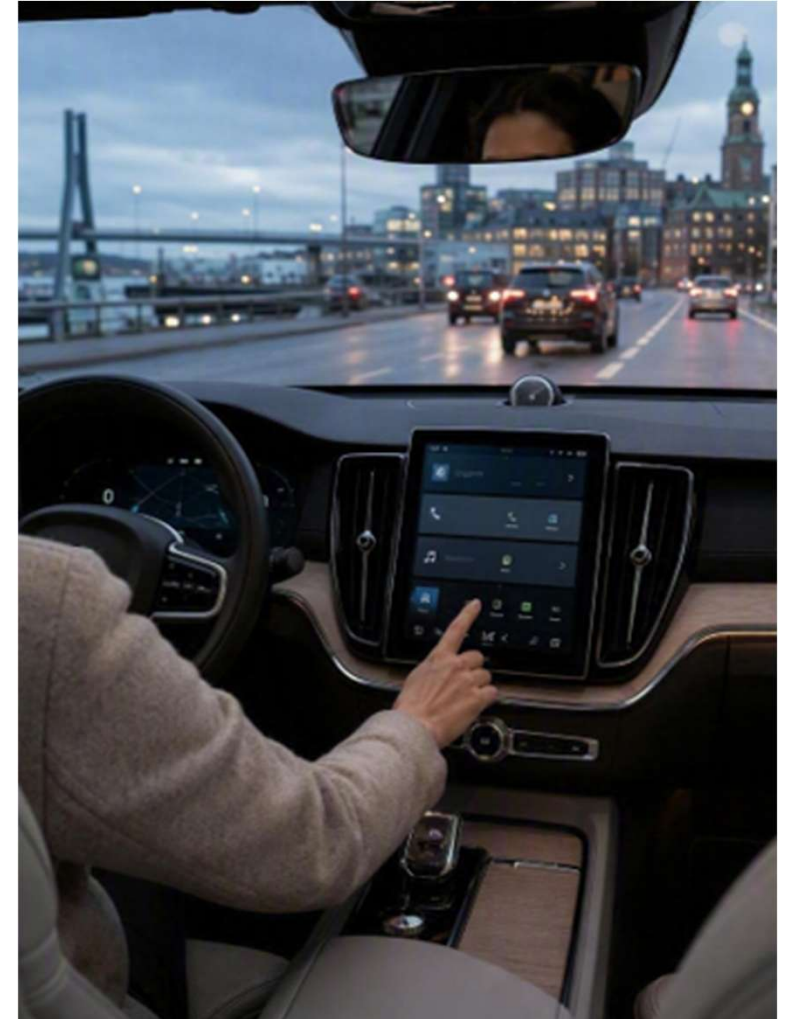


# Driver interaction with central display in real-world driving conditions

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# Scope

## What we examine

How frequently company-car drivers in Sweden physically interact with the central display during everyday driving.

## What we look for

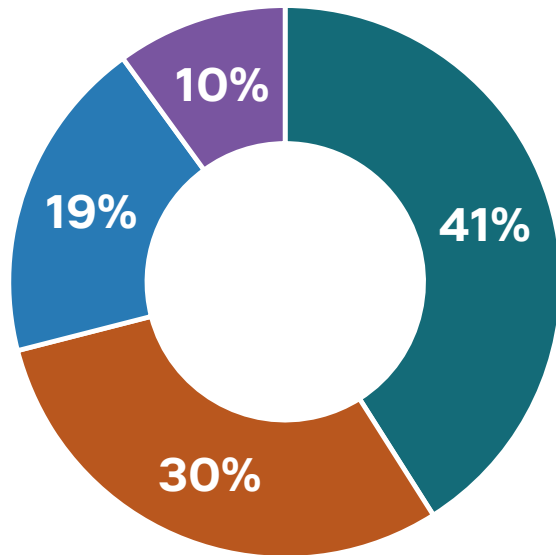
Patterns of central display (CD) use, including phone interactions, mirror adjustments, and overall frequency of use.

# Research questions

- 01** To what extent do drivers initiate phone calls using the vehicle's infotainment system rather than handheld device?
- 02** When and how often do drivers adjust mirrors through the central display and under what driving conditions?
- 03** How do touch interaction patterns and duration vary with driving speed?

# How drivers initiate phone calls

Study period: 21 months (February 23/November 24) Vehicles: 1,281 Trips: 575,000



- **41%** Handheld phone
- **30%** CD call list
- **19%** Mirrored apps on CD
- **10%** Voice control

**Most calls are initiated via infotainment, but 41% still use a handheld phone.**

# Mirror adjustment without physical buttons

Study period: 6 months (February 25/August 25) Vehicles: 169 Trips: 42,436

**43%** of vehicles  
with no mirror  
adjustment

**<1% trips included mirror adjustments**  
1–2 adjustments per trip  
About half within the first 8 minutes

**64%**  
while stationary

**36%**  
while moving  
mostly below 30 km/h

# Central Display usage

Study period: 3 months (April 26/June 26) Signal: touch screen and home button usage

