In-Car Displays:
Customer Expectations, Trends and Human Factors

PhD in Cognitive Psychology

- Visual attention and hazard perception
- Eye movements and driving experience

Driving Simulation Research

Jaguar Land Rover

HMI, Voice, Vision, Displays

Technical Specialist

In-car displays:
Customer expectations, trends and human factors

1. **Customer expectations**
2. Instrument cluster
3. Central information display upper
4. Level 3 autonomy and beyond

1. Customer Expectations – Displays

Image taken from:
news.samsung.com/

1. Customer expectations - Cars

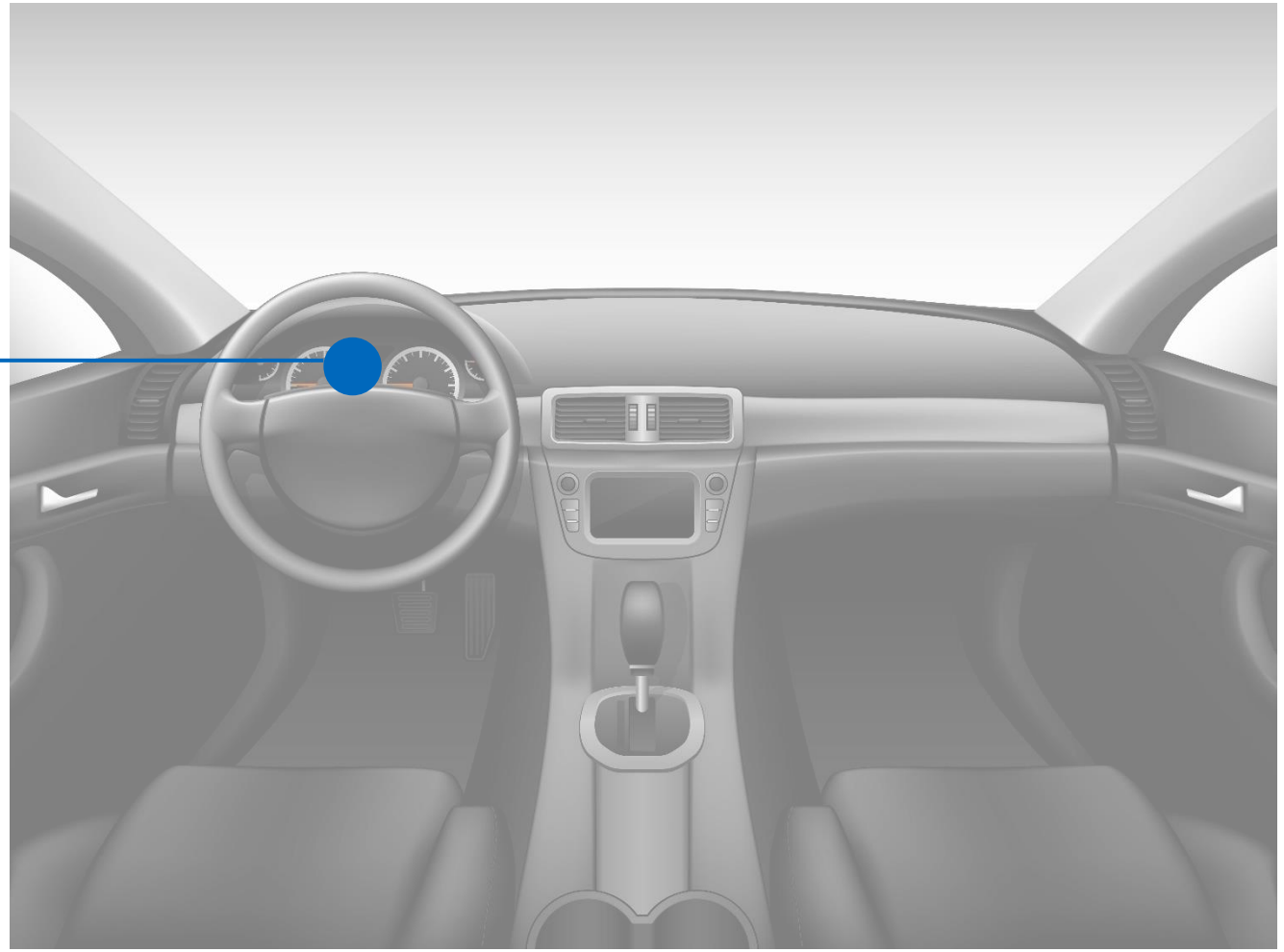
Image taken from:
teslamotors.box.com/pressfiles

2. Instrument Cluster

Instrument Cluster

Central Information Display (CID) – Upper

Central Information Display – Lower



Trends

- 12.3”, 8:3 will be the norm for all cars as 12.3” is a well defined area within the steering wheel
- Larger than 12.3” with curved displays within the premium sector.

