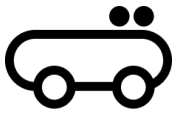
GOCO



GOCO: An Outdoor Companion Mobility System for Autonomous Robotaxis

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ABSTRACT

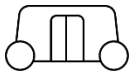
This thesis explores how autonomous mobility can evolve transportation into an intelligent companion that supports the everyday life of families. As autonomous driving technologies remove the need for human control, travel time becomes an opportunity for productivity and social interactions. Through literature review, user research, interviews, and scenario-based design, this study investigates how daily commuting can become a meaningful experience rather than time lost in traffic.

The outcome is GOCO (Go Companion), an AI-powered robotaxi ecosystem that combines an AI-based mobility service with an adjustable interior cabin. By integrating personal and family schedules, real-time urban data, and vehicle intelligence, GOCO proactively plans journeys and coordinates family commutes, acting as a trusted family member throughout the day.

Ultimately, this thesis proposes a new vision of “robotaxi as an outdoor companion in daily life” by integrating AI-based service design, interaction design, and interior design that can enhance the productivity of busy individuals, strengthens family connections, and improves the overall everyday life of a family.

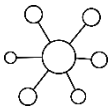
PROJECT INTRODUCTION

GOCO consists of two parts: **the Body and the Brain.**



The Body

Is the physical body of this intelligence: the robotaxi cabin itself. The interior is designed as an adaptive space that translates the AI's decisions into tangible experiences. It supports productive work, family and friends interactions by dynamically adapting the cabin layout according to the needs of each passenger.



The Brain

Is an AI-powered service ecosystem. It connects with users' personal devices, calendars, communication platforms, and mobility data to build an understanding of the family's routines, preferences, personalities, and history. Using this information, the AI proactively plans journeys, coordinates family schedules, optimizes commuting, personalizes interactions, and adapts the mobility experience throughout the day.

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Autonomous Mobility Research
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ABBREVIATIONS

This section provides the abbreviations used throughout the thesis. Since the research discusses autonomous vehicles, human–machine interaction, and intelligent mobility systems, many technical terms and recurring concepts are referred to by their abbreviations. Including this list improves readability, ensures consistency, and allows readers to quickly reference unfamiliar terms.

Non-Driving Related Tasks (NDRTs)
Travel-based activities (TBAs)
Activity-based travel (ABT)
In-vehicle productive travel time(IPTT)
In-Vehicle Activities (IVAs)
Shared Autonomous Vehicles (SAV)
Virtual Assistance (VA)
virtual companionship (VCS)
conversational agent (CA)
Mobility as a Service (MaaS)
value of time (VOT)
Dynamic Driving Task (DDT).
Service-Oriented Architecture (SOA)
ROS 2 (Robot Operating System 2)
GPS (Global Positioning System)
signal-oriented Electronic Control Units (ECUs)

01

INTRODUCTION

This chapter introduces the foundations behind the thesis.
the relationship between everyday life, time, and mobility.

Pick up at 9:00 AM
From: House
To: The office

Taking my girl to school

ART OF EVERYDAY LIFE

The art of everyday life is about finding meaning in ordinary daily routines and finding beauty and intention in the small, repetitive moments of your day instead of waiting for extraordinary moments. Activities such as commuting, working, or shopping become opportunities for presence, connection, and well-being. By being present and surrounding yourself with meaningful objects, everyday moments become more intentional. This perspective reflects de Certeau's *The Practice of Everyday Life*, which argues that everyday routines are meaningful practices through which people shape their lived experience (de Certeau, 1984).

Want to meet friends

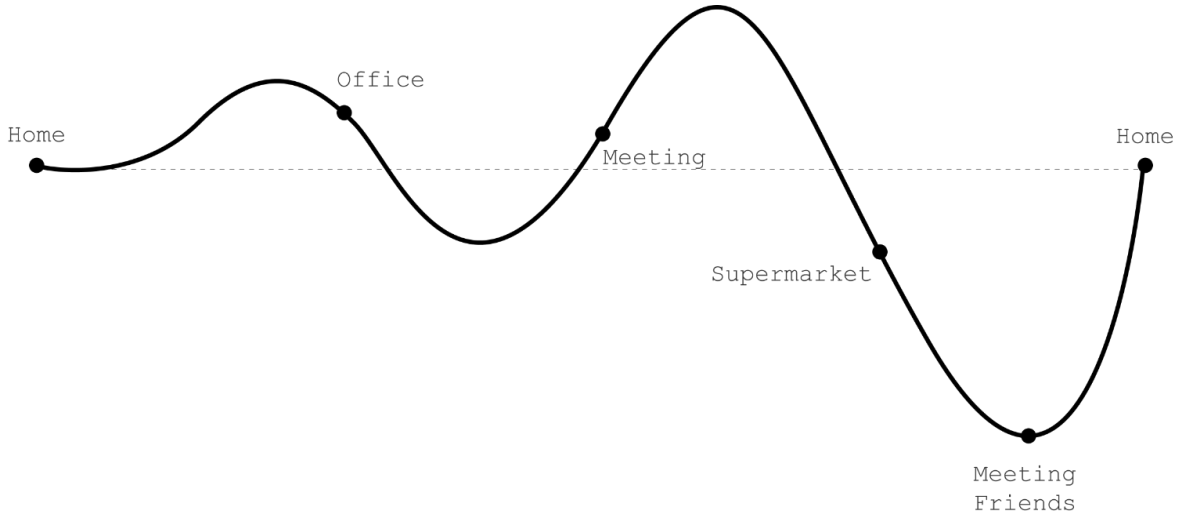
Going to the doctor

Returning home

Harmony of Everyday Mobility

If everyday life is a composition of routines, then mobility is its rhythm that connects them together. Every transition between places is part of the story of our day. We wake up, prepare for work, drop children at school, attend meetings, meet friends, buy groceries, and return home. Each activity is connected by movement. Mobility is the invisible wave that connects them together. Harmony in everyday mobility can be understood as the balance between movement and daily life.

Tim Ingold describes movement as an essential way through which people experience and engage with the world, emphasizing that life is understood through continuous movement rather than isolated destinations (Ingold, 2011). Similarly, John Urry argues that mobility is embedded in everyday social life and shapes how people connect with places, people, and daily activities (Urry, 2007).



The quality of a commute in between, shapes the quality of the day. A stressful morning journey can reduce focus before work even begins. An exhausting evening commute can leave little energy for family, hobbies, or rest. In contrast, a calm and meaningful journey can become a moment to prepare mentally, complete small tasks, connect with loved ones, or simply pause and recharge.

Harmony is created when different elements move together with balance and intention. Everyday life follows the same principle. Work, family, friendships, personal time, and responsibilities each have their own rhythm, and mobility is what allows them to connect. Every journey is more than a commute, it is a transition between roles, emotions, and moments of life. The quality of these transitions determines whether our days feel stressed or harmonious. **When movement flows naturally, everyday life becomes a balanced composition** rather than a sequence of disconnected task.

The Value of Time

Time is the only resource every human being shares equally. Regardless of our background, we all receive the same twenty-four hours each day. Yet what makes time precious is not its quantity, but the experiences of it. We cannot see time, touch it, or store it. We experience it through moments—a conversation with a friend, a walk through the city, a family dinner, or the quiet satisfaction at the end of a day. These moments eventually become memories, reminding us that our lives are measured not by years, but by the quality of the experiences that fill them.

Time is unlike any other resource because it is:

- **Finite** — once a moment passes, it can never be reclaimed.
- **Universal** — every person is given the same twenty-four hours.
- **Experiential** — its value depends on how it is lived, not how it is measured.

These characteristics reflect philosophical and psychological perspectives on time, emphasizing that while time is equally available to everyone, its value is determined by how it is experienced rather than simply measured (Bergson, 1910; Zimbardo & Boyd, 1999).

Commuting, waiting, and transitioning between places are usually treated as empty times between activities. We focus on reaching the destination rather than experiencing the journey itself. Yet these moments quietly shape our daily lives. They influences our mood before work, our energy when returning home, and the quality of the relationships we maintain throughout the day.

The philosopher **Henri Bergson** described this distinction through the idea of **lived time**. While clock time measures hours and minutes, lived time is measured by experience. A joyful hour can feel like a few minutes, while a few minutes of waiting can seem endless. What we remember is not how much time passed, but how that time felt.

If time is the medium through which life is experienced, then mobility should be more than a way of moving people.

As autonomous technologies remove the responsibility of driving, travel time becomes an opportunity. The vehicle evolves into a space where people can work, reflect, connect with family, or simply enjoy a moment of calm before the next part of their day. The future of mobility is therefore not only about reaching destinations faster, but about transforming travel into a meaningful part of everyday life.

Figure 1. Volvo 360 AV concept

Value of Time (VOT) and Willingness to Pay (WTP)

Traditionally, travel time has been considered a cost because drivers are unable to perform other activities while driving. However, autonomous vehicles fundamentally change this concept by allowing occupants to reclaim travel time for other purposes.

Mahamied (2026) explains that autonomous vehicles can transform commuting into an opportunity for working, reading, relaxing, social interaction, or entertainment. As driving responsibilities disappear, travel time is no longer perceived as "lost time" but as productive or enjoyable time. Consequently, the perceived value of time spent inside the vehicle increases, influencing users' willingness to pay (WTP) autonomous mobility.

willingness to pay is influenced by multiple factors including perceived safety, travel convenience, service quality, trust in automation, and expected personal benefits. Users are generally more willing to pay for autonomous mobility when they believe the technology provides significant improvements over conventional transportation, such as reducing stress, increasing comfort, or allowing productive use of travel time. (Mahamied, 2026)

WTP Factor	Evidence from Literature	Key Insight
Productivity & Time Value	Passengers can work, rest, multitask, or enjoy leisure activities during autonomous travel.	Productive use of travel time increases the perceived value of autonomous mobility and willingness to pay (WTP).
Convenience & Utility	Users prioritize convenience, flexibility, and service quality over cost.	Higher perceived usefulness leads to greater acceptance and WTP.
Trust & Safety	Safety perception, system reliability, and transparent communication strongly influence user confidence.	Trust is one of the strongest predictors of adoption and WTP.
Risk & Privacy	Technical uncertainty, cybersecurity concerns, and data privacy issues reduce confidence, especially in shared services.	Perceived risks lower users' willingness to adopt autonomous mobility.
Onboard Digital Services	Intelligent digital services, comfort features, and personalized experiences enhance the travel experience.	Rich onboard services increase perceived utility, comfort, and WTP.
Vehicle Ownership Model	Private autonomous vehicles provide greater privacy and control than shared autonomous vehicles.	Private services generally achieve higher WTP than shared mobility.
User Characteristics	Income, technology awareness, previous AV experience, and demographics influence user preferences.	Acceptance and WTP vary considerably across different user groups.

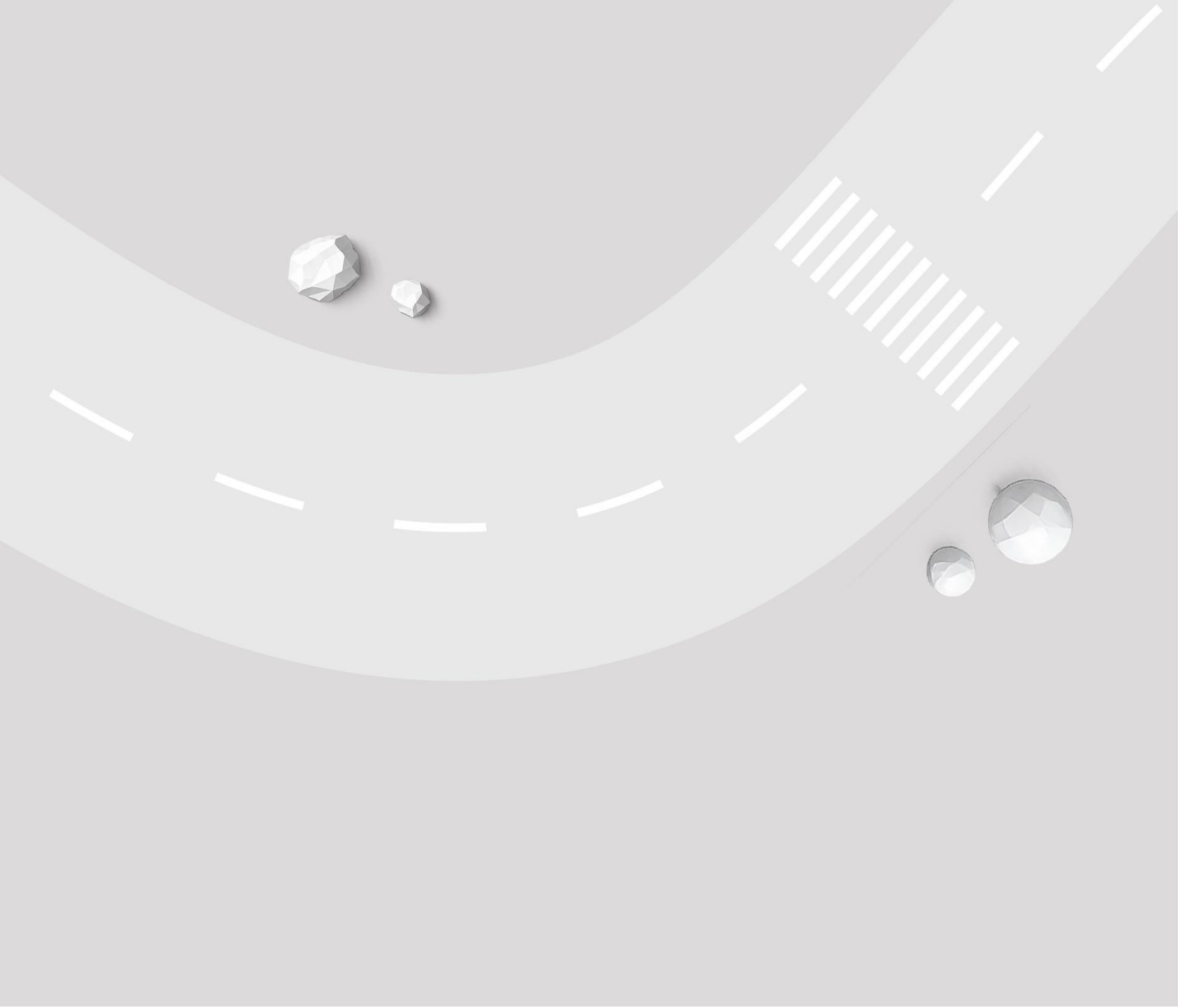
1.Factors affecting willingness to pay for a mobility service Table.

Pick up at 2:30 PM
From: Office
To: Meeting 1

02

LITERATURE REVIEW

This chapter reviews the current knowledge on autonomous mobility, robotaxi, AI, and human-centered design.



Research Integration

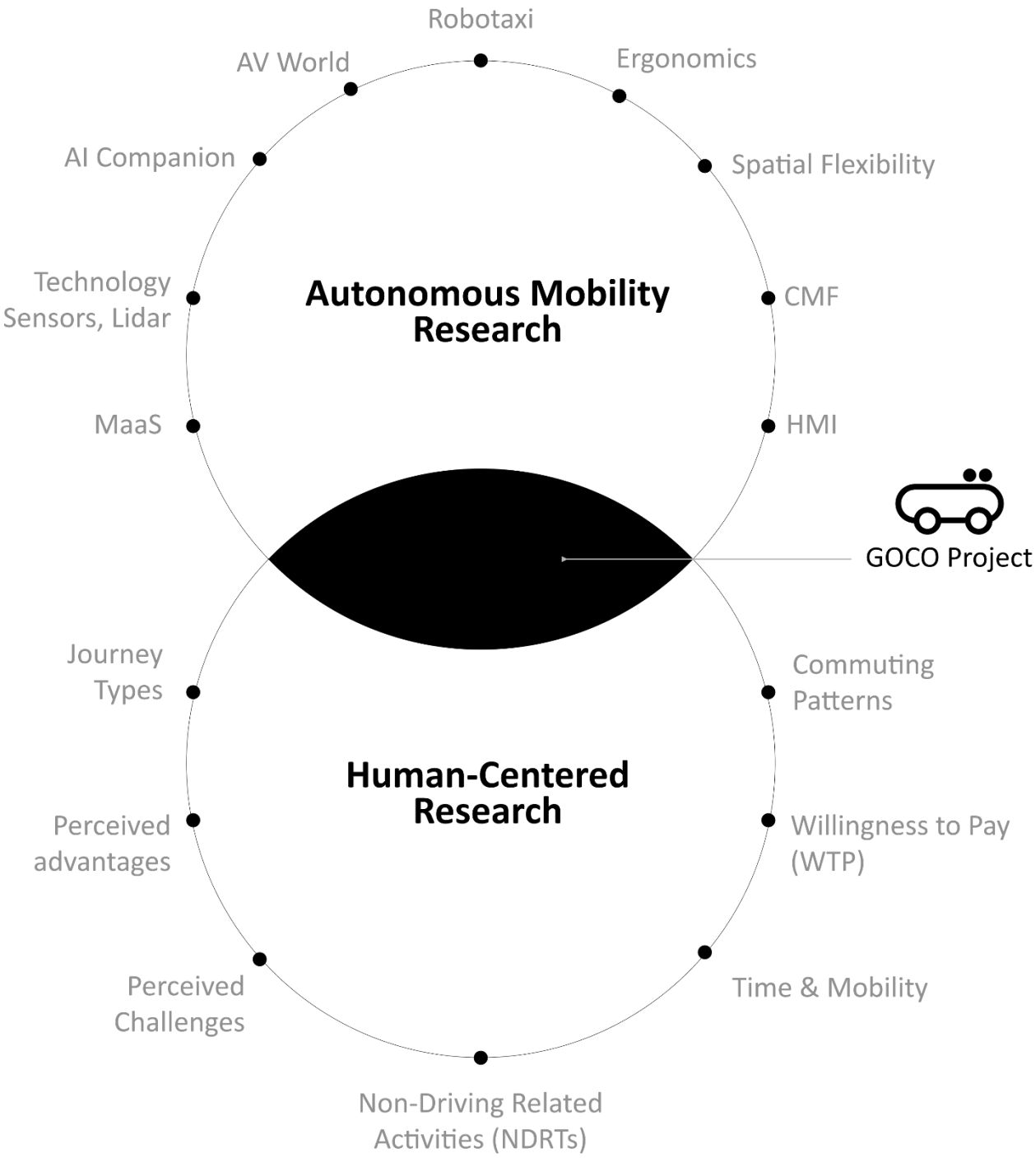
On the path of developing GOCO, I mainly focused my research on two main areas: Autonomous Mobility Research and Human-Centered Research.

The first research area was about understanding the AV world. After studying many autonomous vehicle cases, I entered the robotaxi world and investigated its technological and design aspects. Based on released products and numerous concept vehicles, I gained an understanding of the cabin architecture and the experiences offered inside.

However, after studying these cases, I wanted to take a step backward and explore human intentions and people's relationship with this technology. Therefore, I went deeper into sources that included interviews, surveys, and real-world studies on human behavior toward autonomous vehicles.

The second research area therefore focuses on understanding human behaviors, preferences, and needs during everyday commuting in the city, as well as what people like to do while traveling.

The intersection of these two research streams forms the foundation of the GOCO project.


Robotaxi
Ergonomics
Spatial Flexibility
CMF
HMI
Commuting Patterns
Willingness to Pay (WTP)
Time & Mobility
Non-Driving Related Activities (NDRTs)
Perceived Challenges
Perceived advantages
Journey Types
MaaS
Technology Sensors, Lidar
AI Companion
AV World
Autonomous Mobility Research
Human-Centered Research
GOCO Project

Autonomous Vehicles

Forget the wheel

Autonomous vehicles (AVs) represent one of the most significant transformations in the future of mobility. By integrating artificial intelligence, advanced sensing technologies, high-definition mapping, and connectivity, these vehicles can perceive their environment, make driving decisions, and navigate with partial or no human driving.

Three major application areas that will shape the future of autonomous mobility:

- Personal autonomous vehicles,
- Robotaxis and Rob shuttles,
- Autonomous truck
- Autonomous delivery

	Personal Vehicles	Robotaxis and Roboshuttles	Autonomous Trucks	Autonomous Delivery
Expected Benefits	• Increase road safety by reducing human error • Enhance convenience during travel	• Enhance the flexibility of public transport • Reduce operational costs and improve accessibility	• Address critical driver shortages • Increase efficiency and flexibility with 24/7 uptime	• Improve last-mile delivery efficiency • Reduce delivery costs and delivery times
Ownership	• Privately owned or leased	• Fleet providers own and operate	• Fleet providers own and operate	• Fleet providers own and operate
Technology Level	• From ADAS (L0–L2+) to Automated Driving (L3/L4)	• Autonomy-first system development (L4)	• Autonomy-first system development (L4)	• Autonomy-first system development (L4)
Operating Domain	• Highway, suburban, and urban	• Suburban and urban	• Highway and suburban	• Urban, suburban, and campus environments

Table 2. Comparison of Personal Autonomous Vehicles, Robotaxis, and Autonomous Trucks

1.

Autonomous Personal vehicle
Mercedes-Benz VISION AVTR
-Level 4 Autonomous Driving, Concept car
CES 2020

Robotaxi
Cruise Origin
Level 4 autonomous driving technology for robotaxi service

Autonomous truck
Aurora Driver
Level 4 autonomous driving system for long-haul freight transportation

Autonomous delivery
Nuro R3
Level 4 autonomous driving
Purpose-built for last-mile delivery

Technologies Behind Autonomous Vehicles

Autonomous vehicles rely on a combination of advanced sensing, artificial intelligence, and communication technologies to perceive their surroundings, make driving decisions, and navigate safely without human intervention. The main technologies include:

- LiDAR: Creates a precise 3D map of the environment by measuring distances with laser beams.
- Cameras: Detect lane markings, traffic signs, traffic lights, pedestrians, and other vehicles.
- Radar: Measures the distance and speed of surrounding objects and performs reliably in poor weather conditions.
- Ultrasonic Sensors: Detect nearby obstacles during low-speed maneuvers such as parking.
- Sensor Fusion: Combines data from multiple sensors to improve accuracy, reliability, and safety.
- Artificial Intelligence (AI): Processes sensor data, recognizes objects, predicts traffic behavior, and makes driving decisions.

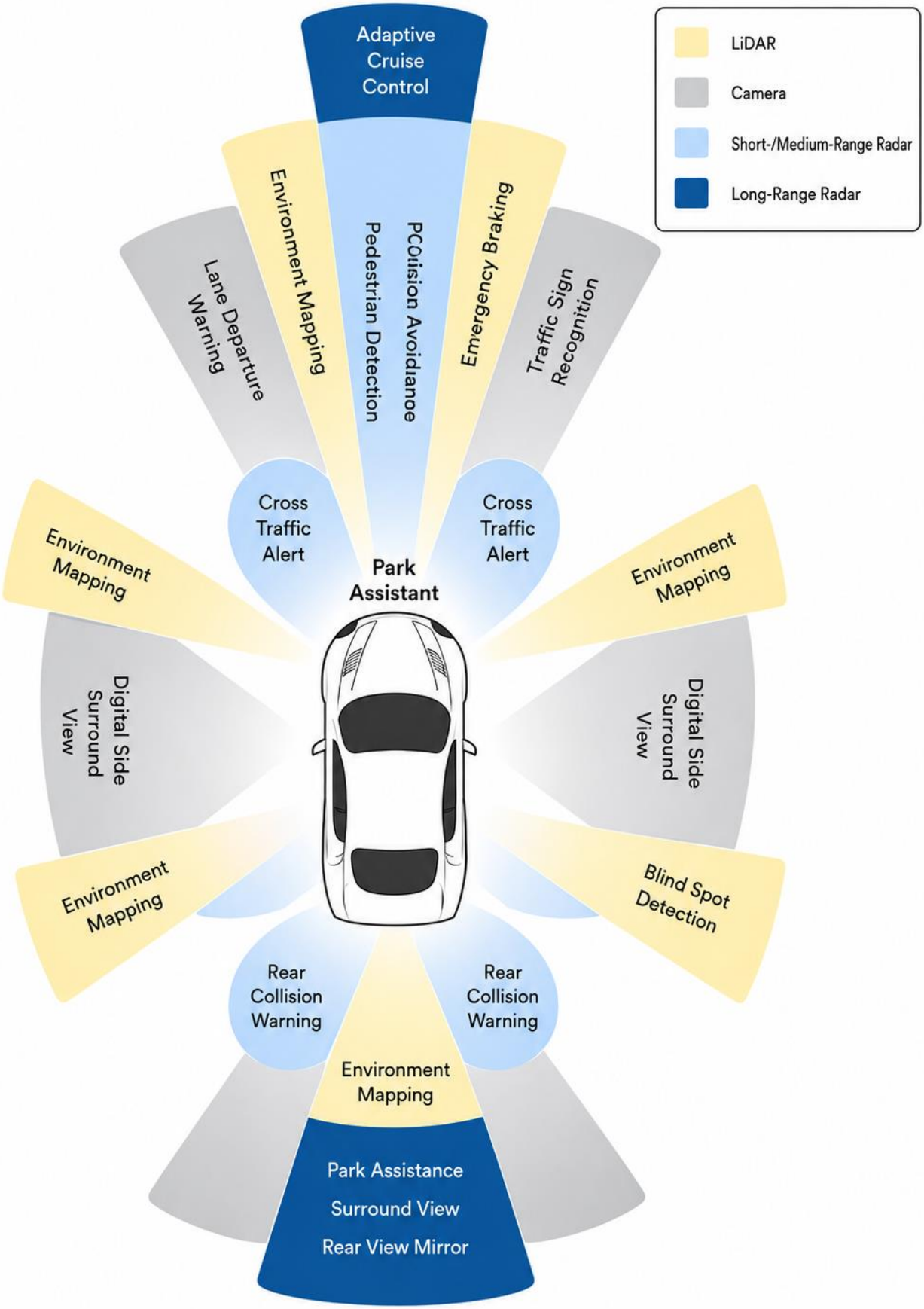


Figure 2. 360° Sensor Coverage of an Autonomous Vehicle

Levels of automation

From assisted to autonomous

In the road mode, six levels of automation are distinguished. They were initially drawn up by the Federal Highway Research Institute (BASt) and have been adopted by SAE International. (Federal Ministry for Digital and Transport, 2025)

Level 0: No driving automation; the driver performs all driving tasks.

Levels 1–2: Driver assistance systems support steering, braking, or acceleration, but the driver remains responsible.

Level 3: The system performs the driving task under certain conditions, but the driver must be ready to take over when requested.

Level 4: The vehicle drives autonomously within a defined operational area without requiring driver intervention.

Level 5: Full driving automation in all road and environmental conditions where a human driver could operate.

