FROM TOUCHDOWN TO TAKEOFF: REDEFINING THE AIRPORT EXPERIENCE *FOR ALL*

Meet the
Team

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INTRODUCTION

Airports serve as vital gateways to global mobility, connecting people, cultures, and economies. Yet, for many travelers, the journey through an airport is fraught with stress, uncertainty, and exclusion. Complex layouts, inconsistent signage, long wait times, and unpredictable disruptions create friction that can leave passengers feeling overwhelmed rather than empowered.

This project takes a human-centered service design approach to critically examine these pain points and identify opportunities for a smoother, more inclusive airport experience. By deeply understanding the needs of diverse travelers— whether first-time flyers, non-native speakers, families, or passengers with accessibility requirements—we aim to redefine the airport journey with a focus on inclusivity, communication and navigation.

Through research, journey mapping, and iterative prototyping, we will explore interventions that enhance wayfinding, communication, and overall passenger flow. Our goal is to design solutions that not only minimize stress but also foster a sense of confidence and ease, ensuring that every traveler, regardless of background or ability, feels supported from check-in to boarding.

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The structure follows our actual design process, ensuring a clear narrative that highlights key insights, challenges, and evolving solutions as we refine the airport experience.

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Discovery & Problem Defintion

Laying the groundwork by analyzing existing services, identifying pain points, and defining our scope.

2

User Research & Strategy

Focusing on understanding traveler needs through research tools and frameworks.

3

Prototyping & Service Development

Exploring low-fidelity prototyping to test and refine the user experience.

4

Refinement & Future Iterations

Developing high-fidelity designs, refining based on feedback, and preparing for user testing.

Discovery
& Problem Definition

The first phase of our design process focuses on understanding the existing airport experience by conducting case studies, analyzing traveler pain points, and identifying opportunities for innovation. By studying current airport services, navigation systems, and user frustrations, we pinpoint key barriers to accessibility, efficiency, and overall user satisfaction.

We then translate these findings into clear problem statements, ensuring we define the right challenges to address before moving into ideation. Finally, we establish the scope of AirEase, ensuring that our solutions align with feasible airport operations and user expectations while addressing the most pressing travel pain points.

Conducting Case Studies

Challenges & Opportunities

Defining Our Scope

Problem Statement

CONDUCTING CASE STUDIES

To create a human-centered and inclusive airport experience, we grounded our design process in empathy and real-world insights, developing detailed personas that represent key user groups:

- A foreign traveler facing language barriers, struggling with unclear signage, communication gaps, and cultural unfamiliarity.
- An elderly couple with limited mobility, navigating accessibility challenges while seeking a smooth and dignified travel experience.
- A single mother traveling with a young child, balancing logistics, security procedures, and the needs of her child.

These personas humanize the systemic issues we uncovered in our research, allowing us to see the airport journey through the eyes of real users.

To deepen our understanding, we mapped each persona's end-to-end airport journey, from arrival and check-in to navigation, and beyond. These journey maps visualize their experiences, highlighting moments of stress, confusion, and inefficiency. By analyzing these key touchpoints, we can pinpoint opportunities to streamline processes, enhance communication, and create a more seamless, supportive experience for all travelers.

Location

Newark Liberty International Airport (EWR), New Jersey

Timeline of Events

- Emma was flying from Newark to Oregon
- Arrived at Newark Airport at 10:00 AM on Thursday
- She has a CLEAR membership (biometric screening for expedited security) but still experienced a 20-minute wait
- Encountered a long TSA line, particularly with many passengers requiring wheelchairs
- Told a TSA officer that her flight was departing in 10 minutes, but received no response or assistance
- Eventually reached her gate but found the experience stressful and frustrating

Positive

- Efficient airport layout helped Emma navigate quickly after security
- Despite delays, she made it to her gate on time

Negative

- Unfriendly TSA staff and tense security environment created a stressful experience
- Unpredictable wait times for CLEAR members

CASE STUDY 1

Emma's Experience:
A Test of Patience at Newark Airport

Emma's journey from Newark to Oregon was defined by inefficiencies and unnecessary stress. Despite having a CLEAR membership, which is designed to expedite security screening, she still faced a 20-minute delay, raising questions about the program's reliability during peak hours. The TSA checkpoint was not only slow but also tense and unwelcoming, with staff displaying impatience and a lack of responsiveness, even when she alerted them about her tight connection.

This experience underscores broader challenges in airport security, where operational efficiency often comes at the expense of passenger experience. Emma's case highlights the need for a balance between security protocols and customer service, ensuring that travelers—especially those using expedited services—experience the seamless, stress-free journey they expect.

CASE STUDY 2

Location

Incheon International Airport (ICN), South Korea

Timeline of Events

- Tam's first flight was delayed, causing her to miss her connecting flight to San Francisco
- Originally, her layover was planned for 4 hours, but it extended to over 10 hours
- She had to obtain a new boarding pass and recheck her luggage
- Security discarded personal materials that were allowed in previous airports
- Tam encountered poor customer service and had to ask to receive compensation
- The language barrier added to the difficulty of navigating the situation

Positive

- Helpful individuals made the long wait more manageable
- Despite poor service, she was eventually accommodated with a new flight

Negative

- Missed connection and extended layover caused significant stress
- Language barrier added to the confusion

Tam's Experience:
A Stressful Layover at Incheon Airport

Tam's journey to the U.S. took an unexpected and stressful turn when a delayed flight caused her to miss her connection to San Francisco. What was meant to be a short layover turned into a 10-hour ordeal, forcing Tam to obtain a new boarding pass and recheck her luggage. Doubling down on her frustration, security confiscated personal items that had been permitted in previous airports, and customer service did not offer the support Tam was hoping for.

This experience highlights the vulnerabilities passengers face when disruptions occur, underlining the need for better communication, timely support, and consistency in security protocols. It also emphasizes the importance of clear communication channels and compassionate service in situations where travelers are stranded, ensuring they feel informed, supported, and valued.

CASE STUDY 3

Location

Newark Liberty International Airport (EWR), New Jersey

Timeline of Events

- Maëla planned her trip in advance but unfortunately did not have her passport, which was still in a visa process
- She tried to use an ID from her home country, but it was not accepted, and she was required to go through the extra security screening
- After waiting 30 minutes for the officer to arrive, she was cleared only 10min before the end of her boarding
- Maëla rushed through the terminal, unsure of the gate's location and struggling with the stress.
- She made it to the gate just in time, being the last passenger

Positive

- TSA allowed Maëla to reach her flight
- Despite the delay, she was able to board the flight

Negative

- The experience caused significant stress and a last-minute rush
- The uncertainty and due to the missing ID led to a frustrating experience

Maëla's Experience:
A Stressful Extra Security Screening

Maëla's experience at Newark Airport was marked by stress and uncertainty. Despite her proactive planning, the lack of accepted identification led to TSA's lengthy extra security screening and an unexpected delay. The 30-minute wait for the officer to arrive compounded the stress, leaving her with limited time to reach her gate.

This case points out how documentation issues can disrupt a smooth airport experience and how important it is for airports to provide clear guidance and support in stressful situations. The lack of clarity about the gate location added to Maëla's anxiety, demonstrating the need for better communication and wayfinding to help passengers navigate efficiently under time pressure. Although Maëla was able to board the flight, the experience emphasized the importance of anticipating potential delays and providing travelers with the necessary support to manage unforeseen challenges.

CHALLENGES AND OPPORTUNITIES

The Pain Points

Across all three case studies, recurring challenges highlight systemic inefficiencies and friction points within the airport experience, which disrupt the passenger journey.Unpredictable security procedures were central pain points, leading to significant delays and confusion for passengers.
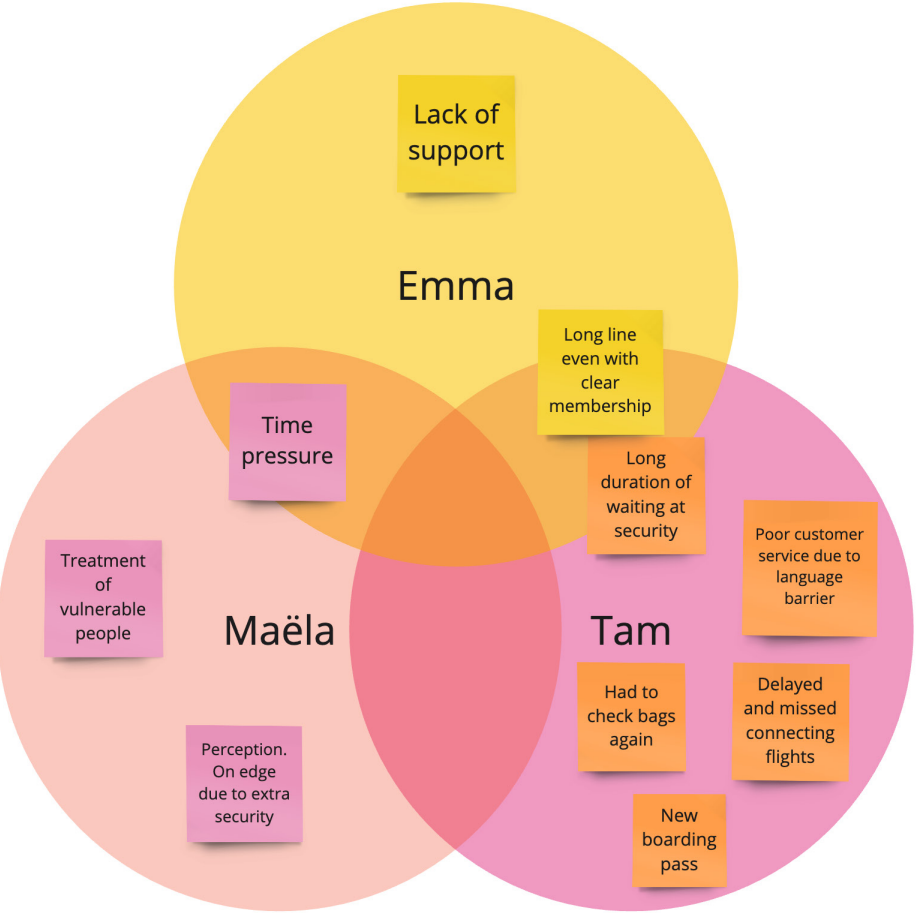
In Case Study 1, Emma faced delays despite using CLEAR, a service meant to expedite her passage, illustrating how long security wait times and inefficient processes contribute to stress. Case Study 2 showed how flight delays and miscommunication about rebooking added frustration, while Tam had to endure poor customer service and a language barrier, making it more difficult to navigate the disruption. Similarly, in Case Study 3, Maëla's lack of valid identification and the extra security screening created a rushed and uncertain journey, forcing her to navigate an unfamiliar terminal under pressure.

These case studies reveal that poor communication, inconsistent procedures, and a lack of support in stressful situations are consistent pain points that contribute to disrupt the travel experience. Addressing these challenges could improve passenger satisfaction and reduce the stress associated with air travel.
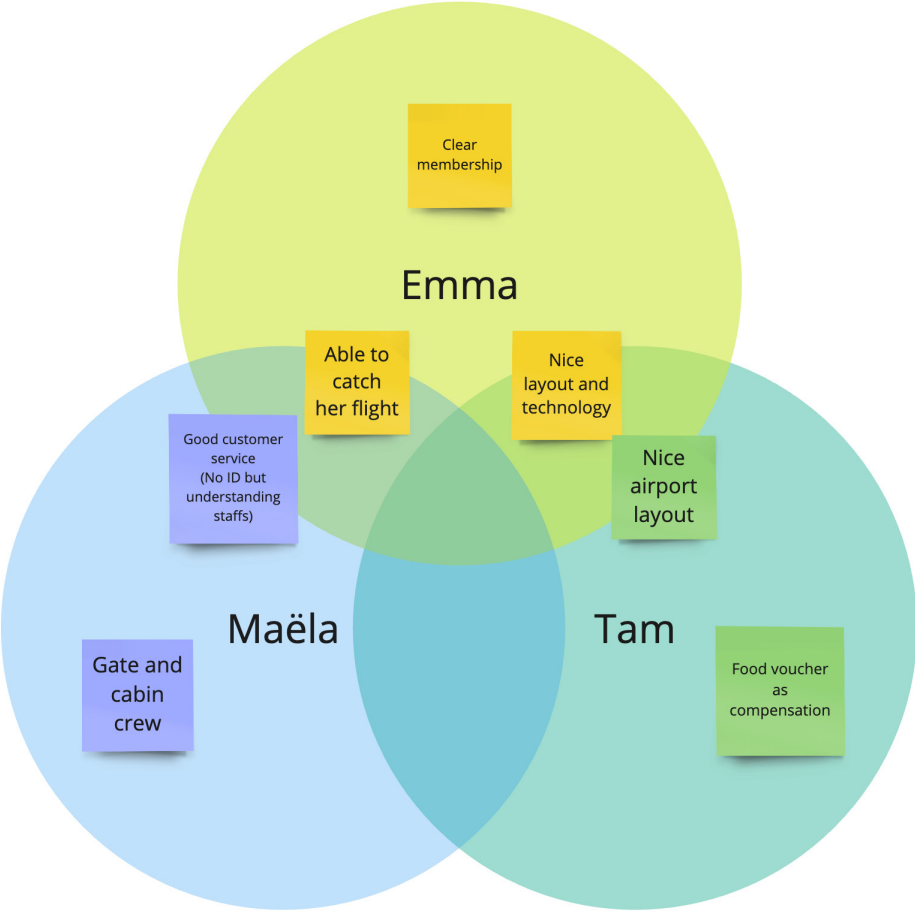
The Positive Aspects

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The Pain Points

Emma
- Lack of support
- Long line even with clear membership
- Long duration of waiting at security

Maëla
- Time pressure
- Treatment of vulnerable people
- Perception. On edge due to extra security

Tam
- Poor customer service due to language barrier
- Had to check bags again
- Delayed and missed connecting flights
- New boarding pass

The Positive Aspects

Emma
- Clear membership
- Able to catch her flight
- Nice layout and technology
- Nice airport layout

Maëla
- Good customer service (No ID but understanding staffs)
- Gate and cabin crew

Tam
- Food voucher as compensation

DEFINING OUR SCOPE

Through our research and early prototyping, we recognized that airport stress is not confined to a single phase or touchpoint—it diffuses through the entire travel experience, from arrival and check-in to security, navigation, and boarding.

To address these challenges holistically, we are taking a systemic approach, ensuring that our solutions can be applied across any airport in the United States. Rather than focusing on isolated improvements, our goal is to enhance inclusivity, communication, and navigation in a way that is adaptable to different airport environments and traveler needs.

A key driver of our approach is technology, which allows us to create seamless, intuitive, and inclusive airport experiences. By integrating real-time guidance and personalized assistance, we can streamline passenger journeys while improving wayfinding, language support, and communication for greater accessibility. Our solutions aim to reduce stress and uncertainty by addressing common pain points such as security bottlenecks, gate confusion, and inconsistent policies. Most importantly, we seek to make every traveler feel seen, special, and supported through intuitive, responsive, and human-centered design.

PROBLEM STATEMENT

"How might we redesign the airport experience to minimize stress, enhance inclusivity, and streamline communication and navigation, ensuring that every traveler feels seen, supported, and empowered throughout their journey? ."

User Research & Strategy

With a clear problem definition, we shift our focus to user-centered research, ensuring that AirEase is designed for real traveler needs. By developing detailed personas and journey maps, we bring our users to life, mapping out their current struggles and envisioning an improved future experience.