**695**

vehicles

**≈ 24.5k**

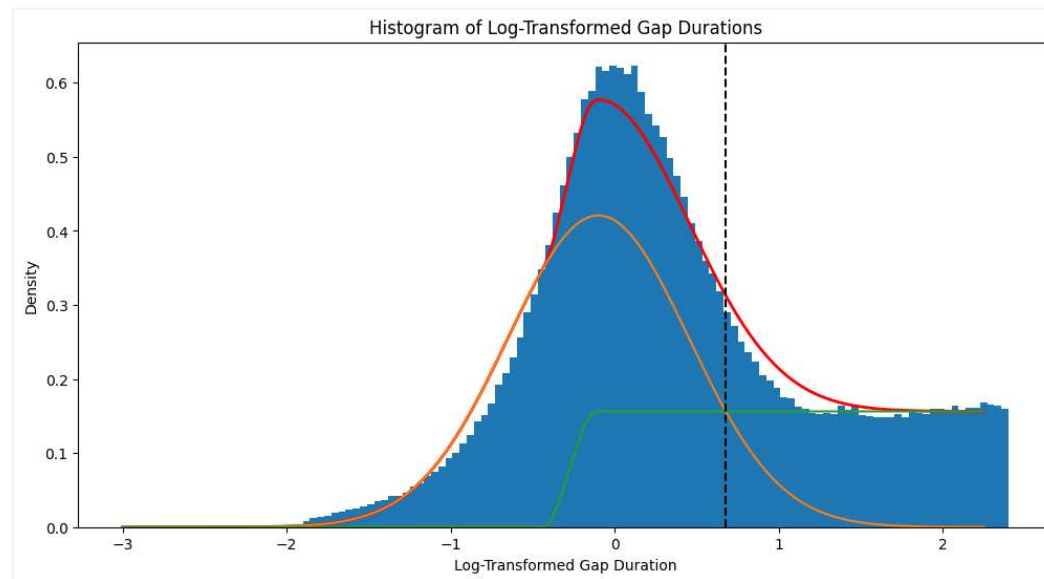
hours of driving

**≈ 1.2M**

km driven

# Defining events

Gaps between presses shorter than 5 s



Distribution of inter-press intervals on a log<sub>10</sub> scale.

The vertical dashed line indicates the estimated breakpoint at  $\log_{10}(t)=0.675$ , corresponding to 4.74 s on the original time scale.

This breakpoint separates short-duration and long-duration gaps.

# Trip level analysis

Including all trips (with and without physical interaction events)

**0,93%**

Time spent in  
events  
of drive time

**0,54%**

Time spent pressing  
of drive time

**0,32**

Presses  
per minute

**19,36**

Presses  
per hour

Drivers spend **under 1%** of driving time physically interacting with the central display.