Figure 3. Audi grandsphere concept with, Level 3 automation, Extendable Steering wheel

Driving mode	Assisted	Automated	Autonomous
SAE level	1 and 2	3	4 and 5
User-vehicle interaction	Driver	Driver / System	System
	– The driver must monitor the system and environment continuously. – The driver must take corrective action. – The driver is responsible. – The system helps the driver complete the driving task.	– Complete transfer of control to the system on activation. – The driver can perform other tasks. – If requested by the system or in the event of obvious anomalies, the driver must take control.	– After activation and, where applicable, within a defined operational area, the system performs the driving task. – The operator can deactivate the system. – In certain SAE Level 4 and 5 systems, passengers may have the option of ending autonomous driving. – If provided for and possible, a driver can take control.
Examples	Assistance systems such as: – Adaptive cruise control – Lane keeping assist	Automated control systems such as: – Automated Lane Keeping System on motorways (ALKS)	Mobility services such as: – Driverless bus/shuttle services – Robotaxis – Autonomous hub-to-hub services

Driver performs the driving task

System performs the driving task

Table 3. Levels of Autonomy

Robotaxi

Future of the public transportation

Robotaxi is a driverless vehicle designed to operate as a taxi service, offering on-demand rides without a human driver (Yang et al., 2023). It would be a part of ride-sharing services and is typically operated by a company rather than an individual. Disruptive technologies, like artificial intelligence, the Internet of Things, navigation systems, and robotics, have significantly evolved robotaxi and trans formed urban mobility (Garikapati & Shetiya, 2024)

As of January 2026, major robotaxi companies worldwide have begun moving from pilot testing into early commercial operations. In the United States, **Waymo(google), Zoox (Amazon), Cruise (GM)** operates fully driverless services in cities such as Phoenix, San Francisco, and Los Angeles. In China, **Baidu Apollo Go**, **Pony.ai,** and **WeRide** run large-scale robotaxi programs across multiple major cities, including Wuhan, Chongqing, Shenzhen, and Guangzhou. In the Middle East, WeRide and **Uber** have operated fully driverless robotaxi services in Abu Dhabi, UAE, since 2024.

"Cruise and Waymo are already offering 24/7 Robo-taxi services in the Bay Area of San Francisco"

	Sharing Structure	
Vehicle Size	Shared-Car	Shared-Ride
Small Vehicles (1–6pax)	Robo-Pod/Taxi/Van	Pooled SAV (Robo-Pod/Taxi/Van)
Mid-Sized Vehicles (7–20pax)	–	Robo-Shuttle/ People-Mover
Large Vehicles (20+pax)	–	Robo-Bus

Table 4. Defining SAV Types

Robotaxis and Roboshuttles have the potential to revolutionize urban mobility. Introducing robotaxis to urban areas may significantly impact citizens' choice of transportation. Modal shifts are likely to go beyond changes in the use of traditional taxi and ride hailing services to also impact public transport and private car use. (World Economic Forum, 2025). fleets of SAVs in urban and suburban areas might substantially reduce conventional and autonomous private car ownership, preventing the above-mentioned disadvantages of PAVs. (PwC, 2024)

Understanding user behavior is therefore essential when designing future autonomous mobility systems. Mahamied (2026) emphasizes that users' willingness to adopt autonomous transportation depends on several interconnected factors, including perceived safety, trust in automation, ease of use, travel convenience, and previous experience with intelligent technologies. Acceptance is influenced not only by the technical performance of autonomous driving systems but also by the quality of interaction between users and the vehicle.

As robotaxis become spaces where passengers spend meaningful travel time, interior design priorities are shifting from traditional driver ergonomics toward passenger comfort, flexibility, and wellbeing. According to Future Market Insights (2026), future robotaxi interiors are expected to incorporate modular seating systems, lounge-inspired layouts, adaptable furniture, integrated digital interfaces, and premium comfort features. These developments reflect a broader transition from vehicles designed for driving toward environments designed for living, working, and social interaction.

The transformation of the vehicle interior is equally important. As robotaxis become spaces where passengers spend meaningful travel time, interior design priorities are shifting from traditional driver ergonomics toward passenger comfort, flexibility, and wellbeing. According to Future Market Insights (2026), future robotaxi interiors are expected to incorporate modular seating systems, lounge-inspired layouts, adaptable furniture, integrated digital interfaces, and premium comfort features. These developments reflect a broader transition from vehicles designed for

driving toward environments designed for living, working, and social interaction.

Flexible seating systems are expected to become one of the defining characteristics of autonomous vehicle interiors. Without a fixed driving position, seats can rotate, recline, or be arranged to support different activities depending on user needs. Modular interiors may also accommodate workstations, collaborative meeting spaces, family-oriented seating arrangements, or relaxation modes during longer journeys. Such adaptability enables a single vehicle to support multiple user scenarios while maximizing passenger comfort and spatial efficiency (Future Market Insights, 2026).

Personalization is another emerging direction for autonomous mobility. Rather than offering identical experiences to every passenger, future robotaxis are expected to adapt cabin settings, entertainment options, climate control, lighting, and digital interfaces according to individual preferences and travel contexts. Artificial intelligence can support proactive recommendations, schedule management, contextual information, and personalized assistance before and during the journey. These capabilities contribute to a more meaningful and comfortable passenger experience while strengthening long-term user engagement (Deng & He, 2026).

Figure 4. ZOOX Bidirectional and face-to-face interior in robotaxi

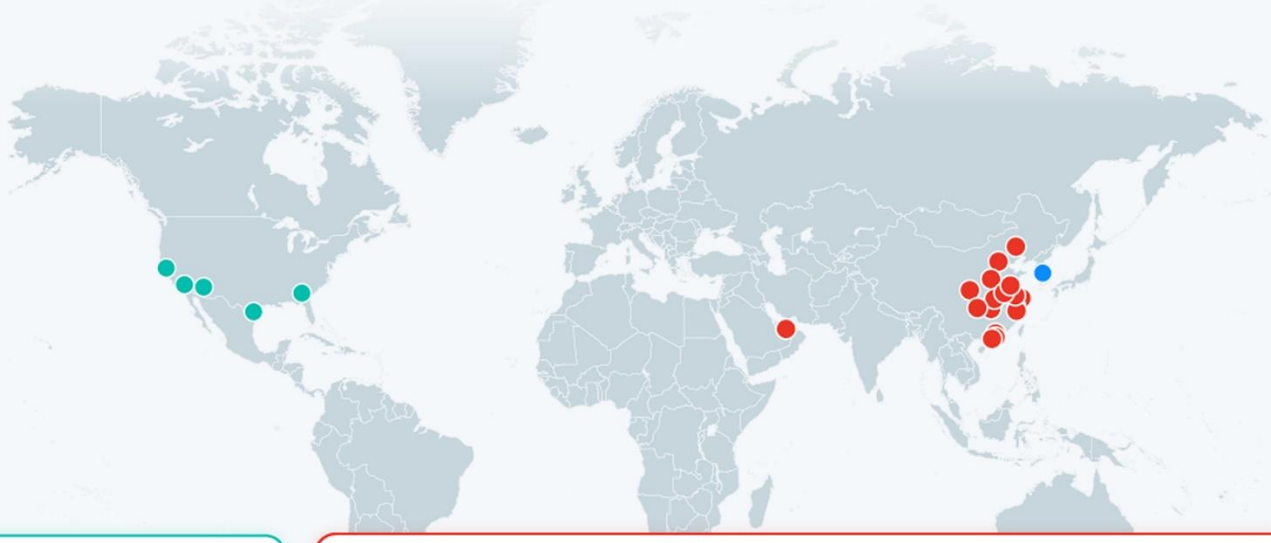
The evolution of robotaxi design reflects a fundamental shift in vehicle architecture. Early autonomous taxis, such as Apollo, Waymo, and Tesla Robotaxi, are still based on normal cars architecture. Although equipped with autonomous driving technology, they retain the traditional vehicle layout with a driver's cockpit, front-facing seats, and a cabin originally designed for human driving.

The next generation of purpose-built robotaxis, including Cruise Origin, Zoox, and Waymo's latest concepts, moves beyond usual car architecture. Since there is no need for a steering wheel or driver's cockpit, the cabin can be completely reconfigured around passengers rather than the driver. This enables **bidirectional layouts, face-to-face seating, flat floors, easier entry and exit, and flexible modular interiors**.
The vehicle evolves from a transportation device into a shared living and working space, supporting social interaction, collaboration, relaxation, and a wider range of non-driving activities during the journey.

	Exterior	Interior
APOLLO		
WAYMO		
TESLA		
GM CRUISE		
ZOOX		
WAYMO		

Where Can You Order a Robotaxi?

Cities where the following selection of self-driving taxis are operational/being tested by passengers



WAYMO
Phoenix, San Francisco, Los Angeles, Austin (TX), Atlanta

TESLA
Austin (TX)

SWM MOBILITY
Seoul

apollo
Beijing, Shanghai, Guangzhou, Shenzhen, Chongqing, Changsha, Wuhan, Hefei, Yangquan, Wuzhen, Chengdu

autoX
Shanghai, Shenzhen, Hangzhou, Guangzhou

DEEPROUTE.AI
Shenzhen, Wuhan, Hangzhou

pony.ai
Guangzhou, Shanghai, Beijing, Shenzhen

SAIC
Shanghai, Suzhou, Shenzhen

QCRAFT
Suzhou

WeRide*
Beijing, Nanjing, Guangzhou, Abu Dhabi, Suzhou, Zhengzhou, Zhuhai

DiDi
Shanghai, Guangzhou

Source: Statista

- In Chinese cities, it is already somewhat more normal to be able to board a robotaxi as several operators are vying for dominance and have expanded fleets. Apollo Go by Chinese tech company Baidu, one of the larger operators, currently has as many as 1,000 robotaxis on the road in Chinese cities like Beijing, Shanghai, Guangzhou, Shenzhen, Wuhan and several more.

Perceived Advantages & Challenges of Robotaxis

A recent user-centered study by Yue Deng and Changyang He (2026) investigated passengers' real-world experiences with robotaxis through 18 semi-structured interviews and autoethnographic ride experiences using Apollo Go in China.

Table 3 and 4 summarizes the main perceived advantages and challenges of current robotaxi services identified by Deng and He (2026), together with representative user quotations that illustrate passengers' experiences.

Advantage	Key Findings	Representative User Quote
Sense of Agency	Personalized control of the cabin environment.	*"I can ask it to turn the volume down... I can say I want the temperature lowered."*
Privacy & Freedom	Greater privacy and personal ownership of the space.	*"With Apollo Go, it feels like this is the car I ordered, and I can say whatever I want inside."*
Reduced Social Interaction	No unwanted conversations with drivers.	*"I can do whatever I want without interacting with anyone, which makes me feel much freer."*
Behavioral Consistency	Predictable, rule-following driving behavior.	*"Robotaxi will follow the rules very strictly. It feels more rational because it doesn't show emotions."*
Standardized Experience	Consistent cleanliness and ride quality.	*"The riding experience in robotaxi is much more standardized and regulated."*
Transparency	Clear pricing and navigation information.	*"Robotaxis won't deliberately take detours."*

Table 4. Perceived Advantages

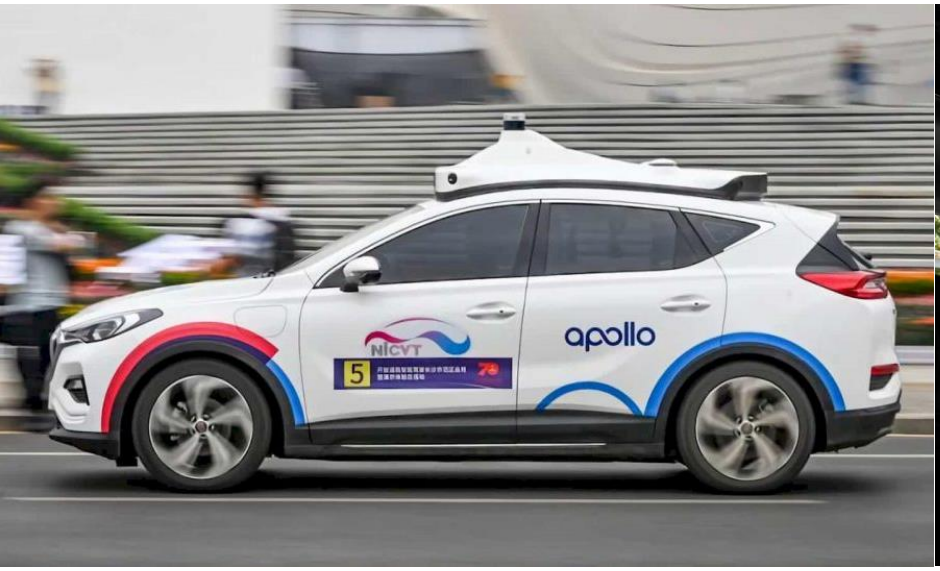


Figure 5. Baidu's robotaxi platform Apollo Go

Challenge	Key Findings	Representative User Quote
Limited Flexibility	Conservative driving and limited adaptability.	*"It keeps letting others go... If you're in a hurry, you definitely wouldn't choose it."*
Fixed Pick-up Points	Inconvenient boarding locations.	*"You have to walk ten or twenty minutes to that fixed point."*
Limited Service	No assistance with luggage or special requests.	*"A driver can help you lift the luggage... Apollo Go can't do that."*
Trip Customization	No route, stop, or driving mode options.	*"I'd like options... drive faster if I'm in a hurry, or more smoothly for elderly passengers."*
Limited Transparency	Insufficient vehicle and system information.	*"I don't know its health condition... none of that is shown."*
Management Issues	Cleanliness and lost-item management.	*"We encountered robotaxis with leftover trash and unpleasant odors."*

Table 6. Perceived challenges

Users Embracing SAVs

Exploring Early Adopter Groups

SAV is an umbrella term for shared autonomous vehicles, like robot taxis provided by a service behind (Mobility as a Service or MaaS).
By analyzing socio-demographic characteristics, travel behavior, and attitudes toward technology, the authors determine which groups are expected to drive the early adoption of shared autonomous mobility (PwC,2024).

- **Young Free Adventurers:** Young, well-educated individuals who are open to new technologies, frequently use public transportation, and value flexible, sustainable, and innovative mobility solutions.

- **Urban Professionals:** Working adults living mainly in urban areas who are familiar with private vehicle ownership but recognize the benefits of autonomous mobility, including greater convenience, improved safety, and reduced congestion.

- **Modern** Sustainable Families: Medium- to high-income households with children that already use shared mobility services and are interested in reducing transportation costs, improving sustainability, and simplifying family travel through shared autonomous transportation.

- **Young Free Adventurers**
  - open to new technologies
  - Prefer flexible and affordable transport over owning

- **Urban Professionals**
  -Constant commutes in city for work
  -private car ownership but interested in smarter mobility options.

- **Modern Sustainable Families**
  Medium- to high-income coordinating multiple family members

Non-Driving Related Tasks (NDRTs)

Automated vehicles (AVs) improve the travel experience by allowing passengers to engage in **Non-Driving Related Tasks (NDRTs)** instead of focusing on driving. Based on an online survey (n = 1,378) and in-depth interviews (n = 18), **Nordhoff et al. (2022)** found that leisure, relaxation, social interaction, and productive activities are the most preferred NDRTs among potential users of highly automated vehicles. These findings indicate that users expect autonomous vehicles to become more than a means of transportation, providing an environment that supports a wide range of everyday activities. Consequently, future vehicle interiors should be designed to accommodate different travel scenarios and user needs.

Furthermore, the concept of **productive use of travel time** extends beyond work-related tasks. **Dannemiller et al. (2023)** suggest that activities such as relaxing, sleeping, reading, listening to music, or simply looking out of the window can also represent meaningful and valuable uses of travel time. This highlights the importance of designing autonomous vehicle cabins that support both productivity and well-being, enabling passengers to choose activities that best suit their personal preferences and journey context.

Figure 6. With a multi-purpose cabin design, the entire cabin vibe changes.

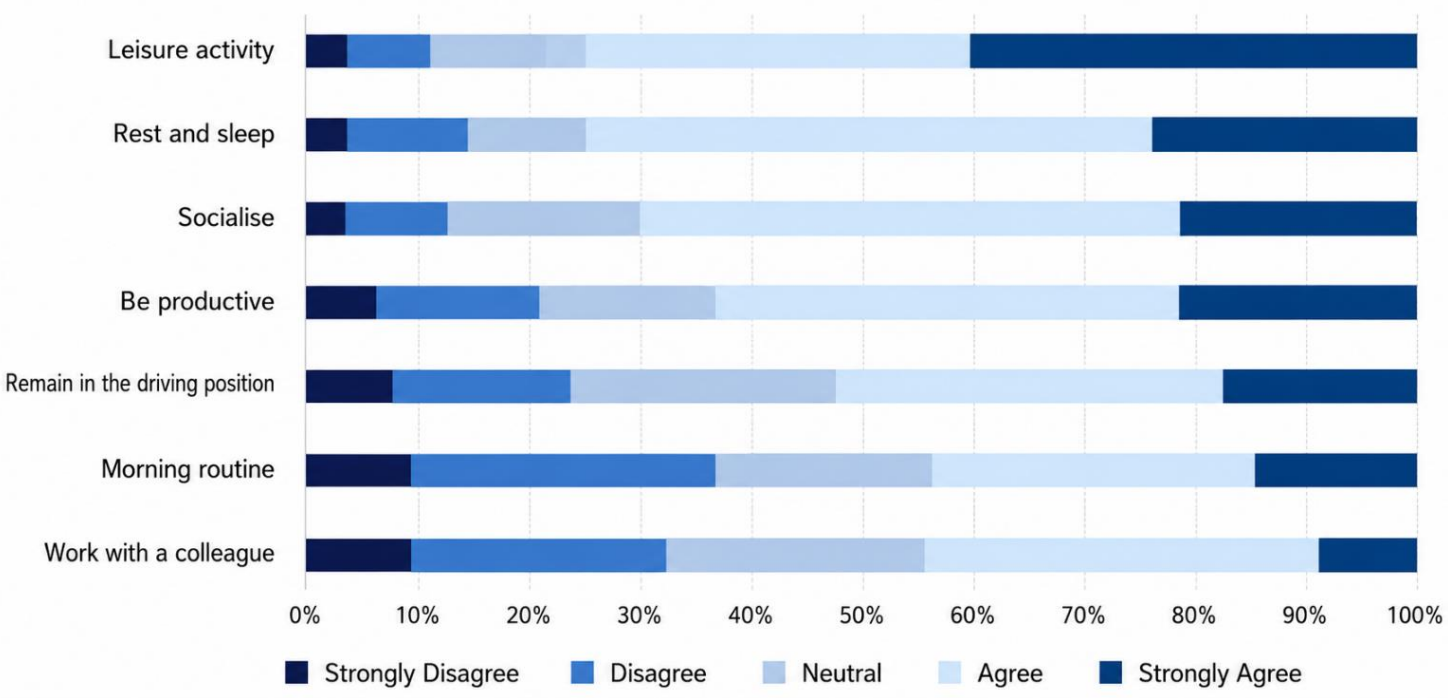
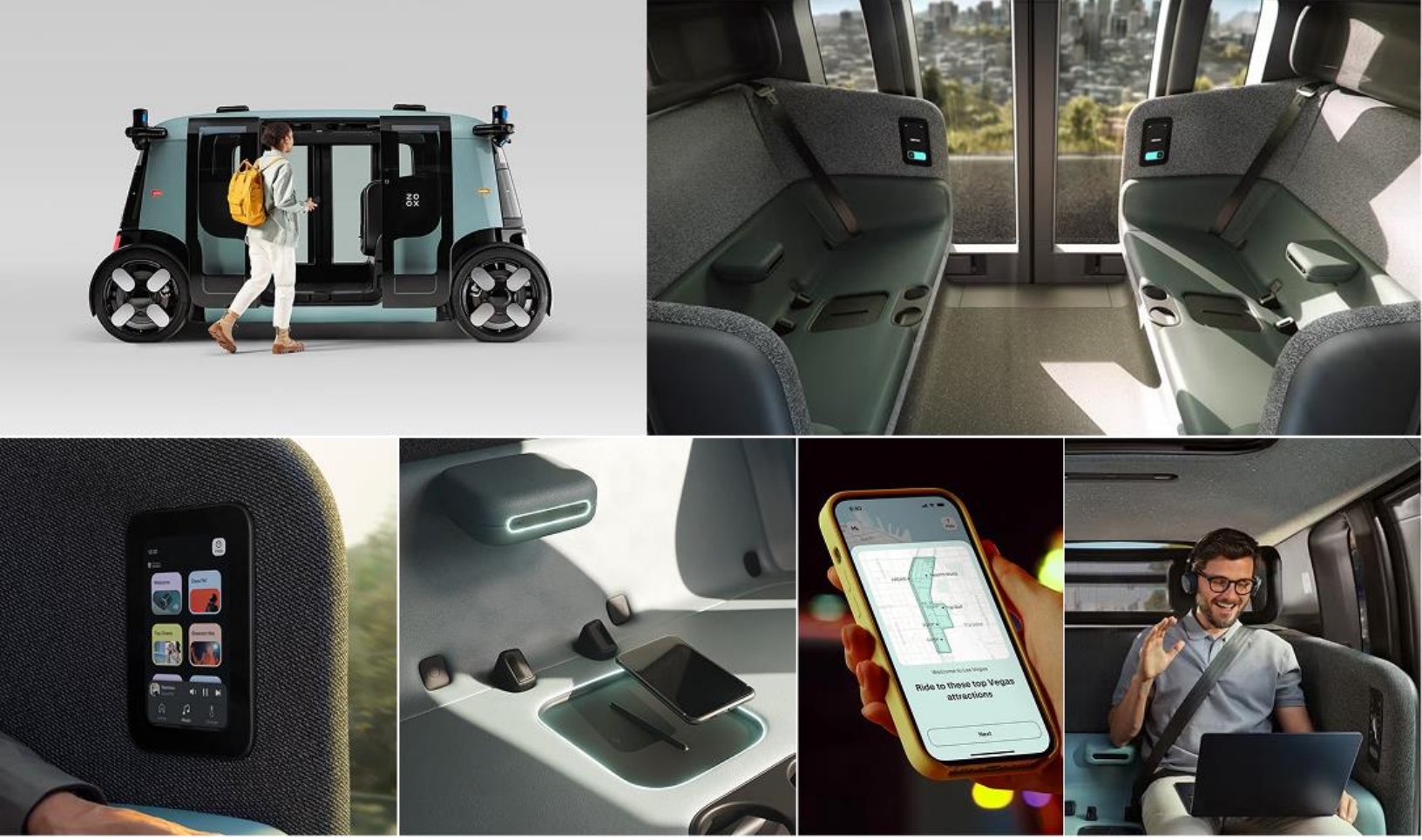


Table 7. Likelihood to Participate in Different Activity Types (n = 566)



ZOOX

Case Study 01

Zoox, an Amazon-owned autonomous mobility company, is developing a purpose-built Level 4 robotaxi designed specifically for shared urban transportation. Unlike retrofitted passenger vehicles, Zoox features a bidirectional design with no steering wheel or pedals, face-to-face seating, sliding doors, and a spacious lounge-like interior that prioritizes passenger comfort and social interaction

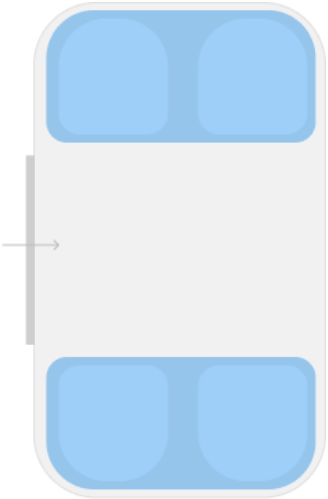


Figure 7. Cabin layout

Production Phase	Available In Las Vegas, San Francisco
Service Model	Shared Autonomous Robotaxi
Seating Capacity	4 Passengers
Seat Configuration	Symmetrical Cabin, Fixed & Face-to-face seating
User Interface	4 Touched Screen
Lighting System	600-Led Celestial Headliner
Control Functions	Audio, temperature, Stopping The Vehicle (Pull-Over Request), Ride Info,
Entry	sliding doors
Dimension	3.63 m × 1.93 m
Dimension Interior	2.5 m × 1.5 m
Safety touchpoints	Recording camera inside cabin, start moving after closing seat belt, Emergency bottom, fail-safe protocols
Technologies	Voice assist, 360° Sensor (lidar, radar, cameras, and ultrasonic sensors)

Table 8. Info Table of ZOOX

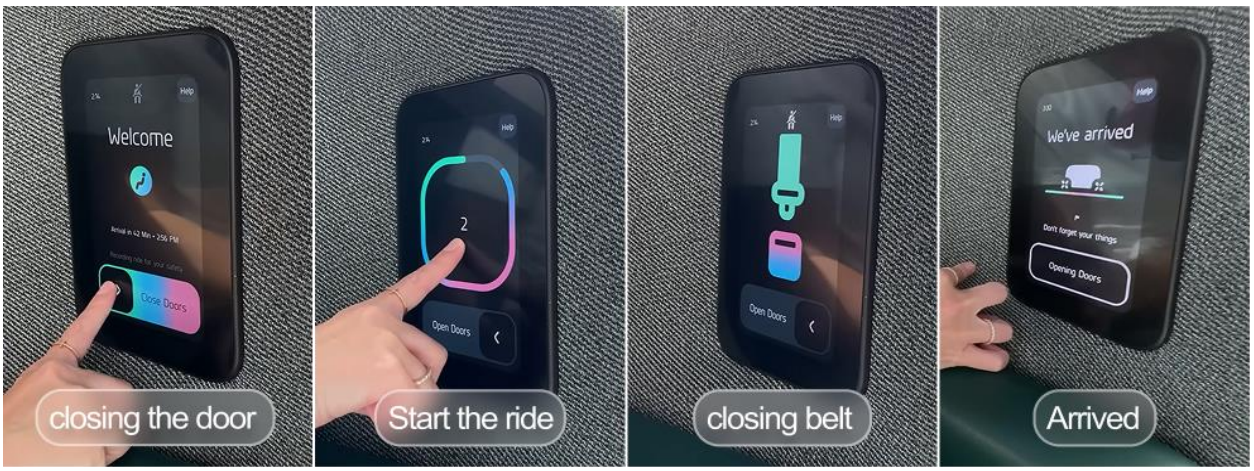
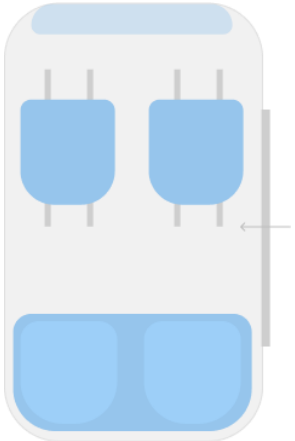


Figure 8.User interface of in ZOOX

WAYMO

Case Study 02

WAYMO Zeeker



Is Level 4 autonomous robotaxi in collaboration with ZEEKR, based on the purpose-built SEA-M (Sustainable Experience Architecture – Mobility) platform. Unlike conventional passenger vehicles adapted for autonomous driving, the Waymo Ojai adopts a passenger-first architecture with a spacious cabin, flat floor, low step-in height, and sliding doors, providing improved accessibility and comfort.

Figure 9. Waymo Zeeker Cabin Layout

Category	Waymo Ojai (Zeekr RT)
Production Phase	Commercial deployment (2026)
Service Model	Shared Autonomous Robotaxi
Seating Capacity	4 Passengers
Seat Configuration	Passenger-first layout, 2+3 seating configuration, flat-floor cabin
User Interface	3 touchscreens
Lighting System	Ambient LED interior lighting
Entry	Dual automatic sliding doors, low-step entry, flat floor
Dimensions	4.87 m × 1.99 m
Interior Features	Spacious cabin, flat floor, USB-C charging ports, cup holders
Technologies	Waymo Driver Gen 6, 13 cameras, 4 LiDARs, 6 radars, AI perception, HD mapping, 360° sensing

Table 9. Info Table of WAYMO Zeeker

Figure 10. features of WAYMO

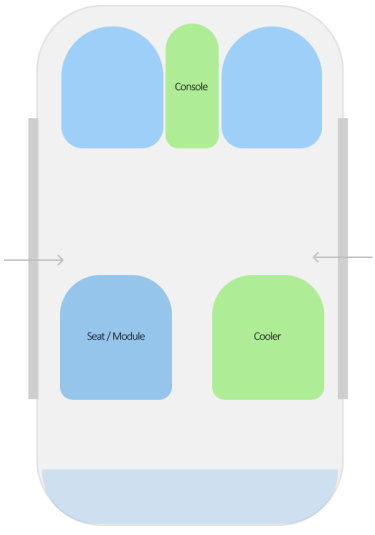


Figure 11. Cabin layout

Case Study 03

Baidu Apollo RT6 is a Level 4 autonomous robotaxi. Its **detachable steering wheel** creates additional interior space, allowing flexible layouts for **2 or 3 passengers**. Baidu envisions the cabin as a multifunctional living space where features such as **desktops, extra seating, gaming consoles, or vending modules** can be integrated depending on the service scenario. The interior also includes practical amenities such as a **drink cooler**, AI-powered voice interaction, and a minimalist digital interface, supporting activities like working, relaxing, or socializing during autonomous travel.