To align our design with both user expectations and service feasibility, we apply tools like the Value Proposition Canvas, ensuring that our solution delivers high-value features without unnecessary complexity. We also analyze existing airport layouts and wayfinding systems to understand where our app can enhance navigation and service efficiency.

Personas & Journey Maps

Value Proposition Canvas

Analyzing Existing Airports

PERSONAS & JOURNEY MAPS

To create a human-centered and inclusive airport experience, we grounded our design process in empathy and real-world insights, developing detailed personas that represent key user groups:

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A <u>Foreign Traveler</u> Facing Language Barriers

This persona exercise highlights the significant challenges faced by a foreign traveler who does not speak English or Spanish, such as difficulty understanding signage, communication with staff, and navigating the airport, leading to confusion and stress.

Anh, 27

Characteristics

- Wears a big smile but is often hesitant to approach people.
- Baseball hat and casual attire— tries to blend in.
- Shy & reserved, avoids unnecessary interactions.
- Ultimate people pleaser—doesn't want to disrupt others or seem "lost."

Motivations

- Catch flights on time to visit family or for important personal events.
- Navigate the airport without feeling embarrassed, overwhelmed, or anxious.
- Feel reassured that they are following the correct process.

Frustrations

- Language Barriers: Not being able to understand English or the dominant airport language.
- Unclear Signage: Not understanding signs, fearing he's in a wrong place.
- Long Waits with Uncertainty: Standing in lines, unsure if it's the right one.
- Complex Airport Layouts: Difficulty finding the correct gate.

Desires

- Move through the airport efficiently and confidently without feeling lost.
- Understand where to go without needing to ask for help.
- Have clear, step-by-step guidance to get to the right place.
- Avoid misunderstandings or missing flights due to language barriers.

Magic Wand Wish

- Clear, step-by-step directions from check-in to the gate.
- Fastest security line suggestions to save time.
- Real-time flight updates with alerts for delays or gate changes.

JOURNEY MAP

A Foreign Traveler
Facing Language Barriers

For non-English-speaking travelers, navigating an airport can be disorienting due to language barriers, inconsistent signage, and verbal-only announcements.

	1 Planning	2 Airport Transfer	3 Check-In	4 TSA Queuing	5 TSA Checkpoint	6 Navigation to Gate	7 Announcements	8 Boarding
Actions	Books flight, checks visa and travel regulations.	Enters airport unsure where to go first, tries to find the check-in counter.	Tries to communicate baggage needs, checks in manually or at a kiosk.	Waits in line and tries to understand TSA instructions.	Removes items, goes through scanner, retrieves belongings.	Tries to follow airport signs to find the gate while looking for restrooms.	Waits at the gate, and listens for announcements.	The traveler waits for their boarding group to be called.
Touchpoints	Airline website, travel agents.	Curbside drop-off & app interface.	Check-in counters, self-service kiosks, app interface.	Security checkpoint, TSA queue	TSA screening area.	Wayfinding signs, flight display screens.	Overhead PA system, airport seating, airlines app.	Gate signage, PA system, boarding pass, gate agents.
Positives	Some booking sites offer language selection.	Some pictograms for directions.	Airline staff assists when approached.	Some TSA agents use gestures to assist.	Some signs use icons for guidance.	Some symbols for gates and restrooms are understandable.	Some airports may have staff available to answer questions.	Clear visual boarding signs help guide passengers
Negatives	Unclear baggage rules, hard to navigate airline policies.	English-heavy signage makes navigation difficult.	Language barrier causes confusion, kiosks lack translation options.	Instructions are spoken too fast, signage is mostly in English.	Nervous about misunderstanding procedures.	English-only maps make it easy to get lost. Unfamiliar with airport layout.	English-only annoucements can be difficult to understand for non-English speaker.	Last-minute gate changes or instructions may go unnoticedif the traveler gets confused.

CURRENT STATE

The traveler experiences heightened anxiety due to language barriers, leading to confusion, self-consciousness, and fear of making mistakes. The journey map reveals critical pain points, such as difficulty understanding TSA procedures, struggling to navigate signage, and missing important flight announcements. While some touchpoints provide limited visual or non-verbal guidance, they are insufficient for a seamless travel experience.

This analysis reinforces the need for improved multilingual support, clearer visual communication, and more intuitive wayfinding systems to help foreign travelers navigate the airport independently and confidently. By addressing these gaps, airports can create a more inclusive and stress-free environment for all passengers, regardless of language proficiency.
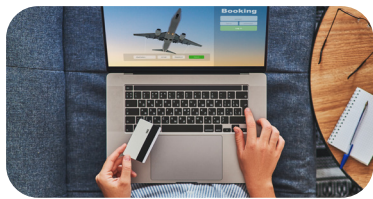
JOURNEY MAP

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	1 Planning	2 Airport Transfer	3 Check-In	4 TSA Queuing	5 TSA Checkpoint	6 Navigation to Gate	7 Announcements	8 Boarding
Actions	Anh books his flight and receives a multilingual travel guide.	Anh arrives at the airport and opens the app for step-by-step check-in guidance.	Anh follows the app's real-time guidance for baggage drop.	At the TSA line, Anh uses the app's visual guide for security screening.	Follows app's guidance and moves smoothly through security.	Anh gets real-time navigation to his gate in Vietnamese.	The app automatically translates annoucemnts and displays it as text.	Anh receives a boarding reminder in his language and proceeds confidently.
Touchpoints	Airline website, travel agents, app interface.	Curbside drop-off & app interface.	Check-in counters, self-service kiosks, app interface.	Security checkpoint, app interface.	TSA security screening area, app interface.	Terminal corridors, airport signage, app interface.	Lounge area, airport seating, app interface.	Gate area, flight display screens, app notifications.
Improvements	Clear instructions in Anh's native language, reducing anxiety.	No confusion about where to go first; instructions are displayed in his native language.	No need to ask for help; the app provides automated, translated instructions.	No language barrier issues; clear visual instructions reduce stress and mistakes.	Faster, stress-free security process; avoids miscommunication.	No need to decipher airport signage; clear turn-by-turn navigation.	Prevents missed flight information, ensuring he stays updated.	Removes the guesswork from the boarding process, ensuring he follows the correct procedure.
App Assistance	The app sends a personalized travel checklist in Vietnamese	The app greets him and guide him trough the terminal.	The app displays step-by-step instructions and directs him to the security checkpoint.	The app provides clear instructions, and how to place belongings in security trays.		The app provides visual and text-based navigation, guiding him to his gate with clear cues.	The app detects important announcements and instantly provides a translated version.	The app provides a real-time notification with boarding group details.

FUTURE STATE

We chose to focus on TSA, and Navigation to Gate because these are high-stress moments where miscommunication can lead to delays, security issues, or even missed flights. While the app provides translation support, the TSA process presents a unique challenge—travelers must follow instructions without access to their phone during screening.

To address this, the app delivers visual step-by-step guidance before they reach the checkpoint, ensuring they are prepared in advance. Additionally, real-time navigation to the gate eliminates reliance on unclear signage, preventing unnecessary detours. This approach doesn't just reduce stress; it ensures autonomy, allowing travelers to move through the airport with confidence rather than depending on others for assistance.

An <u>Elderly Couple</u> with Limited Mobility

This persona exercise highlights the key accessibility challenges elderly travelers face, shedding light on how airport environments often fail to address their unique physical and cognitive needs. Many airports lack sufficient accommodations.

Additionally, cognitive challenges, such as difficulty navigating complex systems or remembering instructions, can be exacerbated by overwhelming crowds and a lack of support. This exercise underscores the importance of creating more inclusive, thoughtful environments that consider the diverse needs of elderly travelers, ensuring they feel supported and empowered throughout their journey.

James, 84

Characteristics

- Prefers structure and planning but dislikes relying too much on technology
- Independent-minded but acknowledges his physical limitations
- Appreciates good service, gets frustrated by disorganization

Motivations

- Excited to visit family and spend time with his grandchildren.
- Still loves traveling, but wants it to be hassle-free.
- Wants to prove to himself that he can still travel without being overly dependent.

Frustrations

- Navigating airports feels overwhelming – distances are too long, signage isn't clear, and wheelchair assistance isn't always easy to find.
- Lack of control over the experience – hates feeling like a burden to others.
- Hard-to-use technology – digital check-in kiosks and airport apps are confusing.

Desires

- More independence while traveling without feeling like he needs constant help.
- A smoothprocess that doesn't require last-minute scrambling.
- More seating and resting spots along the journey.
- A quieter environment where he can easily hear flight announcements.
- Quick and reliable assistance.

Magic Wand Wish

- If James had a magic wand, he would have seamless wheelchair assistance, clear large-text instructions, and quiet waiting areas, making his journey stress-free.

Margaret, 76

Characteristics

- Organized and practical – likes to be prepared and in control.
- Warm and nurturing – always looking out for her husband's needs.
- Patient but can get overwhelmed when things don't go as planned.
- Not very tech-savvy but willing to try if it makes things easier.

Motivations

- Enjoys traveling but values comfort over adventure.
- Excited to spend time with family and create memories.
- Wants to make sure James is well taken care of without feeling overwhelmed herself.

Frustrations

- Airports are exhausting – long walks, heavy luggage, and limited seating make traveling draining.
- Assistance isn't always reliable – sometimes has to hunt down a wheelchair or wait too long for service.
- Not enough clear signage for accessibility services – information desks are hard to locate.

Desires

- A more seamless, organized travel experience so she doesn't feel like she's juggling too much.
- Reliable assistance allowing her to focus on James, not logistics.
- Easier security and boarding procedures that feel less stressful.
- Comfortable seating in all areas so she doesn't have to stand too long.

Magic Wand Wish

- If Margaret had a magic wand, she would ensure reliable help without delays, dedicated elderly-friendly security lanes, and a guided, step-by-step travel experience, so she could focus on enjoying the trip with James.
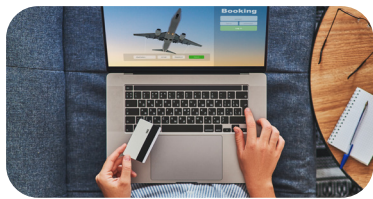
JOURNEY MAP

An Elderly Couple
with Limited Mobility

Elderly travelers often face physical strain from long walking distances, prolonged standing, and difficulties navigating crowded spaces.

	1 Planning	**2** Airport Transfer	**3** Check-In	**4** TSA Queuing	**5** TSA Checkpoint	**6** Navigation to Gate	**7** Waiting at Gate	**8** Boarding
Actions	Books flight, arranges wheelchair assistance, packs	Gets dropped off, searches for wheelchair	Uses kiosk or counter, checks bags.	Waits in security line with mobility aid.	Removes items, goes through scanner, retrieves belongings.	Moves through terminal, looks for resting spots.	Looks for food or lounges.	Tries to hear announcements, boards with assistance.
Touchpoints	Airline website, travel agents.	Curbside drop-off, wheelchair, information desk.	Airline kiosk, check-in counter.	Security checkpoint, TSA Assistance Lane.	TSA screening area.	Elevators, Terminal corridors, airport signage.	Restaurants, lounges	Gate area, flight display screens, airline staff.
Positives	Can request assistance in advance.	Staff sometimes assists.	Staff assists when asked.	Some priority access available.	Some agents assist elderly	Some moving walkways.	Some quiet areas exist.	They can pre-board.
Negatives	Booking sites can be complex, accessibility options unclear.	Long walk to check-in, wheelchair stations hard to find.	Kiosks hard to use, long wait time.	Long standing time, no seating.	Removing shoes hard, slow screening process.	Limited seating, unclear mobility routes.	Hard to reach food courts, limited seating.	Crowded seating, unclear announcements.

CURRENT STATE

Margaret and James' frustrations—long walking distances, unclear signage, difficulty finding assistance, and lack of comfortable waiting areas—reveal systemic issues that create stress and dependency on others. While some priority access services exist,

they are not always easy to locate or use efficiently, leading to anxiety and frustration. The journey map also shows that while moments like pre-boarding and quiet lounges provide relief, gaps remain in wayfinding, security screening, and mobility support.
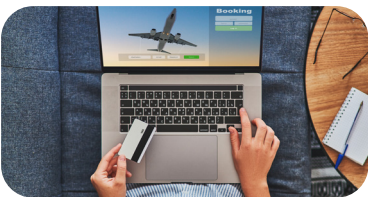
This analysis reinforces the need for proactive, technology-driven solutions, such as real-time navigation with accessible routes, virtual queuing for TSA, and automated mobility assistance requests, to ensure a more seamless and dignified travel experience.

JOURNEY MAP

Elderly travelers often face physical strain from long walking distances, prolonged standing, and difficulties navigating crowded spaces.

	1 Planning	**2 Airport Transfer**	**3 Check-In**	**4 TSA Queuing**	**5 TSA Checkpoint**	**6 Navigation to Gate**	**7 Waiting at Gate**	**8 Boarding**
Actions	They book flight, and pack.	They arrive at Newark International Airport and open the app.	They check-in at kiosk or counter and check bags.	Instead of standing in line, they queue virtually via the app.	A notification alerts them when it's their turn.	The app guides them smoothly through the terminal.	They head to a quiet lounge where they can rest before boarding.	They receive real-time flight updates and a pre-boarding reminder.
Touchpoints	Airline website, travel agents, app interface.	Curbside drop-off, wheelchair, app interface.	Check-in counters, self-service kiosks, app interface.	Security checkpoint, TSA Assistance Lane, app interface.	TSA Assistance Lane and security screening area, app interface.	Terminal corridors, airport signage, app interface.	Lounge area, airport seating, app interface.	Gate area, flight display screens, app notifications.
Improvements	Mobility assistance is prebooked. Priority TSA lane access is confirmed in advance.	No waiting —an agent is automatically dispatched when they check in via the app.	Real-time directions to priority check-in and baggage drop points, eliminating guesswork.	No need to stand in line. The app keeps them informed trough virtual queue and wait time.	They remain seated until it's time to go through security, avoiding fatigue. No last-minute rushing.	Clear navigation ensures they follow the most accessible path.	Instead of waiting in noisy, crowded seating areas, they relax in a dedicated peaceful space.	No need to listen for announcements. They receive personalized alerts.
App Assistance	App confirms pre-booked mobility services, sends reminders, and provides a travel itinerary.	The app greets them and an agent arrives within minutes.	The app guides them to the priority check-in counter, reducing confusion.	Displays: "You are in the priority queue. Please proceed to the assistance lane in 11 minutes."	The app displays: "You are next in queue, please proceed now to the priority lane."	The app displays an accessible route, highlighting elevators and rest areas along the way.	The app suggests a quiet relaxation lounge nearby. A guided path appears, leading them there.	The app notifies them: "Your flight begins pre-boarding in 10 minutes."

FUTURE STATE

Curbside Drop-Off, TSA, and Relaxation Options while waiting for boarding were prioritized because they address both logistical and physical challenges. While curbside mobility assistance is pre-arranged, unexpected delays or miscommunication can occur.

The app ensures real-time coordination with airport staffs so that travelers are not left waiting without support. At TSA, the biggest concern is long queues and standing for extended periods. The app's virtual queue system allows them to remain seated until it's their turn, minimizing exhaustion. Finally,

rather than being confined to noisy, high-traffic waiting areas, the app guides them to quiet lounges or accessible seating. These interventions ensure a dignified and stress-free experience, allowing elderly travelers to navigate the airport comfortably and independently.

