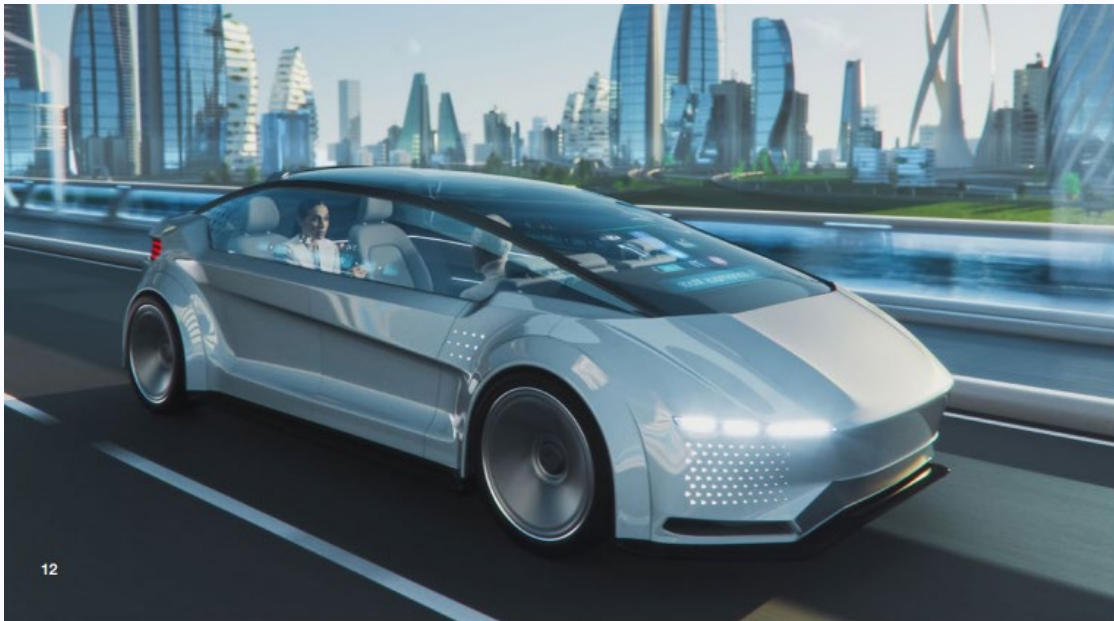
“Autonomous vehicles will have a strong positive impact on sharing concepts”

- From PWC 2018 “Five trends transforming the automotive industry”



“By 2035, 40% of new cars in the UK could have self-driving capabilities”

- From HM Government 2022 “Connected & Automated Mobility 2025: Realising the benefits of self-driving vehicles in the UK”



Some possible interior acoustical consequences

- An interior noise environment that is changed for the better?
- Changes to the powertrain sources?
- Aerodynamic and road noise sources?
- Need for interior noise control?
- Assessment of sound quality?
- A greater focus on communication and entertainment systems?
- Generation of personal sound zones?
- Presentation of immersive audio technologies?

LET'S HAVE A WORKSHOP!



ISVR | Institute of Sound
and Vibration Research

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WORKSHOP ON THE ACOUSTICS OF AUTOMOTIVE INTERIORS
2nd – 3rd March 2023
Chilworth Manor Best Western Hotel
University of Southampton Science Park, Southampton, UK

- With thanks to Erika Quaranta, Simon Roberts, Filippo Fazi, Derrick Nirmalan!

YOUR QUESTIONS