Production Phase	**Commercial operation in China (Apollo Go robotaxi service)**
Service Model	Shared Autonomous Robotaxi
Seating Capacity	2–3 Passengers (configurable)
Seat Configuration	Flexible cabin layout 2 or 3 seats/ detachable steering wheel
User Interface	Central touchscreen and AI voice interaction
Entry	Two automatic sliding doors
Dimension	4.76 m × 1.88 m
Interior Features	Detachable steering wheel, spacious flat-floor cabin, flexible seating layout (2–3 passengers), drink cooler, modular interior concept supporting desktops, extra seating, vending machines, or gaming consoles
Technologies	Level 4 autonomous driving, LiDAR, cameras, millimeter-wave radar, ultrasonic sensors, AI computing platform

Table 10. Info Table of Apollo RT6

Figure 12. Features of Apollo

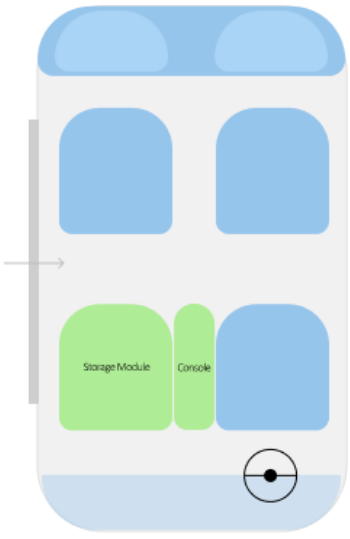


Figure 13. Cabin layout

Case Study 04

The **WeRide GXR** is a purpose-built Level 4 autonomous robotaxi designed for shared urban mobility.it is designed for up to 6 passengers which in some cases the third seat can be changeable to a consule module. The WeRide GXR represents a shift from adapting existing vehicles into robotaxis toward designing vehicles specifically for autonomous mobility. Features such as the hidden B-pillar, spacious cabin, flat floor, and large sliding door prioritize passenger experience, accessibility, and efficient commercial operation, making the vehicle well suited for future urban shared mobility services

Category	WeRide GXR Robotaxi
Production Phase	Commercial operation in China, UAE, and Saudi Arabia
Service Model	Shared Autonomous Robotaxi
Seating Capacity	Up to **5 Passengers**
Seat Configuration	Two captain seats in the second row and rear bench seating; no front passenger seat
User Interface	WeRide Go mobile app, in-cabin touchscreen, emergency stop button
Entry	Hidden B-pillar design with one front-hinged door and one automatic sliding door
Dimension	**5.018 m × 3.10 m wheelbase** (Cabin height: **1.34 m**)
Interior Features	Spacious flat-floor cabin, dedicated luggage area, extra-wide door opening, soft-edge interior, no front passenger seat

Table 11. Info Table of WeRide

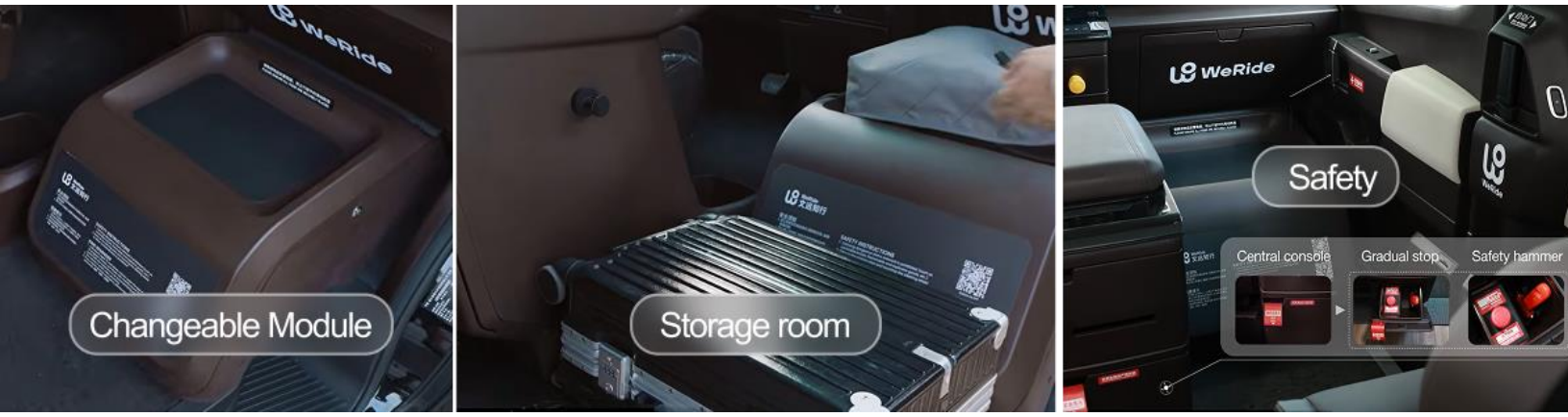
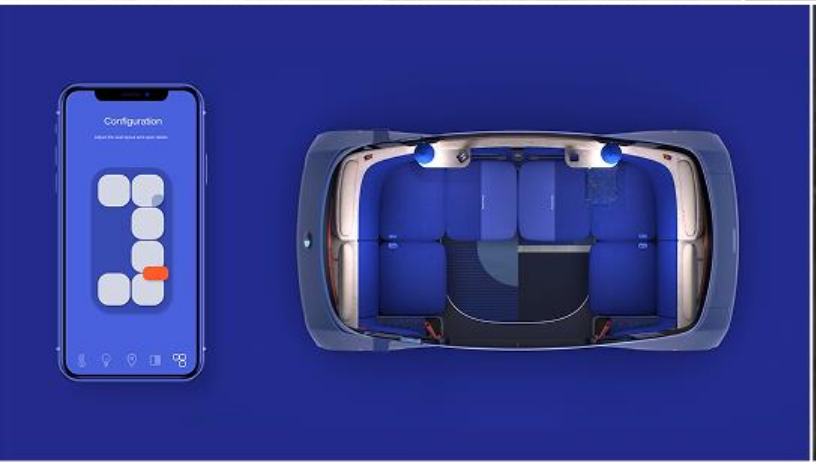


Figure 14. Features of WeRide



PriestmanGoode.

Case Study 05

Priestman Goode-London

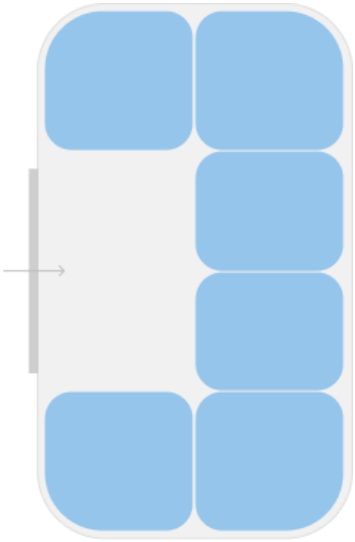


Figure 15. Cabin Layout

Priestman Goode's *New Car for London* is a 2021 concept for a fully autonomous, electric ride-hailing vehicle designed specifically for future urban mobility. Unlike conventional cars adapted for autonomous driving, it was developed from the inside out, prioritizing passenger experience through a spacious modular interior, configurable seating, and app-controlled personalization. The concept emphasizes accessibility, flexibility, and community-focused design, proposing the robotaxi as a comfortable public space that integrates seamlessly into everyday urban life.

Production Phase	Concept Phase
Service Model	Shared Autonomous Robotaxi
Seating Capacity	4 Passengers
Cabin Layout	Modular interior
Seat Configuration	Support different use-cases (wheelchairs, luggage, bicycles)
User Interface	Mobile App, Narrow info bar near window, EHMI
Lighting System	600-Led Celestial Headliner
Control Functions	Audio, lighting, temperature, cabin layout, stopping The Vehicle (Pull-Over Request), ride Info
Entry	sliding doors

Table 12. Info Table of Priestman

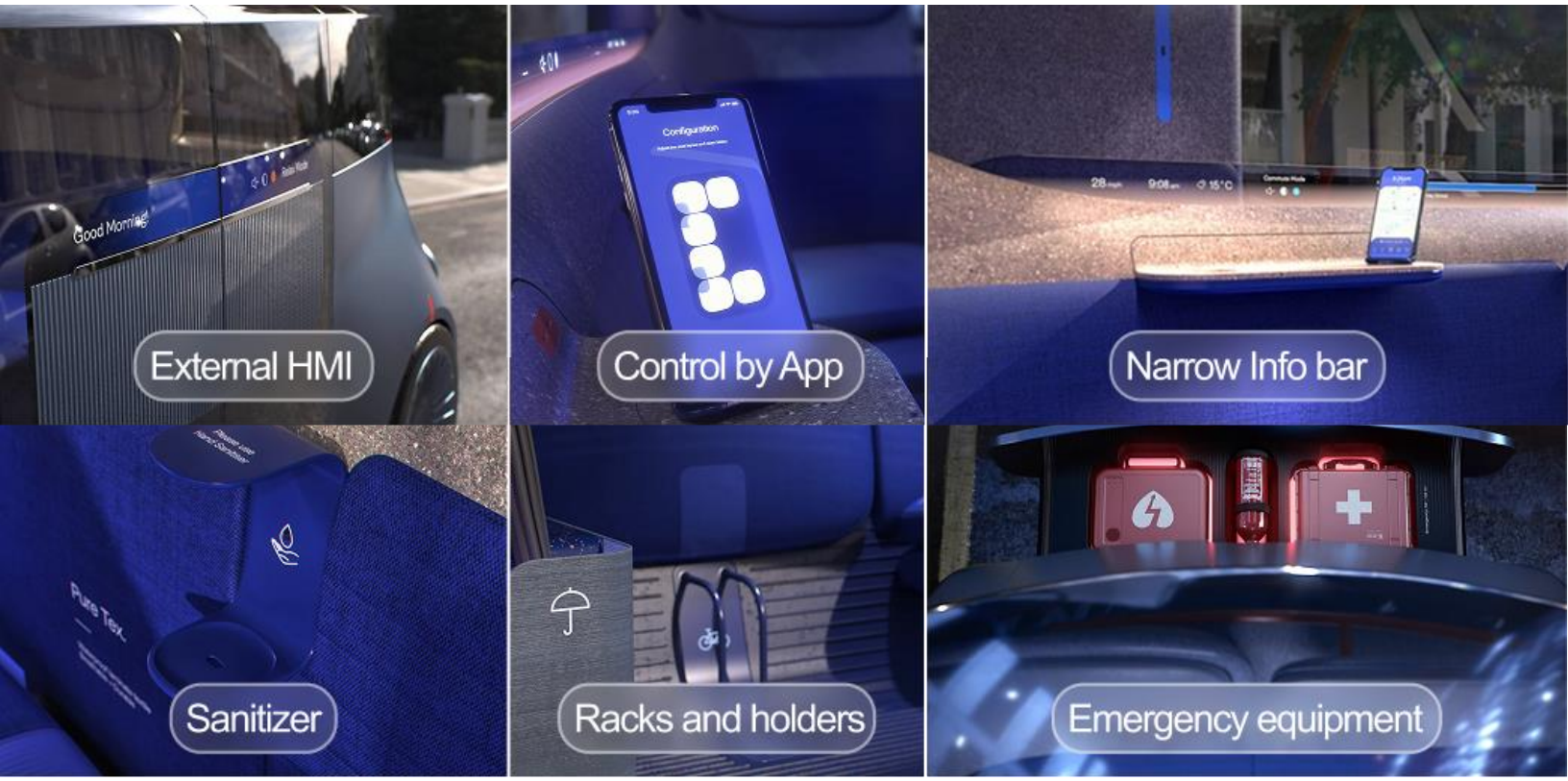


Figure 16. Features of Priestman concept Robotaxi

Cabin Configuration

Autonomous-Ready Lounge Seating Systems for Robotaxis

As robotaxis become common, what kind of seats and cabin layouts will manufacturers need, and how will this market grow? Future Market Insights (2026)

- Purpose-built robotaxis need seats that replace the traditional driver position with a passenger-facing cabin layout.
- Powered rails and swivel systems raise value per vehicle since the seat becomes a moving cabin module.
- Integrated belts and sensing features lift content value as rotated seating creates fresh restraint needs.
- Fleet service models favor durable trim and modular components that reduce downtime during high ride volume.

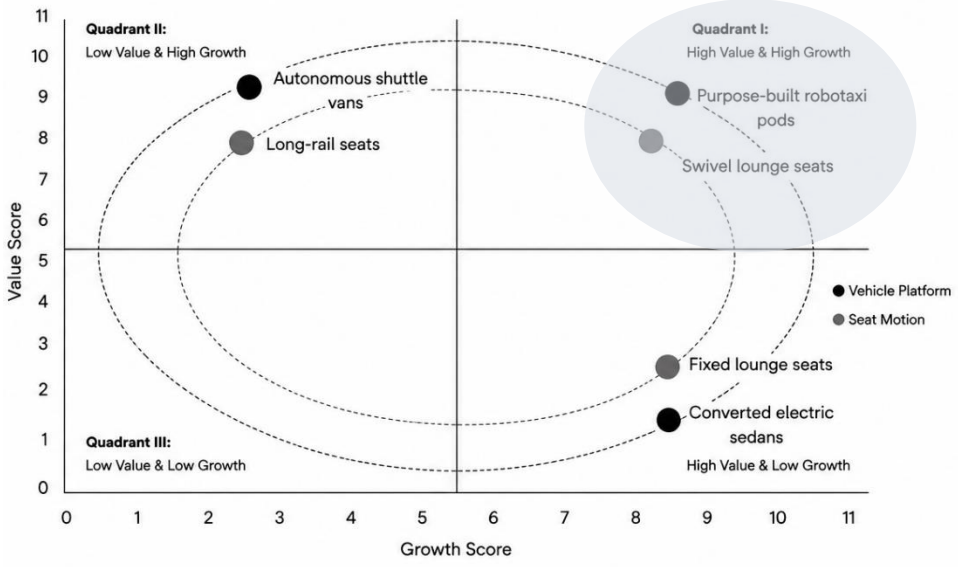


Table 13. Robotaxi Interior Design Trends and Market Opportunities

TOYOTA-MX OASIS

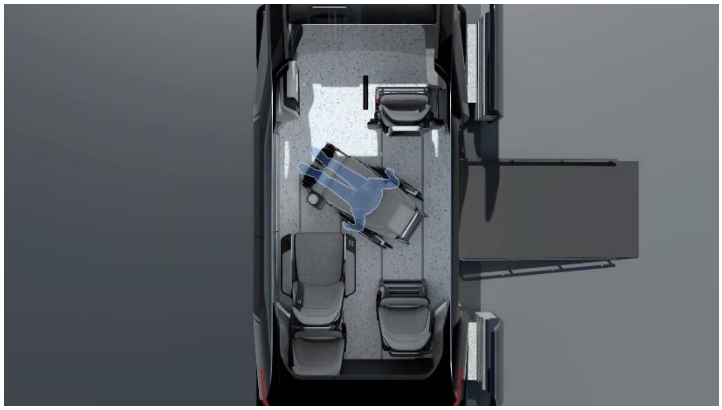
CES 2023

Rail system both on the floor and the back rest make it possible to reconfigure the setting and the purpose of traveling.

MAGNA

2024

Magna's reconfigurable seating system allows the vehicle to adapt to the consumer. The swivel seats with nearly two meters of rails, creates a 270-degree rotation of both the driver and front passenger seats.



TOYOTA-MX221

CES 2022

A modular Level 4 robotaxi concept featuring rail-mounted, reconfigurable seating that can be repositioned or replaced for different use cases. One configuration is designed for wheelchair accessibility

TOYOTA-Maas

CES 2023

Designed for various space application such as business, dining, and entertainment, the interior is equipped with "Tailored Space System" that allows easy configuration through detachable modules and rail system on walls.

HMI

Future Trends in Automotive Personalized HMI Design

Cars are no longer just a simple means of transportation but they are now gradually transforming into mobile living spaces and becoming an important part of the digital economy. The future automotive HMI system will automatically adjust and optimize the interface layout, function settings, and operation logic to better align with user needs through artificial intelligence, machine learning, data analysis, and an increasing trend towards greater intelligence and automation. For example, the systemic capable of automatically adjusting the positions of seats, mirrors, and steering wheel according to the driver's habits and preferences, even before the driver gets into the car to complete these settings. Additionally, it can learn the user's entertainment preferences ,and automatically recommend music and movies that match with the passenger's tastes which can be automatically played at the right time. Furthermore, it can also anticipate the driver's needs and actively provide relevant driving information and advice to avoid the driver's active operation, such as navigation, weather forecasting, and data analysis to reduce driving risks through better human-vehicle cooperation with the assistance system. (Wang, 2023) LG Display's autonomous vehicle concept demonstrates how advanced display technologies can create a more connected and comfortable cabin. The concept features a 34-inch panoramic OLED dashboard display, flexible OLED screens integrated into curved interior surfaces, and a 12.6-inch Transparent OLED placed between two facing seats. This transparent display functions as an interactive control panel for entertainment and cabin settings while preserving the openness of the interior. The concept highlights how transparent interfaces can provide intuitive interaction without creating visual barriers, supporting the idea of future autonomous vehicles as flexible living and working spaces (LG Display, 2023).

Brain-Computer Interfaces (BCIs)

AVTR concept car 2021-Mercedes Benz

Records brain activity and establishes a direct connection to the vehicle

Body Biometric

Hyundai Mobis

biometric interaction, attention-sensing, body posture, body movement, temperature, ECG sensors

VR

Audi Holoride

VR games that adapt to the car's motion to reduce motion sickness and entertain passengers.

AR

Maybach-s class

augmented-reality HUD that displays lane edges, objects in the road, and other information important to drivers.

Interactive Transparent Window

AUO Corporation

Interactive Transparent Window display solution through the smart cockpit platform

EHMI (External)

Zeeker

on the vehicle exterior that communicate with pedestrians and passengers.

AI Core

This diagram illustrates the evolution of AI systems from isolated functional tools into unified intelligent ecosystems integrated into everyday human life. Traditionally, digital systems such as search engines, productivity tools, social platforms, and entertainment applications have existed separately, each serving a single purpose. However, contemporary AI development is gradually converging these functions into one interconnected and adaptive system centered around the user's daily experiences, behaviors, and emotional needs. The framework highlights five interconnected dimensions of future AI ecosystems: information and search, productivity and task support, social interaction, entertainment and experience, and personal fulfillment. At the center of this convergence is the AI core, which enables contextual understanding, adaptive learning, and personalized interaction across different aspects of life. In this paradigm, AI no longer acts only as a tool for executing commands, but evolves into a continuous companion capable of assisting, coordinating, communicating, and emotionally engaging with users.

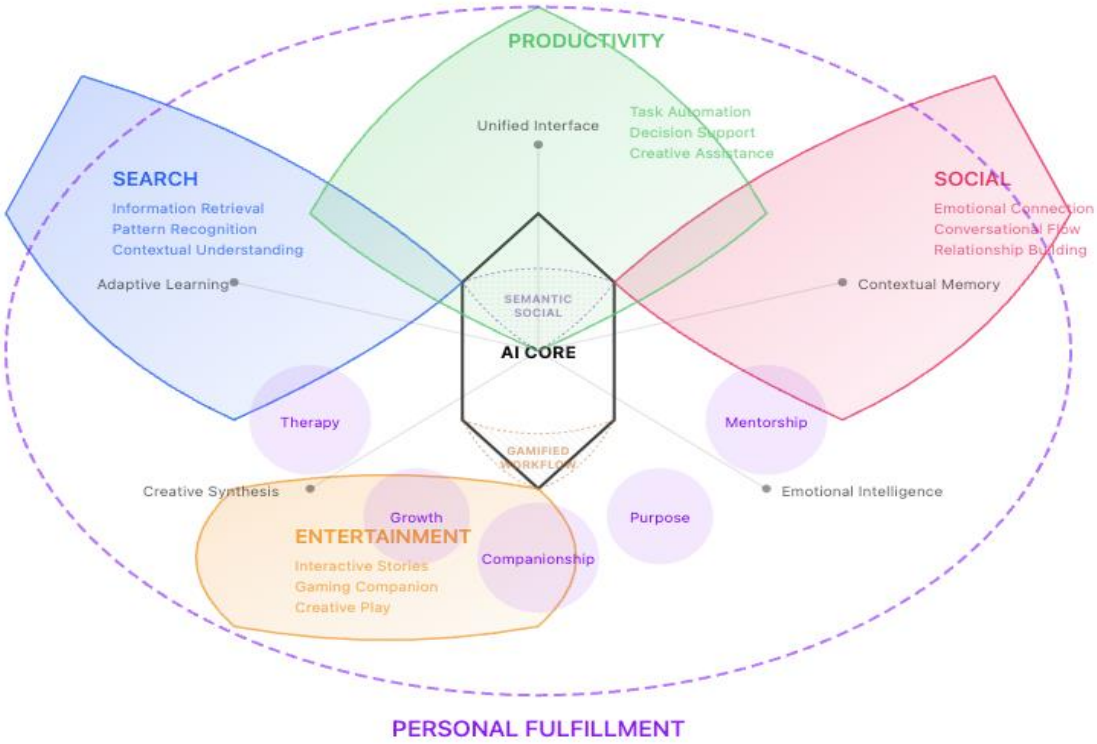


Figure 17. The Expanding Role of AI in Human Activity

AI Companionship

From Assistance to companionship

Research shows that social relationships are important conditions that contribute to psychological well-being (Krämer et al., 2011).Companionship, a special form of friendship, is perceived as an important aspect to strengthen psychological well-being (Rook, 1987).Companionship is described as having someone familiar with whom you like spending time, while a relationship is characterized by an inner and intimate bond, an intense affection, and a high emotional connection (Bukowski et al., 1993, 1994; Mendelson & Aboud, 2012). Therefore, companions differ significantly from assistants, who are not co-equal, do not elicit feelings of closeness, do not form long-term social bonds, and do not behave proactively (Bukowski et al., 1994; Krämer et al.,2011; Seymour et al., 2018). In human-computer interaction, many researchers believe that systems with social and affective behaviors are perceived as more natural and effective when people interact with them (Strohmann et al., 2023).

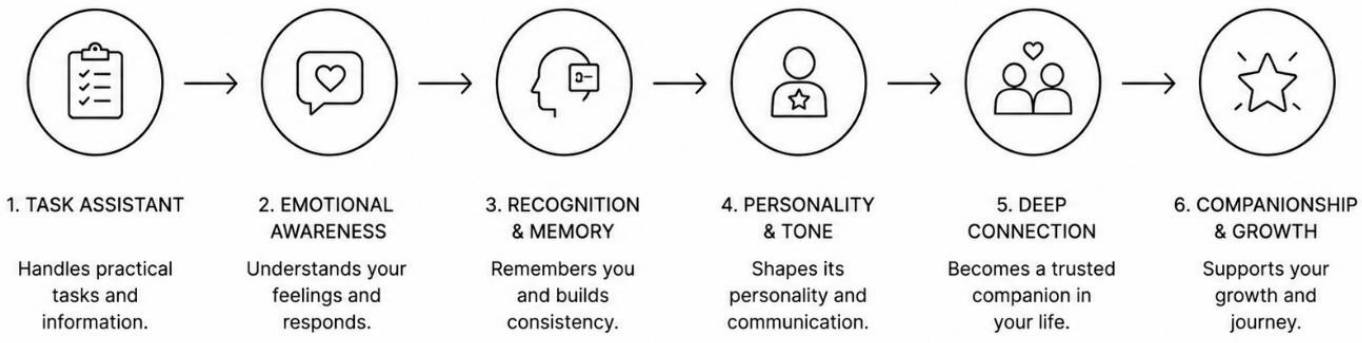


Figure 18. From AI assistant to AI companionship

Indoor companionship

“AI companion” is not a single product category. In current practice it spans at least four families of systems: utility-first voice assistants such as Alexa and Google’s home assistant stack; relational chat companions such as Replika; proactive care companions for ageing in place such as ElliQ; and affection-oriented social robots such as LOVOT. The underlying literature likewise uses overlapping terms rather than one standard definition: conversational-agent research distinguishes text, voice, graphical, and physical embodiments; relational-agent research emphasizes sustained social-emotional relationships; and companion-robot research focuses on social, emotional, and cognitive support in daily life.

For everyday life, voice assistants are the clearest examples of *hybrid* companionship: they do not mainly sell themselves as “friends”, but they increasingly combine utility, continuity, memory, and social presence. Amazon’s Alexa+ now centers on generative-AI conversation, personalized memory, proactive prompts, multi-step tool use, cross-endpoint continuity, and shared-home personalization through features such as Visual ID and personalized reminders. Google’s smart-speaker stack is moving in a similar direction through Gemini for Home, which adds more natural conversation, personal results, Voice Match, conversation across devices, calls, broadcasts, routines, media, lists, calendars, and smart-home control. (Amazon, 2025)

Technically, contemporary companions are converging on a layered architecture: near-device sensing and filtering; speech and multimodal understanding; dialogue orchestration; memory and personalization; tool and API execution; and multimodal response.

The main product differences lie in where the system sits on three important trade-off curves: edge versus cloud, utility versus relational depth, and reactive versus proactive interaction.

Designing for life companionship is fundamentally different from designing a question-answering bot. The goal is not only to answer correctly, but to fit into routines, relationships, and domestic spaces over time. Older-adult co-design work shows that people want companions that are socially appropriate to the situation: active in isolation, quieter in social contexts, able to remember prior interactions, respectful of privacy, supportive of social connection, and capable of empathy without becoming overbearing. Relational-agent research similarly shows that long-term engagement depends on persistence, social-emotional framing, and repeated usefulness rather than single-session novelty. (Author et al., 2024)

In practice, five UX tensions dominate companionship design. The first is proactivity versus intrusiveness: proactive suggestions and check-ins are often central to companionship, but can also feel rude, invasive, or patronizing when mistimed. The second is personalization versus creepiness: memory and context make assistants more helpful, but only if users understand what is remembered and can manage it. The third is warmth versus deception: humanlike voices and emotionally intelligent responses may improve comfort, but they can also obscure the system's actual competence and limits. The fourth is shared-home convenience versus identity confusion: ambient assistants in homes must separate users, permissions, and reminders well enough to avoid mis delivery. The fifth is persistence versus the

right to forget: companionship depends on continuity, but users also need robust deletion, reset, and portability controls.