An <u>Elderly Couple</u> with Limited Mobility

This persona exercise highlights the significant and often overwhelming multitasking burden placed on parents traveling alone with young children. It underscores how parents must manage a multitude of responsibilities simultaneously.

From handling luggage and navigating security procedures to keeping their children entertained and ensuring their safety, the constant juggling of physical, emotional, and logistical tasks creates a high-stress environment, making the travel experience more challenging for single parents. This exercise also emphasizes the need for thoughtful design solutions that can streamline and ease these complex processes, ultimately making travel more manageable and enjoyable for families.

James, 84

Characteristics

- Patient but may feel overwhelmed by stress or unexpected challenges.
- Protective of her child's safety and well-being.
- Values time-saving solutions and convenience.

Motivations

- Able to balance her responsibilities as a parent while managing travel logistics efficiently.

Frustrations

- Long queues and delays, especially with a restless child.
- Lack of family-friendly facilities (e.g., nursing rooms, play areas, stroller access).
- Difficulty managing luggage, tickets, and her child simultaneously.
- Limited assistance for solo parents traveling with young children.

Desires

- A seamless, stress-free travel experience from check-in to boarding.
- Clear communication and support from airport staff.
- Quick and efficient security checks that accommodate families.
- A calm, welcoming environment that caters to both her and her child's needs.

Magic Wand Wish

- A dedicated family lane for check-in, security, and boarding.
- On-site childcare assistance or babysitting services for short breaks.
- Interactive play areas near gates to keep her daughter entertained.
- Quiet, comfortable resting zones for parents and children.

Margaret, 76

Characteristics

- Curious, energetic, and easily distracted.
- May feel anxious or overwhelmed in crowded or noisy spaces.
- Relies on her mother for comfort and reassurance.
- Short attention span and needs constant stimulation.

Motivations

- To explore and have fun in a new environment.
- To feel safe and close to her mother

Frustrations

- Long periods of waiting with nothing to do.
- Confusion or fear in loud, crowded, or unfamiliar spaces.
- Boredom during flights or while sitting still.
- Discomfort from hunger, thirst, or tiredness.

Desires

- Fun, engaging activities to keep her entertained (e.g., play areas, interactive screens).
- Comfortable spaces to rest or nap. Easy access to snacks, drinks, and kid-friendly meals.
- A sense of safety and closeness to her mother.

Magic Wand Wish

- A magical playground at the airport with slides, toys, and games.
- A cozy, quiet space to nap or relax with her mom.
- A chance to meet other kids and play together.

JOURNEY MAP

A <u>Single Mother</u>
with her Young Child

For a parent traveling alone with a child, airport stress comes from juggling security procedures, managing the child's needs, and minimizing disruptions.
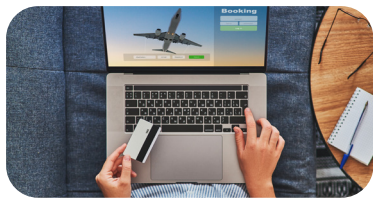
	1 Planning	**2** Airport Transfer	**3** Check-In	**4** TSA Queuing	**5** TSA Checkpoint	**6** Navigation to Gate	**7** Airport Retail	**8** Waiting at Gate
Actions	Books flight, packs essentials for child, plans snacks.	Manages child, and luggage while navigating drop-off.	Uses self-service kiosk while keeping child occupied.	Waits in line, entertains child, prepares for security check.	Removes items, goes through scanner, retrieves belongings.	Walks long distances while managing child, stroller, and carry-ons.	Buys snacks, finds seating, looks for child-friendly entertainment.	Entertains child, keeps track of boarding time.
Touchpoints	Airline website, app, email notifications.	Curbside drop-off, baggage carts, airport staff assistance.	Check-in counters, self-service kiosks.	Security checkpoint, designated family lanes (if available).	TSA screening area, security bins.	Terminal corridors, airport signage.	Restaurants, shops, kids' zones, airport lounges.	Gate seating area, boarding queue.
Positives	Family boarding often available.			Some airports have family lanes, occasional assistance from TSA agents.	Some TSA agents assist, security procedures in place for families.		Some airport have play areas, fand some restaurants have food options for kids.	Early boarding for families, some seating areas have charging stations.
Negatives	Hard to find child-friendly travel info, uncertainty about TSA rules for kids.		Juggling child and documents makes the process stressful, long lines at counters.	Long waits lead to impatience, difficulty managing child and carry-ons.	Child gets anxious, no clear guidance on family-friendly security options.	Hard to find family restrooms, limited play areas, exhaustion from carrying child.	Food lines are long, limited child-friendly dining areas, overstimulation from airport environment.	Child gets bored and restless, stressful boarding process with luggage and stroller.

Mackenzie struggles to balance time pressure, security procedures, and her child's needs while managing luggage and documents. TSA is especially challenging as she juggles belongings, keeps her child on track, and follows regulations without phone access. Long waits and limited child-friendly engagement add stress, making the journey feel chaotic. Though helpful staff provide relief, no seamless solution integrates navigation, entertainment, and logistics.

This highlights the need for pre-boarding organization tools, digital wayfinding, real-time notifications, and engaging child-friendly solutions that allow parents to focus on their journey without feeling overwhelmed.
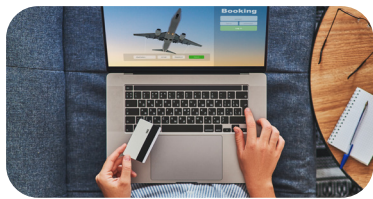
JOURNEY MAP

A <u>Single Mother</u> with her Young Child

For a parent traveling alone with a child, airport stress comes from juggling security procedures, managing the child's needs, and minimizing disruptions.

	1 Planning	**2 Airport Transfer**	**3 Check-In**	**4 TSA Queuing**	**5 TSA Checkpoint**	**6 Navigation to Gate**	**7 Airport Retail**	**8 Entertainment**
Actions	Books tickets, selects a child-friendly travel option, and pre-orders food.	They arrive at Newark International Airport and open the app.	They check-in at kiosk or counter and check bags.	Kiara watches a fun, child-friendly animation that explains TSA's role.	Sarah smoothly moves through TSA while Kiara follows instructions.	Sarah gets a notification that Emma's meal is ready at McDonald's.	Sarah shops duty-free perfume trough the app, selecting gate-delivery.	The app notifies them about an AR Art Exhibition to keep Kiara engaged.
Touchpoints	Airline website & airport app interface.	Curbside drop-off & app interface.	Check-in counters, self-service kiosks, app interface.	Security checkpoint, app interface.	TSA security screening area, app interface.	Terminal corridors, airport signage, app interface.	Duty-free store, app interface.	Play area, AR exhibit, app interface.
Improvements	Allows advanced meal orders and airport shopping to save time later.		Real-time directions to priority check-in and baggage drop points, eliminating guesswork.	Kiara is engaged and prepared, reducing stress for Sarah.	TSA experience is efficient and stress-free, with no tantrums or confusion.	No waiting in lines — pre-ordered food is ready when they arrive	Avoids rushing through stores with an impatient child.	No need for screen-based distractions — Kiara is engaged while Sarah relaxes.
App Assistance	App provides a family travel checklist and a pre-order option for food & duty-free shopping.		The app guides them to the family check-in counter, reducing confusion.	App plays kid animation and provides Sarah with a checklist for TSA prep.	Virtual checklist for parents, and a child-friendly security process.	The app notifies that pe-ordered meal is ready. A map appears, guiding them to pickup.	App confirms: "Your order will be delivered at Gate 12 before boarding."	The app directs them to the exhibit. Kiara sees art come to life, interacting with moving animations.

TSA, Airport Retail, and Entertainment were chosen as key intervention points because they balance efficiency with convenience. The TSA process requires parents to manage their child while following strict security rules, often without access to their phone during bag scanning.

By offering a TSA prep checklist and child-friendly guides, the app helps parents streamline this phase. Airport retail and entertainment ease travel fatigue, while pre-ordered meals and gate-delivered shopping minimize crowds and optimize wait time. Interactive exhibits provide engaging alternatives to excessive screen time, creating a smoother, more enjoyable experience for parents and children.
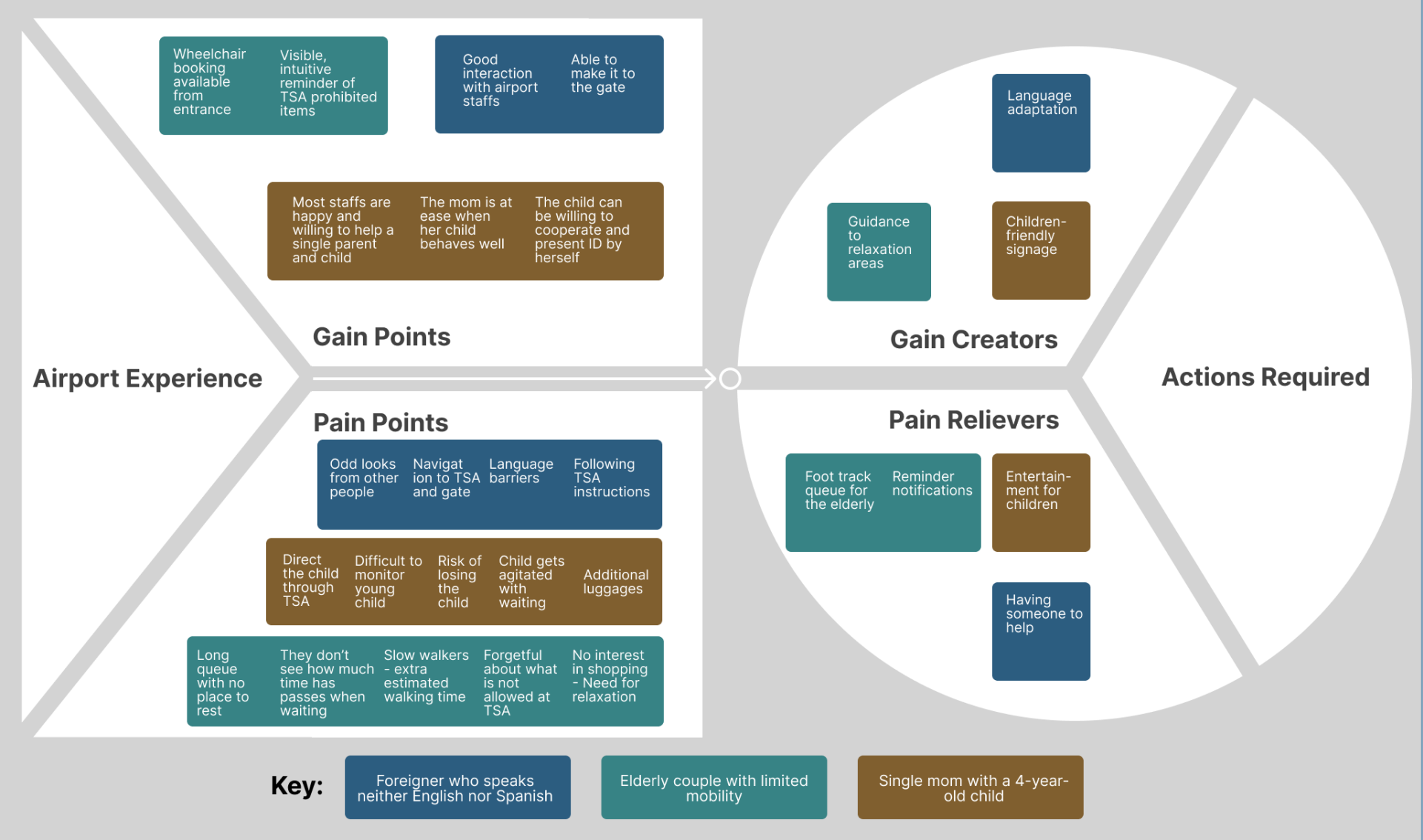
VALUE PROPOSITION CANVAS

The Value Proposition Canvas provides a structured way to map out the specific needs, challenges, and opportunities for improving the airport experience for our three personas. By categorizing pain points, gains, gain creators, and pain relievers, we gain a clearer understanding of where interventions are most needed and how an airport app can address these challenges.

A key insight is that stressors vary significantly between user groups—the single mom struggles with managing her child and luggage while navigating security, the elderly couple faces physical strain and long wait times, and the foreign traveler encounters language barriers and unclear signage.

Despite these differences, shared pain points such as TSA confusion, long queues, and navigation difficulties highlight system-wide inefficiencies that impact all travelers.

The canvas also reinforces that proactive solutions like digital wayfinding, virtual queues, personalized reminders, and child-friendly engagement can create a more inclusive and seamless experience. By translating these insights into actionable design solutions, we ensure our interventions are not only functional but also deeply aligned with real traveler needs.

Airport Experience

Gain Points

| Wheelchair booking available from entrance | Visible, intuitive reminder of TSA prohibited items | Good interaction with airport staffs | Able to make it to the gate |

| Most staffs are happy and willing to help a single parent and child | The mom is at ease when her child behaves well | The child can be willing to cooperate and present ID by herself |

Pain Points

| Odd looks from other people | Navigation to TSA and gate | Language barriers | Following TSA instructions |

| Direct the child through TSA | Difficult to monitor young child | Risk of losing the child | Child gets agitated with waiting | Additional luggages |

| Long queue with no place to rest | They don't see how much time has passes when waiting | Slow walkers - extra estimated walking time | Forgetful about what is not allowed at TSA | No interest in shopping - Need for relaxation |

Gain Creators

Language adaptation

Guidance to relaxation areas

Children-friendly signage

Pain Relievers

Foot track queue for the elderly

Reminder notifications

Entertainment for children

Having someone to help

Actions Required

Key:

| Foreigner who speaks neither English nor Spanish | Elderly couple with limited mobility | Single mom with a 4-year-old child |

ANALYZING AIRPORT MAPS

Effective wayfinding is essential to ensuring that travelers can navigate airports with ease, confidence, and minimal stress. Airports are inherently complex environments, but their layouts and signage strategies play a significant role in shaping passenger experiences. A well-designed airport layout reduces travel anxiety, enhances accessibility, and improves overall efficiency, particularly for passengers with unique needs, such as elderly travelers, parents with young children, and non-English speakers.

Through our analysis, we categorized airports based on their wayfinding complexity, assessing how terminal connectivity, visual clarity, and spatial design impact navigation. Some airports, like Changi and Tan Son Nhat, exemplify intuitive and seamless layouts, allowing travelers to move efficiently with

minimal external guidance. Others, like LAX and Reagan, present moderate wayfinding challenges due to decentralized structures, requiring stronger signage and digital navigation support. At the highest level of complexity, airports such as Heathrow and Atlanta create cognitively demanding environments, where passengers face fragmented connections, overwhelming information density, and the potential for missed flights.

Our analysis highlights that efficient airport navigation relies on logical zoning, clear pathway structures, and intuitive terminal connections. This reinforces the need to simplify spatial layouts, enhance wayfinding tools, and integrate digital navigation solutions to help travelers move efficiently, regardless of an airport's complexity.

Intuitive & Seamless Layouts:
Changi & Tan Son Nhat

Changi Airport (Singapore) and Tan Son Nhat Airport (Vietnam) demonstrate best-in-class navigation strategies by prioritizing logical zoning, centralized services, and intuitive spatial organization. These airports are designed with straightforward pathways and clear visual hierarchies, reducing reliance on extensive signage.

