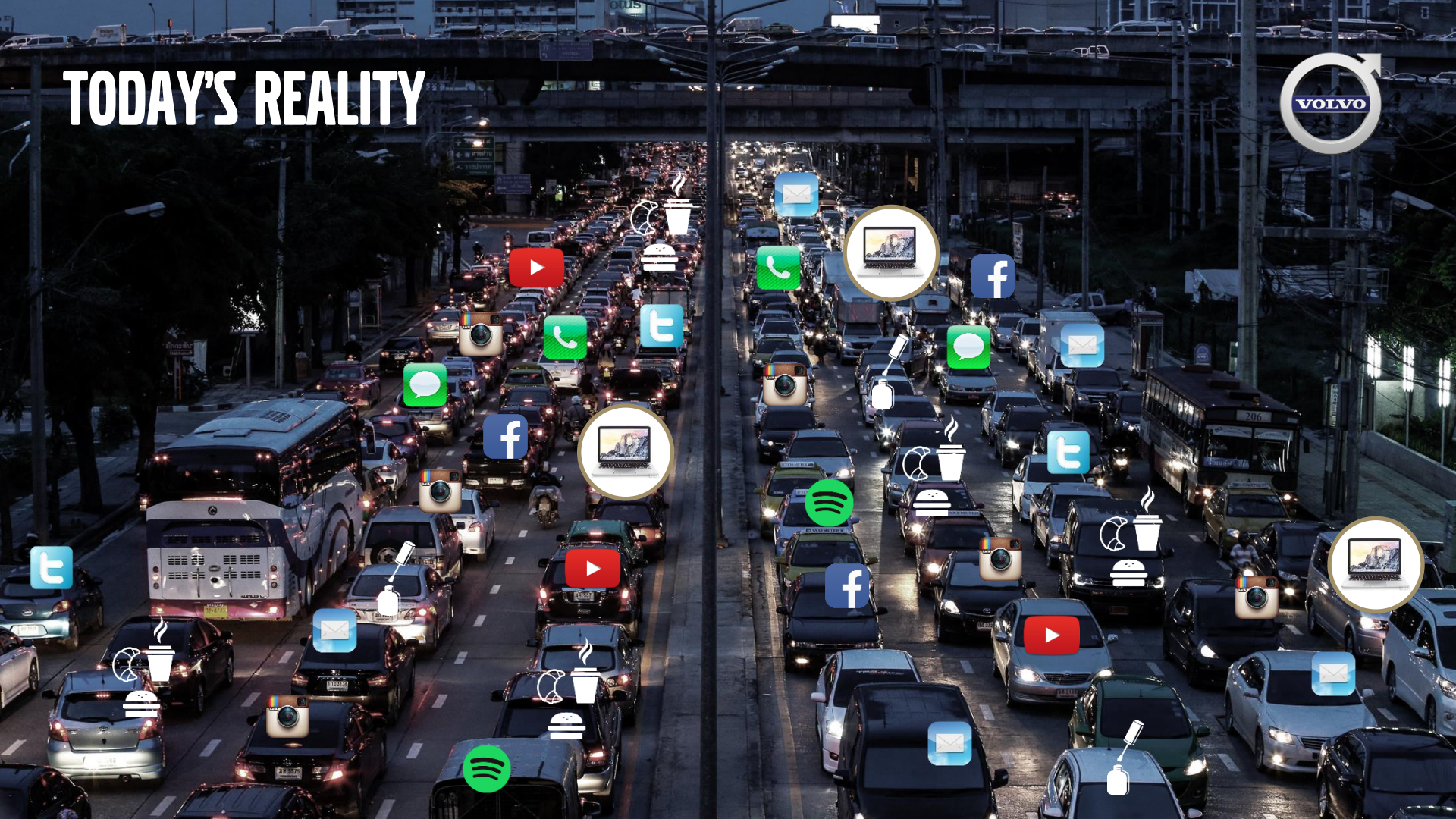
DRIVERLESS CARS AND AUTONOMOUS DRIVING

HENRIK JARLEBRATT, VOLVO CARS

GLOBAL TRENDS

- Urbanisation
- Growing mega cities
- Air quality major health problem
- Traffic accident global health issue
- Time for commuting
- Desire for time efficiency
- Desire for constant connectivity