System	Orientation	Capabilities	Users
Alexa+	Household AI companion	Smart home, reminders, shopping, entertainment	Families
Google Assistant + Gemini	Conversational home assistant	Smart home, media, reminders, calendars	Google ecosystem users

Figure 14. Two main players of indoor companionship

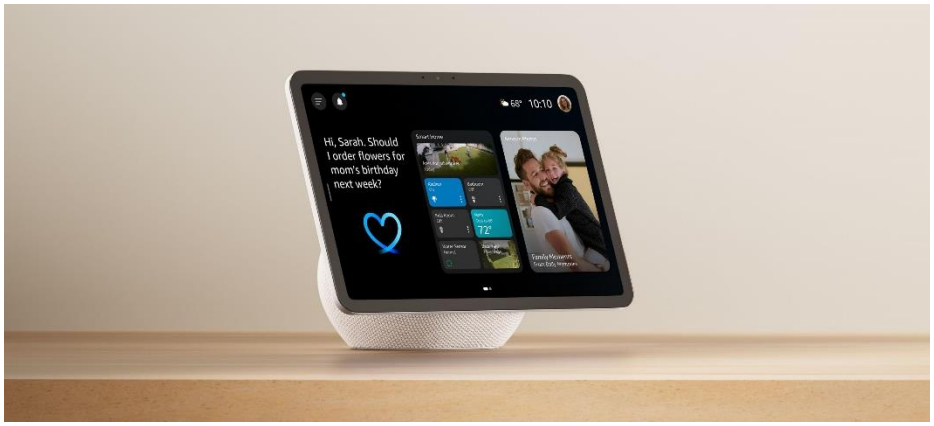


Figure 19. Amazon Alexa+, an AI-powered smart home assistant.

Figure 20. Google Assistant with Gemini for conversational AI and smart-home interaction.

Unlike conventional smart home devices that respond only to commands, social robots are designed to provide continuous assistance, autonomy, and companionship within the home. They can perform household tasks, interact naturally with users, and learn daily routines to offer proactive support. An example of this evolution is the NEO Home Robot, developed by 1X Technologies. NEO combines advanced AI, perception, and robotics to assist with household chores while interacting with users in a natural and human-centered manner. Equipped with multiple microphones, cameras, speakers, and an AI computing platform, the robot is capable of understanding voice commands, navigating indoor environments, manipulating objects, and collaborating with humans.

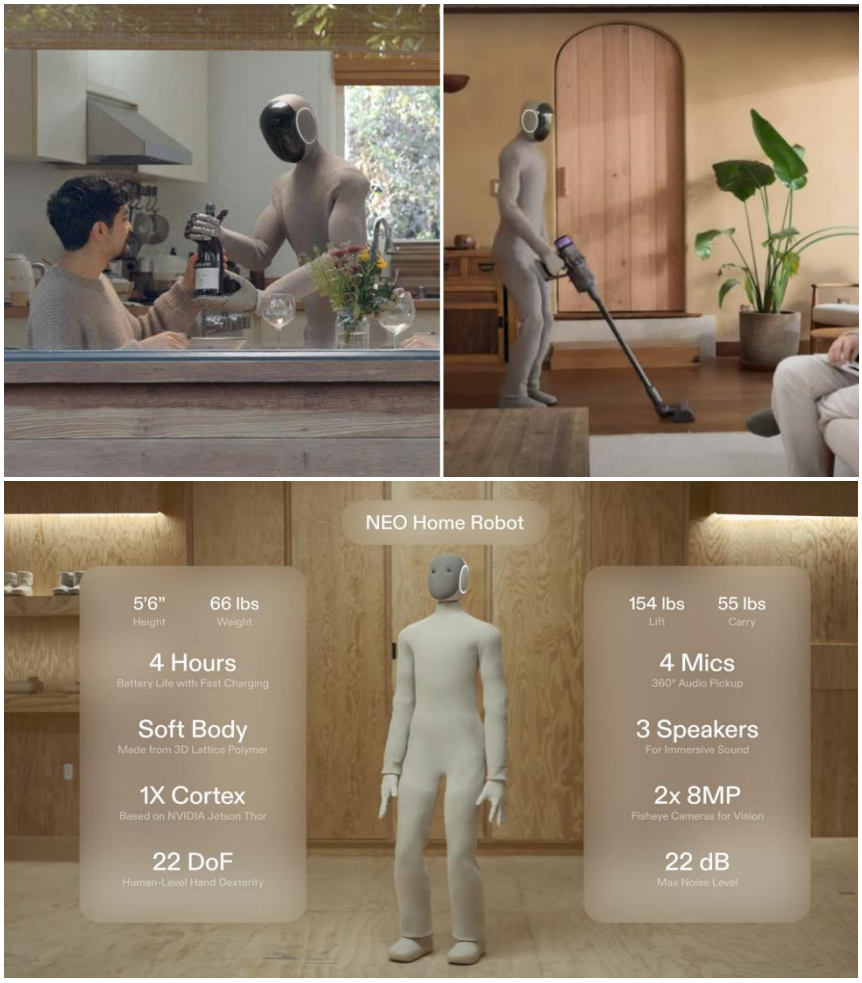


Figure 21. NEO Home Robot, an AI assistant for household tasks and human interaction.

Outdoor companionship

Outdoor AI companionship is a distinct class of AI system that accompanies a person while moving through public spaces, coordinating journeys, handling uncertainty, and mediating transitions between places, tasks, and social roles. Unlike indoor companions such as Alexa+ and ElliQ, which are primarily designed for stable home environments and daily domestic routines (Amazon, 2025; Intuition Robotics, 2024), outdoor companions operate in dynamic, location-dependent contexts where mobility, connectivity, and real-time decision-making are essential.

Rather than existing as a single mature product category, outdoor companionship is emerging through several related technologies. Robotaxis and autonomous ride-hailing services provide the deepest level of integration by combining AI, mobility, and the vehicle experience into one system (Deng & He, 2026). In-vehicle assistants such as NIO's NOMI GPT extend conversational AI into mobility by offering personalized interaction and contextual assistance (NIO, 2024). Assistive navigation technologies, including WeWALK and Microsoft Soundscape, demonstrate how AI can support users while moving through urban environments (WeWALK, 2024; Microsoft, 2023).

By contrast, indoor companionship is usually built around stable places and repetitive domestic patterns. Alexa's official routine and reminder features are organised around time-based triggers, smart-home actions, weather, media, and household automation, while ElliQ is explicitly framed around

ageing in place, wellbeing prompts, family contact, and loneliness reduction in the home. The indoor companion's core job is to orchestrate life within a location; the outdoor companion's job is to orchestrate life between locations. Mobility integration is where outdoor companionship becomes strategically interesting. There are three escalating levels of integration.

Robotaxis provide the deepest integration because transportation, the cabin interface, and the AI companion are part of one seamless experience. Services such as Waymo already operate at large scale, allowing the system to manage routing, arrival timing, the in-cabin experience, and post-ride activities within a single platform. Waymo, 2025; WeRide, 2025).

Ride-hailing offers a moderate level of integration. Here, the companion is shared between the mobile app and the mobility service. Partnerships such as WeRide with Uber and Grab show how route planning, payment, and service management can be integrated through existing ride-hailing platforms.

Micromobility currently provides the lightest integration. Companion features are mainly found in navigation and accessibility tools that support safe routing, obstacle detection, and wayfinding rather than emotionally expressive AI. This represents an opportunity for future mobility companion design.

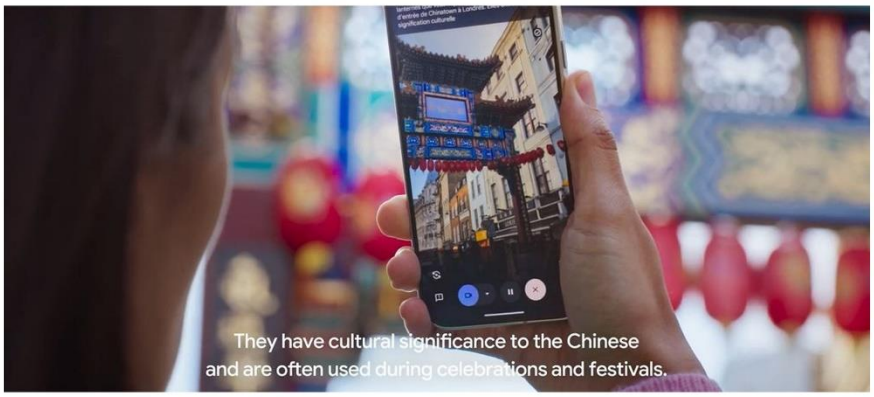
To better understand the concept of outdoor companionship, several existing products and services were reviewed. Although these systems serve different mobility contexts, they demonstrate how artificial intelligence, navigation, accessibility, and autonomous transportation are increasingly integrated to support users beyond simple travel. Together, they illustrate the emerging convergence of AI and mobility technologies that is shaping future personal mobility experiences (Kellerman, 2023).

Product	Mobility Context	Key Features
Waymo One	Autonomous robotaxi	Autonomous ride-hailing, real-time trip information, app control.
NIO NOMI GPT	AI companion for private vehicles	Voice assistant, personalization, schedule support.
Google Astra	Context-aware AI assistant	Real-time vision, multimodal interaction, contextual memory.
Microsoft Soundscape	Outdoor navigation	3D audio navigation, landmark guidance, spatial awareness.
WeWALK Smart Cane	Accessible pedestrian mobility	Obstacle detection, voice guidance, haptic feedback.

Table 15. Examples of Existing Outdoor AI Companionship Systems

Waymo One

NIO



Google Astra

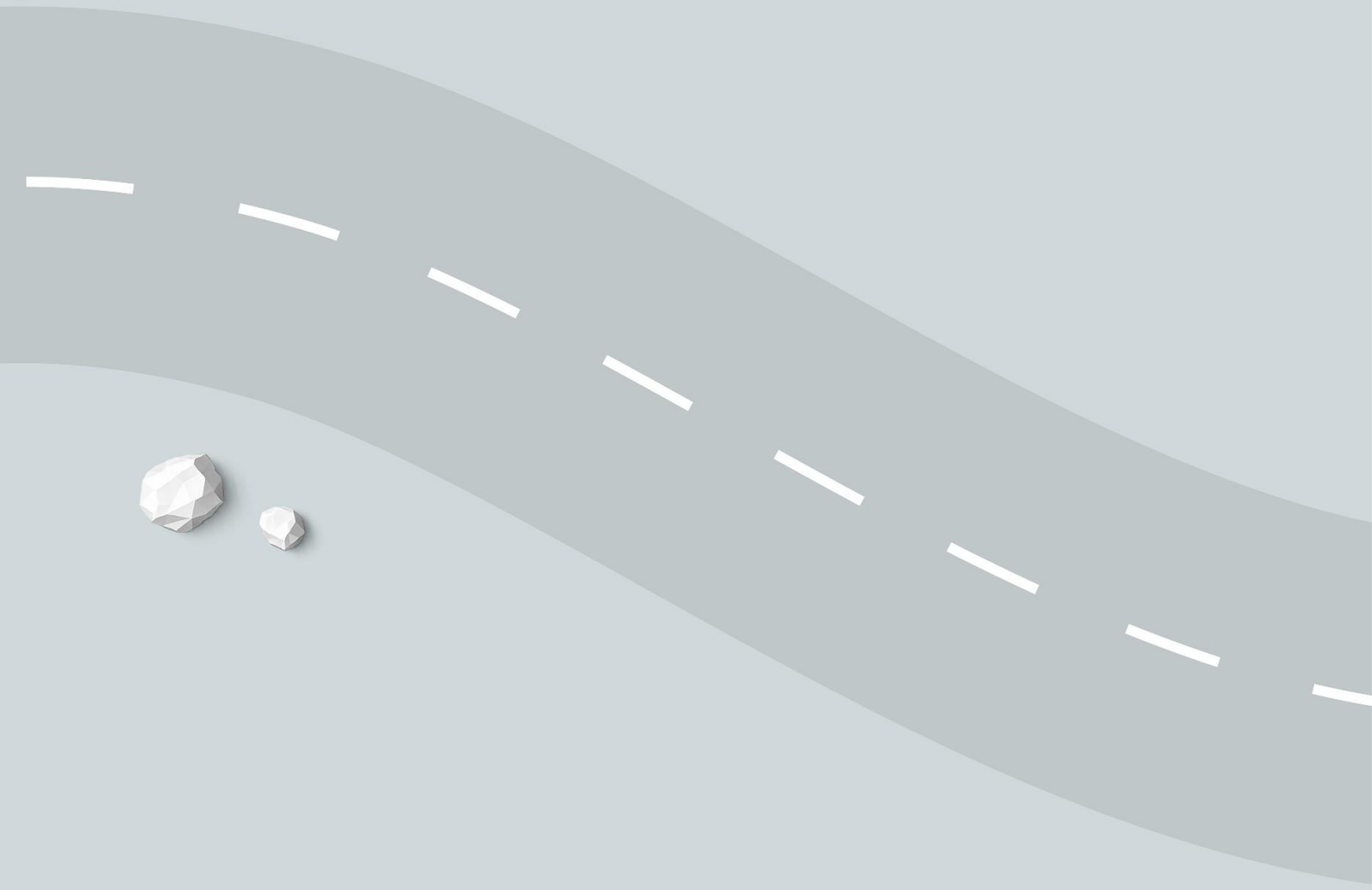
Microsoft
Soundscape

WeWALK Smart
Cane

03

USER RESEARCH

This chapter presents the user research through online survey and in-depth interview to build the persona profile.



Pick up the child from school
2:30 PM
From: schhol
To: Home

Online Survey

General Picture

For the first step of the user research, I did an online survey to get a general understanding of daily commuters and their commuting habits. The survey aimed to identify the main groups of commuters, how do they usually commute in the city and for what reason, what they do during their commute, and how they generally feel while commuting. In the final section, a few questions were added to explore users' willingness to use robotaxi services and their expectations for this future mode of transportation.

The questionnaire was divided into five main sections:

- Participant Profile
- Daily Commuting Behavior
- Commuting Experience
- Robotaxi Acceptance
- Desired Robotaxi Experience

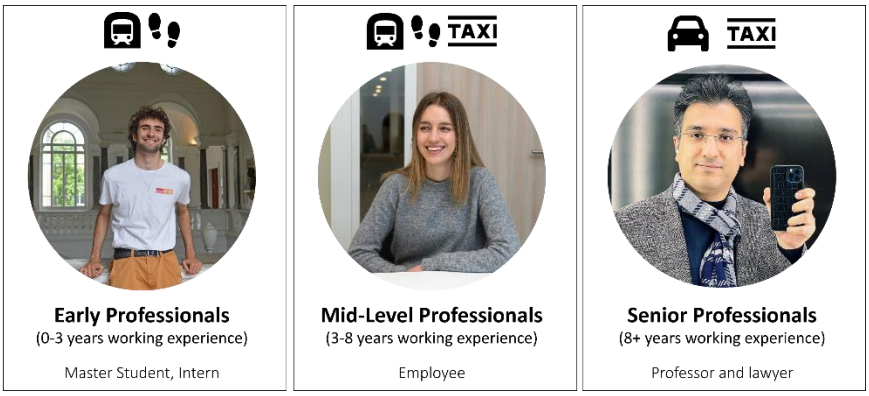
Research Method	Online questionnaire, GOOGLE FORMS
Participants	30 respondents in Milan
Number of Questions	23
Research Type	Quantitative survey
Objective	Understand general groups of commuters and their commuting method and habits

Key Findings of the online survey

1. User Classification

One of the main key findings of the survey was the classification of users based on their professional experience and daily commuting way. Three main groups were identified:

- **Early Professionals (0–3 years of working experience),** mainly public transport
- **Mid-Level Professionals (3–8 years of working experience),** public transport, private car
- **Senior Professionals (8+ years of working experience),** private car, Taxi



2. A Workday Lost in Commute

Another key finding was the amount of time people spend commuting during a working week. More than half of the respondents spend around 45 minutes each way commuting, which means 1.5 hours per day on the road. Considering that they travel to work at least 4 days a week, this adds up to about 6 hours per week, almost the equivalent of one full workday spent commuting.

Deep Interview

Final Persona

After the online survey, I mainly focused on Senior Professionals, as they mostly commute by private car and occasionally use taxis or ride-hailing services. From this group, I selected one participant—a senior lawyer—or an in-depth interview.

This qualitative research aims to understand current work-related behaviors during commuting and to explore future possibilities for working during travel, particularly in autonomous taxi scenarios.

Interview Type: Semi-structured deep interview
Method: Online video call
Duration: Approximately 40 minutes
Participant: 42-year-old lawyer and university lecturer
Date: January 2026

The questions focused on the following topics:

1. What places do you regularly need to go to for work-related tasks?
2. How many times per week do you usually visit these places?
3. Do you use a taxi or ride-hailing service to go to work? If yes, why do you choose it and how often do you use it?
4. Can you describe the journey of your busiest day, from morning until the end of the day?

5. What family-related responsibilities do you usually have?
6. What personal tasks do you usually do during the week?
7. On average, how many hours per day do you spend commuting?
8. What do you usually do while commuting?
9. Imagine you could book a robotaxi for an entire day. How do you think this would affect the rhythm of your day?

Qualified Data

Key Findings

The participant works as a lawyer and university lecturer, regularly commuting between the law office, university, client companies, and judicial centers. On busy days, he spends 2–3 hours traveling between 4–5 different locations and on the way he is constantly on phone and having around 50 calls a day.

Although he usually drives his own car, he prefers taxis when visiting busy judicial centers or when he wants to avoid the stress of parking. However, using a taxi limits his flexibility later in the day, as he depends on others for personal or family activities.

For him, the idea of booking a robotaxi for the whole day was particularly interesting because it could provide a private space for work-related phone calls and meetings. Client privacy is very important in his profession, and many conversations cannot be discussed openly in a regular taxi. He explained that there have been many occasions when he had to stay late at the office just to finish a confidential phone call before going home. He also mentioned that a robotaxi could act as a small mobile office, allowing him to have private conversations with clients even during breaks between court sessions.

One of the biggest challenges in his daily routine is collecting documents from multiple offices before arriving at his main workplace. Traffic, parking, and

constantly thinking about the next destination increase his mental workload, and in some cases he even cancels tasks because finding parking is too difficult.

The interview also revealed that work often leaves him with very little time and energy to spend with his family, highlighting how commuting affects not only productivity but also work–life balance.

Andrea Mazzeo

Lawyer & University Professor

Age	40
Location	Milan, Italy
Status	Married, One daughter
Education	Law, PHD
Occupation	Senior Lawyer University Professor

ABOUT ANDREA

Andrea is a senior lawyer **managing a highly dynamic and stressful lifestyle across multiple locations in Milan.** He splits his time between his private law practice, court appearances, corporate advisory work, and teaching law at the university. He is deeply committed to his family and aims to be present for his daughter despite his demanding schedule.

KEY LOCATIONS

- Private law office
- Courthouses
- Company office (3 days a week)
- University (2 days a week)
- Government offices
- Client meeting locations

PERSONALITY

Ambitious

Organized

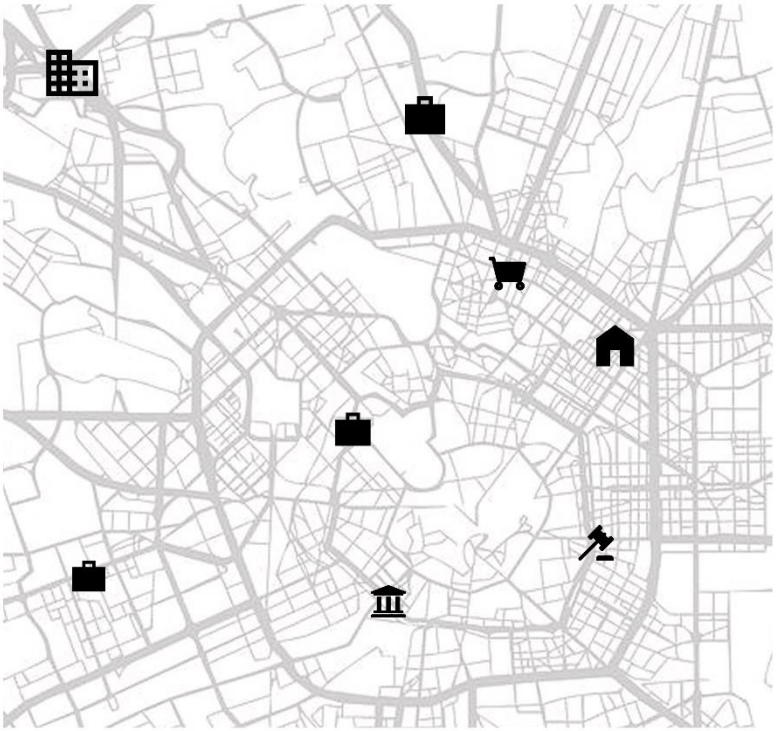
Responsible

Social

Tech-savvy

GOALS

- Be energetic and hyper every day.
- feel refreshed everyday before reaching to the office
- Provide the best service to his clients.
- Manage his time better and reduce stress.
- Be present for his family and watch his daughter grow.
- Stay healthy and maintain work–life balance.



Commuting pattern

TAXI

- Travels mainly by private car or taxi.
- In a day he often has to move between 5-6 locations in the city.
- Every morning taking coffee outside.
- Takes taxi when he needs to go to center.
- Takes taxi when he knows he can’t find parking.
- Takes taxi when he is in rush or stressed.
- on the way he is constantly on call.
- Have to commute mainly during rush hours with heavy traffics.

PAIN POINTS

- **Moving across multiple locations makes me tired.**
  Some days, before arriving at the office, I have to go to two different offices to collect documents. Traffic and parking problems make me lose half of the day and I arrive at work already tired and not refreshed.

- **Late calls with important clients and I have to stay in office.**
  Some nights I have to stay late in the office to make an important call with a client. I can't do it at home because of privacy concerns, and I can't drive while focusing on the conversation.

- **Family time is limited.**
  Because of his high pressure lifestyle and intense works he can’t be there for his family a lot. many time he couldn't go for shopping because he was late.

- **Need to pick up others.**
  Many times after work, we plan to go to a restaurant or a gathering with friends. I often need to pick them up, which takes a lot of time, or they come with another car, and we go separately.

Persona life layers

Work, Family & Friends, Personal

Based on the data collected from the deep interview, I mapped the participant's life into three main layers: Work, Family & Friends, and Personal. The largest layer is related to work, showing that most of his time, energy, and daily mobility are occupied by professional responsibilities. As a lawyer and university lecturer, he constantly moves between the law office, courthouse, client companies, government offices, and the university, making work the center of his everyday life.

The second layer represents his family and social life. These include spending time with his wife and daughter, visiting family members, shopping for the house, taking his child to classes, and meeting friends. Although these activities are important to him, they are often affected by his busy work schedule and receive less attention.

The innermost layer contains his personal activities, such as going to the gym, medical checkups, personal care, banking, and other daily errands. These are usually the first activities that get postponed or sacrificed when work becomes more demanding.

The interview clearly shows that work has a strong influence on the other two layers. The more demanding his work becomes, the less time and energy remain for family and personal life. This creates an imbalance in his daily routine, where many personal and family-related activities are continuously adjusted around his professional commitments.

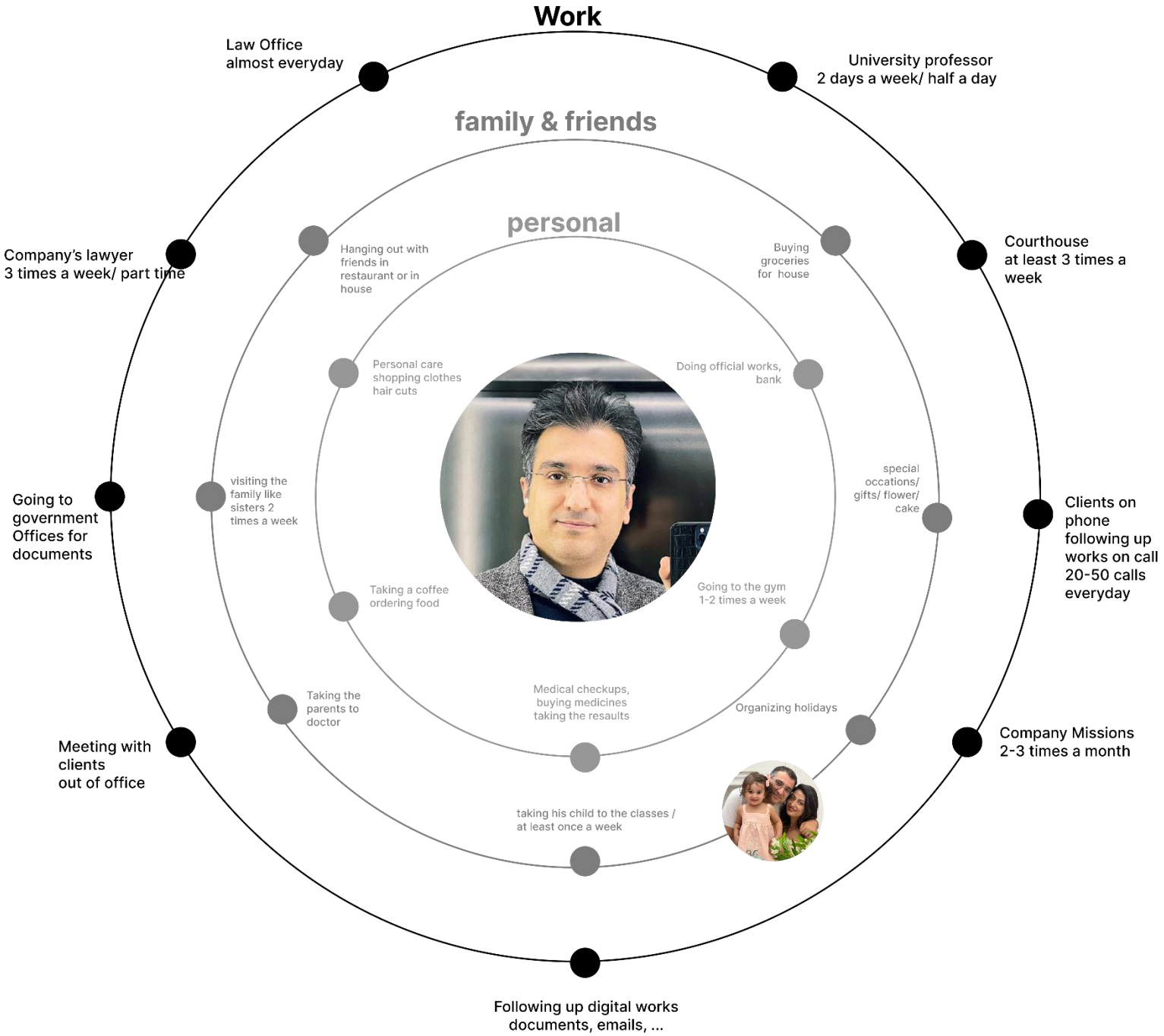
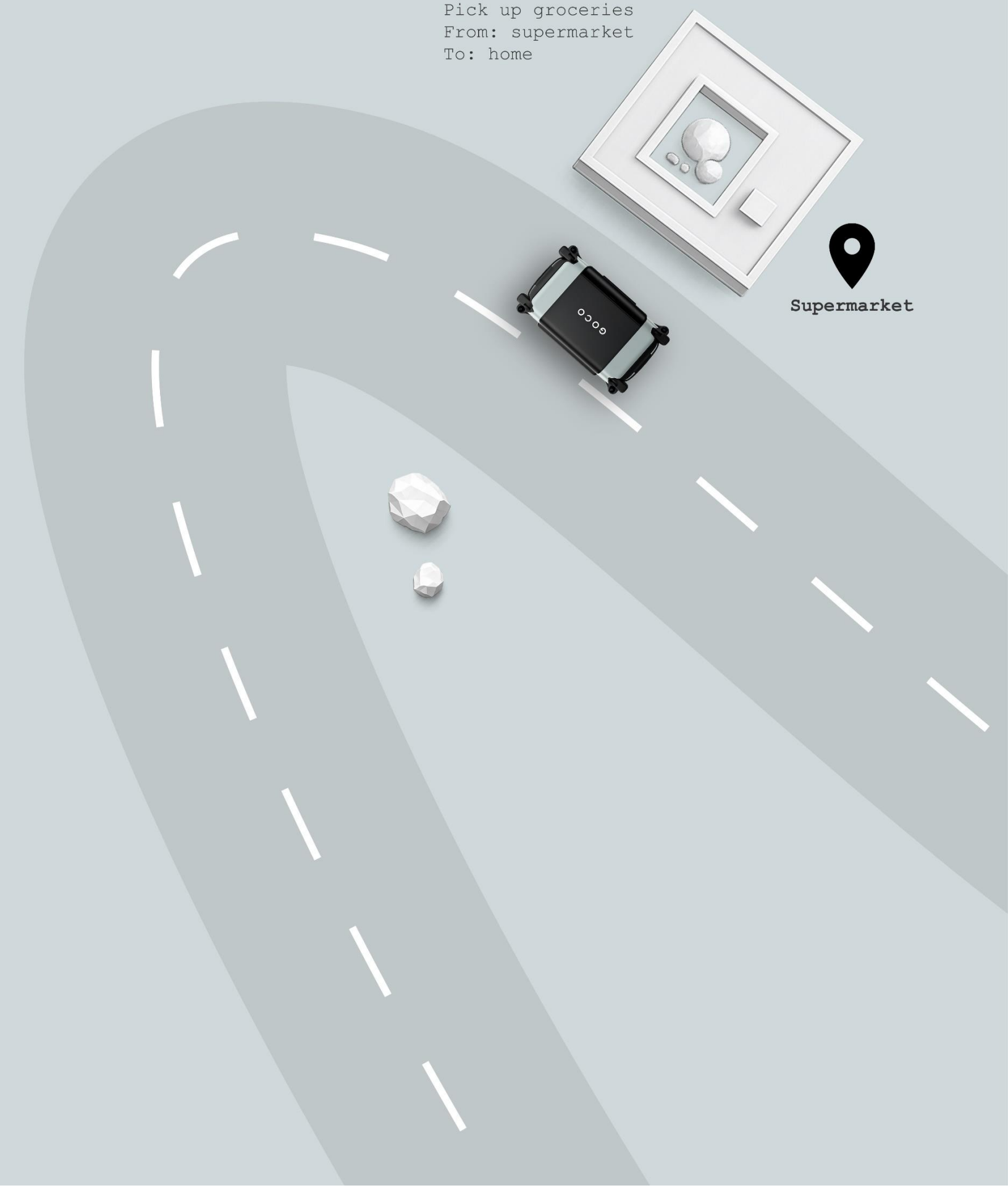


Figure 22. Three Main Layers of the Persona's Life

Pick up groceries
From: supermarket
To: home



04

Project definition

This chapter presents the GOCO concept as an AI-powered outdoor companion. It explains the connected ecosystem and system architecture.