Changi, in particular, excels with its well-defined terminal divisions and predictable connections between key areas, ensuring that travelers can transition smoothly from check-in to boarding without confusion.

Tan Son Nhat, though smaller, maintains a structured and efficient layout, minimizing unnecessary complexity. With fewer branching corridors and a focus on direct routes, passengers can easily move between terminals without needing excessive wayfinding interventions. This approach significantly benefits non-English speakers, elderly travelers, and families, who may struggle with complex airport environments.

How the app Communicates:

In easy-to-navigate airports like Changi and Tan Son Nhat, an airport app serves as a support tool rather than a necessity. It can provide on-demand guidance, real-time updates, and interactive maps to enhance the smooth layout without overwhelming travelers.
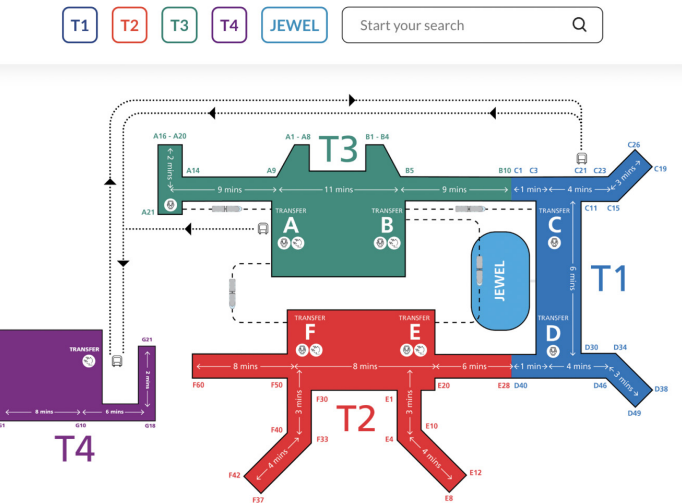
**Changi Airport**
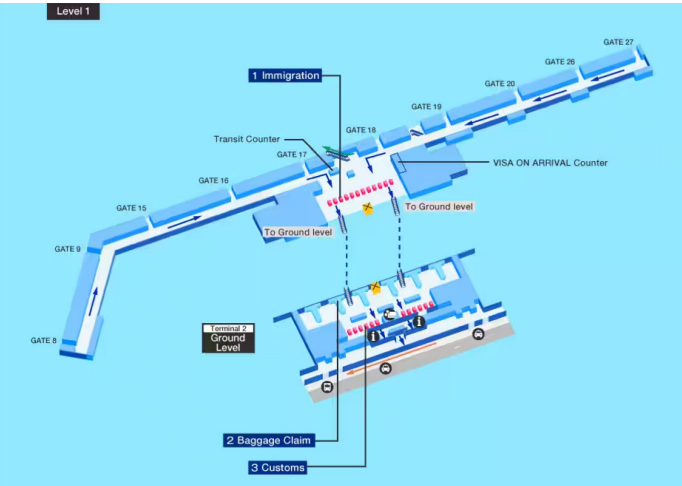
Tan Son Nhat Airport

Moderate Complexity Airports:
### LAX & Reagan

Los Angeles International Airport (LAX) and ReaganNational Airport (DCA) present moderate wayfinding challenges due to their decentralized layouts and multiple intersecting pathways. These airports require more deliberate navigation efforts, particularly for travelers unfamiliar with the airport or those facing tight layovers.LAX, for example, has multiple disconnected terminals, making intra-airport transfers challenging. Many passengers must rely on airport shuttles, unclear signage, or personal knowledge of the layout to navigate between terminals efficiently. Similarly, Reagan's multiple intersecting areas create confusion when moving between concourses, particularly for first-time travelers. These navigation difficulties increase stress and the likelihood of missed connections, emphasizing the need for enhanced wayfinding tools.

How the app Communicates:

In moderately complex airports like LAX and Reagan, the app becomes a crucial guide by offering step-by-step directions, shuttle schedules, and proactive alerts to help travelers manage transfers and tight layovers with ease.
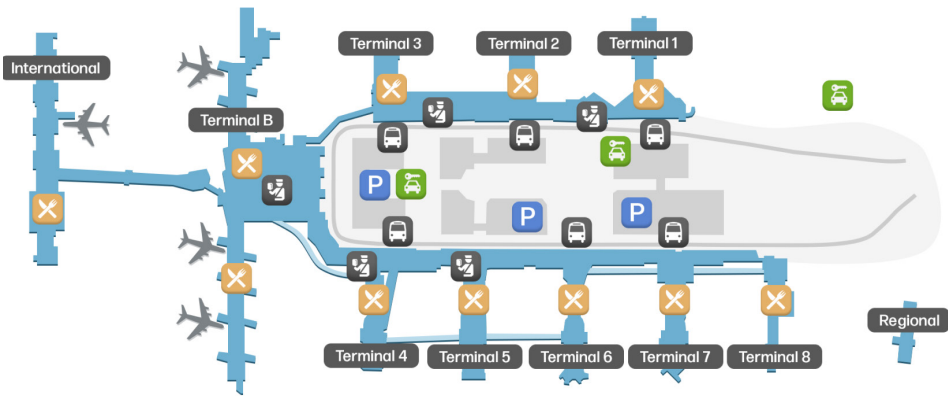
LAX Airport
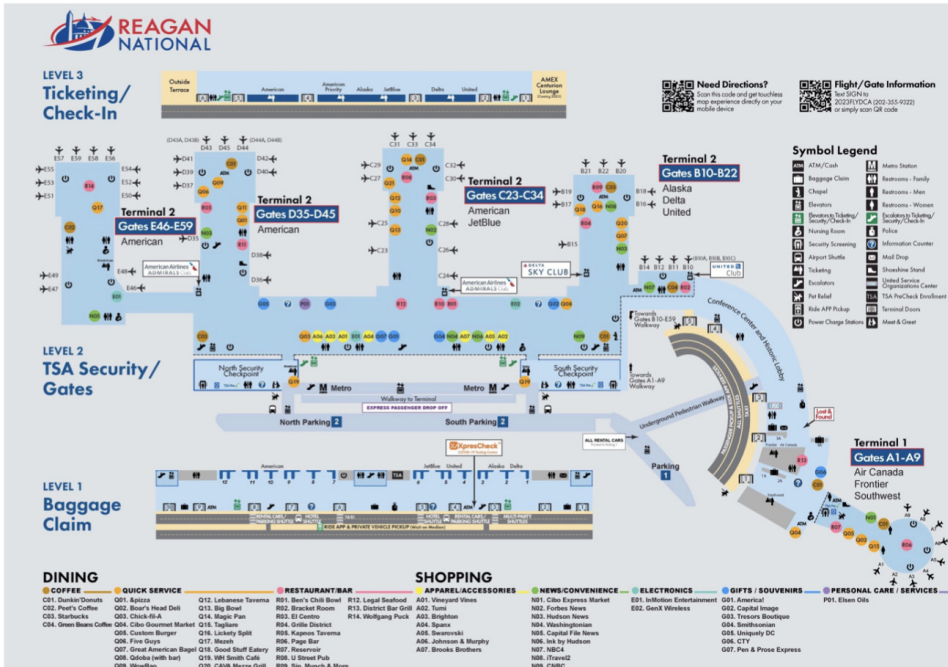
Reagan Airport

High Complexity & Stressful Airports:
Heathrow & Atlanta

London Heathrow (LHR) and Hartsfield-Jackson Atlanta International Airport (ATL) represent the most challenging environments for travelers due to their intricate layouts, fragmented terminal structures, and overwhelming signage density. These airports require significant wayfinding efforts, as passengers must navigate multi-terminal connections, dense crowd flows, and high-pressure time constraints.

Heathrow's spread-out terminal configuration often forces travelers to rely on airport transport systems or complex wayfinding sequences. With multiple terminals positioned at varying distances, transfers can be time-consuming and disorienting, particularly for travelers unfamiliar with the layout. Similarly, Atlanta's high-volume passenger flow and dense information displays make it difficult to immediately recognize key travel paths, increasing cognitive load.

These navigation obstacles disproportionately affect high-risk travelers, including elderly passengers, those with mobility limitations, and non-English speakers. Missed connections, stress, and inefficient routing are common consequences of these highly complex environments.

How the app Communicates:

In highly complex airports like Heathrow and Atlanta, the app acts as a real-time personal assistant, providing live navigation, smart alerts, and accessibility-friendly routes to reduce stress, prevent missed connections, and streamline the passenger experience.
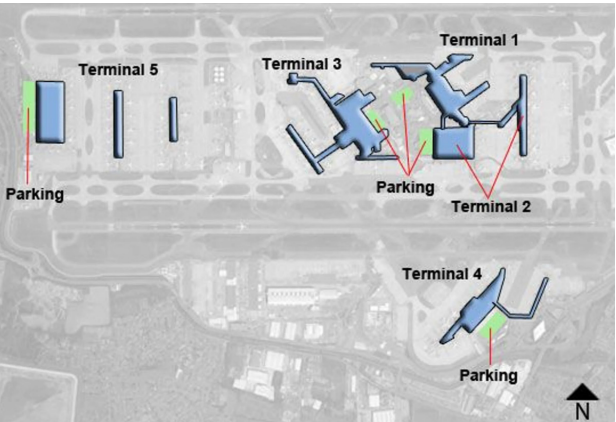
London Heathrow Airport

Atlanta International Airport

Prototyping
& Service Development

This section explores key prototyping and service development methods—Paper Prototyping, Lego Prototyping, Interactive Prototyping (low fidelity), Service Staging, and Service Blueprinting—to refine and validate our design. These hands-on tools help simulate real-world interactions, allowing us to test, iterate, and optimize the airport experience for diverse travelers.

By addressing the needs of personas like a single mom with a child, a non-English-speaking traveler, and an elderly couple, we uncover pain points, improve accessibility, and refine key processes such as check-in and security. The insights gained directly inform our design decisions, ensuring a user-friendly and inclusive service.

Paper Prototyping

Lego Prototyping

Interactive Prototyping (Lo-Fi)

Service Staging

Service Bueprint

PAPER PROTOTYPE

Identifying Bottlenecks in the Airport Experience

In this early prototyping stage, we transformed key insights from our case studies into tangible, low-fidelity models to critically analyze inefficiencies in the airport experience—focusing particularly on the TSA security process. Our approach prioritized understanding existing pain points rather than immediately proposing solutions. By developing paper prototypes, we created a controlled environment to simulate real-world interactions and stress-test current systems, allowing us to uncover hidden inefficiencies that may not be apparent in standard evaluations.

Through iterative testing, we explored various traveler scenarios, including passengers with tight layovers, first-time travelers, and those requiring additional security checks. This method helped us pinpoint inconsistencies in screening procedures, inefficiencies in queue management, and gaps in customer service, particularly in moments where clear communication or traveler support was lacking. By identifying these procedural bottlenecks, our prototypes served as a foundation for future service improvements, ensuring that any design interventions we propose are grounded in real user needs and contribute to a more seamless, stress-free airport experience.

RUN-THROUGH 1

Emma's Experience:
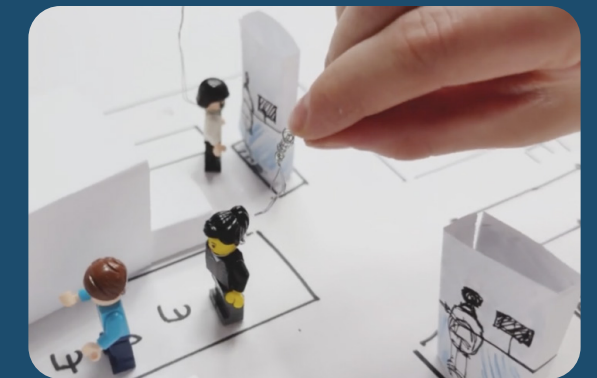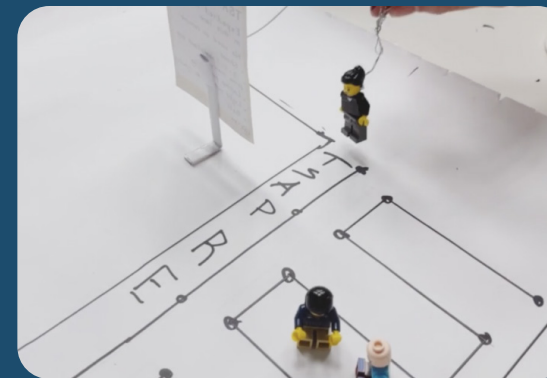### A Test of Patience at Newark Airport

Los Angeles International Airport (LAX) and ReaganNational Airport (DCA) present moderate wayfinding challenges due to their decentralized layouts and multiple intersecting pathways. These airports require more deliberate navigation efforts, particularly.

Observations:

- Even with expedited screening, Emma still faced a 20-minute delay, undermining the program's promise of speed.
- Negative Atmosphere and unempathetic TSA Interaction: People were visibly frustrated and annoyed, signaling an overall stressful and chaotic environment.
- Lack of Assistance for Urgent Travelers: Even when Emma informed security about her tight connection, she received no response or help.

Insights and Reflection:

- Better Queue Management for Assisted Travelers: Airports could implement a dedicated accessibility lane for wheelchair users and others needing extra time, preventing bottlenecks.
- Support for Time-Sensitive Travelers: Airports should introduce priority security assistance for travelers with near-departure flights.

RUN-THROUGH 2

**Tam's Experience:**
A Stressful Layover at Incheon Airport

Los Angeles International Airport (LAX) and ReaganNational Airport (DCA) present moderate wayfinding challenges due to their decentralized layouts and multiple intersecting pathways. These airports require more deliberate navigation efforts, particularly.

Observations:

• Inconsistent Security Policies: Items that were previously allowed on her first flight were suddenly confiscated during the recheck.

• Lack of Clear Communication: TSA officers did not provide a sufficient explanatio of why certain items were now prohibited, leading to frustration.

• Emotional & Time Pressures: Having already faced delays, unexpected security hurdles increased anxiety and fatigue.

Insights and Reflection:

• Security policies should be clearly communicated in advance, especially for transit passengers. A real-time app update or digital notification on item restrictions could prevent surprises.

• Streamlined Security for Transit Travelers: Instead of treating layover passengers like new arrivals, a dedicated transit security lane could reduce unnecessary rechecks.

RUN-THROUGH 3

Maëla's Experience:
A Stressful Extra Security Screening

Los Angeles International Airport (LAX) and ReaganNational Airport (DCA) present moderate wayfinding challenges due to their decentralized layouts and multiple intersecting pathways. These airports require more deliberate navigation efforts, particularly.

Observations:

• Lengthy Extra Security Screening: Maela had to wait 30 minutes before undergoing additional screening, which was not clearly explained.

• Lack of Communication: TSA officers did not proactively inform her of why she was being screened or how long it would take.

• Emotional Stress & Uncertainty: The unexpected delay caused anxiety, and the led to a last-minute sprint to the gate.