2. Instrument Cluster – Mercedes S-Class

Human Factors concerns

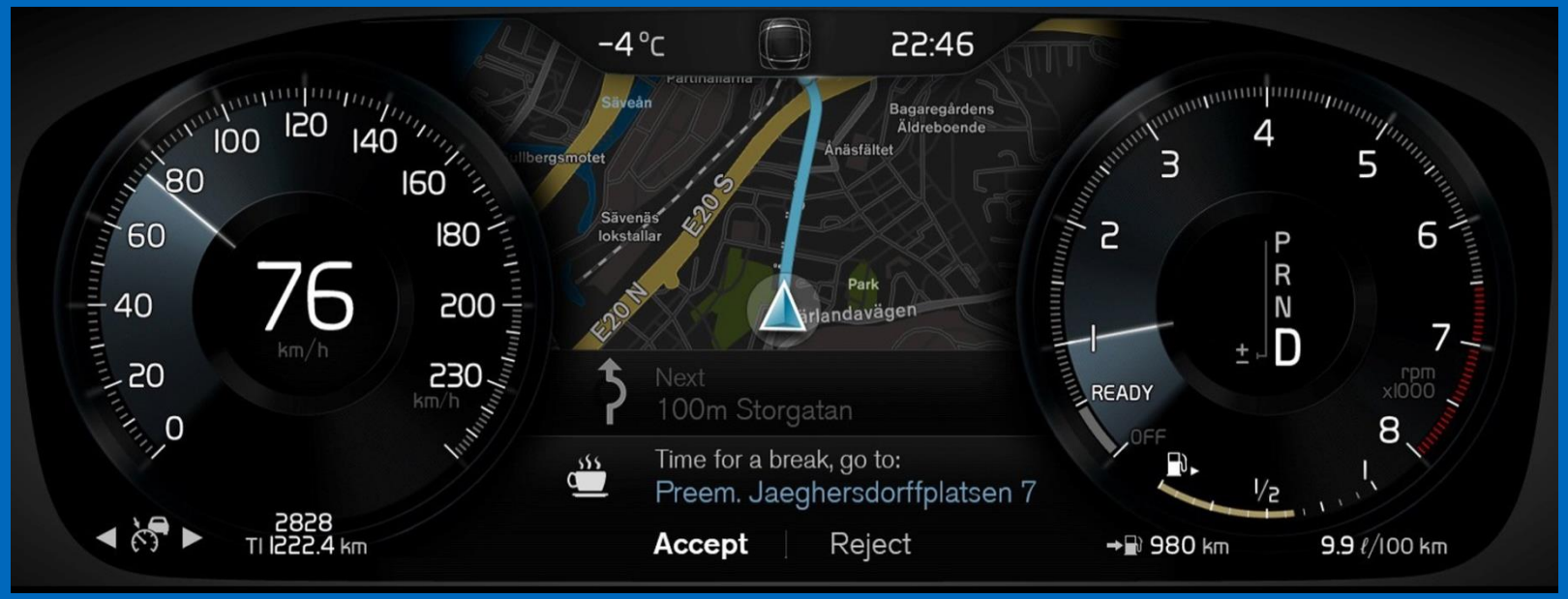
- Visual accommodation
- Continuous optic flow

2. Instrument Cluster – Mercedes S-Class

Recommendations

- Critical Driver Information (secondary if HUD is present)
- Limited interactions via steering wheel buttons