Connected Ecosystem

Positioning the project

Today, every person is connected to a digital ecosystem that constantly receives, shares, and synchronizes data between different devices and systems to provide better performance and a more personalized experience. This ecosystem extends from the user's personal devices to the home environment and finally to the outside world.

The first layer consists of personal devices, such as smartphones, laptops, smartwatches, and wireless earbuds. These devices carry personal information through connected applications and cloud services. Smartphones and laptops manage calendars, emails, contacts, and daily activities, while smartwatches continuously monitor health data such as heart rate, sleep, and physical activity. Together, these devices build a detailed understanding of the user's daily life and behavior.

The second layer is the smart home ecosystem. It includes connected devices such as Google Nest, Amazon Alexa, smart displays, thermostats, smart lighting, and other home appliances. These devices communicate with each other through AI assistants and, more recently, AI companions to support daily activities, automate household chores, improve comfort, and create a more intelligent living environment.

The third layer extends beyond the home into the outdoor ecosystem. This is where GOCO is positioned. Rather than considering a robotaxi as only a means of transportation, this thesis proposes it as a smart object that becomes part of the user's

digital ecosystem. By securely connecting with the user's personal devices, cloud services, and smart home, GOCO can access the contextual information needed to understand the user and their family. As a result, when the user leaves the house, the mobility system already knows their schedule, preferences, destinations, and family activities. This enables GOCO to proactively coordinate daily journeys, optimize travel plans, and support the family throughout the day, creating a seamless transition from indoor AI companionship to outdoor AI companionship.

Figure 23. Integration of Personal, Home, and Outdoor Ecosystems GOCO as Part of the User's Connected Ecosystem

Outdoor companionship

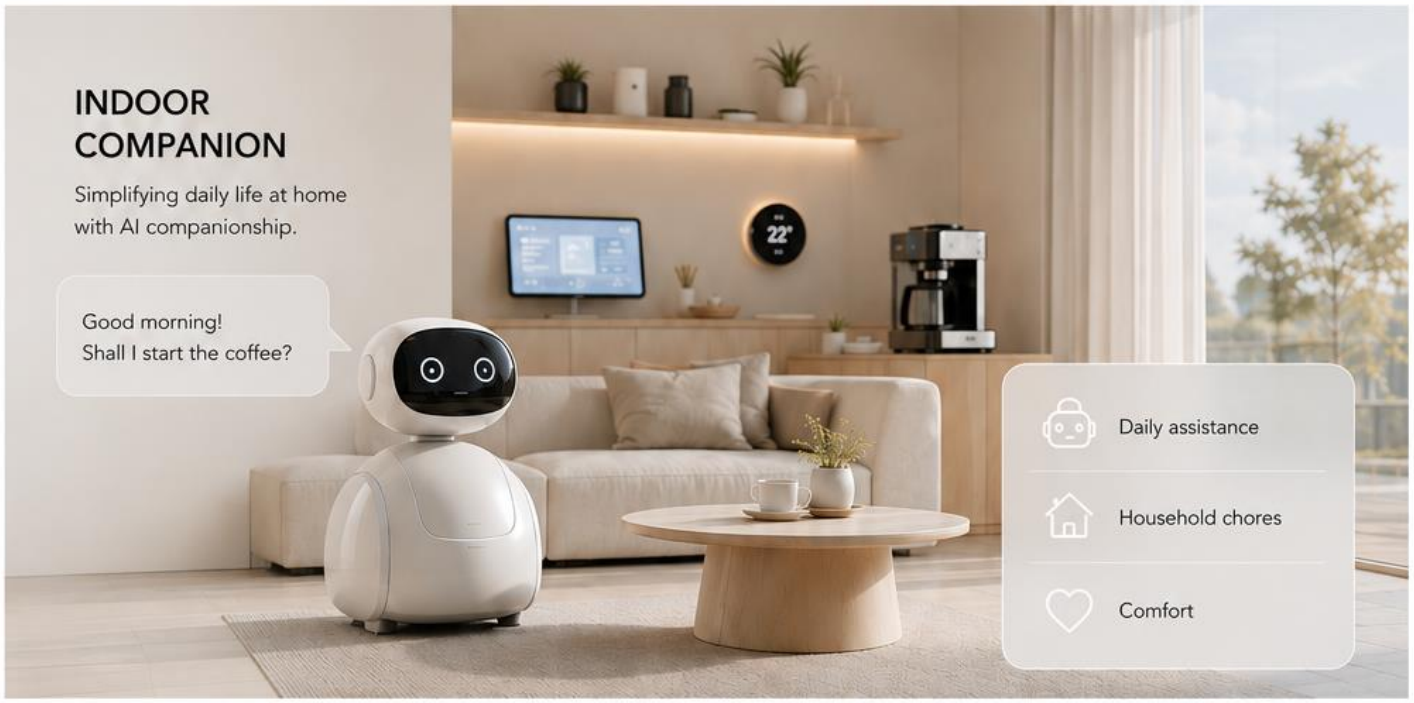
Orchestrate life between locations.

Seeing projects related to home assistance and AI companionship for indoor environments that can simplify daily life, free up time, and even allow users to interact naturally with AI inspired the idea of extending this concept beyond the home. It led me to explore how a similar system could act as an outdoor companion—simplifying daily activities outside the home, supporting everyday mobility, and helping people save time throughout their day.

Design the vehicle not as a chatty novelty, but as a mobility-native companion for transitional life moments. The best design direction is to combine predictable routing, accessible pickup and drop-off, multimodal reassurance, privacy-preserving memory, and carefully bounded proactivity, so that the cabin functions as a reliable “third space” between work, family, errands, and rest.

Technically, the dominant design pattern is a hybrid edge–cloud architecture. Real-time perception, localization, and safety responses must run locally for latency and robustness reasons, while mapping, continuous improvement, fleet learning, and heavier reasoning often rely on cloud infrastructure. The design tension is clear: the more personally adaptive and proactive the companion becomes, the more it needs data about location, schedules, behavior, and preferences; yet the more it collects, the greater the privacy, governance, and emotional-manipulation risk. That tension is now reflected in connected-vehicle privacy guidance, cyber-security regulations, the EU AI Act timeline, US transparency initiatives, and broader scrutiny of AI companions.

CONNECTED ECOSYSTEM
AI that understands you and connects everything.
31
Personal data & preferences
Health & activity tracking
Schedule & appointments


INDOOR COMPANION
Simplifying daily life at home with AI companionship.
Good morning! Shall I start the coffee?
22°
Daily assistance
Household chores
Comfort

OUTDOOR COMPANION
Simplifying daily life outside the home and saving time.
GOCO
ETA 8:30 AM
Next meeting 9:00 AM
Picking up Alex at 3:30 PM
GOCO
Smart mobility
Time saving
Family coordination

Family Companion

GOCO a member of family

GOCO is a part of the family's daily life. The family can rent robotaxi for the next day, then the GOCO AI connects to their digital ecosystem, collecting information from calendars, personal devices, appointments, routines, work schedules, and preferences. Based on this shared data, GOCO creates the most efficient plan for the commutes of the family.

It can take Andrea to work, then drive the daughter to school, bring his wife to her doctor's appointment, and continue supporting Andrea throughout his workday. Later, it can pick up the daughter from school and combine her trip with Andrea back home. By merging trips whenever possible, GOCO reduces merge travels giving family members more opportunities to spend time together.

GOCO can also perform cargo tasks. It can collect online shopping, deliver important documents, or complete small errands while the family is busy. If there is a dinner planned with friends, GOCO can coordinate the route, pick everyone up, and take the group to the restaurant together.

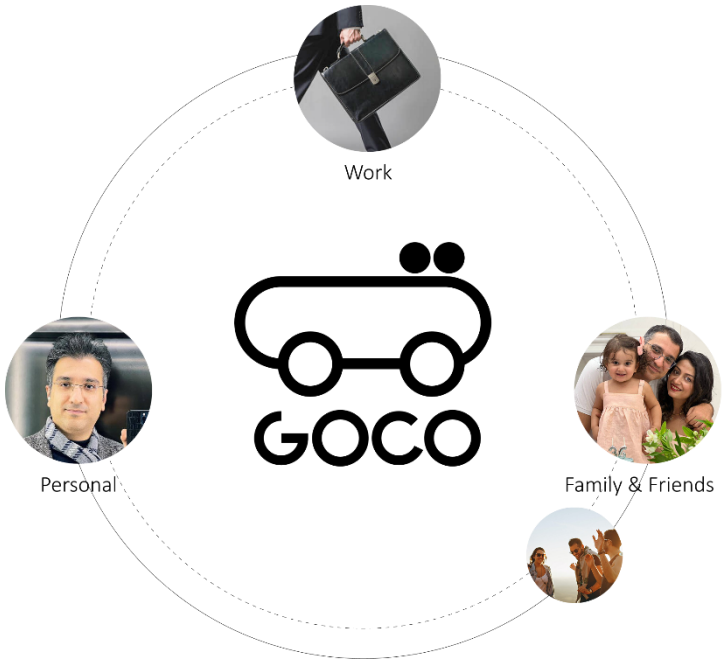


Figure 24. GOCO as a Daily Life Companion

Commute-Working

Micro tasking

During a busy working day, the persona constantly moves between different locations across the city for meetings, work activities, and personal responsibilities. A large amount of time is often lost in traffic, searching for parking spaces, and transitioning between places. Through robotaxi integration, commuting time becomes a calm and supportive space where users can continue light work activities while traveling, helping free up valuable time throughout the day.

The commute-working principle allows users to manage small micro-tasks that are often forgotten within busy schedules and later become sources of stress and distraction. Assisted by the AI companion, these tasks capture by GOCO system during the busy days based on the shared data of the personal devices and then during the trip will be gently remembered to the user. These micro-tasks may include: Calls and meetings, Replying to messages and emails, Scheduling and calendar management, Reviewing task lists and organizing activities, Writing short notes , Briefly checking documents, Preparing for upcoming meetings.

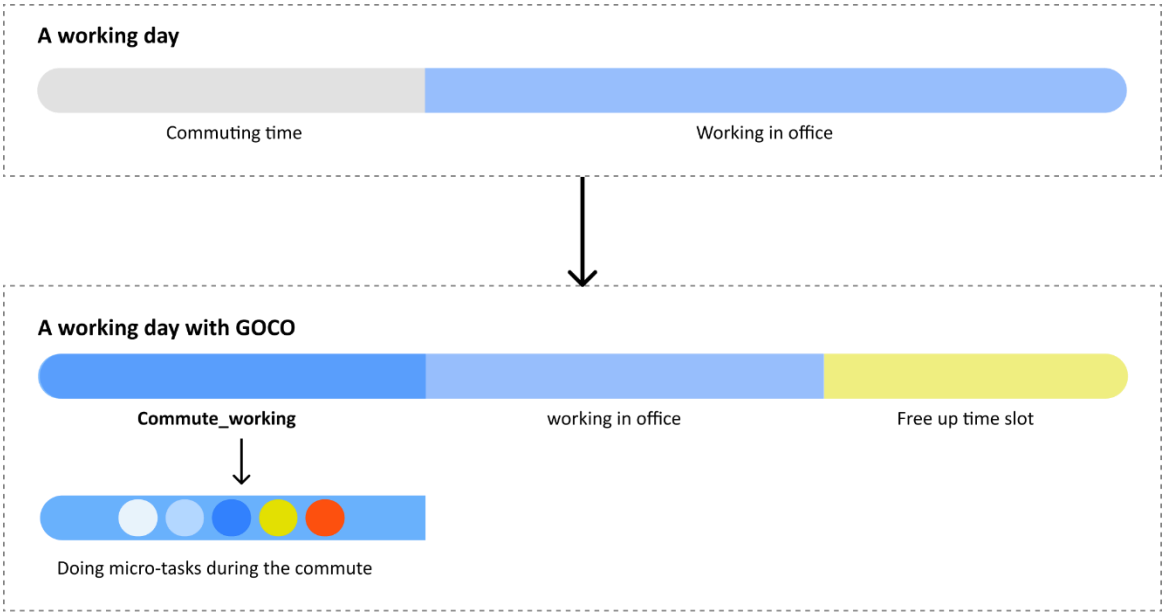


Figure 25. Commute-working and microtasks

The brain & The Body

This ecosystem map illustrates how GOCO functions as an outdoor companion by connecting users, their digital ecosystem, and the robotaxi into one intelligent mobility system. GOCO gathers data through connections with users' personal devices, digital applications, urban infrastructure, and the robotaxi itself. Based on this information, it analyzes, organizes, and coordinates daily mobility, personalizes the cabin environment, and continuously adapts in real time according to the user's needs and daily routines.

As a result, GOCO goes beyond transportation and creates value by saving time, reducing commuting waste, improving productivity, enhancing wellbeing through a lower-stress lifestyle, strengthening family bonds by creating more time together, increasing safety, especially for children, and supporting more sustainable mobility and cleaner cities.

ECOSYSTEM MAP

GOCO system Design for Everyday Family Mobility in Urban Environments

1. USERS

Dad / Lawyer
- Work commute
- Work meetings
- Work tasks
- Personal tasks

Mom
- Grocery shopping
- Social activities
- Appointments
- Daily planning

Child
- School commute
- Learning & education
- Entertainment

Family/Friends
- Events/celebrations
- Dinner outings

Flexible interior system

- Adjustable interior mode
- Folding Table (1/2 wings)
- Adjustable Hight table
- Transparent sliding Smart Screen
- Lighting, Music & Ambience
- Storage & Personal Space

The Body

GOCO

Outdoor Companion Mobility System

The Brain

2. connect with GOCO

Application/Website

Chat and Voice command

AI companion character

3. GOCO connects to

- Personal Devices (Smartphones, Wearables, Laptops
- Digital Applications
- Urban Infrastructure Data

4. GOCO data cloud

User Data
- Data from personal devices and connected applications
- User profiles & family relationships
- Personal preferences (food, music, seating, routes)
- Daily routines & habits
- Emotional state & wellbeing indicators
- Trip history, behavior patterns & feedback

City infrastructures data
- Location & mapping services
- Charging station availability
- Parking availability
- Road maintenance information
- Real-time traffic conditions
- Weather forecasts and conditions
- Local events & city activities
- Public transportation information

Robotaxi data
- Vehicle status (battery, charging, maintenance)
- Autonomous driving systems (sensors, cameras, LiDAR)

6. Cabin Modes

Working
- one wing table
- level 1 screen

Meeting
- 2 wing table
- level 1 screen

Family/social
- Table folded
- level 1-3 screen

Online meeting
- 1 wing table
- level 3 screen

Child
- Table folded / one wing
- level 2 screen

Cargo
- Hidden storage

HOW IT WORKS (FLOW)

User shares with GOCO the plan of the day

↓

GOCO understands & analyzes all the data

↓

GOCO organizes and merges the commute plan

↓

User optimizes and confirms the plan

↓

GOCO executes the plan

↓

Adapts in real-time

↓

Learns & improves

5. GOCO output

- Commute-working assistant (microtasks, meetings)
- Family's mobility companionship (combines all members commute in one plan and sometimes merge the trips)
- Proactive suggestions based on personal data
- Personalized AI companionship during commute based on the profiles
- Route and trip optimization(finding best routes, less traffic, parking to save time)
- Modifying the cabin setting

7. OUTCOMES & VALUE

Saves Time
Less commute waste

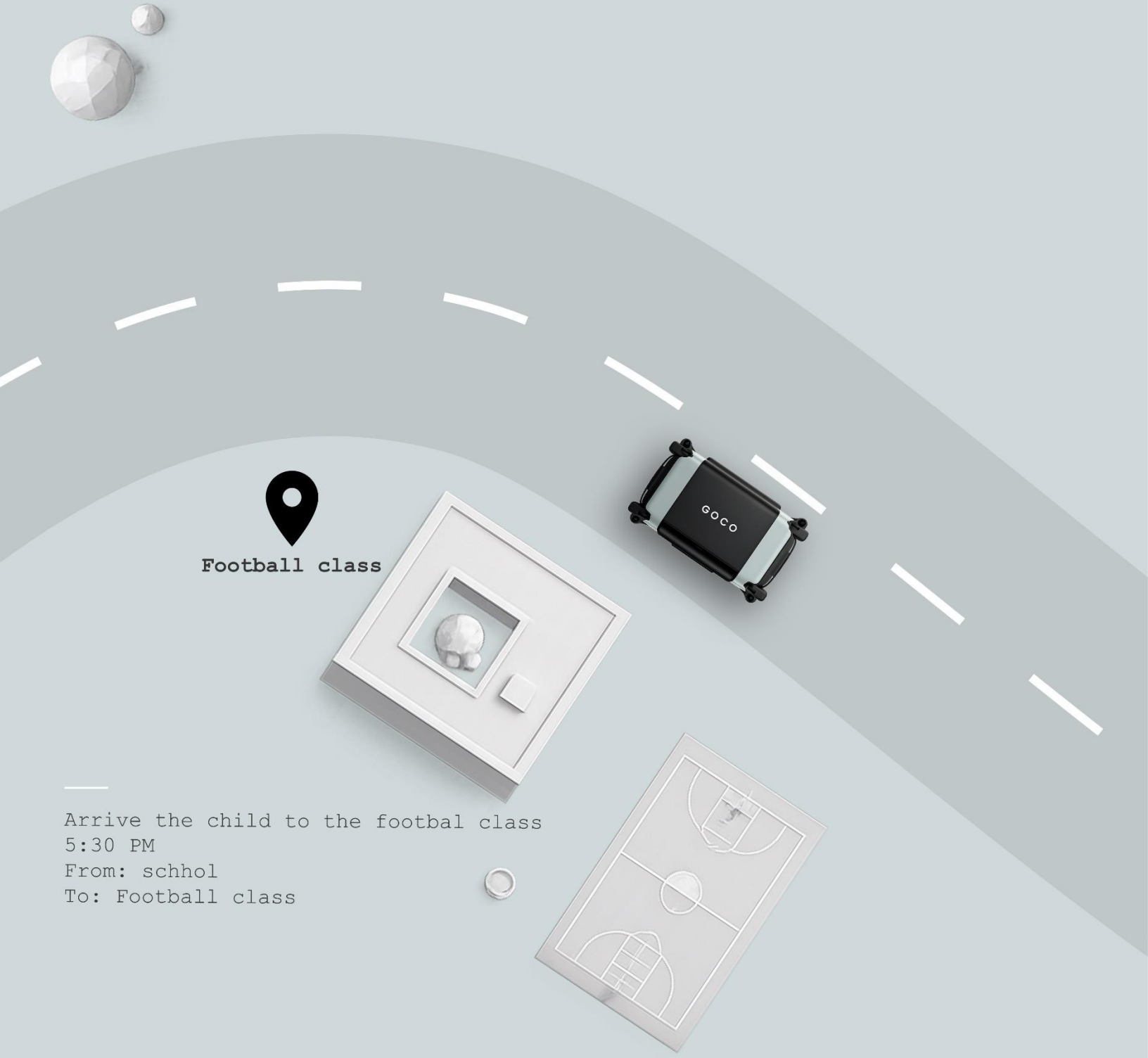
Greater Safety
Child protection

Productivity
Work more on the go

Better Wellbeing
Lower stress life

Stronger Bond
More time together

Sustainable
Clean cities



Arrive the child to the footbal class
5:30 PM
From: schhol
To: Football class

05

GOCO Design

This chapter describes the design development of GOCO, from the first sketches to the final proposal.

Overview

The GOCO cabin design was developed through four main design phases, starting from the initial concept sketches and ending with the final interior design and user experience. Each phase included regular discussions with my supervisor, where I evaluated the strengths and weaknesses of the current design and identified the improvements needed for the next stage. This iterative process helped transform the concept into a more ergonomic, flexible, and user-centered robotaxi cabin. The final phase focused on the cabin's interaction design, material selection, CMF, and digital interface, giving GOCO its final identity and creating a seamless experience between the passengers and the autonomous vehicle.

Phase 1 – Concept Exploration

The project began with hand sketches and digital sketches to explore different ideas for the robotaxi cabin. During this stage, the focus was on generating concepts and understanding the overall vision rather than creating realistic or detailed designs.

Phase 2 – Initial 3D Model

The first 3D model was developed in SolidWorks using simple forms and proportions. At this stage, the focus was on defining the cabin layout and exploring a multi-purpose interior without considering detailed ergonomics.

Phase 3 – Flexibility Development

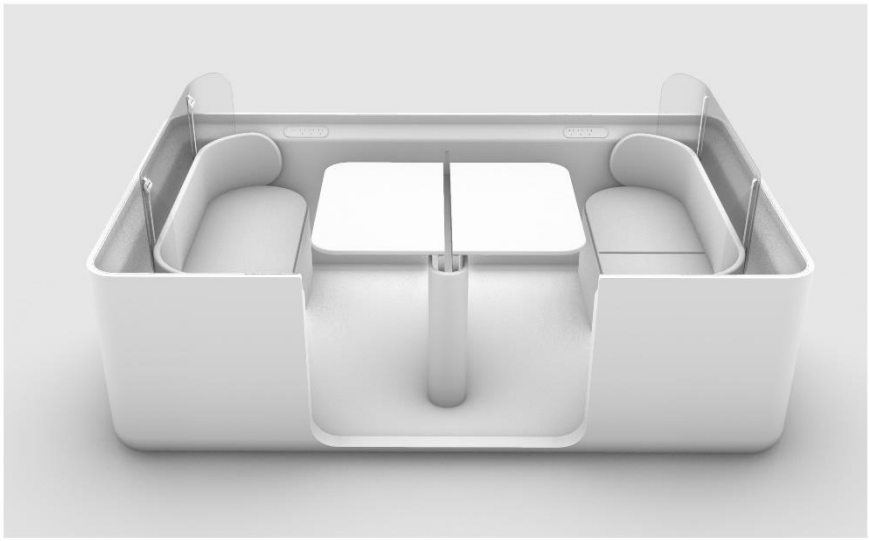
The cabin was redesigned with improved ergonomics and flexibility in Rhino and Solidworks. The seating layout, interior proportions, and modular features were refined to create a more comfortable and adaptable space for different user activities.

Phase 4 – Final Cabin Design

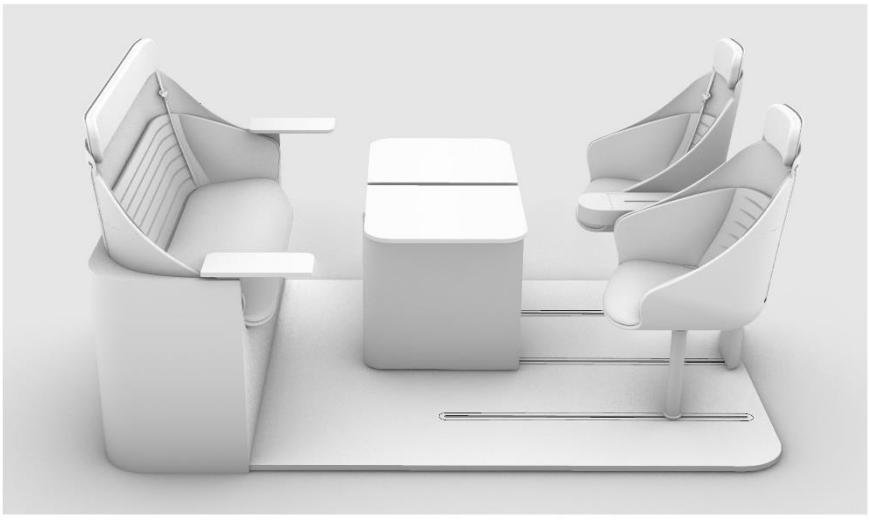
The final cabin focused on user comfort, Flexibility and reconfiguration. The interior components, storage solutions, seating, table system, and CMF were finalized in this stage.