TODAY'S REALITY



SHAPING THE FUTURE MOBILITY

AD will be important for a sustainable mobility

- Improved traffic safety
- Improved environmental outcomes
- Regain time

IT WAS ALWAYS ABOUT FREEDOM

AND IT'S STILL ABOUT FREEDOM

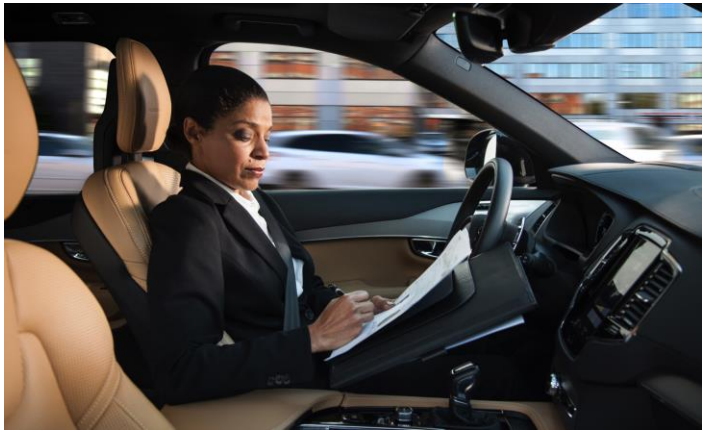
VOLVO VISION 2020
No one should be killed or seriously injured
in a new Volvo car by 2020

PILOT ASSIST VERSUS AUTOPILOT

PILOT ASSIST / SUPERVISED

- Driver is responsible, should monitor and supervise
- Driver responsible to intervene whenever needed
- Limitations: Lane markings, road design, oncoming objects, pedestrians, animals, restrictions in steering/braking/acceleration force that can be applied

AUTOPILOT / UNSUPERVISED



- Manufacturer responsible
- Tested on and expects extreme situations
- Takes precautions, takes decisions
- Driver free to do something else

DRIVE ME, INTERFACE - 167758

https://www.media.volvocars.com/global/en-gb

BY JOINT EFFORT AND PROPER RESEACH

Global challenges – Demand a joint effort

Drive Me – Nordic model of collaboration

Research platform – How autonomous cars can contribute to a sustainable development

