

# The Car as an Office: Are Consumers Finally Ready?

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# 1. Apps for In-Car Productivity

"Imagine your car as a mobile office and living space, where you can conduct meetings, write emails, check your calendar, and other work-related tasks, all while you drive..."

For 2 decades this statement has been a prominent marketing sentiment and future vision peddled by automakers and their suppliers. These products and services go beyond the core travel use cases of navigation, communication, and entertainment. These apps would truly allow the car to be an extension of its owner's home and office, allowing them to stay engaged in a task while safely traveling to their next destination.

The "productivity" category of in-car use cases has proven to be quite alluring to automotive stakeholders, and for obvious reason. The benefits of equipping cars with native or projected productivity apps are numerous:

- Meeting car owners where they are, at any time. By allowing car occupants to conduct work on the move, automakers can credibly sell a vision of fully integrating a car into every part of the car owner's life.
- A new data pipeline. Stakeholders could get access to a new treasure trove of real-time
  data about car owners and renters. This is of particular interest to suppliers from the
  consumer/enterprise tech space like Microsoft, who have tried for years to gain a more
  solid foothold in the automotive sector.
- Marketing optics. Subjectively, integrating apps for work into the cockpit allows the
  automaker to iteratively realize its future vision, while also marketing themselves as
  future-facing and friendly to tech companies. Put plainly: It paints automakers in a
  futuristic light to investors and future car buyers.

The challenges of equipping cars with apps designed for work tasks are even more obvious:

- Marginal usefulness in a car. Other than early adopters, tech enthusiasts, and
  premium-class buyers seeking to "tick all the boxes" for their next vehicle, car owners
  have shown questionable readiness/appetite for work-related features. It can be seen
  as designing technology for technology's sake, rather than designing for everyday use.
- Questionable usability in a car. Figuring out how to make calendar, messaging, and other functions practically usable in the car has remained a challenge.
- Regulatory challenges. As European governments take greater interest in the possible
  distractions new tech can present in the cockpit, automakers and suppliers in the
  European market will need to be mindful of introducing any feature that could be
  perceived as encouraging distraction.

# 1.1 Sample Use Cases

Before analyzing the future prospects for in-car productivity apps, we first must explore the use cases these apps might serve. This list of use cases is certainly not exhaustive, but still indicative of the tasks productivity apps and services must enable in a car.

#### Conference calling/virtual meetings

- o Place a call
- Manage call attendees
- Mute or unmute self or other attendees
- Activate or turn off camera for self or attendees

#### Email or direct message (DM) management

- Write emails or DMs, including recipient information and subject lines where appropriate
- o Read received, sent, or draft emails or DMs (aloud or via a screen)

#### Calendar management

- Set meetings
- Change meeting times
- o Change meeting invitees

#### • Real-time personnel management

- Check on staff/colleague availability
  - Check and edit personnel calendar
  - Check current personnel availability (on the clock or active, versus off the clock or inactive)
- Adjust staff schedule

#### Note-taking

 Dictating or writing notes based on an active work item, before during or after a conference call.

#### • Document creation or editing

- Word processor
- Presentation creator/editor
- Spreadsheet editor

#### • Car-specific business management

- Track expenses
- Track mileage

#### • Business management

Signing authorizations

# 1.2 Developed Examples

Several of the use cases described in Section 1.1 have been exhibited in recent years, either as proofs-of-concept at conferences like CES, or via live deployments.

One very notable player in this space is Microsoft, which has positioned itself at the forefront of in-car productivity. Microsoft's endeavors in automotive go beyond cloud-computing partnerships that leverage its Azure capabilities. Microsoft is now using their Office 365 productivity suite, and their Copilot AI agent, to more directly deliver value to car occupants.

- Back in 2016, <u>Microsoft partnered with Harman</u> to integrate portions of its Office 365 suite into Harman infotainment systems, as part of an exhibition for CES 2016.
- In 2024, <u>Samsung/Harman announced another collaboration with Microsoft and Cariad</u> in which car occupants can join a Teams meeting through an in-car calendar, using a web conferencing app built by Harman.
- Microsoft Teams presently integrates with the Android Auto smartphone projection system, allowing car occupants to view upcoming meetings, join meetings, and use speed dial for calls.
- In 2025 <u>Microsoft announced a partnership with Mercedes</u> to arm the MB.OS operating system with Teams and the Copilot AI assistant, starting with the new CLA model.
- Also in 2025, <u>Cerence announced its development of an AI agent specifically designed for work in a car</u>, that integrates with Microsoft 365 Copilot.



Figure 1. Harman's integration of Office 365 for the 2016 CES (source: Harman)

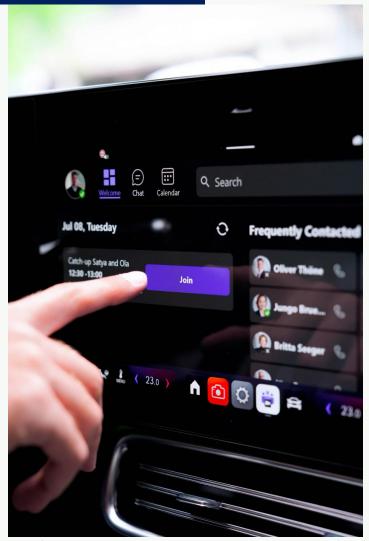


Figure 2. Microsoft Teams integration in MB.OS announced in 2025 (source: Mercedes)

One stakeholder largely missing from this wave of "work-in-the-car" apps is Google/Alphabet. Though Google has arguably the biggest consumer-facing presence in cars with the spread of its Automotive OS and services, and Google Workspace is the standard shared-work ecosystem across many enterprises, Workspace apps currently do not seamlessly connect with Android Auto or Google Built-In.