Phase 1 – Concept Exploration

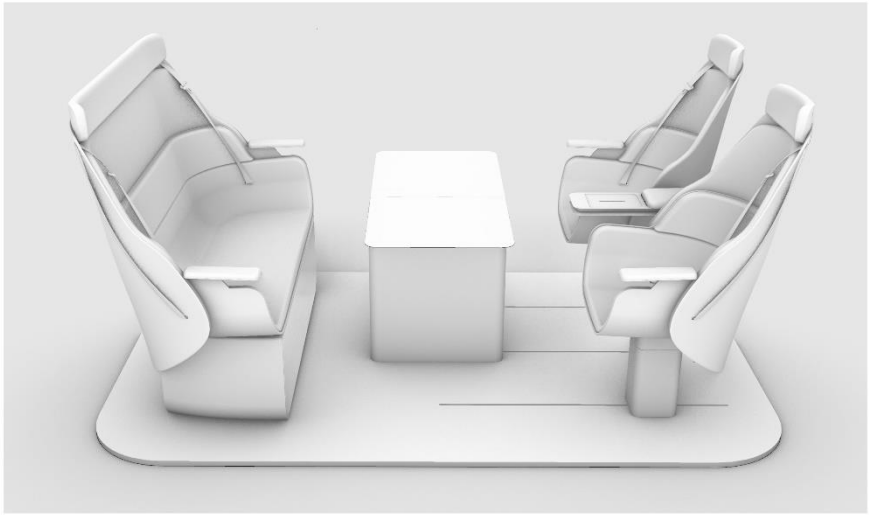
Phase 2 – Initial 3D Model



Phase 3 – Flexibility Development



Phase 4 – Final Cabin Design



Phase 1

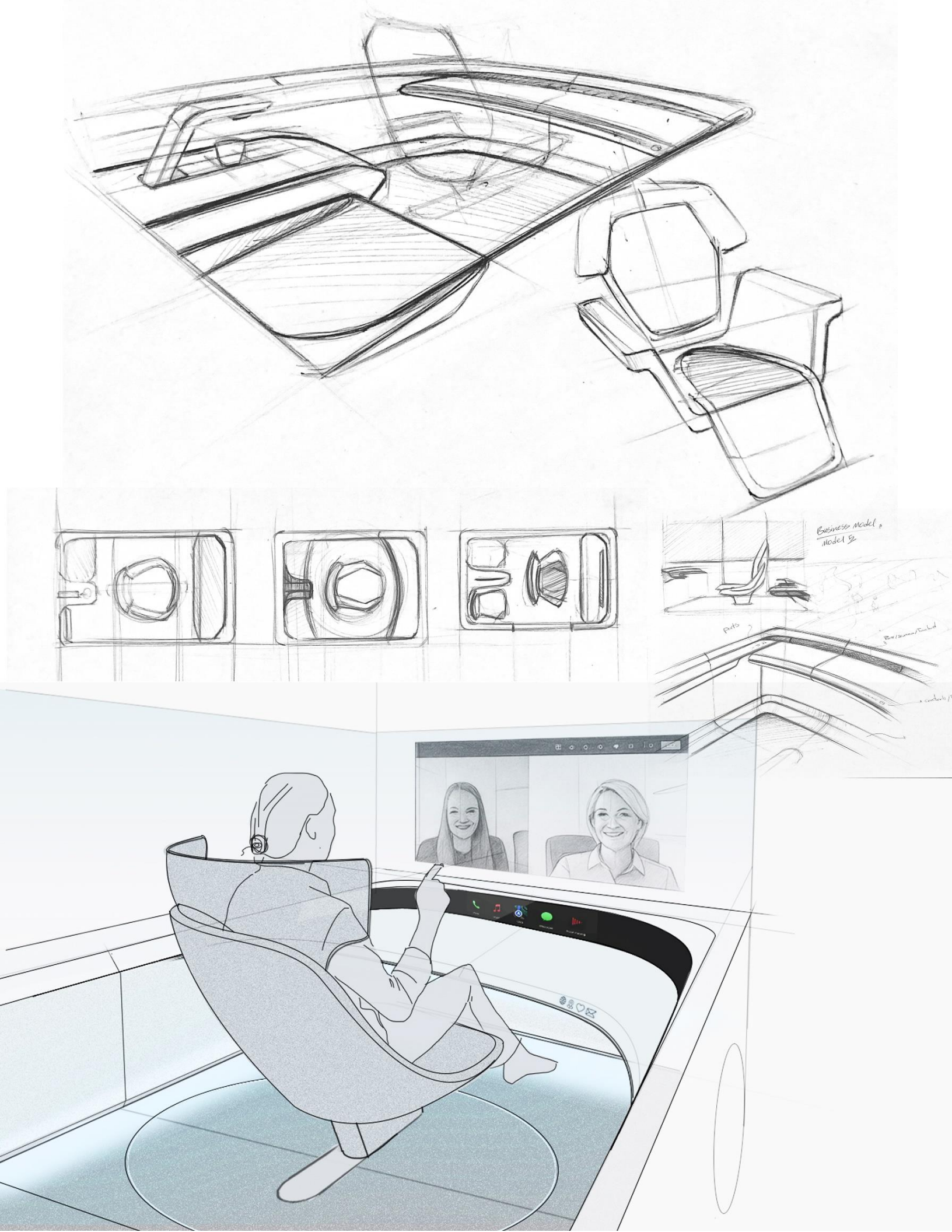
Concept Exploration

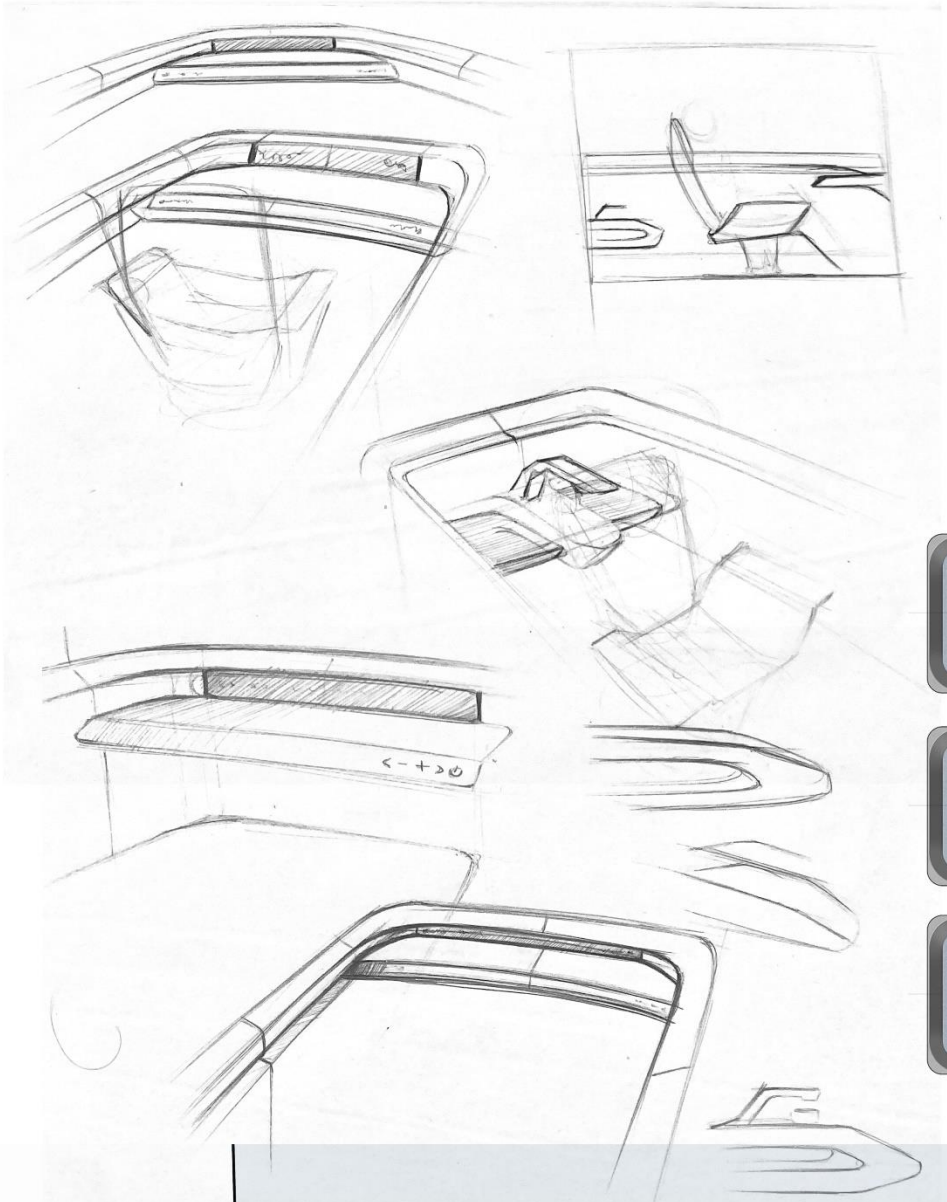
The first phase of the project focused on exploring the initial vision of GOCO. At this stage, I started by sketching different interior layouts to understand how a robotaxi could become a productive space instead of just a means of transportation. My main inspiration came from business-class cabins in airplanes, where passengers can work comfortably and privately during their journey.

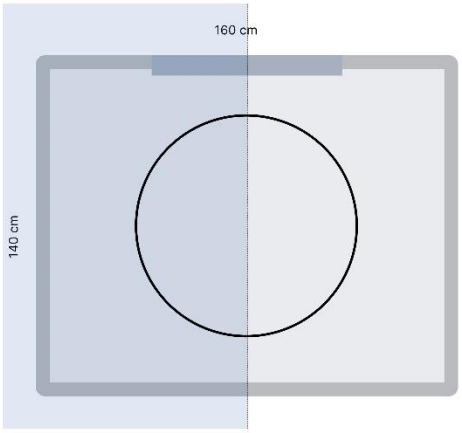
The concept was mainly designed for senior professionals who spend a significant amount of time commuting between meetings. Therefore, the cabin included a dedicated workspace, a comfortable seat, a large desk, charging ports, and an integrated digital interface for video calls and trip information. The sketches helped me visualize the overall atmosphere and define the first interior proportions before moving into digital modeling.

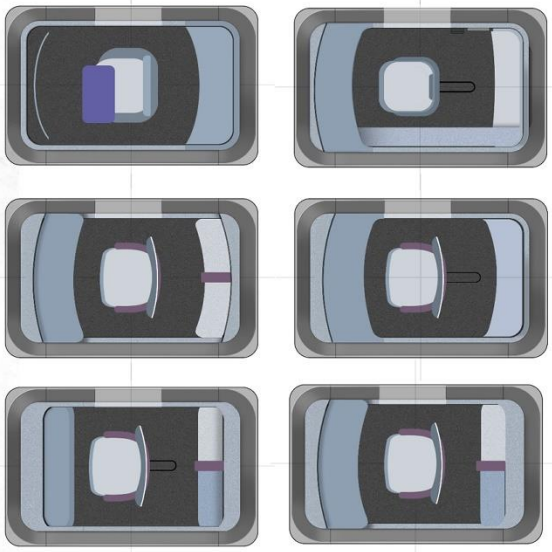
Although this concept was still very simple and focused only on work activities, it established the foundation for the following design phases.

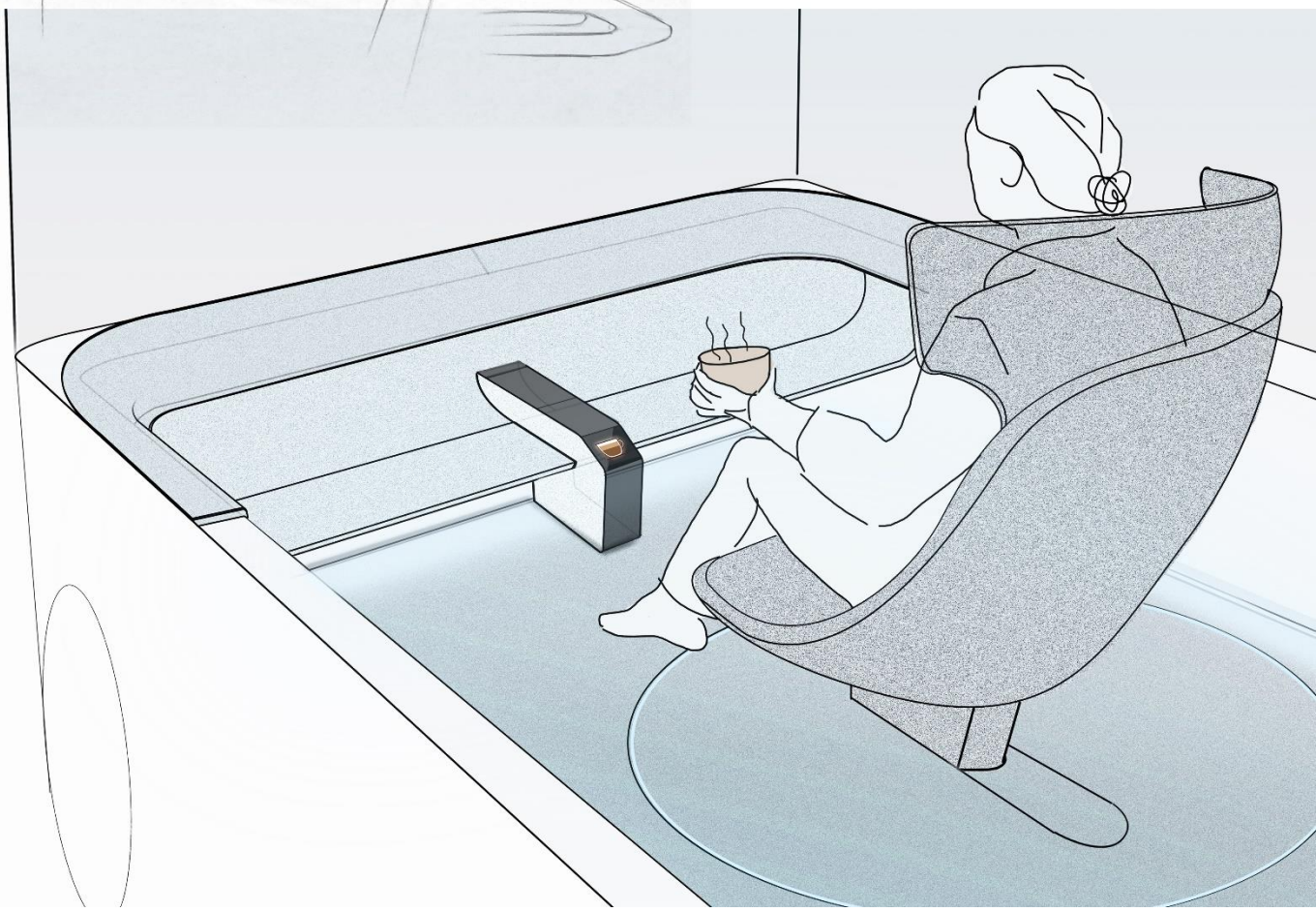
After developing the first sketches, I continued exploring different layouts and proportions to better understand the relationship between the user and the cabin. Several top-view arrangements were tested to study seat position, workspace dimensions, and circulation inside the vehicle.


Business Model
Model S2
Parts



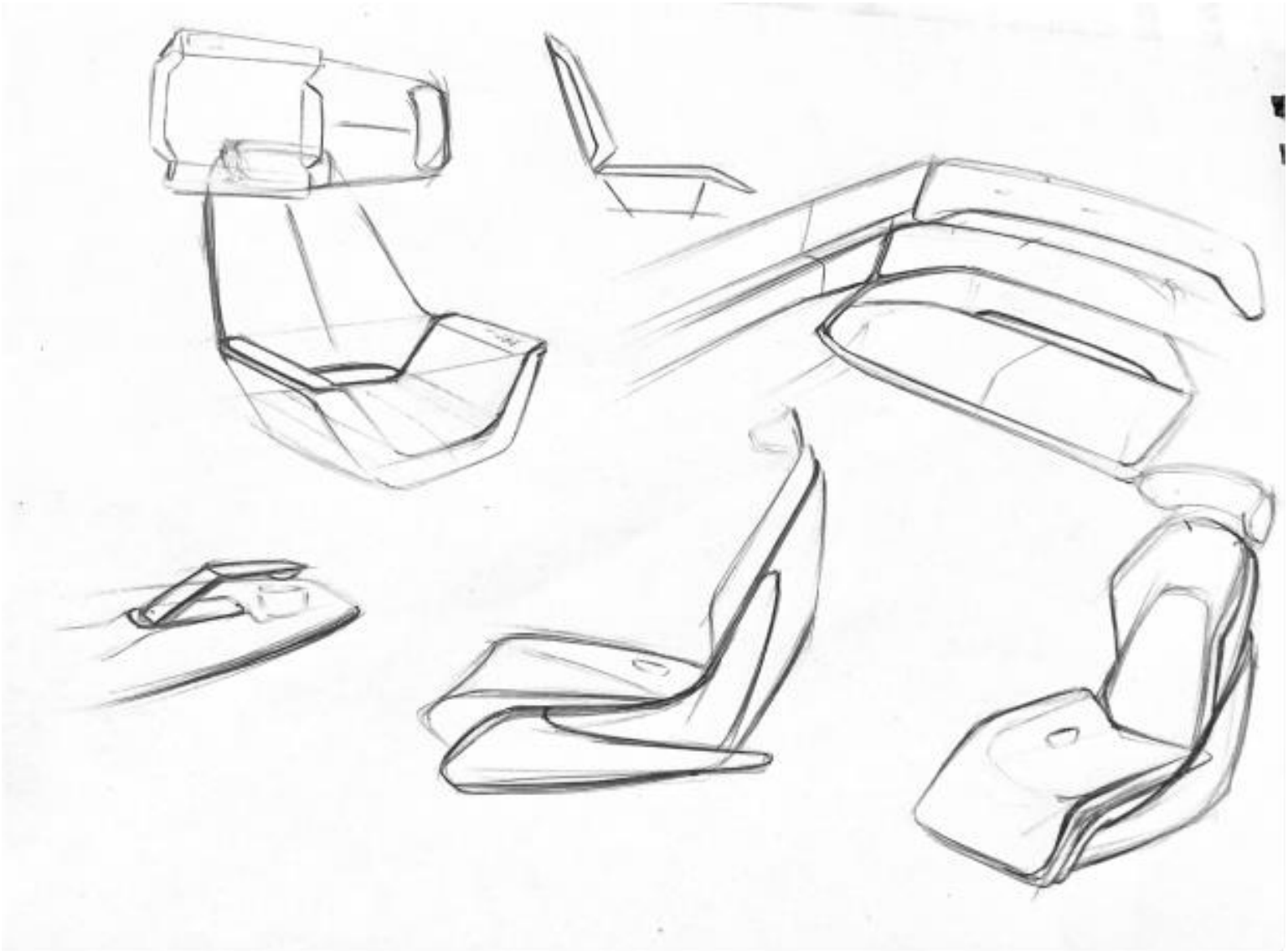

160 cm
140 cm





At this stage, the concept was intentionally ambitious and idealistic. I imagined the robotaxi as a private mobile office equipped with everything needed for productive work, including a rotating lounge chair, a fixed working desk, charging ports, a digital interface, and even an integrated coffee machine. The rotating seat was designed to provide a 360° view while allowing users to easily interact with the workspace or enjoy the surroundings.

Although many of these ideas were later simplified or redesigned, this phase helped identify the strengths and limitations of a work-focused cabin. It also highlighted the need to expand the concept beyond productivity and consider the wider daily activities and emotional needs of future passengers.



Phase 02

Initial structure

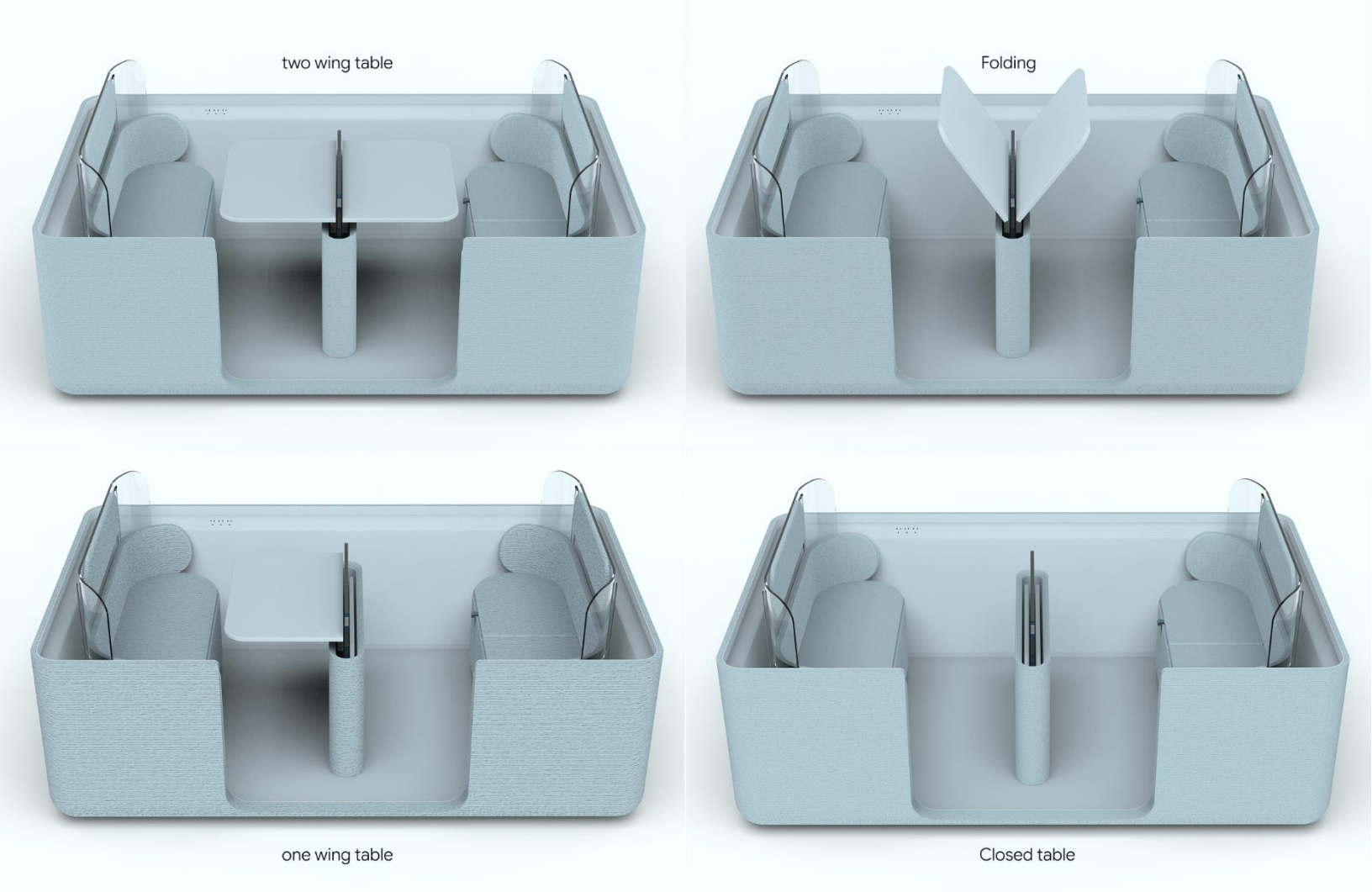
During this phase, I transformed the initial concept into its first 3D model. The main objective was to create a flexible cabin that could support different daily activities instead of focusing only on work. I started exploring how the same interior could easily adapt to work, meetings, and family use without changing the overall cabin layout.

The key feature introduced in this phase was the folding two-wing table. The table could be used in different configurations depending on the activity. One wing could be opened for individual work, both wings could unfold for meetings, and the table could remain closed to maximize the available space for family or leisure activities. A central screen was also integrated to display trip information, media content, and other digital interactions. Although this concept introduced greater flexibility, several limitations became apparent during the evaluation.

The seats and the central console were fixed, reducing the adaptability of the cabin. The passengers seated opposite the driving direction could not rotate to enjoy the forward view, and the permanent central console occupied a large amount of interior space. In addition, the side screens and seating ergonomics required further refinement.

This phase highlighted the importance of designing a truly modular interior. The feedback from this stage guided the next design iteration, where ergonomics, seat movement, and a more adaptable cabin layout became the main priorities. The folding two-wing table became the main element that enabled these different configurations. Depending on the scenario, one wing, both wings, or neither could be opened, allowing the

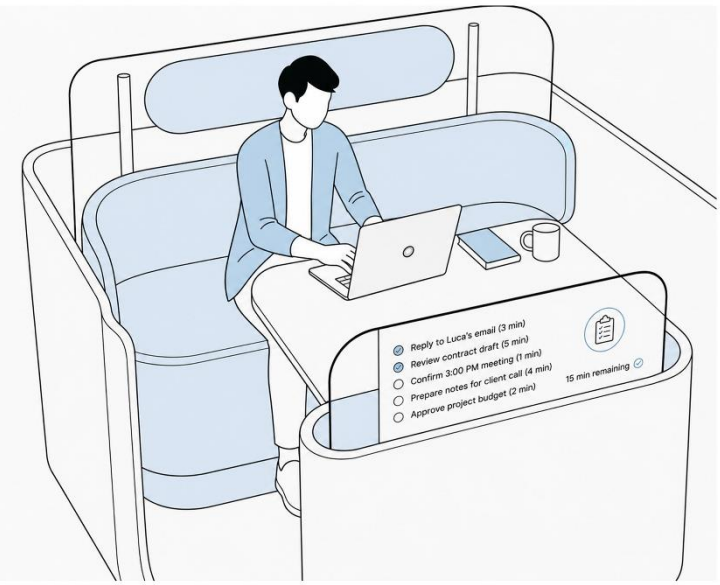
cabin to easily switch between work, meetings, relaxation, family activities, or cargo transportation. This exploration also helped define the role of the digital interface, AI assistance, and adaptable furniture within the cabin.



Scenario building

At this stage, I expanded the project beyond a work-focused robotaxi and started exploring how the cabin could support different moments of users' daily lives. Instead of designing for a single activity, I developed multiple usage scenarios to understand how one flexible interior could adapt to changing needs throughout the day.

By building these scenarios, I realized that the value of GOCO was not only providing a workspace but creating a versatile companion that supports productivity, social interaction, family experiences, and everyday tasks. This phase marked an important shift from designing a mobile office to designing a multi-purpose autonomous living space.



Working mode

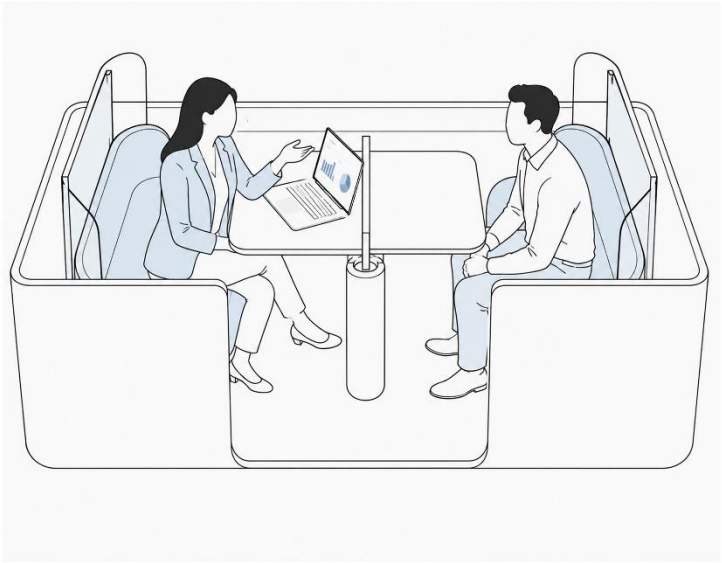
1 wing table

A mobile workspace, enabling passengers to commute-working. A single-wing foldable and height adjustable table provides a comfortable surface for working on a laptop, while the Level 1 transparent screen displays trip information or the work related data.