Insights and Reflection:

• Transparency Reduces Anxiety: Travelers should be informed of why they are being screened, what the process entails, and how long it might take. A real-time wait-time display or digital notification system could alleviate stress.
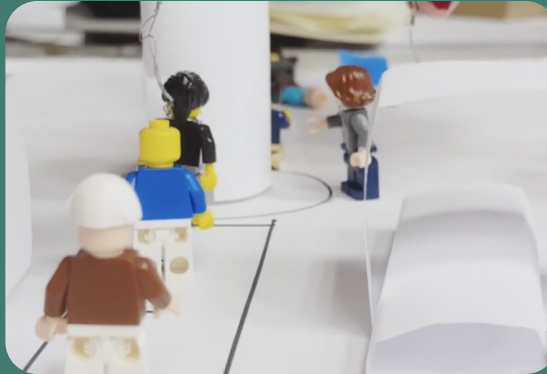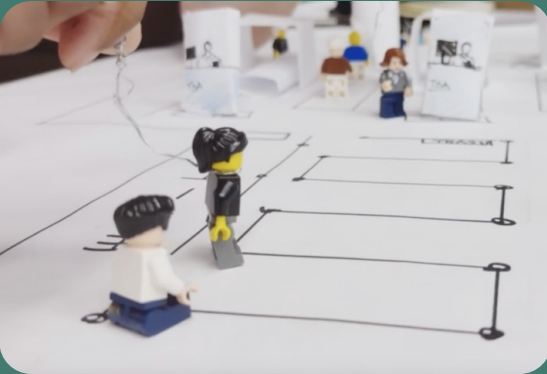
LEGO PROTOTYPING

To better understand the real-world challenges faced by travelers, we used LEGO prototyping to simulate the airport journey for our three personas. This hands-on, low-fidelity approach allowed us to visualize complex systems, recreate key interactions, and observe traveler behavior in a controlled yet dynamic setting.

In our first run-through, each persona navigated the airport without any additional assistance, following the existing process from check-in to boarding. This exercise helped us pinpoint key friction points, such as unclear signage, security bottlenecks, and accessibility barriers, while also revealing emotional responses like stress, hesitation, and frustration. By mapping these experiences in a tangible way, we were able to identify critical areas for intervention and lay the groundwork for future design iterations.

Through LEGO prototyping, we gained valuable insights into the systemic challenges of the airport experience, reinforcing the need for clearer communication, streamlined processes, and more inclusive solutions to enhance traveler confidence and ease.
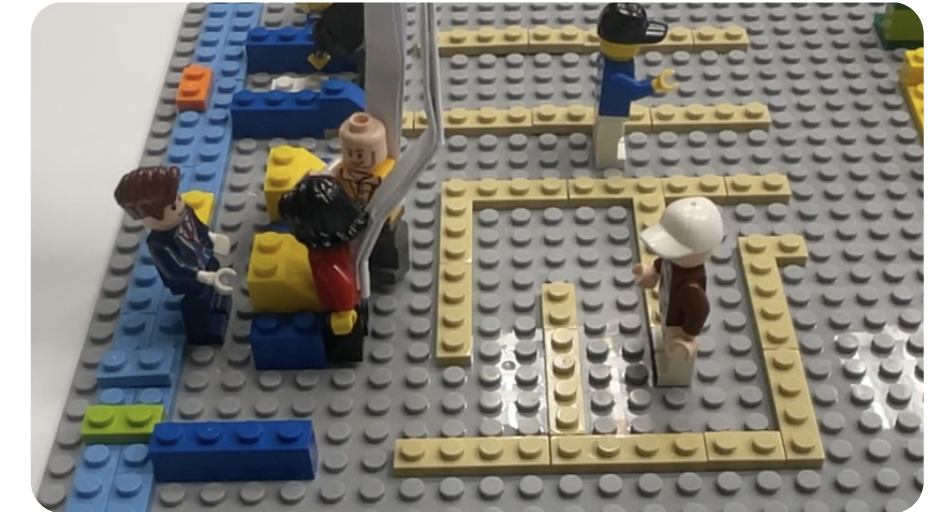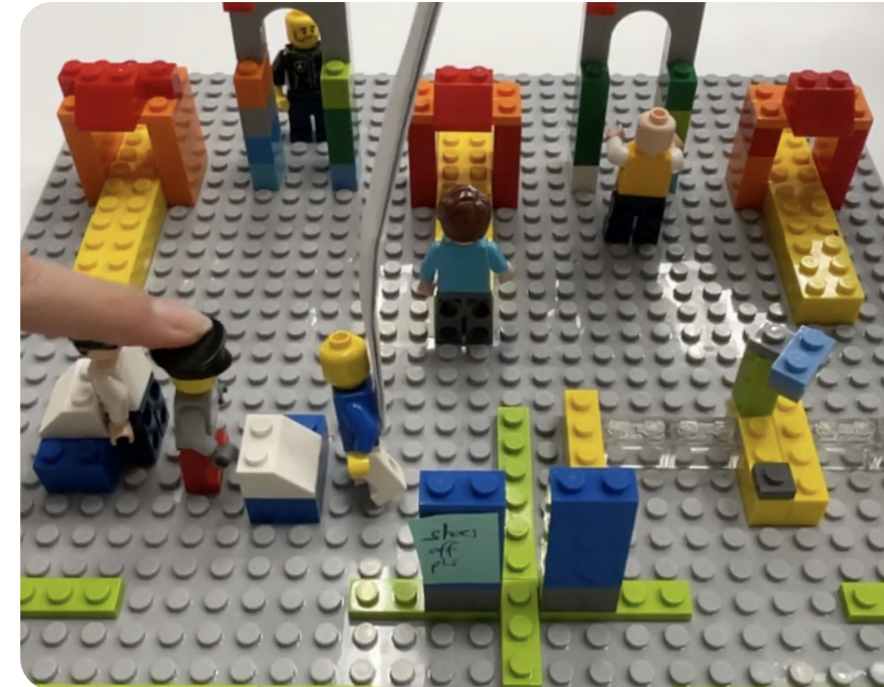
LEGO WALKTROUGH
## A [Foreign Traveler](#) Facing Language Barriers

Los Angeles International Airport (LAX) and ReaganNational Airport (DCA) present moderate wayfinding challenges due to their decentralized layouts and multiple intersecting pathways. These airports require more deliberate navigation.
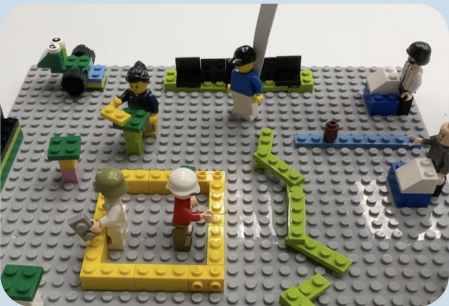
Los Angeles International Airport (LAX) and ReaganNational Airport (DCA) present moderate wayfinding challenges due to their decentralized layouts and multiple intersecting pathways. These airports require more deliberate navigation.

Check-In & Bag Drop

TSA Checkpoint

Navigation to Gate
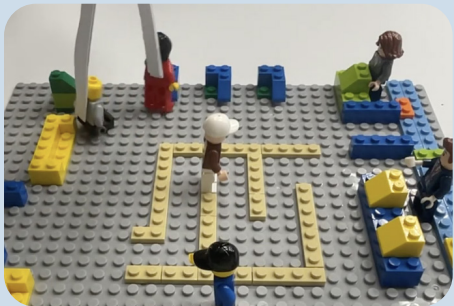
Waiting at Gate

Check-In & Bag Drop
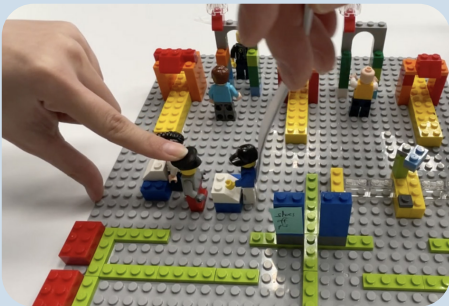
TSA Checkpoint
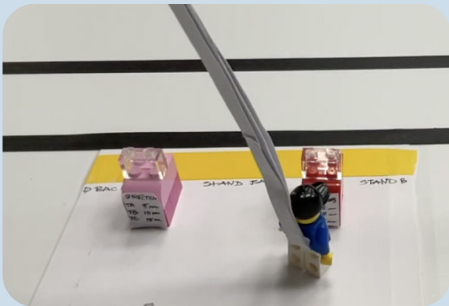
Navigation to Gate

Waiting at Gate

Observations:
- Overly cautious and didn't know where to go.
- Having to rely on body language to communicate and understand.
- Feels anxious and confused during the process.

Insights:
- Avoids people in larger groups and doesn't like waiting in line due to not knowing where he has to go.
- Feeling judged by others adds an emotional burden.

Observations:
- Anxiety about the screening process due to language barriers.
- Difficulty understanding instructions from TSA staff and takes a long time to go through security screening.

Insights:
- The fear of making mistakes in front of TSA agents creates psychological pressure, leading to embarrassment and reduced confidence.

Observations:
- Arrives to early for the train and feels anxious due to thinking he missed it.
- Difficulty understanding signage and directions
- Feels lost and stressed due to the time pressure.

Insights:
- There's a need for multilingual signage in places with clear visibility.
- Having more signage with universally recognized icons or symbols would help.
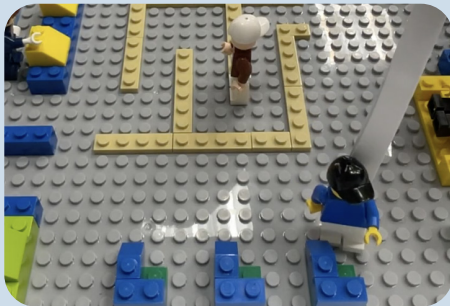
Observations:
- He is unsure about which gate is the correct one and ended up went to the incorrect gate.
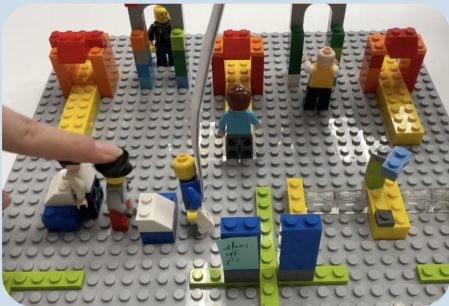- Faced language barriers when interacting with people so he is not able to ask for direction to his gate.

Insights:
- Language barriers and unclear gate information can lead to navigation errors, causing stress and potential delays for travelers.
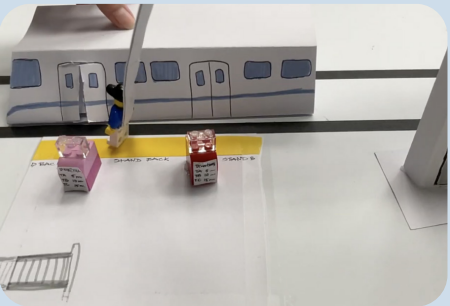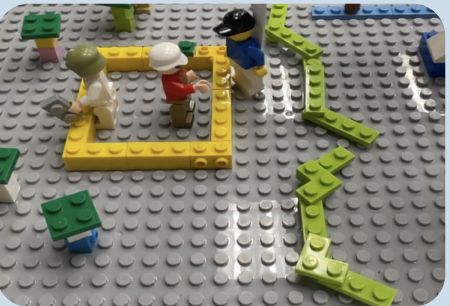
Observations:
- App directs him to use the self check-in kiosk with multilingual support.
- Receives clear instructions and assistance in their preferred language.

Insights:
- Multilingual support, real-time updates, and alternative route options streamline the check-in process, reducing stress and improving efficiency for travelers.

Observations:
- Uses the app to access translated instructions and real-time guidance.
- Goes through security smoothly.
- Feel good and relaxed stress and embarrassment.

Insights:
- Access to translated instructions and real-time guidance reduces stress and embarrassment, creating a smoother security experience.

Observations:
- Uses the app for multilingual navigation and real-time updates.
- Finds the way easily with step-by-step guidance

Insights:
- There's a need for multilingual signage in places with clear visibility.
- Having more signage with universally recognized icons or symbols would help.

Observations:
- Has more time to spare and is able to enjoy a comfortable experience without having to talk to anyone.
- Uses the app to receive multilingual boarding notifications and instructions.

Insights:
- Real-time multilingual notifications in the app reduce the risk of boarding mistakes.
- Automated step-by-step boarding instructions help maintain a sense of control.

CURRENT STATE

FUTURE STATE

LEGO WALKTROUGH
## An <u>Elderly Couple</u> with Limited Mobility

Los Angeles International Airport (LAX) and ReaganNational Airport (DCA) present moderate wayfinding challenges due to their decentralized layouts and multiple intersecting pathways. These airports require more deliberate navigation.
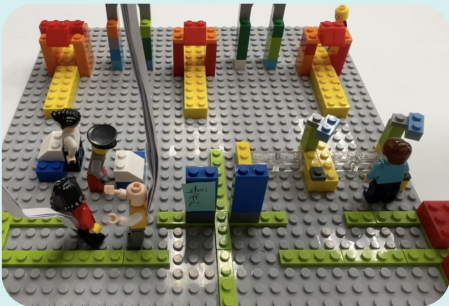
Los Angeles International Airport (LAX) and ReaganNational Airport (DCA) present moderate wayfinding challenges due to their decentralized layouts and multiple intersecting pathways. These airports require more deliberate navigation.

Check-In & Bag Drop

TSA Checkpoint

Navigation to Gate

Waiting at Gate

Check-In & Bag Drop

TSA Checkpoint

Navigation to Gate

Waiting at Gate

Observations:

- Slower walking to line and confusion on which line to queue.
- Physical strain from standing in long lines.
- Confused about where to line up, queued in the wrong line.

Insights:

- Elderly travelers may default to the most visible line instead of the one meant for them.
- Some passengers may not know where priority lanes are, due to lack of cleat guidance.

Observations:

- Slow mobility clogs TSA line which irritates other travelers.
- Difficulty removing shoes and lifting luggage.
- Forget what types of items need to be removed and get confused .

Insights:

- A seating area with queue times and call numbers could mitigate the physical strains for travelers with limited mobility and speed up the traffic on regular queuing lines for other travelers.

Observations:

- Fatigue and confusion from long walks and unclear signage.
- Lack of rest areas along the way.

Insights:

- A staff member could help them navigate to gate after they are done packing from TSA area.

Observations:

- Missed the final boarding announcements while waiting.
- Lost track of time and become the last passengers to board the plane (almost missed the flight).

Insights:

- Elderly travelers may feel uncomfortable asking for directions repeatedly Agents or staff personnel from airlines to help assist.

Observations:

- App directs them to sky priority line where there is no long queue.
- App is cumbersome at first for the elderly couple, but navigate them to the correct line.

Insights:

- Proactive assistance— instead of waiting for passengers to find help, airports could integrate location-based alerts that notify nearby staff when a traveler needs assistance.

Observations:

- The line is still slow because of their slow movements.
- Receive reminders to dispose of any large amount of liquids.
- They do not get confused or as intimidated by technology as in the beginning.

Insights:

- The digital interface must be designed for accessibility, ensuring large text, clear contrast and simplicity.
- A hybrid solution (digital + human intervention) would be best.

Observations:

- App directs them to find an accessible route.
- Receive estimated walking time to get to the gate based on their mobility.
- Feel more confident and in control of the situation.

Insights:

- A staff member with cart or airline agent to help guide them could be useful as elderly people prefer human-to-human connection than technology.

Observations:

- App navigates them to a relaxation area.
- Uses the app to locate accessible amenities and comfortable seating.
- App sends notifications about boarding updates.