2. Instrument Cluster – Mercedes S-Class



Good example

- Driver focused, no clutter
- Good magnification

Bad example

- Too much information
- Poor legibility

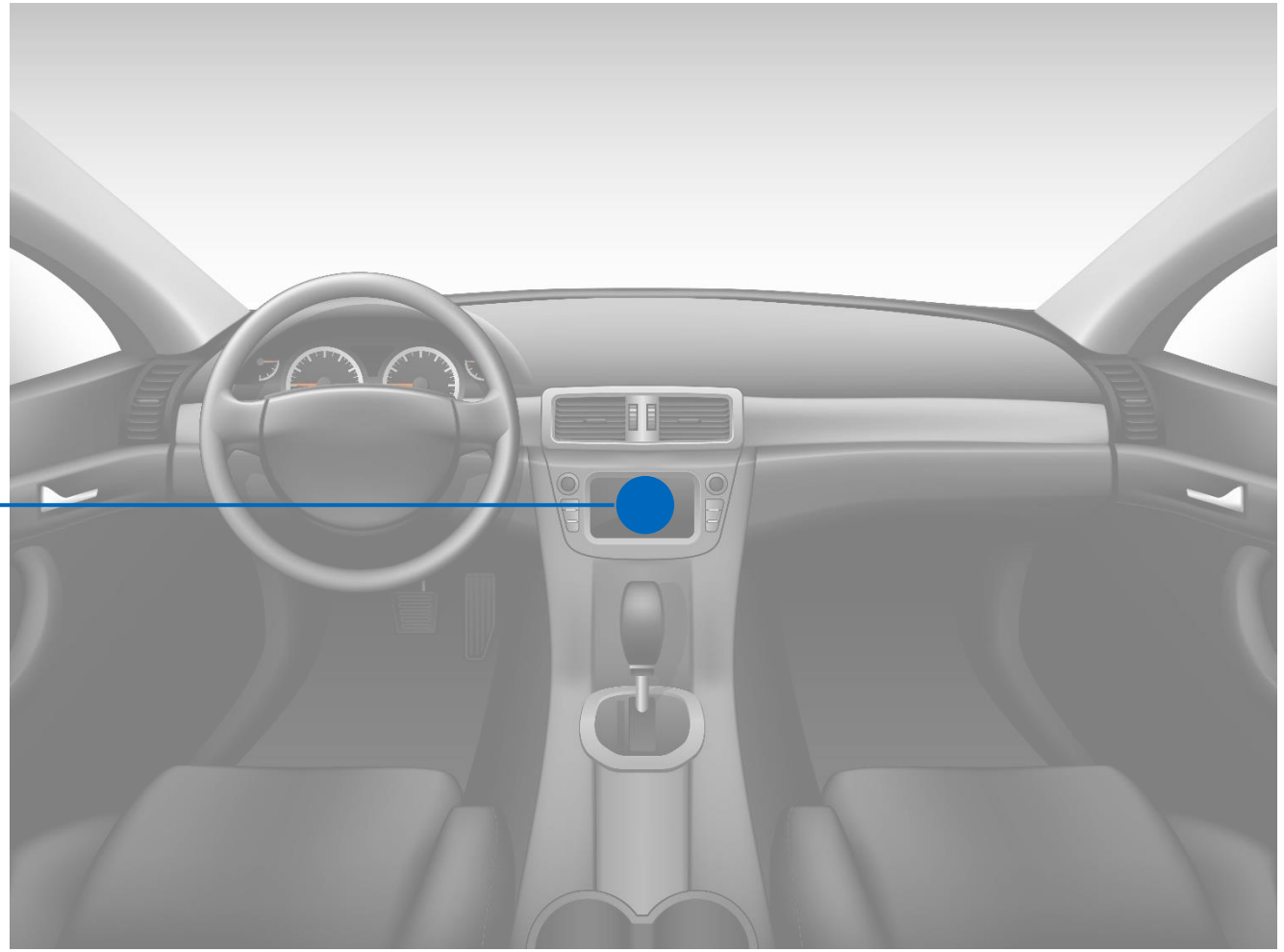
2. Instrument Cluster – Volvo XC90 vs Audi A4

3. Central Information Display Upper

Instrument Cluster

Central Information Display (CID) – Upper

Central Information Display – Lower



Trends

- Larger than 10”
- Touchscreen is a must have have
- Aspect ratio similar to CE devices