# Event level analysis

Including only trips with physical interaction events

≈ **216k**

Physical interaction  
events

≈ **475k**

presses recorded

≈ **229 h**

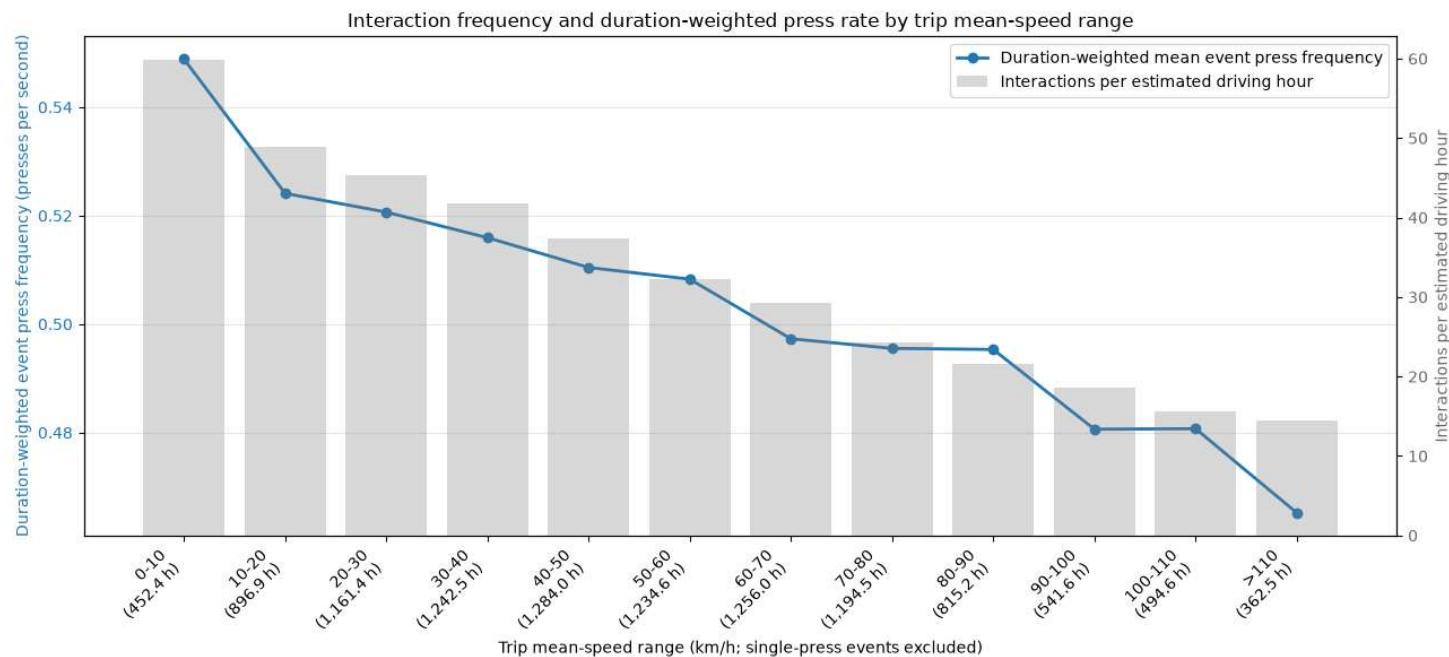
total event duration

≈ **133 h**

spent pressing

Around **two presses** per interaction event on average.

# Touch interactions by driving speed



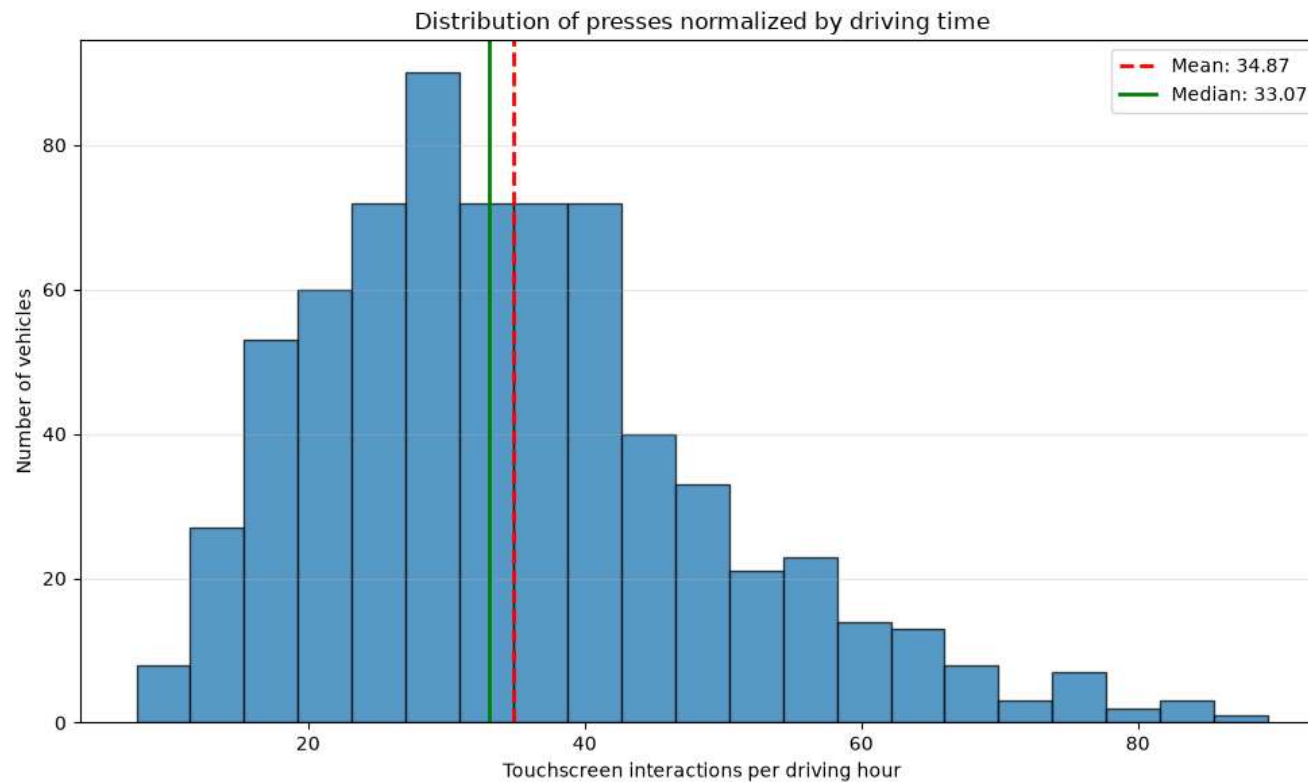
**4 times**

fewer interactions  
per hour on high-  
speed trips

**≈15%**

slower pace within  
events

# Touch interactions across vehicles



In most vehicles

**20-45**

presses per driving hour.

# Summary

**Handheld phones** remain a common method for call initiation.

**Mirror adjustments** without physical controls are rare.

**Interaction frequency** declines at higher speeds, but interaction pace remains similar.

**Display interaction** accounts for less than 1% of driving time.

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# Limitations

Driver demographics could not be accounted for.

Event length depending on adjustment task (uncontrolled).

Initial mirror adjustment behavior may not be captured.

**V O L V O**