Insights:

- Pushotifications with visual and sound alerts help travelers stay informed without having to rely on loudspeaker announcements, which may be difficult to hear or understand.
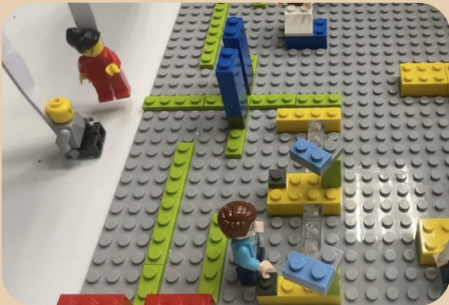
CURRENT STATE

FUTURE STATE

LEGO WALKTROUGH
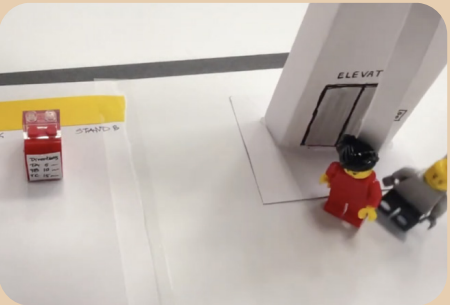## A <u>Single Mother</u> with her Young Child

Air travel can be a challenging experience, especially for a single parent. This section explores the key obstacles faced by a single mother traveling with her child, highlighting moments of frustration and opportunities for improved support.

With the app, the single mother's airport experience becomes more seamless and less stressful. The app minimizes logistical challe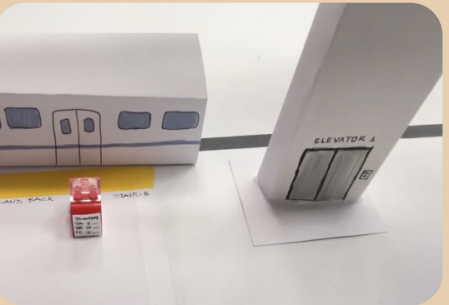nges, reducing the mental and physical strain of traveling alone with a child. This section explores how digital tools can transform travel for single parents, making airports more accessible and stress-free.

Check-In & Bag Drop

TSA Checkpoint

Navigation to Gate

Waiting at Gate

Check-In & Bag Drop

TSA Checkpoint

Navigation to Gate
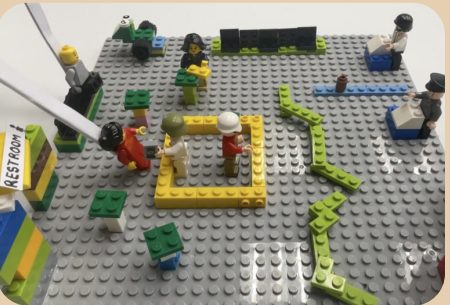
Waiting at Gate

Observations:
- Struggles to manage luggages and hold the phone whilst controlling her child and waiting in a long queue.
- Feels stressed and overwhelmed by the process.

Insights:
- The physical and mental load is overwhelming for a single parent.
- Maybe the app could communicate with sound so that she does not need to physically holding her phone.

Observations:
- Juggles child and carry-on items while removing shoes and electronics.
- Has a difficult time giving directions to her child during TSA screening.

Insights:
- Mother needs more support with navigation.
- There's a lack of clear, child-friendly guidance results in confusion among several travelers.

Observations:
- Struggles to navigate with carry-on bags and her child in a crowded subway.
- Feels lost and stressed due to unclear signage and lack of assistance.

Insights:
- The absence of dedicated assistance means single parents must rely solely on their own problem-solving skills, making travel inefficient.

Observations:
- Limited time to shop or eat while managing her child.
- Difficulty finding child-friendly restrooms or play areas.

Insights:
- The mother worries about flight timing, making the child feel anxious.
- Real-time text and sound alerts guide travelers to stay on schedule.

Observations:
- Uses the app to locate the self check-in counter to print boarding passes and drops bags easily without having to queue up.

Insights:
- With the app, the process feels more controlled, reducing stress.
- Physical interventions such as a dedicated family check-in area or priority kiosks would further improve efficiency.

Observations:
- The app has an instruction guidance made for children.
- The app and the digital instruction sign remind them to dispose of food and drinks.
- Receives real-time guidance and estimated waiting time.

Insights:
- The mother does not need to mentally prepare her child or direct her.
- The app's pre-screening reminders reduce last-minute scrambling.

Observations:
- Both parent and child are composed, relaxed. There is no tension or any stressful moments.
- Uses the app for step-by-step navigation and real-time updates.

Insights:
- A smart carry-on cart that follows travelers, could reduce the hassle of managing bags—especially helpful for families navigating the airport.

Observations:
- App directs to child play area.
- App sends real time updates about boarding.
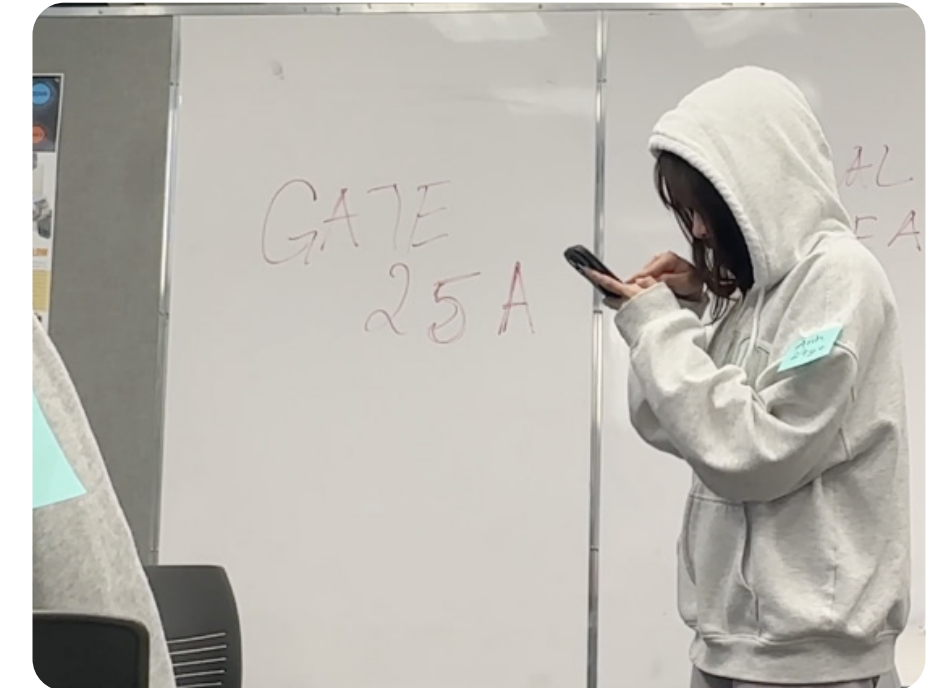- Boards the plane smoothly and comfortably.

Insights:
- Adding a feature to pre-order food or online shop and deliver to their gate would be useful for travelers who don't have much spare time before boarding.

CURRENT STATE

FUTURE STATE

SERVICE STAGING

Service staging is a vital method in service design, enabling us to simulate real-life interactions and test potential solutions in a controlled environment before full-scale implementation. By creating realistic scenarios based on the needs of diverse personas—such as a single mom with a 4-year-old child, a foreign traveler who does not speak English, and an elderly couple with limited mobility—we can identify and address pain points that may arise in airport settings.

This approach allows us to evaluate critical touchpoints like navigation, communication, and assistance, ensuring that the service design accommodates all passengers' unique challenges. Through service staging, we can refine these processes, optimizing the airport experience to be more inclusive, efficient, and user-friendly, ultimately leading to a more seamless journey for every traveler.

SERVICE STAGING
A Foreign Traveler Facing Language Barriers

For foreign travelers, navigating an unfamiliar airport can be daunting due to language barriers, cultural differences, and complex procedures. By staging key moments, we can observe how technology can bridge communication gaps, reduce confusion, and enhance the travel experience..

This analysis reinforces the need for intuitive, language-adaptive solutions that empower travelers with real-time guidance, clear instructions, and seamless interactions, ensuring they feel confident and in control throughout their journey.

This proposal focuses on improving the airport experience for foreign travelers who face language barriers, ensuring they feel as confident and capable as any other passengers.

By staging key moments—such as bag drop-off, TSA checkpoints, and navigation—we can assess how well the app facilitates communication with agents, provides procedural guidance, and assists with real-time translations. Testing these interactions will help determine the feasibility of proposed features and ensure they effectively address traveler frustrations. The findings from this process will guide the development of solutions that create a more inclusive, stress-free airport journey for non-English-speaking travelers.

Aim:

Explore how the app can break down the language barriers, allowing foreign travelers to be as empowered as others.

Questions to be Answered:

- How can the app facilitate with the agents at the bag drop off and TSA check points despite the language and cultural barriers?
- How can the app empower foreign travelers to be more knowledgable about the TSA procedures?
- How can an app help travelers navigate effectively and effortlessly?
- How does the app assist foreign travelers with understanding announcements and important updates?

Objectives:

- Identify key moments during the journey and key features to relieve the frictions.
- Explore the feasibility of the app's potential features

Planned Actions:

- Act out the interactions between the app and the traveler at key touch points.
- Act out the way travelers can follow the step-by-step guidance provided by the app.
- Act out the translation assistance of the app

| Check-In & Bag Drop | TSA Checkpoint | Navigation to Gate |

Observations:

- The app detects the traveler's arrival and displays a greeting in their language.
- It immediately provides step-by-step check-in instructions.
- The traveler navigates the terminal smoothly without confusion.
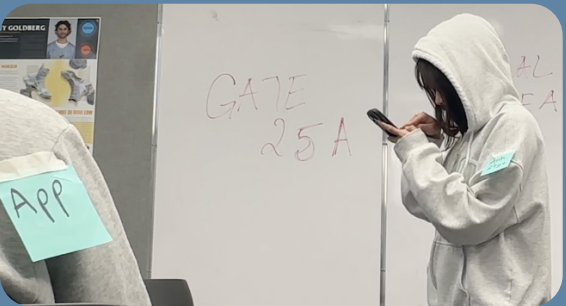- Receives real-time updates.

Insights:

- Language barriers can make verbal interactions stressful, but the app minimizes the need for them.
- Clear, real-time instructions increase confidence and reduce uncertainty for international travelers.

Observations:

- Being prepared reduces friction at TSA and makes transitions smoother.
- Less confusion means fewer tense interactions between travelers and staff.
- TSA agents can focus on security tasks instead of repeating instructions.

Insights:

- The app's proactive guidance reduces miscommunication, creating a smoother experience for both travelers and TSA staff.
- More use of pictograms, multilingual digital screens, and pre-check videos could help travelers navigate security more easily.

Observations:

- The traveler is initially confused until the app processes the announcement.
- Keeping their head down while using the app prevents them from fully absorbing their surroundings.
- They risk bumping into others due to a lack of spatial awareness.

Insights:

- Travelers need reassurance when announcements start—an in-app "Currently Translating" screen could help manage expectations.
- The app should encourage travelers to pause and read notifications rather than multitasking while walking.

SERVICE STAGING
An Elderly Couple with Limited Mobility

As mobility limitations and cognitive load become factors in their journey, it is crucial to ensure accessibility, ease of navigation, and stress-free transitions. By staging key moments, we can observe how an app can intuitively adapt to their needs.

This analysis reinforces the importance of human-centered technology that empowers elderly travelers, allowing them to maintain independence while receiving the support they need.

This proposal focuses on understanding and addressing the physical and cognitive challenges that elderly travelers may face during their airport journey.

By staging key interactions—such as requesting wheelchair assistance, accessing priority queues without standing for long periods, and navigating to designated relaxation areas—we can evaluate how an app can serve as a supportive travel companion. Through these simulations, we aim to assess the feasibility of these features and refine them to ensure they effectively reduce strain, enhance comfort, and provide a more dignified and stress-free airport experience for elderly travelers.

Aim:
- Explore ways a mobile app can reduce physical and cognitive strain for travelers with limited mobility.

Questions to be Answered:
- How can the app facilitate wheelchair assistance from curbside drop-off to boarding?
- How can the app innovate the priority queueing system without making travelers with limited mobility physically stand in line?
- How can the app guide and provide travelers with relaxation options?

Objectives:
- Identify key moments during the journey and key features to relieve the frictions.
- Explore the feasibility of the app's potential features

Planned Actions:
- Simulate the elderly couple get wheelchair assistance through the app.
- Simulate the virtual priority queueing system via the app.
- Simulate the elderly couple being guided to quiet relaxation areas.

Check-In & Bag Drop

Check-In & Bag Drop

Relaxation Area

Observations:
- The travelers are impressed by the technology rather than intimidated by it.
- The app communicates with them verbally.
- They feel immediate relief when the wheelchair arrives.

Insights:
- Older travelers are more receptive to technology when it feels intuitive and accommodating.
- The app empowers elderly travelers by allowing them to navigate independently without asking for help.

Observations:
- Margaret has to push her husband's wheelchair while holding the phone, making multitasking difficult.
- Virtual queuing minimizes the physical strain of standing in line.

Insights:
- A wheelchair with a built-in phone holder and storage space would ease the travel experience.
- Reducing physical effort allows elderly travelers to feel more in control and less dependent on others.

Observations:
- Moving James from the wheelchair to a relaxation chair requires effort.
- Margaret may need assistance at some point.

Insights:
- Wheelchairs with built-in reclining or relaxation features could enhance comfort.
- A quick-assist request feature in the app would make getting help more seamless.

SERVICE STAGING
A Single Mother with her Young Child

For a single mother traveling with her young child, navigating the airport can be an overwhelming experience. By staging these key moments, we can observe interactions, emotions, and behaviors, allowing us to refine the service design to better support parents.

This analysis reinforces the need for solutions that reduce cognitive and physical strain, improve communication, and create a more seamless airport experience for both parent and child.

This proposal focuses on enhancing the airport experience for a single mom traveling with her child by identifying key stress points and exploring solutions to reduce friction.

By staging critical moments—such as TSA screening, food ordering, and child entertainment—we can evaluate the feasibility of proposed app features and assess their effectiveness in minimizing stress for both parent and child. This structured approach helps ensure that solutions are practical, user-friendly, and aligned with real passenger needs. The insights gained from this process will inform future design iterations, leading to a more seamless and supportive travel experience for families.

Aim:
- Explore ways of reducing strains on the interaction between the parents and their children.

Objectives:
- Identify key moments during the journey and key features to relieve the frictions.
- Explore the feasibility of the app's potential features.

Questions to be Answered:
- How can the app help a single mom prepare for TSA screening with minimal stress and provide a child-friendly way to explain security procedures to the child?
- Would a pre-order or express pickup or gate-delivery service be beneficial for food and shopping purchases?
- How can the app keep the child entertain without involving screen time?

Planned Actions:
- Stage the security screening process where the mom has to handle luggage, documents, and her child.
- Test food and shopping pre-ordering and gate delivery functionality.
- Stage AR interactive play areas, engaging both parent and child

| TSA Queuing | TSA Screening | Entertainment |
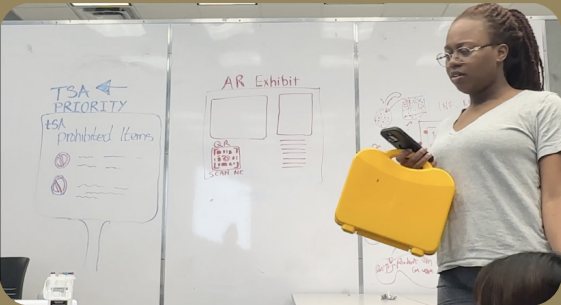
Observations:
- Eager to get through TSA smoothly.
- Shows the app to the child and is pleased with their focus.
- Child knows what to remove from the bag before reaching TSA.
- Mother has her hands full.