3. Central information display upper – Cadillac CT6

Human Factors

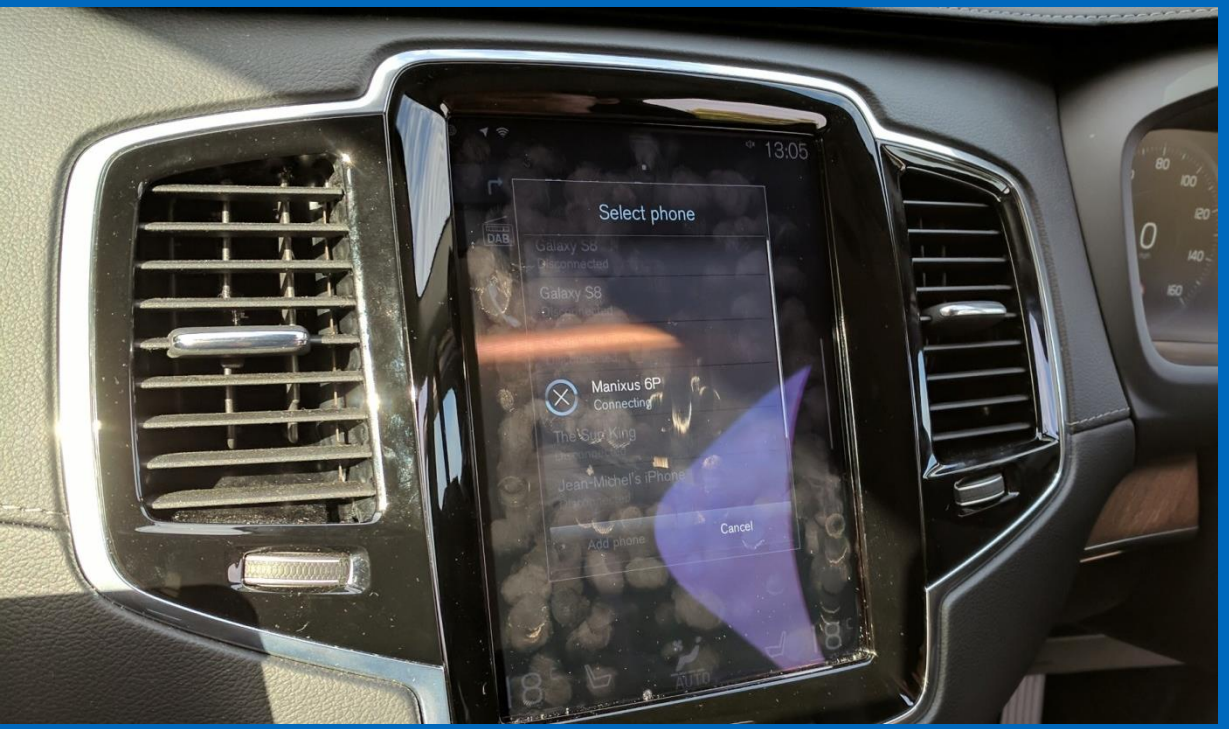
- Reflections and display size size
- Fingerprints
- Featuritis and distraction