Other smaller companies have also tried to find their own niche in this space, mostly centered around mileage and expense tracking for gig workers and business owners. It should be noted that these services are primarily delivered via mobile apps on a user's smartphone, not via integrated apps for a car.

- <u>MileIQ</u> developed a tracking app (for individuals or fleets) that allows a business to monitor mileage and expenses for tax reporting purposes.
- Other mileage and expense trackers for wider segments include <u>Stride</u>, <u>Gridwise</u>, and <u>Everlance</u>.

### 1.3 HMI Modalities

The benefits of enabling productivity features in the car have never been in question. The main challenge has always been determining how to deliver that value to a user in a car, using the HMI modalities available to suppliers in a car.

The primary ways car occupants interact with an infotainment system (the most likely path a work-related product is to be delivered in a car) are via voice controls/assistants, and visual/manual controls like touchscreens, knobs, and buttons.

#### • Regarding voice assistants:

- Voice is the primary modality in which text entry and notification triage happens in a moving car.
- Voice control performance in the car has improved markedly in the past 5-10 years.
- Even so, voice has a number of natural challenges as a primary HMI modality, and these challenges would be exacerbated in work contexts.
  - Error correction is extremely difficult.
  - Visual feedback/confirmation is often not provided for voice input or output.

#### • Regarding touchscreens and other manual controls:

- HMI modalities for visual/manual control (e.g. touchscreens, touchpads, buttons, knobs, etc.) are most ideal for tasks requiring rich and nuanced input.
   These tasks might include writing a direct message or email, manipulating a calendar, or editing a to-do list or expense report.
- However, these tasks require long and complex interactions on visual/manual controls. Thus these tasks will not be suitable for a moving car until "Level 4" automation becomes commonplace in privately owned vehicles.
- For "work-in-the-car" use cases, we also must note the roles large language models (LLMs), and cameras/video could play in future implementations.
  - Work and productivity are increasingly common usage categories for popular LLMs, so naturally any "car as an office" concept will need to account for LLM performance.

- Voice would need to be the primary LLM input for the foreseeable future. Even though in-car voice controls have improved over the past decade, input and output performance would need to get even better for reliable LLM usage.
  - Occupant-facing cameras (equipped with facial recognition and/or lipreading technology) could certainly help to address this issue.
- Cockpit and driver-facing cameras could also potentially be leveraged for videocalling.
- The obvious drawback is that if a driver are looking at the camera (or the screen where other meeting attendees' faces can be seen), the driver is then not looking at the road environment.
  - It should also be noted that in video meetings, research has found attendees are often looking at their own video feed, not at other attendees'.

# 2. Analysis and Future Prospects

- From a 10,000-foot viewpoint, bringing apps like Microsoft Teams (or Slack, or even Google Workspace) into a car is a clear example of design and development following human behavior.
  - Cars are a natural extension of the car owner/renter's life. Lots of car occupants already take
    calls in their cars, including work calls. And despite decades of effort to mitigate driver
    distraction, lots of car occupants send and receive written communication in their cars,
    including work texts, emails, or DMs.
  - It should also be noted that not all phone calls and texts require the same amount of cognitive load. Work is sometimes a stressful and intellectually intense activity, therefore phone calling and messaging associated with productivity/work is likely to be associated with greater cognitive load, and higher levels of potential distraction.
- In the far term i.e. once "Level 4" or "Level 5" automated driving systems are achieved in personally owned or rented cars, and a driver does not have to be in the loop attentionally, and a driver does not have to gain situational awareness at very short notice... all use cases described in Section 1.1 of this report will be fair game.
  - o In this context, the car becomes a cross between a mobile device and a living space. As such, any task conducted in the home or on the go, using intelligent home speakers, smartphones,

web cameras, and so forth could be accomplished in a car using a car's integrated speakers, microphones and cameras.

- But in the near term, productivity features that "stick" in cars must be car/travel specific.
  - Mileage trackers, expense trackers, and other apps that do not necessarily require active, ongoing input from a car occupant will be low-hanging fruit for the foreseeable future.
- "Phone copycat" or "laptop copycat" features will only work if/when the driving context becomes similar to the usage context of phones or laptops.
  - In fact, inserting "phone copycat" features without significant guardrails in place (e.g. inmotion lockouts of visual elements including video calls) could be seen as encouraging unsafe behavior.
  - And as Tesla found in a recent court case, the cost of tacitly encouraging unsafe behavior could reach 9 figures.
- One exception to the travel-specificity requirement, and related concerns about distraction, is the use of productivity apps in stationary moments.
  - As we noted in a recent UDS report, messaging and emails are incredibly common tasks undertaken by car owners while sitting in their parked cars.
  - By extension, markets where hired cars equipped with rear seat "offices" are more normal could see greater and faster uptake for in-car productivity apps. China is one notable example.
- Though cars are an extension of the owner/renter's life, that does not necessarily mean that every car owner wants to be able to bring work into the car.
  - On the contrary, many car owners see their cars as their form of escapism. For many, the
    one thing they might like about being in a car is the inability to conduct work for a certain
    amount of time. For those car owners, could the inclusion of a productivity app like
    Microsoft Teams be a detractor toward vehicle purchase?
- Of course, there is one large elephant in the room that could trample any near-term prospects for incar productivity apps: Regulators.
  - European regulators have recently taken a greater interest in features that could present distraction or security breaches in a car. <u>New Euro NCAP testing protocols from 2026 will</u> encourage OEMs to de-emphasize touchscreens for certain in-car tasks.
  - Global automakers should take note and (worst case) monitor ongoing developments, or (best case) take an active role in exploring which in-car productivity use cases are safest to deploy in specific countries/contexts.

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