Insights:
- Managing luggage while keeping track of a child adds stress.
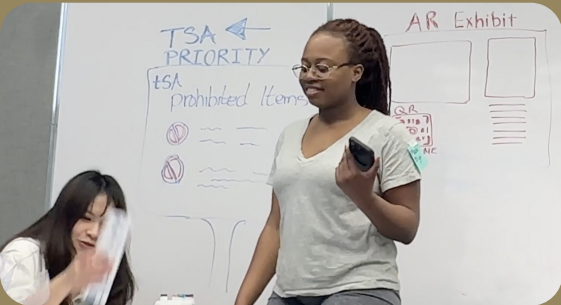- Hands-free or assisted solutions could improve the mother's experience.
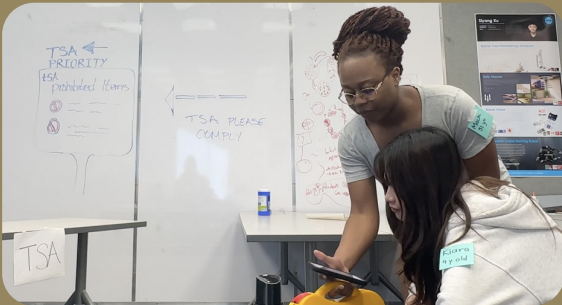
Observations:
- The app detects their arrival at TSA and provides step-by-step instructions via GPS.
- A child-friendly animated video engages the child with clear TSA instructions.
- Both parent and child remain calm and relaxed.

Insights:
- The mother is relieved from having to repeatedly guide her child.
- A well-designed digital experience can reduce travel anxiety for parents.

Observations:
- The mom is excited to offer her child entertainment that isn't just screen time.
- She juggles her bag, phone, and child simultaneously.
- The child gets excited when the app notifies them that their McDonald's order is ready.

Insights:
- Airports need engaging, non-screen-based entertainment for children.
- Parents benefit from smoother multitasking solutions.
- Notifications for parents should be subtle and non-disruptive, ensuring they don't create additional distractions.

INTERACTIVE PROTOTYPE

In this phase, we explored how a mobile app could seamlessly integrate into the traveler's journey, providing real-time support, navigation, and decision-making assistance. Using an interactive prototype, we simulated key touchpoints where the app could intervene to reduce stress, enhance accessibility, and improve overall efficiency.

Through this simulation, we observed how the app could alleviate common pain points, such as:

Simplifying check-in with digital boarding passes and step-by-step guidance.
- Providing clear wayfinding with interactive maps and real-time walking directions.
- Offering timely alerts for security wait times, gate changes, and flight updates.

By embedding technology as a proactive travel companion, we demonstrated how digital solutions can empower travelers, enhance confidence, and create a smoother, more intuitive airport experience.

FIRST LO-FI PROTOTYPE

The first set of hand-drawn wireframes served as the foundation for shaping AirEase, allowing us to quickly explore layout ideas, user flows, and essential features before moving into digital prototyping. These low-fidelity sketches helped us visualize how travelers would navigate the airport using the app.


By mapping out the core interactions early, we were able to identify potential pain points, refine the user experience, and establish a clear structure before transitioning to mid-fidelity wireframes. This ideation phase ensured that every feature aligned with our goal of creating a seamless, intuitive, and stress-free airport experience.

MID-FI TO HI-FI PROTOTYPE

The transition from hand-drawn wireframes to mid-fidelity wireframes allowed us to refine the layout, structure, and user flow of AirEase, ensuring a more intuitive experience before moving into high-fidelity design. The mid-fi wireframes provided a clearer visualization of screen organization, button placement, and navigation paths, helping us identify areas for improvement early in the process.
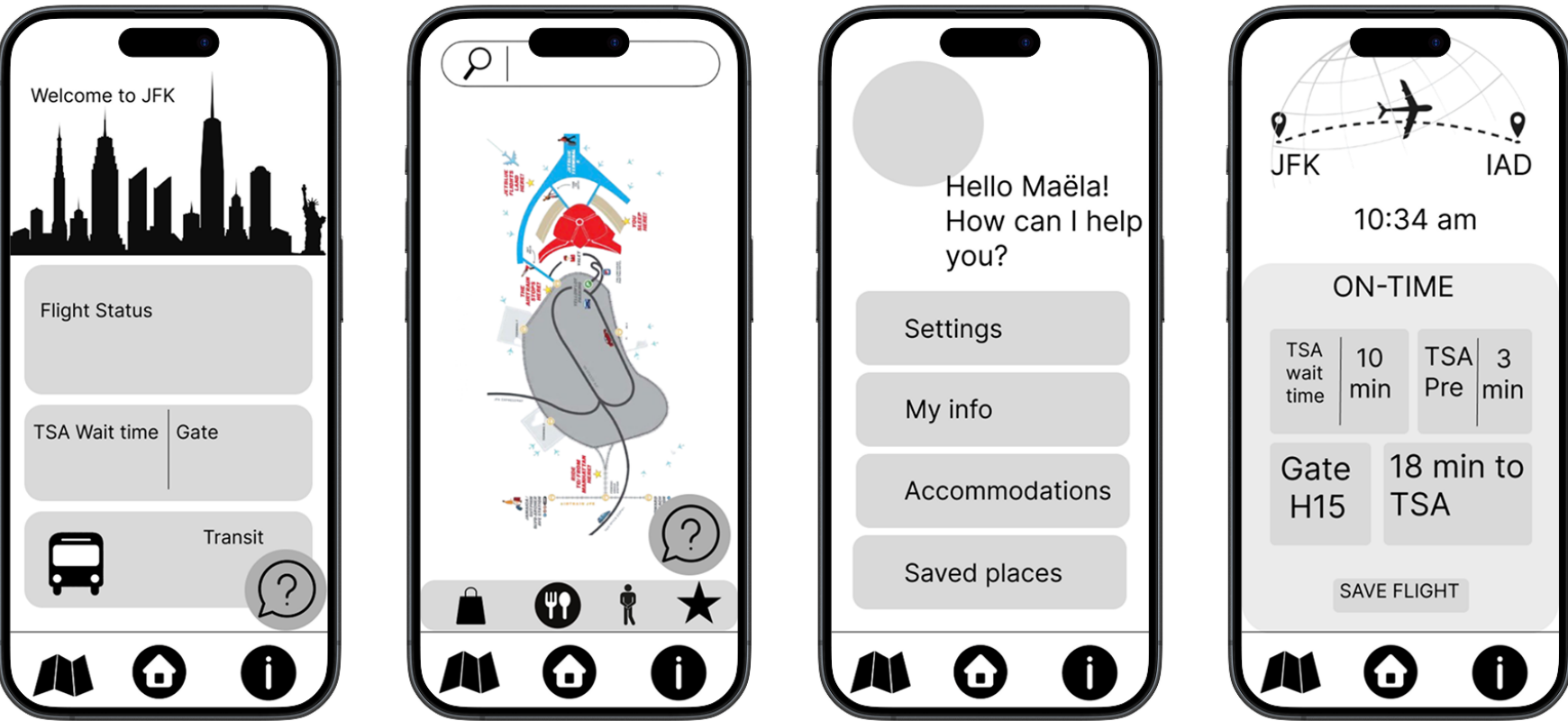
From there, we developed the hi-fi prototype in Figma, focusing on a consistent color palette, typography, and visual hierarchy to enhance readability and accessibility. This final stage transformed the app into a polished, user-friendly interface that aligns with our goal of creating a seamless and stress-free airport navigation experience.

USER TESTING SESSION

Throughout our testing, users shared valuable feedback on AirEase's core features, highlighting areas of strength and opportunities for improvement. While many appreciated the app's intuitive navigation and AI assistant, certain usability challenges emerged, particularly in high-stress situations. Below are the main takeaways:

- **Navigation:** AR guidance was well-received, but users emphasized the need for more physical signage in airports, as checking a phone while handling luggage or a child was inconvenient. The app was less useful when rushing but became helpful after reaching the gate.

- **Rebooking a Flight:** Users preferred Easabelle to suggest the best rebooking options upfront rather than browsing an extensive list. A filtering system for price and time, along with gate location and walking time, was suggested.

- **Virtual Priority Queue:** The feature was widely appreciated, with requests for a "Request TSA Assistant" option and clearer directions on accessing the priority lane.

- **TSA Checklist & Children's Video:** The checklist was most useful before arriving at TSA, with suggestions for an interactive version. The video was helpful, but users in a rush struggled to watch it in real time.

- **AI Assistant (Easabelle):** Described as a "delightful surprise," users wanted Easabelle to offer verbal communication and lock screen notifications to reduce manual interaction.

- **Food & Shopping Pre-Order:** Travelers found this feature valuable post-rebooking but not when rushing. Estimated preparation times were requested for better planning.

- **UI/UX Design Feedback:** Users suggested improving accessibility, ensuring consistent styling, enhancing text readability, and minimizing distractions in the interface.

These insights will guide refinements to make AirEase even more seamless and traveler-friendly.

Refinement
& Future Iterations

This section explores key prototyping and service development methods—Paper Prototyping, Lego Prototyping, Interactive Prototyping (low fidelity), Service Staging, and Service Blueprinting—to refine and validate our design. These hands-on tools help simulate real-world interactions, allowing us to test, iterate, and optimize the airport experience for diverse travelers.

By addressing the needs of personas like a single mom with a child, a non-English-speaking traveler, and an elderly couple, we uncover pain points, improve accessibility, and refine key processes such as check-in and security. The insights gained directly inform our design decisions, ensuring a user-friendly and inclusive service.

Final Interactive Prototype

Blueprint & Flowchart

3D Prototyping

Vision Video

Future Opportunities

FINAL INTERACTIVE PROTOTYPE

The final interactive prototype of AirEase integrates key features for a stress-free, inclusive airport experience. Travelers can navigate with standard or AR maps, get real-time TSA guidance, and receive personalized support from Easabelle, the AI assistant. The Plan Ahead feature enables food pre-ordering, online shopping, and access to relaxation and entertainment options. Travelers can also reserve sleeping pods, enjoy meditation and music, or explore art galleries and play areas. With smart navigation, AI-driven recommendations, and well-being features, AirEase enhances efficiency, accessibility, and comfort.
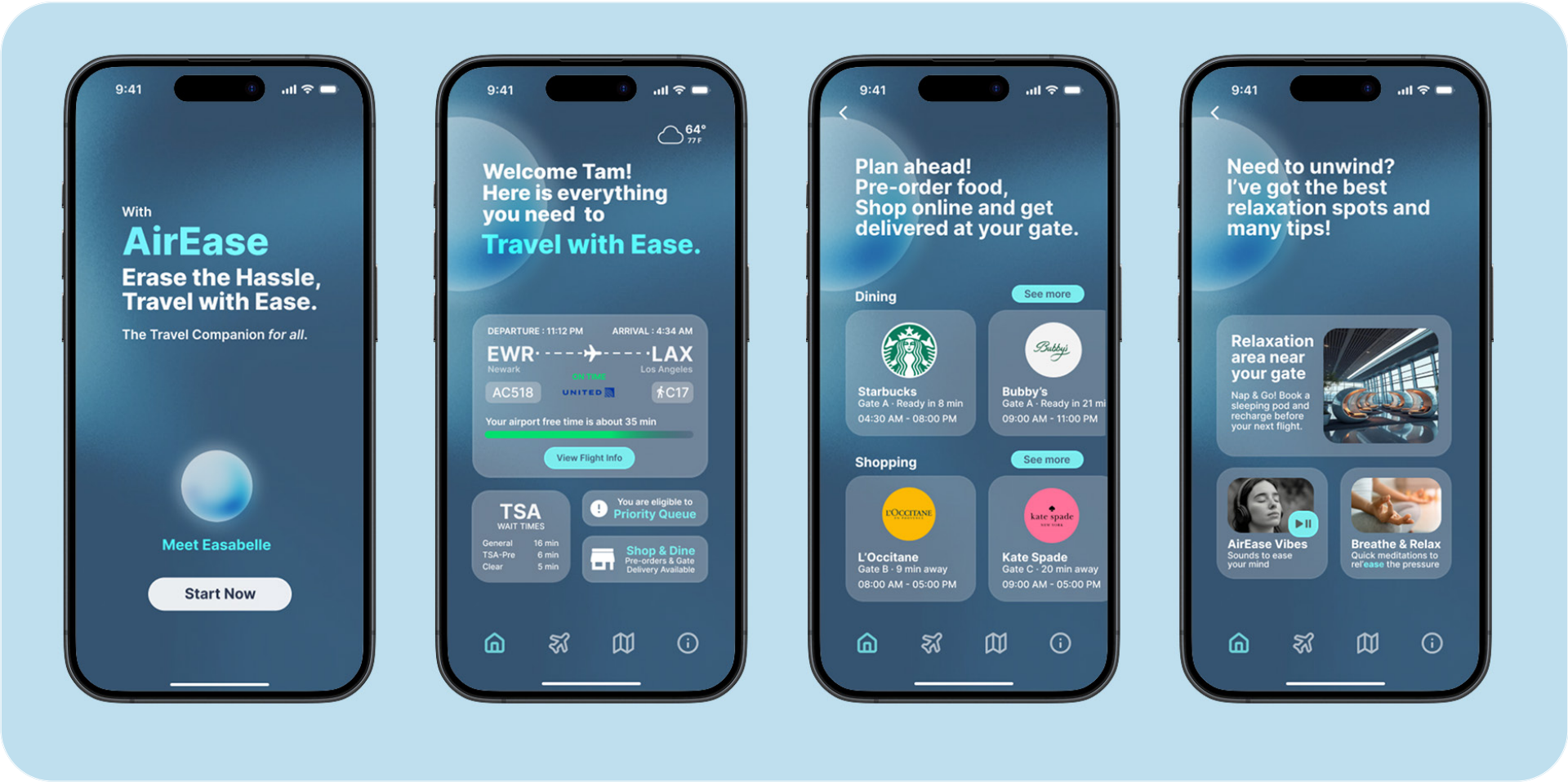

WHAT'S NEW THIS TIME

Flight Rebooking

AirEase is the ultimate airport app designed to eliminate the hassle and frustration of flight disruptions. Whether your flight is delayed or canceled, AirEase works instantly to find the best rebooking options, ensuring you reach your destination as smoothly as possible. With real-time updates, intuitive navigation, and seamless integration with airlines, AirEase keeps you informed and in control at every stage of your journey—no more standing in endless customer service lines or scrambling for alternatives.