Pilots with real customers in real traffic

TRANSPORT STYRELSEN

TRAFIKVERKET
SWEDISH TRANSPORT ADMINISTRATION

Autoliv

Drive Me
SELF-DRIVING CARS FOR SUSTAINABLE MOBILITY

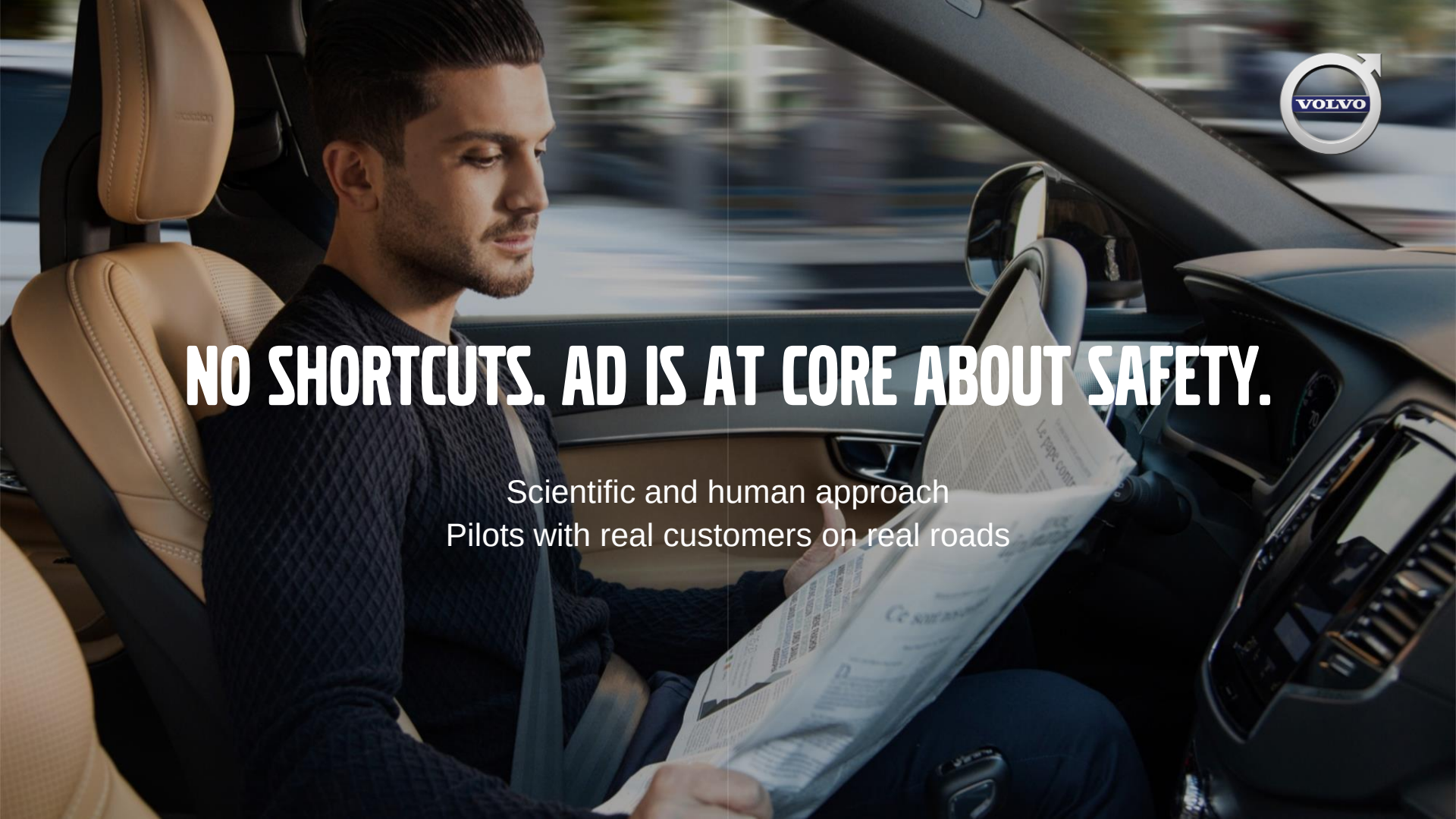
City of Gothenburg

LINDHOLMEN SCIENCE PARK

CHALMERS

DRIVE ME VIDEO 189739

https://www.media.volvocars.com/global/en-gb



NO SHORTCUTS. AD IS AT CORE ABOUT SAFETY.

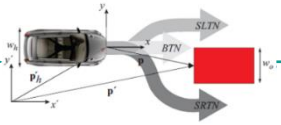
Scientific and human approach
Pilots with real customers on real roads

SAFETY IMPACT ANALYSIS

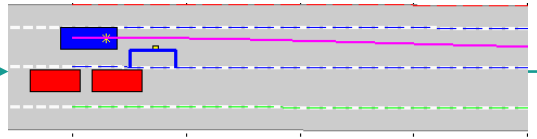
1) Self-driving conditions

2) Definition of safety conflict situations

3) New precautionary safety and conflict management



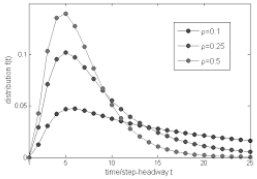
4) Virtual CAE verification v1



5) Vehicle design to prevent new risks e.g. *Driver's role, handovers, misuse, seating positions, drowsiness etc*

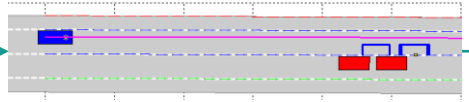
6) Field test(s)