Online meeting mode

1 wing table

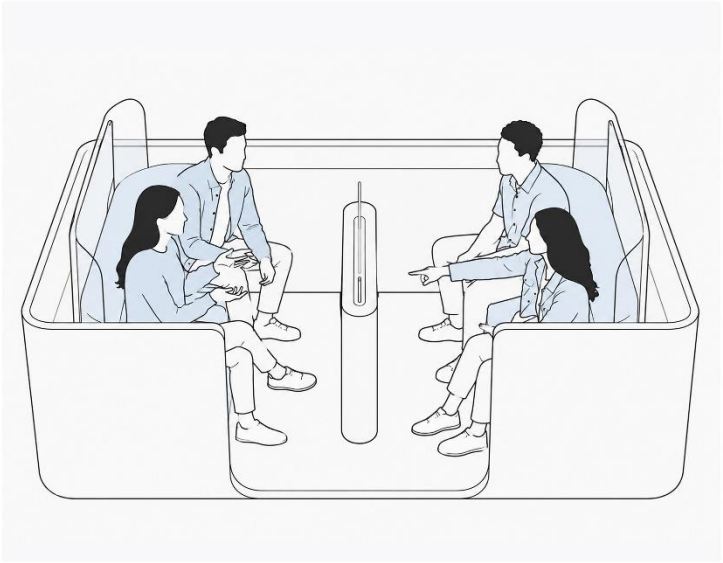
Video calls and virtual meetings. Combined with the single-wing foldable table, it provides a comfortable and professional environment.



In person meeting mode

2 wing table

private meeting space for face-to-face discussions during travel. The dual-wing foldable table creates a shared workspace between passengers.



Family / Social mode

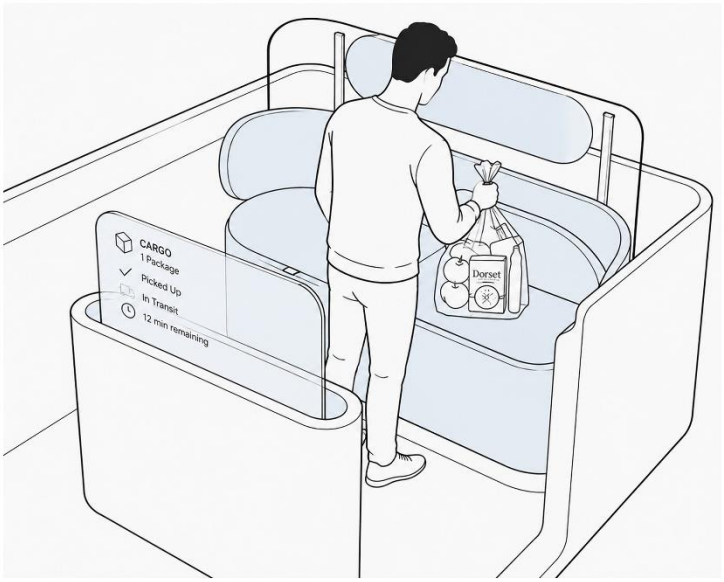
Table closed

social lounge for conversation and shared experiences during travel. The AI knows the personal taste and have interaction with users in case. Mutual trips / Media playing.

Child's mode

The AI can support educational activities, storytelling, city tours, communication with family members, and entertainment throughout the journey. The setup helps children feel accompanied, secure, and engaged while parents remain connected remotely.

- Contacting family
- AI companion (tutor/ city tour/ playful conversations)
- Media playing



Cargo mode

The hidden storage compartment can be easily accessed and provides secure space for grocery deliveries, document transportation, and everyday cargo needs.

Phase 03

Developed version

During this phase, the project evolved from an initial concept into a more practical and ergonomic cabin. The main objective was to improve flexibility while keeping the design clean, simple, and easy to use. Every component was reconsidered to support different activities without occupying unnecessary space or adding complex mechanical systems.

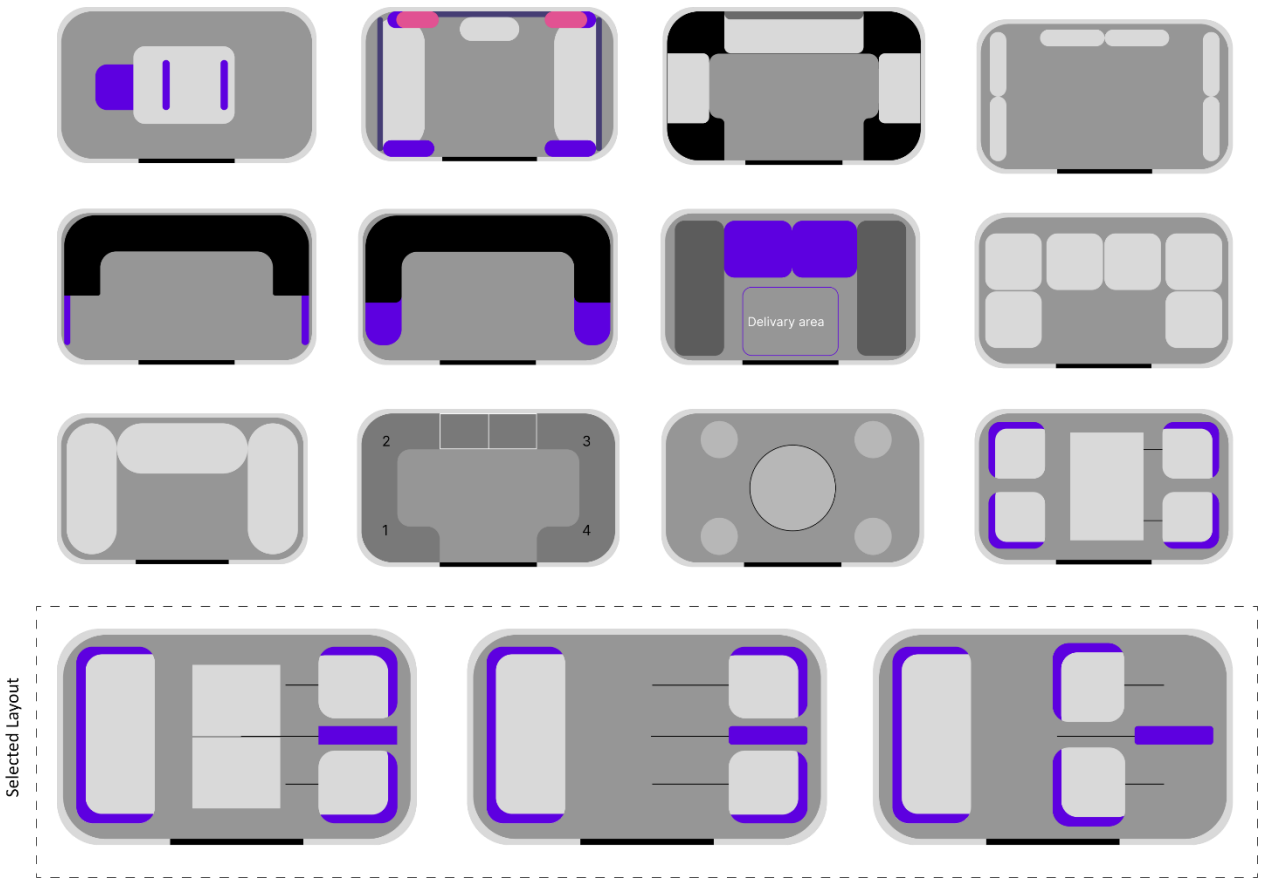
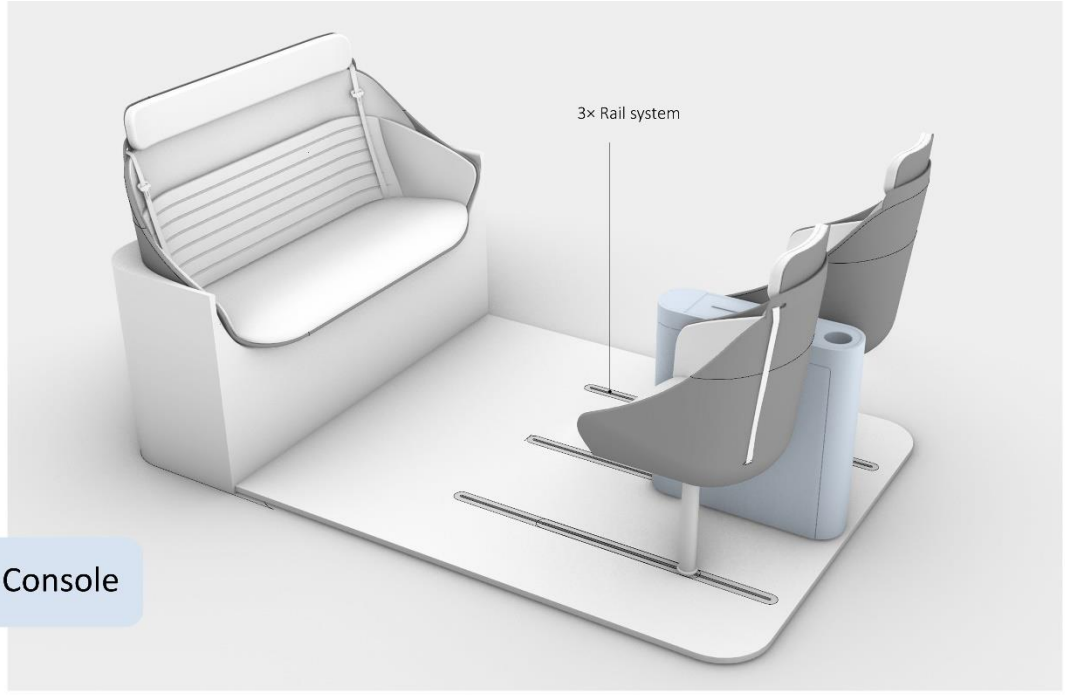
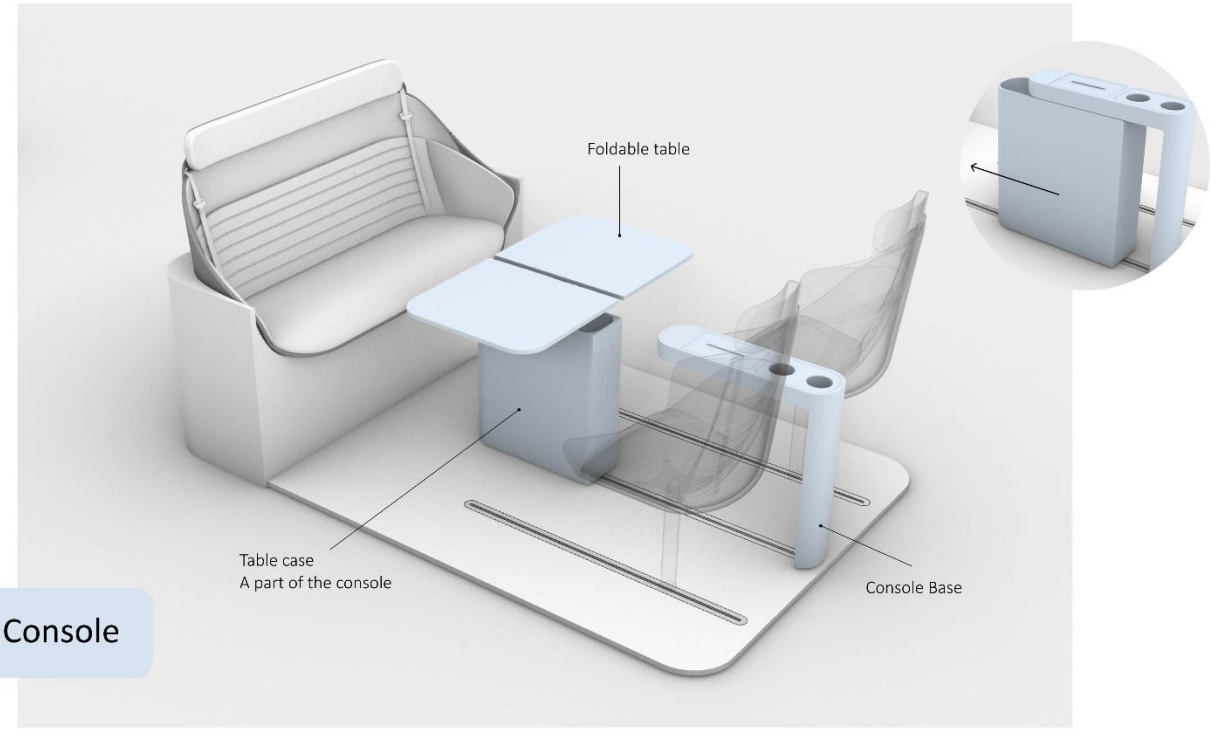


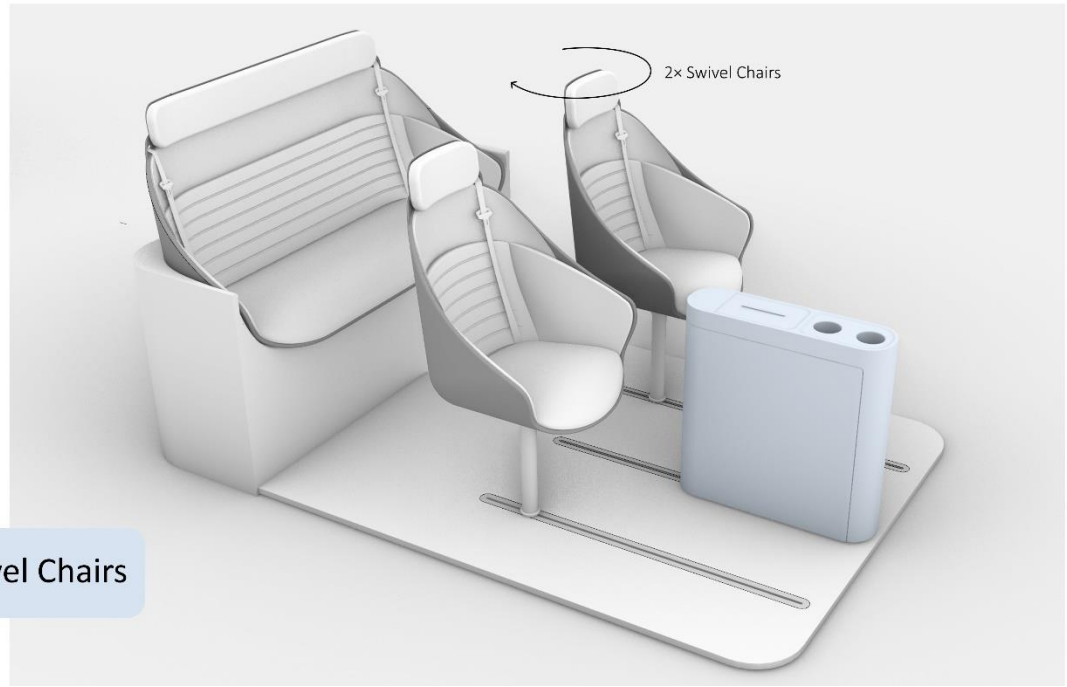
Figure 5. Cabin Top view Layout configuration for more flexibility



Closed Console



Open Console



2× Swivel Chairs

A new rail system was introduced, allowing the front seats and the center console to be repositioned according to different scenarios. The foldable table was integrated into a movable console, making it possible to transform the cabin for work, meetings, or relaxation while keeping the interior open when the table was not needed. The front seats were also redesigned with swivel functionality to improve interaction between passengers and provide a more adaptable seating arrangement.

One of the main improvements in this phase was the introduction of a rail system, which significantly increased the flexibility and adaptability of the cabin. The seating layout was redesigned into a 3+2 configuration, consisting of one large bench seat facing the driving direction and two individual seats positioned opposite it. Unlike the previous concept, the individual seats could slide freely along the floor rails and rotate 360°, allowing passengers to easily adjust their seating position based on different activities. They could face each other during meetings or conversations, rotate toward the driving direction to enjoy the outside view, or create a more open cabin layout when needed. This new seating system solved one of the main limitations of the previous design, where passengers seated in the rear-facing seats were unable to look forward. Overall, the rail system made the cabin much more flexible, user-friendly, and capable of supporting a wider range of travel scenarios while maintaining a clean and modern interior design.

Phase 04

Final cabin design

In this final phase, the project evolved from designing the cabin itself to designing the entire GOCO mobility ecosystem. The focus shifted toward how the robotaxi interacts with users before, during, and after each journey. Instead of functioning only as a vehicle, GOCO becomes an intelligent companion that understands the daily routines, preferences, and schedules of every family member to organize their commuting experience. The AI system connects with users' personal devices, calendars, and smart home systems to automatically plan trips for the following day. It can combine the journeys of different family members, optimize routes, and coordinate multiple tasks into a single itinerary. For example, GOCO can take one passenger to work, drop a child at school, collect groceries or deliveries on the way, and later pick up family members, reducing unnecessary travel while making daily life more efficient. During the journey, GOCO provides personalized assistance based on each passenger's habits and preferences. It can remind users about upcoming meetings, suggest and manage micro-tasks, provide navigation and trip updates, or communicate naturally through voice interaction. For children, the system can offer educational content, entertainment, or facilitate video calls with parents to create a safer and more engaging travel experience. The main interaction happens inside the cabin through the integrated interface and voice assistant, while the companion mobile application is used before the trip to confirm schedules, customize preferences, and review planned routes. Together, these touchpoints create a seamless experience in which GOCO continuously adapts to users' lifestyles, transforming commuting time into productive, meaningful, and personalized moments.

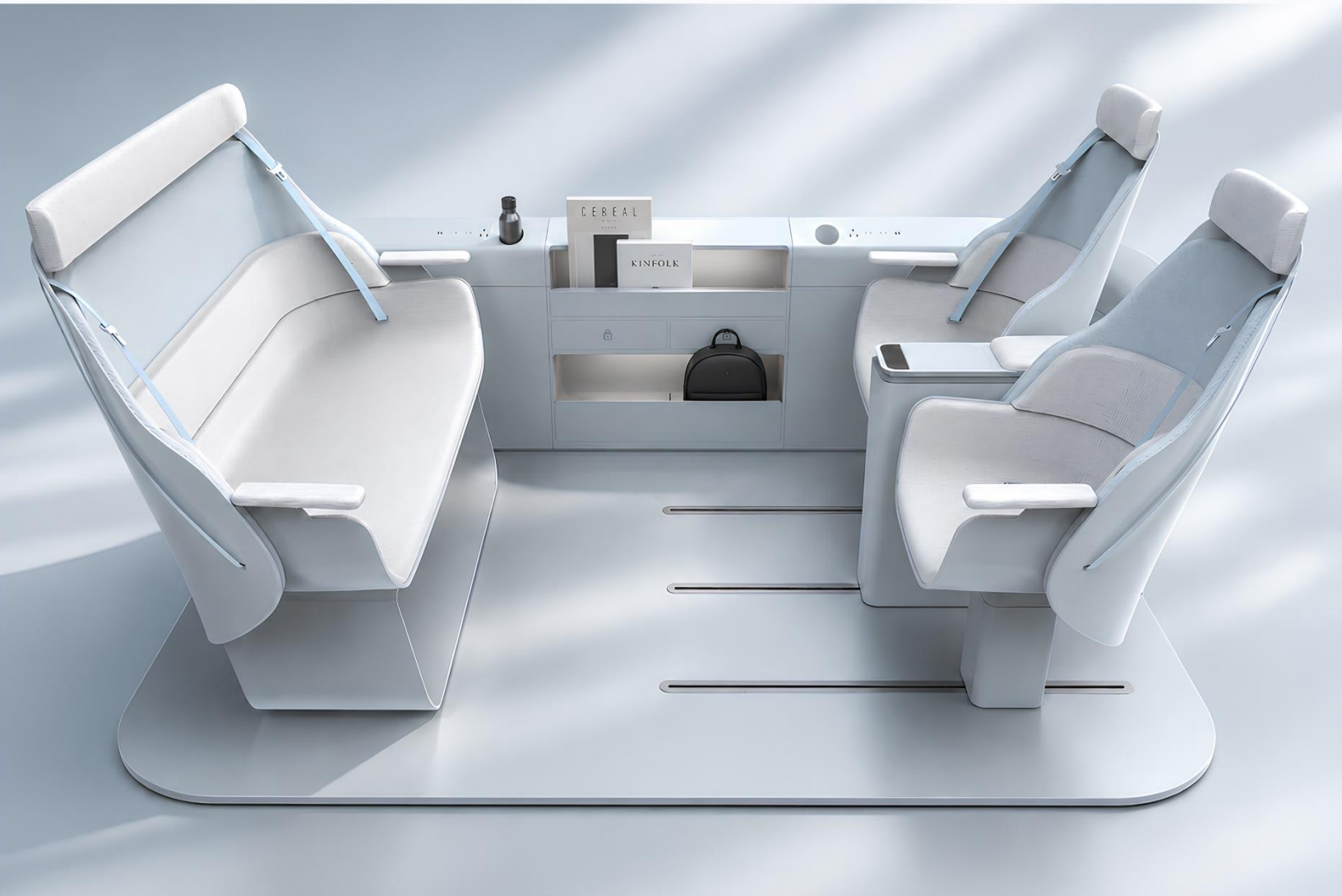
Commute-working

During the commute, **the user** can work on daily tasks while GOCO reminds them of important micro-tasks that might otherwise be forgotten, giving them the opportunity to complete them during the journey. The cabin provides a comfortable seat and an adjustable table with a laptop stopper, ensuring the laptop remains stable while the vehicle is moving. Charging ports and a mug holder are conveniently located next to each seat, allowing the user to stay connected and comfortable throughout the trip.

The table module can slide along the integrated rail system and its height can be adjusted to suit the user's preferred working position. If the user has a bag or suitcase, dedicated storage spaces are available to keep their belongings secure. In addition to working, the user can make video calls or even hold private meetings inside the cabin. For professionals such as lawyers who often require confidential conversations with clients, GOCO provides a quiet and private environment, transforming commuting time into a productive and flexible workspace.

Spaces for Personal Belongings

Several dedicated storage areas for passengers' personal belongings. The upper open shelf is designed for frequently used items such as books, tablets, or notebooks, allowing easy access throughout the journey. Below it, a lockable storage compartment provides a secure place for valuable or confidential items, such as documents or parcels that may need to be picked up or delivered during the day. A bigger space at the bottom is intended for backpacks, handbags, or other medium-sized belongings. Each seat includes integrated charging ports and a mug holder.



The space beneath the seat is reserved for larger luggage, such as a suitcase, helping keep the cabin organized while maximizing legroom and ensuring a clean, uncluttered interior. Together, these storage solutions support both everyday commuting and work-related travel by keeping personal belongings secure, accessible, and well organized.

Everyday Family Life

GOCO extends beyond individual commuting by creating a flexible cabin for families and friends. More than a means of transportation, it offers a comfortable environment where passengers can spend quality time together, socialize, or simply enjoy the journey. The modular seating allows the two single seats to rotate toward the windshield, adapting the cabin for different activities and viewing preferences. For children, GOCO provides a safe and engaging travel experience. The spacious table supports drawing, reading, and other activities, while the AI companion offers entertainment, educational interaction, and communication with parents. By understanding family routines, GOCO can also assist with tasks such as coordinating schedules or school pick-ups. Through its adaptable interior and intelligent companion, GOCO transforms travel into a more connected, enjoyable, and personalized experience for every passenger.