3. Central information display upper – Cadillac CT6

Recommendations

- BIG 5 features
- Screen position
- AR/AG/AFP

3. Central information display upper – Cadillac CT6



Bad example

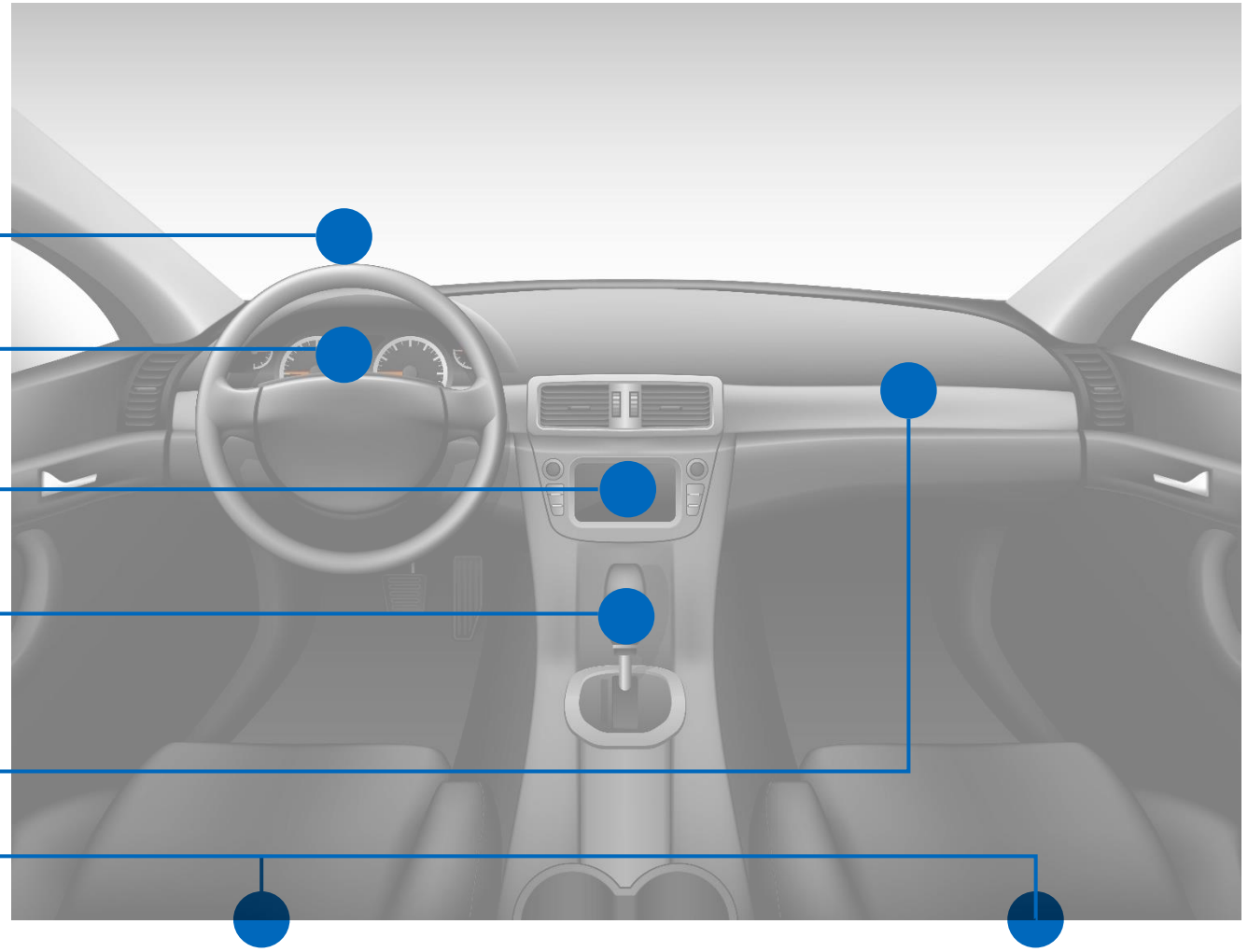
- Larger area open to sky / sky / reflections
- Fingerprints

Good example

- Vertical positioning
- Better AFP technology

3. Central information display – XC90 vs 7-series

4. Level 3 and beyond



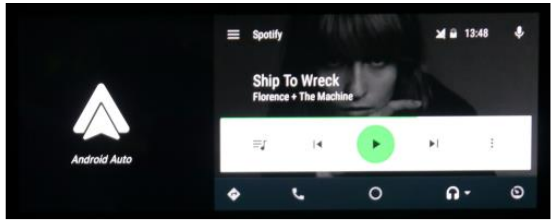
Today we have a driver-centric in-car user experience.

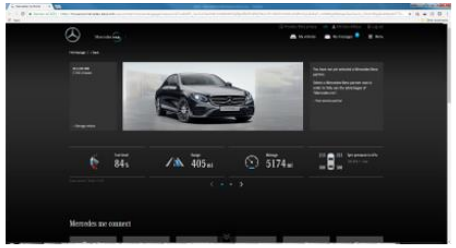
For example, the front passenger gets no dedicated entertainment or car information

With more autonomous features and shared mobility the focus should be on a holistic approach to in-car experience.

Connecting the “creative spaces” of driver, front-seat, and back-seats.

With new technologies and interactions that could generate novel gamification approaches, entertainment and productivity solutions.





Harmonization

Customers need to feel that every pixel and every experience is designed holistically. A truly harmonized Digital UX with systems that learn from each other.

Thank you

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