7) Safety performance indicators



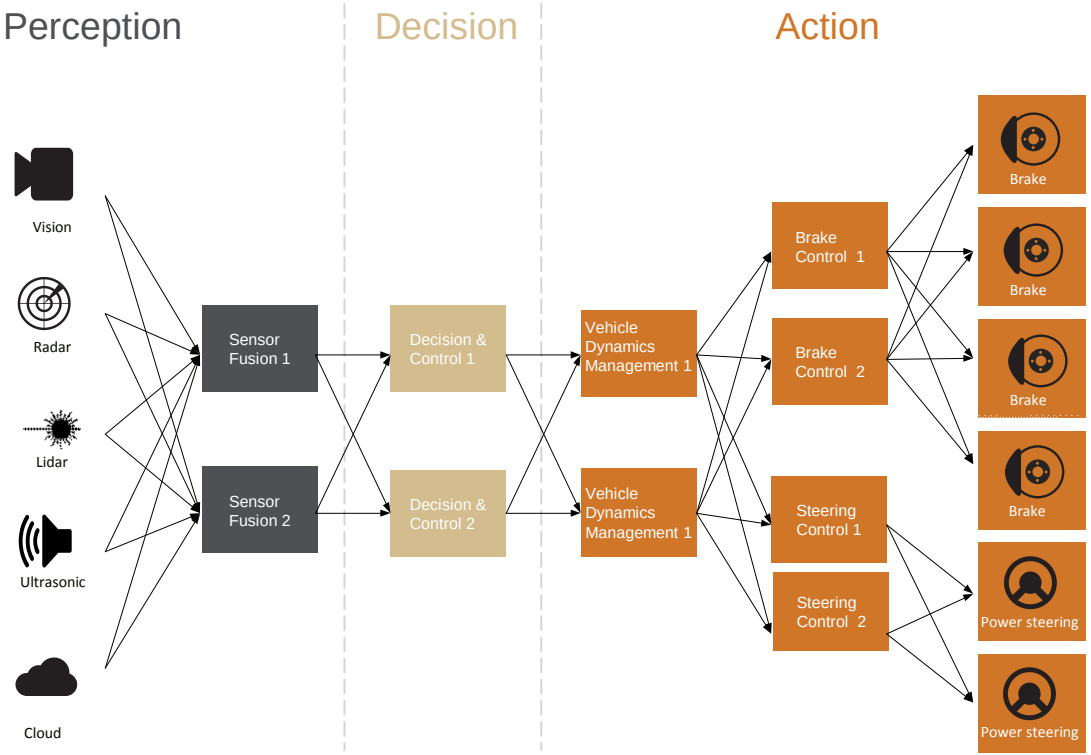
8) Determine if new risks emerge

9) Virtual CAE verification v2



10) Sum all safety evidence

REDUNDANCY


Perception
Decision
Action
Vision
Radar
Lidar
Ultrasonic
Cloud
Sensor Fusion 1
Sensor Fusion 2
Decision & Control 1
Decision & Control 2
Vehicle Dynamics Management 1
Vehicle Dynamics Management 1
Brake Control 1
Brake Control 2
Steering Control 1
Steering Control 2
Brake
Brake
Brake
Brake
Power steering
Power steering

THE PILOTS – ALL ABOUT LEARNING

- Traffic environments
- Customer preferences
- Exporting the Nordic model of collaboration

Gothenburg
2013

London
2017

China
2017

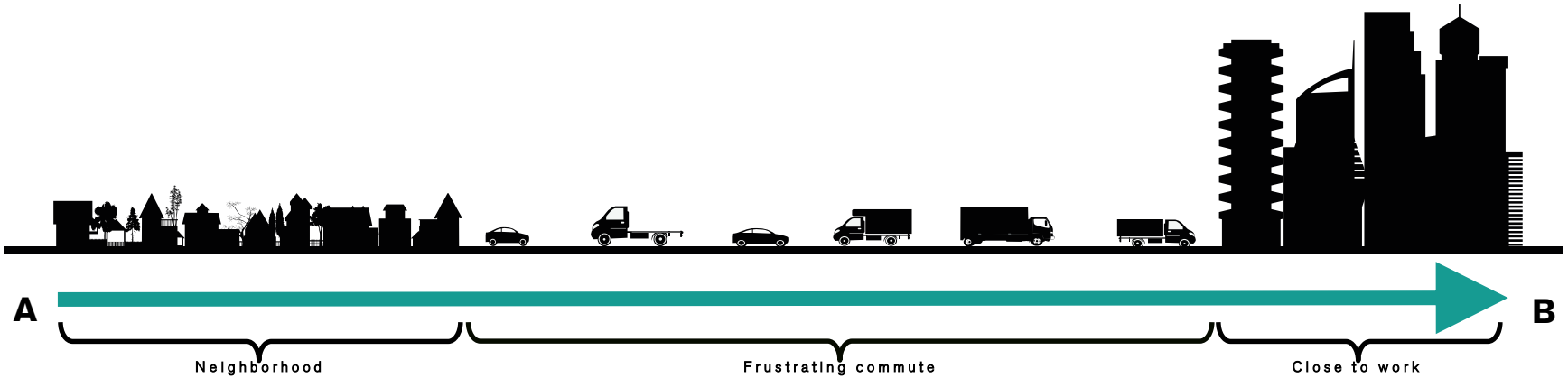
Gothenburg – proof of concept
China and London – verify our technology

PILOT IN GOTHENBURG

- The world's first large scale project for self-driving cars
- Starting in 2017
- 100 customers on real roads (~50 km)
- Verifying our technology
- From supervised to unsupervised

WELL-DEFINED COMMUTE HIGHWAYS

- Customer focus
- Simplification
- Risk Management



Your neighborhood, children,
no lane markings, roundabouts, …

Well defined use case on city highways

Traffic lights, pedestrians, bicyclists,
...

FINALLY – C26 OUR VISION

C26 VIDEO 169536

https://www.media.volvocars.com/global/en-gb

THANK YOU
VOLVO
LDK 258
MXF 117
Drive Me