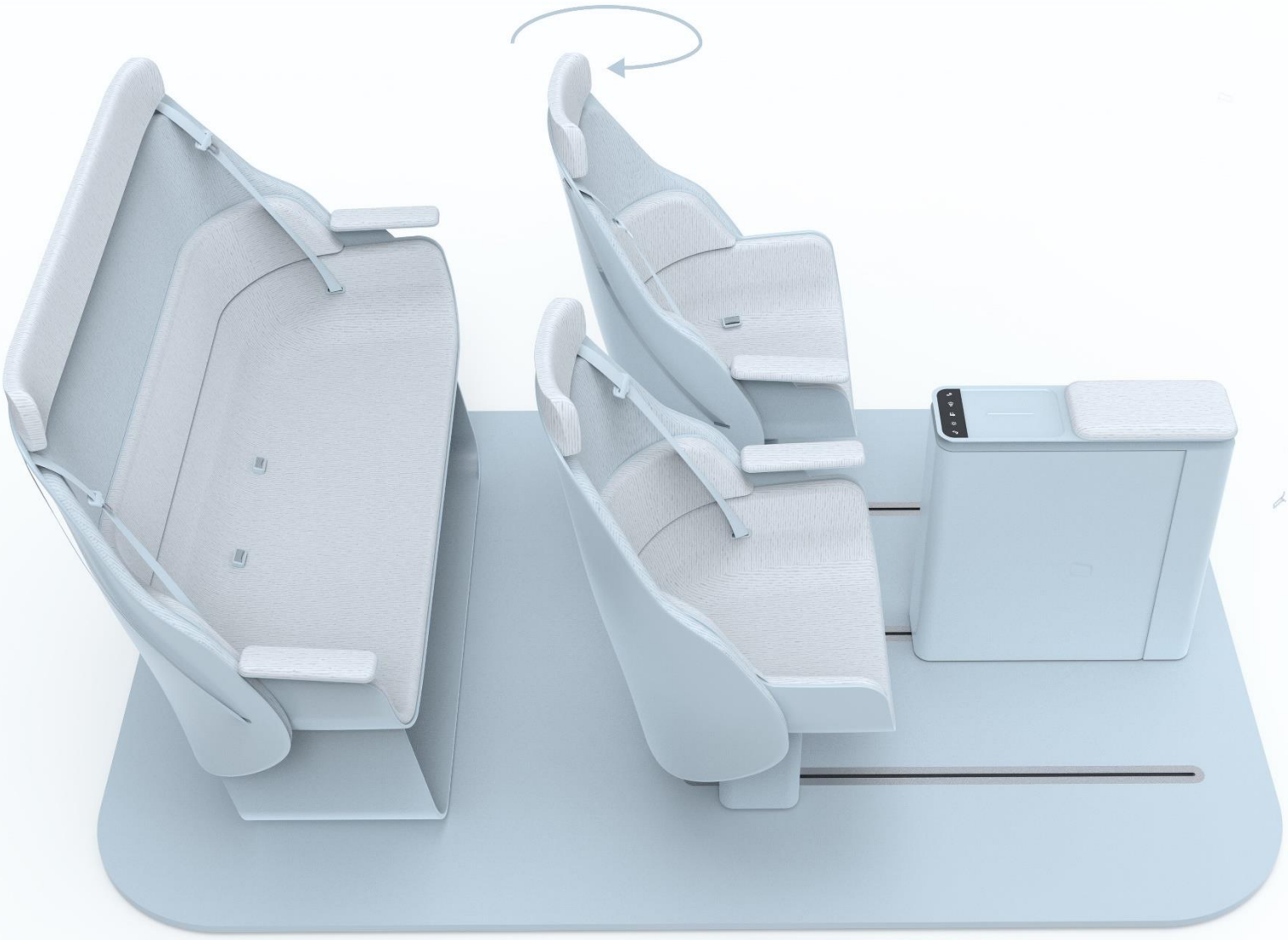
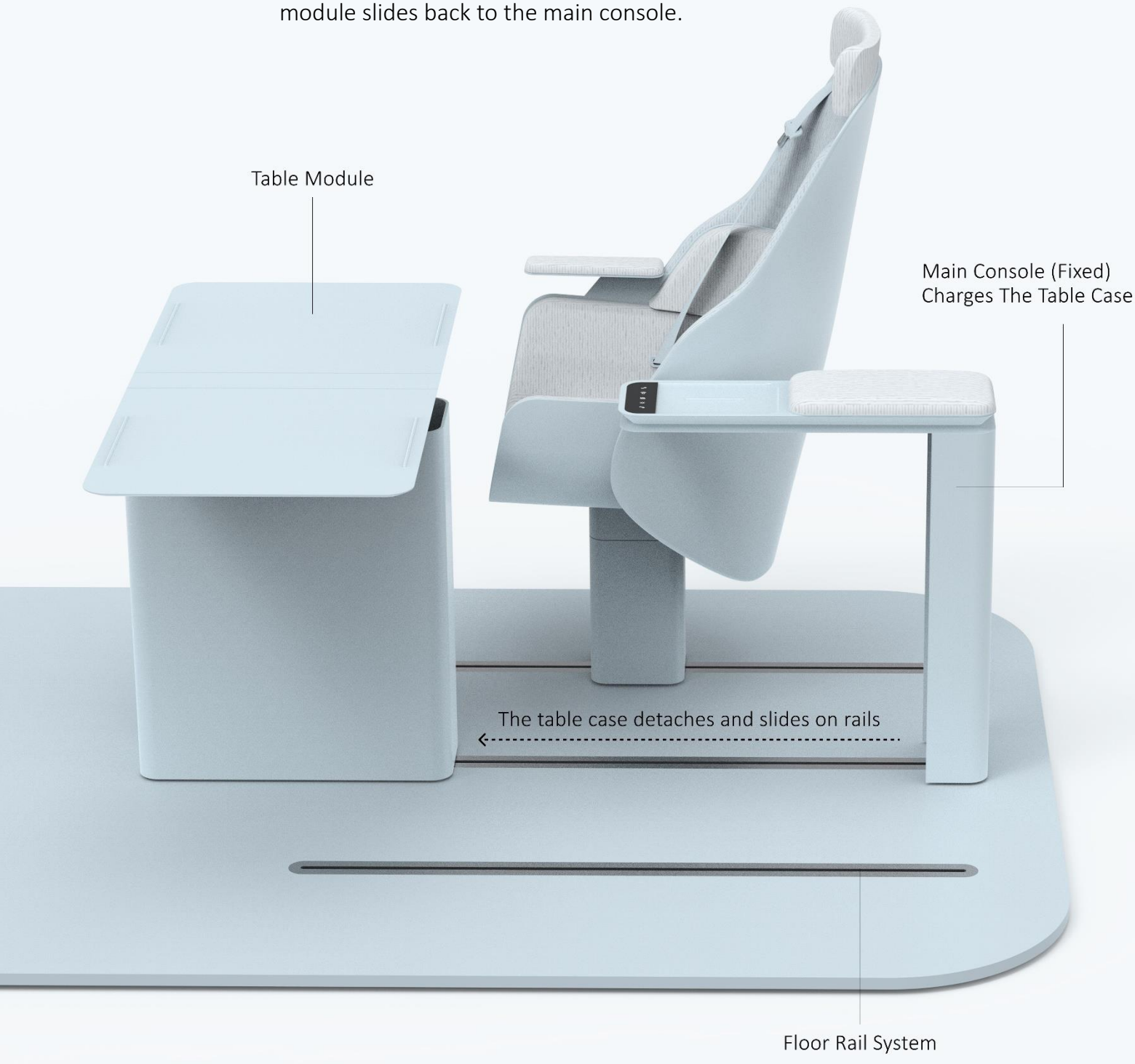
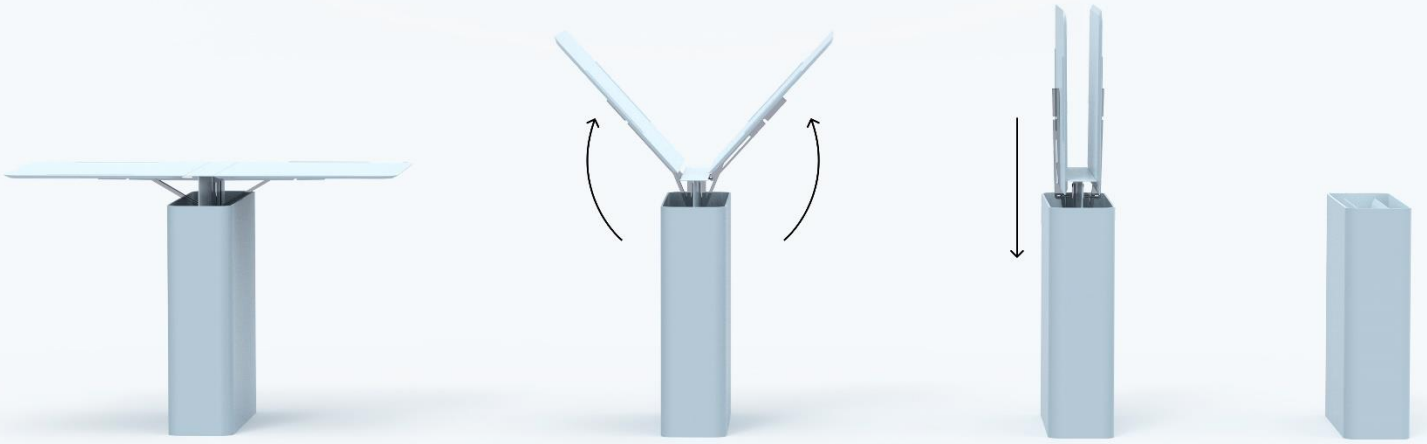


Table Mechanism

The detachable table module moves along the floor rails and locks in the position. Then, the table is lifted by a linear actuator, and the two wings open automatically to create a tabletop. After use, the wings fold back into the case, and the module slides back to the main console.

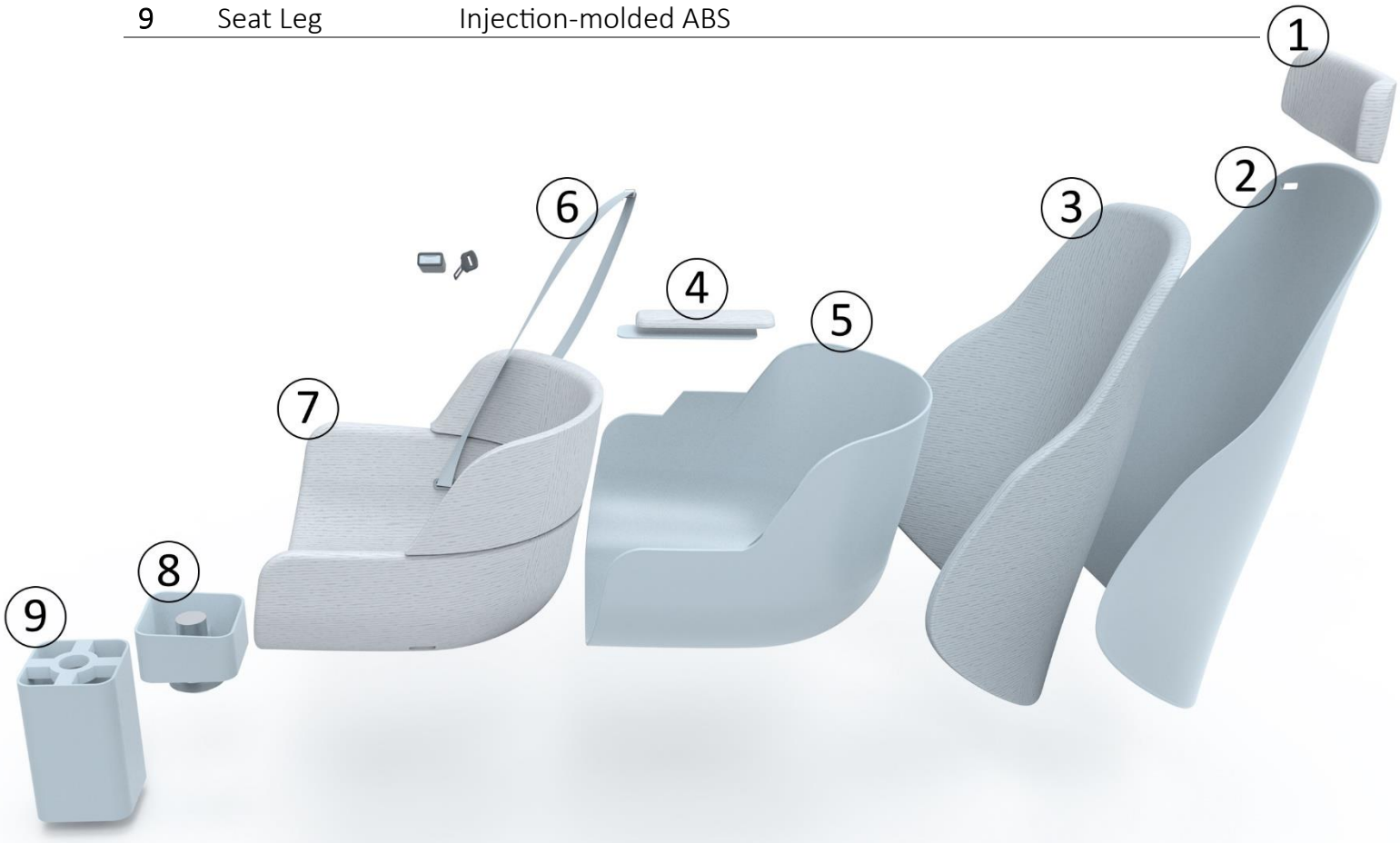


2 Tabletop Wings
4 Four-Bar Linkage
2 Linear Guide Rail
2 Linear Actuator
2 DC Electric Motor


Open
Upward Rotate
Sliding Down
Closed

CMF

No.	Part	Material
1	Headrest	PU foam with Recycled Polyester Fabric
2	Outer Seat Shell	Injection-molded ABS
3	Back Rest Cushion	PU foam with Recycled Polyester Fabric
4	Armrest	ABS core with PU foam and Recycled Polyester Fabric
5	Inner Seat Shell	Injection-molded ABS
6	Seat Belt	Automotive polyester webbing
7	Seat Cushion	High-resilience PU foam with Recycled Polyester Fabric
8	Rotating Part	Injection-molded ABS, steel bearing assembly, and aluminum housing
9	Seat Leg	Injection-molded ABS

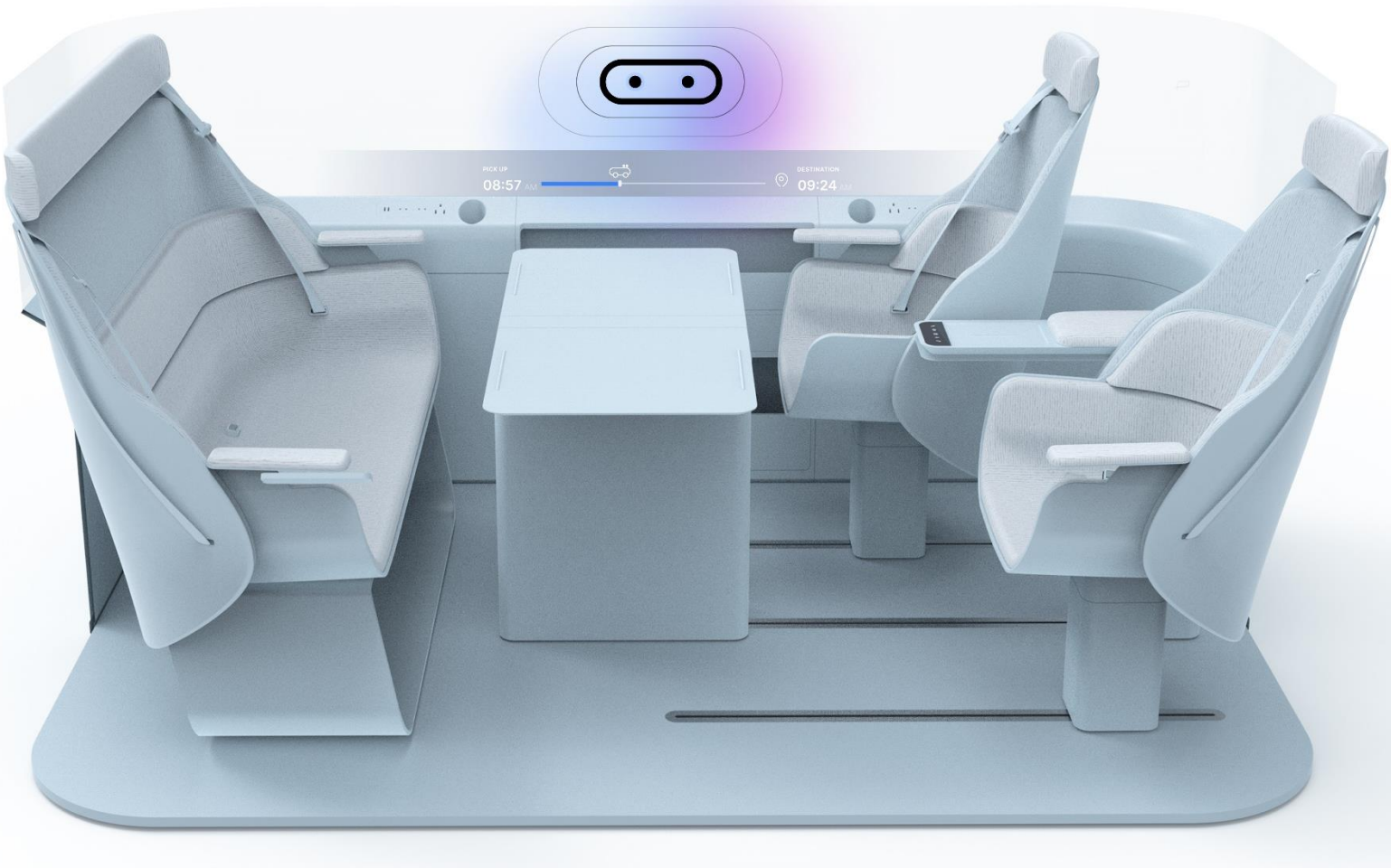


Recycled Polyester Tailored Knit Fabric is a lightweight, breathable upholstery made from **100% recycled PET**. It offers a soft, durable surface, reduces material waste through tailored knitting, and supports sustainable automotive design.

Windshield Interface

The transparent windshield serves as the primary interaction surface, displaying only the information that is relevant at the right moment to avoid overwhelming the user. Contextual information such as navigation, upcoming activities, and journey updates is presented only when needed, creating a clear and distraction-free experience.

Most interactions with GOCO take place through natural voice conversation and the connected mobile application. Users can easily adjust cabin settings, manage their journey, and access personalized services through voice, while the application allows them to review travel plans and confirm AI-generated itineraries before each trip. Together, these interfaces provide a seamless and intuitive user experience.



YOUR RIDE
Ride GOCO-247
Pickup → Spiga 26
Departs at 08:30 from Piazza Gae Aulenti
Arrives at 09:15
RIDE STATUS
On time
Smooth ride ahead
Spiga 26
1.6 km
Arrival 09:15

Branding

To create the identity of GOCO, I wanted to design something simple and friendly. The goal was to create a brand that users can easily connect with and feel comfortable using everyday. Since GOCO is designed as an outdoor companion, emotional connection, and a sense of familiarity was the main interests.

GOCO is created from two main terms: **GO + CO.**

GO refers to going, **movement**, and daily commuting, while CO stands for **companionship**, reflecting the project's vision as an outdoor companion that supports users throughout their daily life.

The font of GOCO is made of all from “O” which symbolize tire and representing the identity of mobility. The capsule shape of the logo is a minimal and simplified representation of a robotaxi. Its clean, rounded form reflects the vehicle's friendly, autonomous, and modern identity while reinforcing the concept of smooth and effortless mobility.

The visual identity uses rounded corners to express movement, smoothness, and a friendly feeling. A playful design language was chosen because GOCO becomes part of the user's everyday routine, so it should feel approachable, warm, and easy to connect with.

The light blue color was selected because it creates a calm and relaxing atmosphere. It is also a color commonly used in work environments, helping users feel focused, comfortable, and less stressed during their journey.

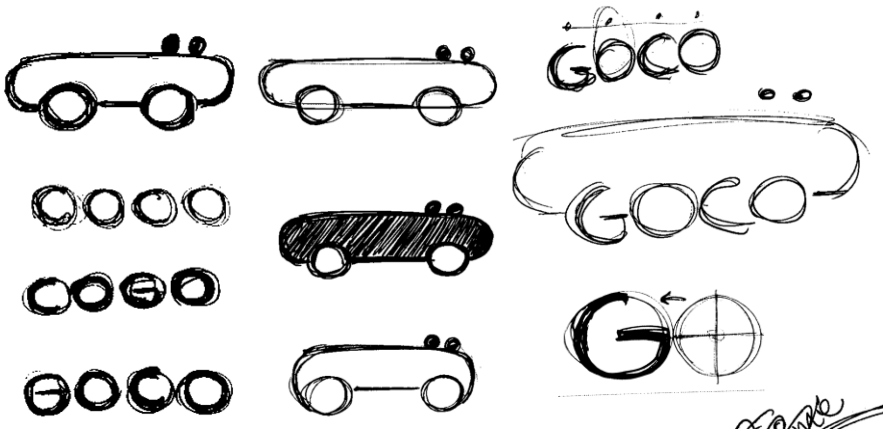


Figure 6. Hand sketches of the logo

Primary Version Logo

GOCO

Logo V1

GOCO

Logo V2

GOCO

Colors

272C2F

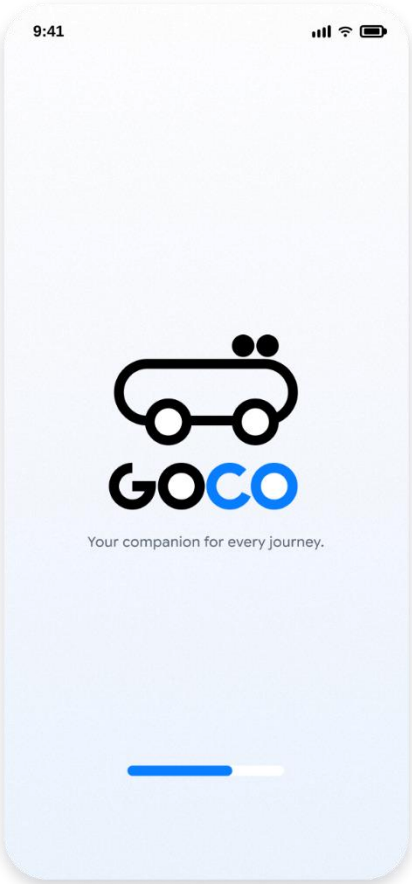
CAD8E3

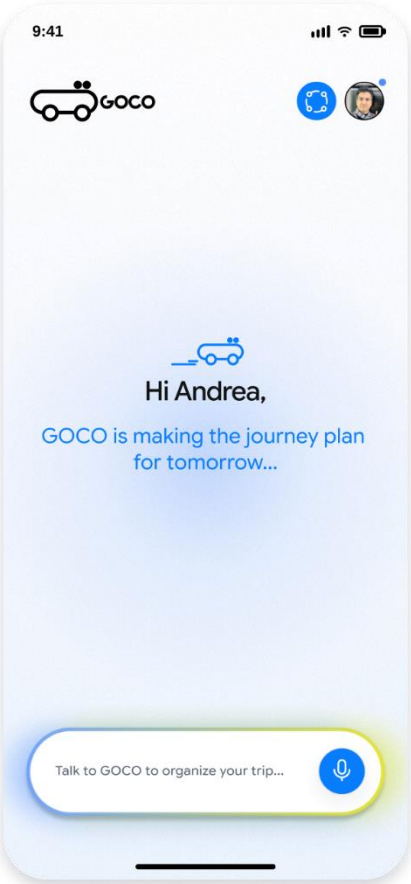
DCE3E9

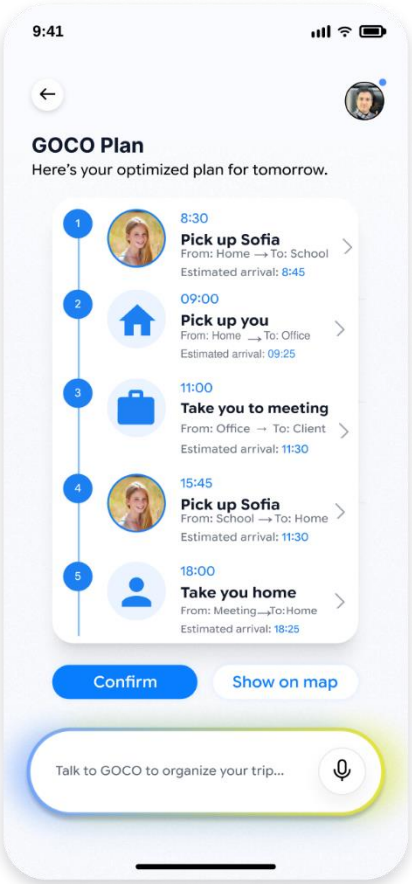
FFFFFF

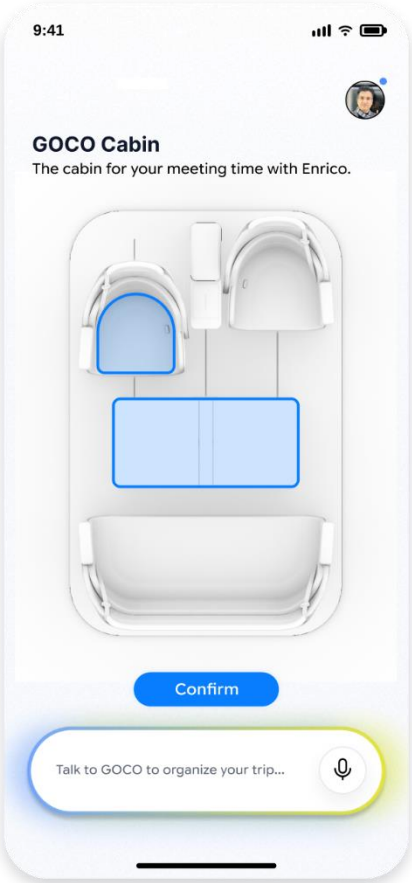
Connected Application

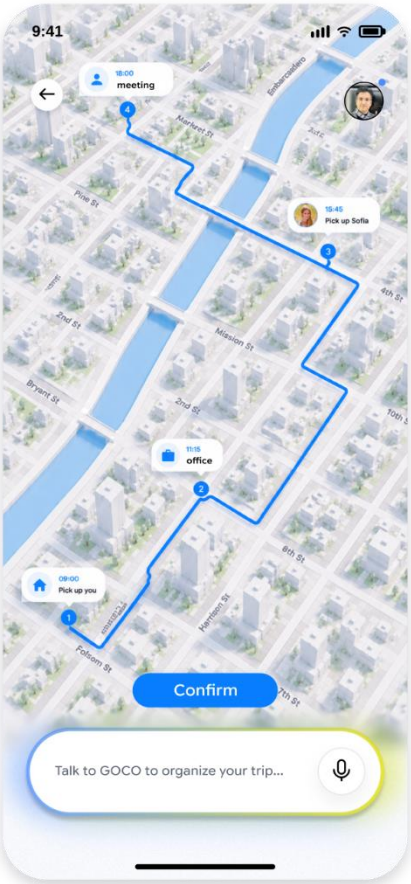
The GOCO connected application is designed to create a seamless interaction between the user and the robotaxi before and during each journey. Rather than functioning as a conventional ride-booking application, it serves as a communication platform between the user and GOCO. Based on the user's calendar, preferences, and daily activities, GOCO automatically generates an optimized travel plan, which is presented through the application for review. The user can make any necessary adjustments, configure the cabin if needed, and provide the final confirmation before the journey begins. During the trip, the application also provides real-time navigation and enables natural interaction with the GOCO AI companion. By integrating trip planning, cabin configuration, navigation, and conversational AI into a single interface, the application extends the companionship experience beyond the vehicle, maintaining a continuous connection between the user's digital life and the autonomous mobility ecosystem.

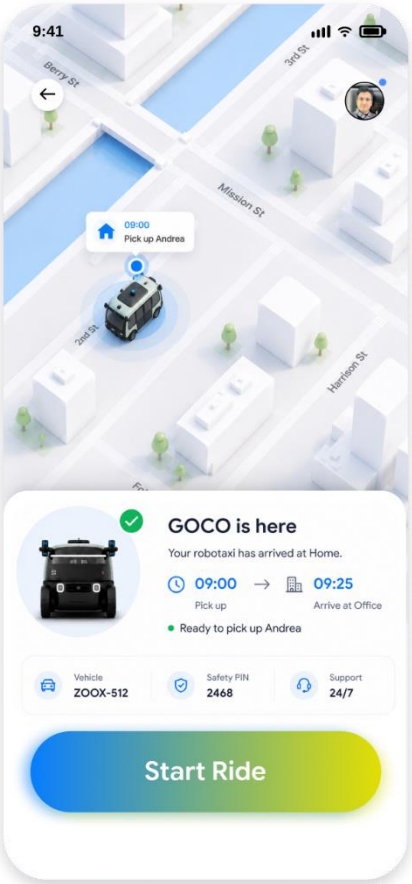

9:41
GOCO
Your companion for every journey.


9:41
GOCO
Hi Andrea,
GOCO is making the journey plan for tomorrow...
Talk to GOCO to organize your trip...


9:41
GOCO Plan
Here's your optimized plan for tomorrow.
1
8:30
Pick up Sofia
From: Home → To: School
Estimated arrival: 8:45
2
09:00
Pick up you
From: Home → To: Office
Estimated arrival: 09:25
3
11:00
Take you to meeting
From: Office → To: Client
Estimated arrival: 11:30
4
15:45
Pick up Sofia
From: School → To: Home
Estimated arrival: 11:30
5
18:00
Take you home
From: Meeting → To: Home
Estimated arrival: 18:25
Confirm
Show on map
Talk to GOCO to organize your trip...


9:41
GOCO Cabin
The cabin for your meeting time with Enrico.
Confirm
Talk to GOCO to organize your trip...


9:41
18:00
meeting
15:45
Pick up Sofia
11:15
office
09:00
Pick up you
Confirm
Talk to GOCO to organize your trip...


9:41
09:00
Pick up Andrea
GOCO is here
Your robotaxi has arrived at Home.
09:00
Pick up
09:25
Arrive at Office
Ready to pick up Andrea
Vehicle
ZOOX-512
Safety PIN
2468
Support
24/7
Start Ride

Conclusion

GOCO reimagines the robotaxi as more than an autonomous means of transportation. Instead of focusing only on moving users from one location to another, the project explores how autonomous mobility can become an outdoor companion that actively supports everyday life. By integrating artificial intelligence, personalized planning, and a flexible interior environment, GOCO transforms commuting into meaningful and productive time while reducing the mental load associated with daily travel.

The research process, including literature review, case studies, user surveys, and in-depth interviews, highlighted that professionals often experience long commutes, fragmented schedules, and continuous task switching. Rather than requiring users to manage every detail themselves, GOCO proposes a human-centered system that understands routines, anticipates needs, and provides proactive assistance before and during each journey. This shifts the role of the vehicle from a passive transport service to an intelligent partner that contributes to productivity, well-being, and stronger connections with family and daily activities.

The interior design reflects this vision through a flexible, lounge-like cabin that supports multiple scenarios, including working, relaxing, meeting, and family travel. Combined with the connected GOCO application and conversational AI companion, the physical and digital experiences become part of a single mobility ecosystem. Users remain in control through simple confirmations and preferences, while the AI manages route optimization, scheduling, cabin configuration, and contextual recommendations.

Although GOCO is a conceptual project, it demonstrates how advances in autonomous driving, artificial intelligence, and connected services can redefine the future of urban mobility. As robotaxis become increasingly available, their value will depend not only on driving automation but also on the quality of the user experience they provide. GOCO suggests that the next generation of autonomous mobility should focus on supporting people's everyday lives, making travel more efficient, more personalized, and more meaningful.

Ultimately, the project argues that future robotaxis should not simply replace the driver—they should become trusted companions that seamlessly integrate with users' routines, helping them reclaim commuting time and creating a more harmonious relationship between mobility, technology, and everyday life.

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