Built for all travelers, Easeablle enhances the rebooking process by assisting passengers both in line and on the go. Whether you're at the airport or managing your itinerary remotely, Easeablle ensures you can quickly secure a new flight, stay onbschedule, and travel with confidence. With AirEase and Easeablle working together, unexpected changes no longer mean chaos— just effortless solutions that put you back in charge of your travel plans.
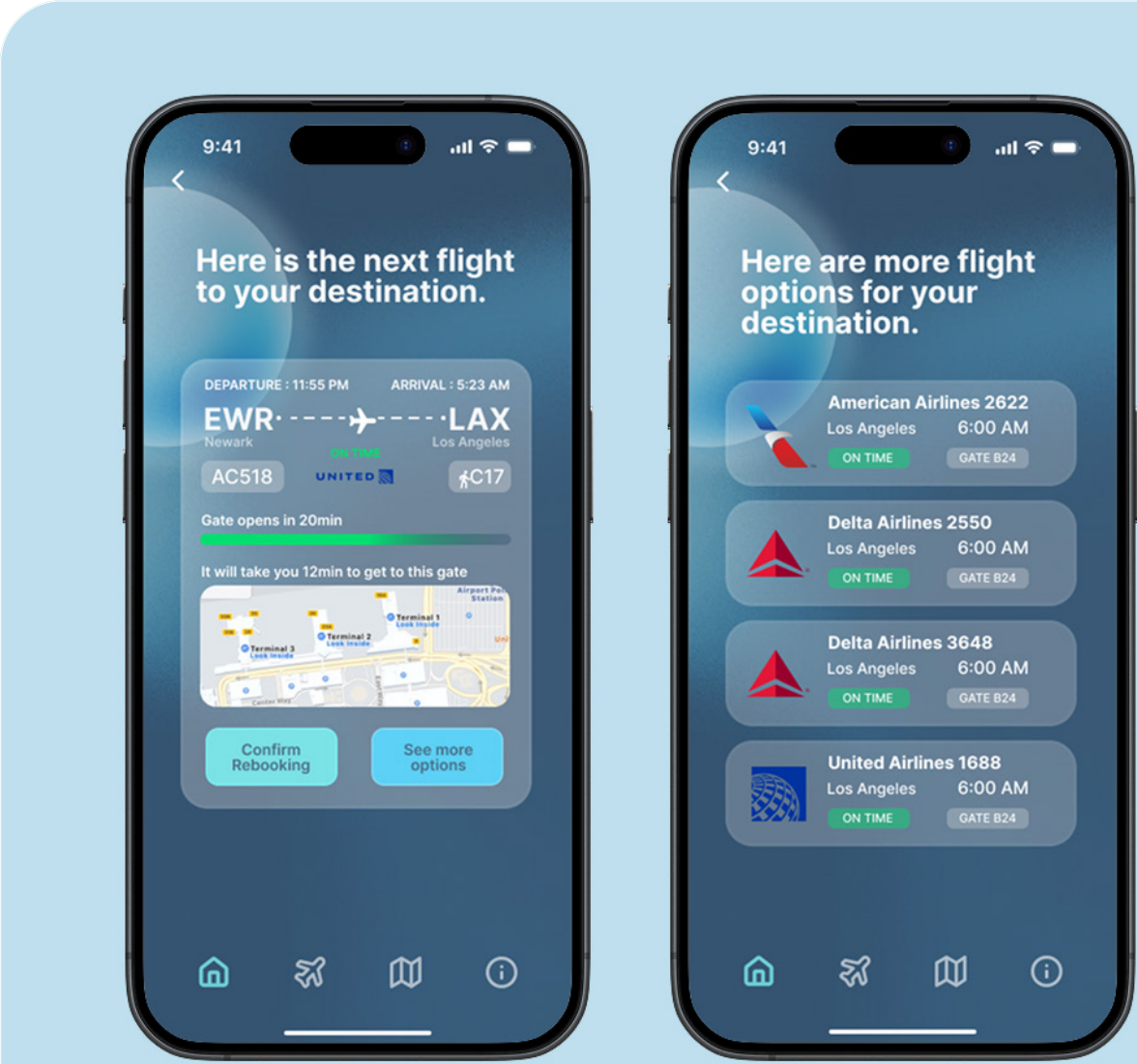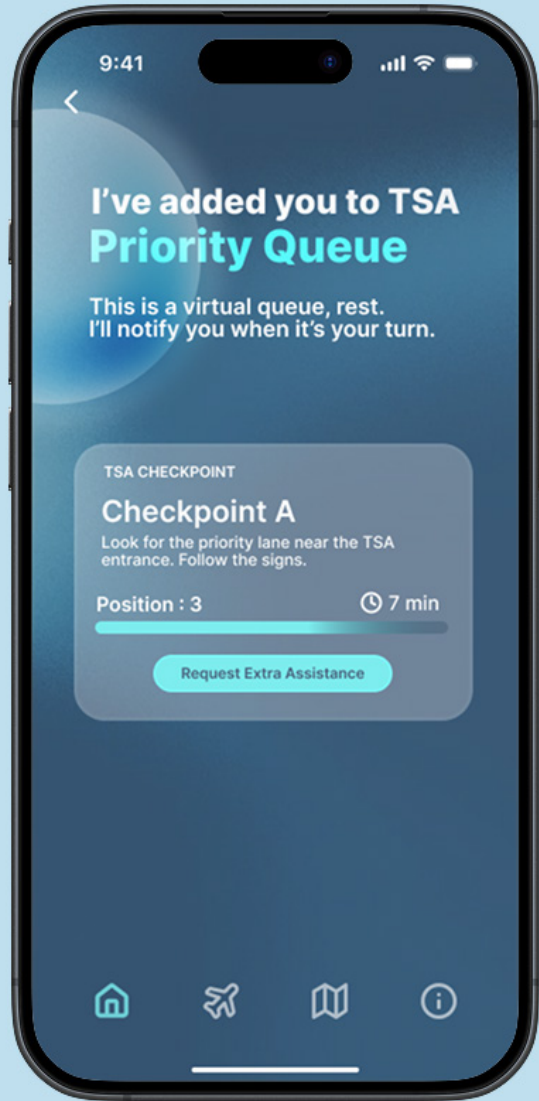
Requesting Extra Assistance

AirEase enhances the airport experience by offering extra assistance through a virtual TSA queue, allowing travelers to reserve a spot in line and reduce wait times at security checkpoints. Instead of standing in long, unpredictable lines, passengers can check into a virtual queue through the app and receive a notification when it's their turn to proceed. This feature not only saves valuable time but also provides a more relaxed and efficient way to navigate airport security. Whether travelers want to grab a coffee, shop, or simply stay seated until their slot is ready, AirEase ensures a smoother and more stress-free airport journey.
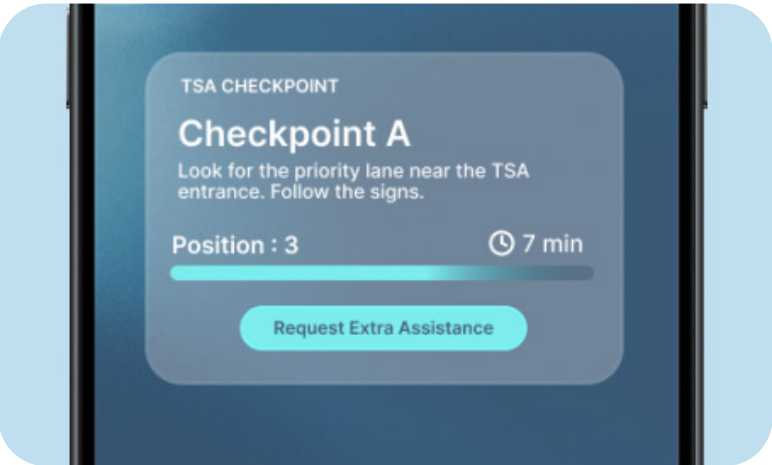
TSA Checklists

AirEase helps travelers move through security checkpoints smoothly by providing real-time TSA preparation alerts. As passengers approach the security line, the app sends a pre-check notification reminding them of TSA requirements, such as removing laptops, liquids, and large electronics from their bags and placing them in a bin. This proactive reminder helps travelers organize their belongings in advance, reducing last-minute scrambling and ensuring they're fully prepared before reaching the checkpoint. By staying ahead of the process, passengers can move through security with ease, avoiding unnecessary delays.

To further enhance efficiency, AirEase sends a second alert when travelers are closer to the screening area, reinforcing the necessary steps for a smooth security experience. This ensures that passengers are ready to remove shoes, belts, and jackets if required, helping the queue move faster for everyone. By minimizing confusion and hesitation at the checkpoint, AirEase not only speeds up individual processing times but also improves the overall flow of security lines. With these timely reminders, travelers can breeze through TSA with confidence and get to their gates without stress.
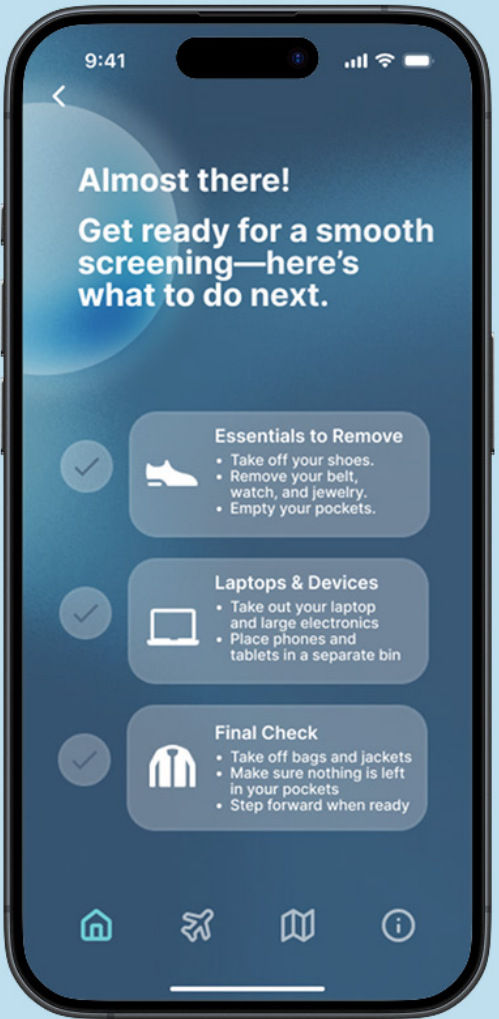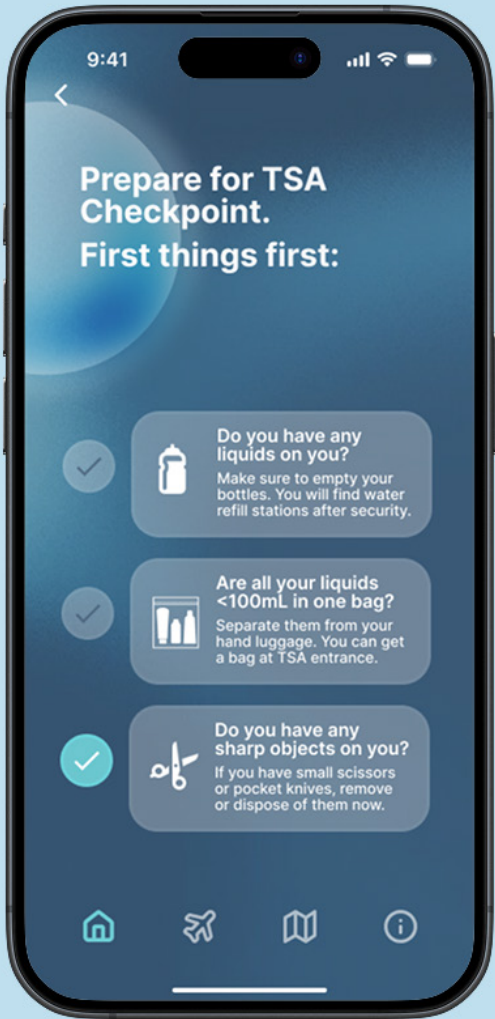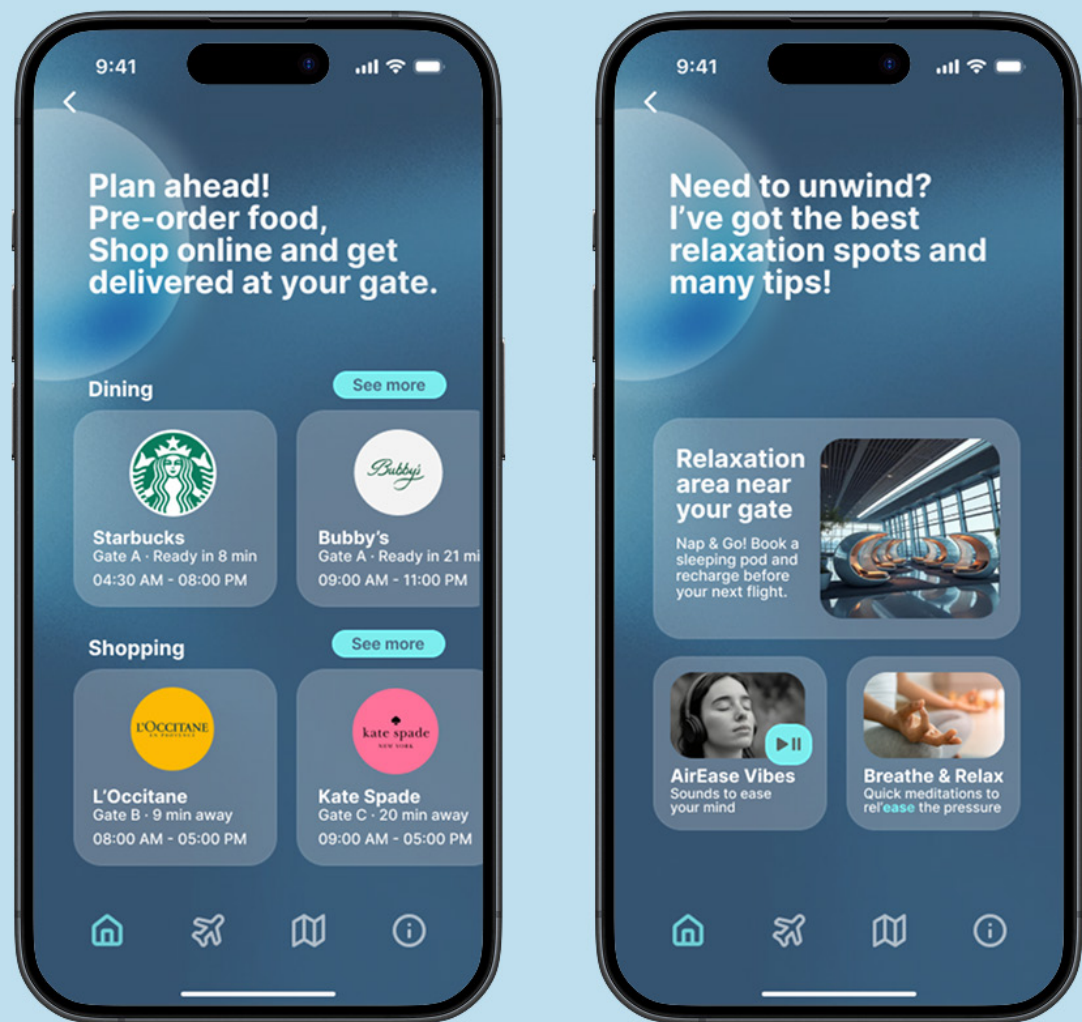
Planning Ahead

AirEase allows travelers to make the most of their time while waiting at TSA or before boarding.

Powered by Easabelle, the app's AI assistant, this feature proactively recommends options based on the traveler's needs, available time, and gate location. Users can pre-order food and shop online, choosing to either pick up their items on the way to their gate or have them delivered directly.

For those seeking relaxation, Easabelle suggests reserving a sleeping pod with guided directions, accessing meditation exercises and music, or exploring nearby art galleries or children's play areas if time permits.

By integrating personalized recommendations, stress-reducing activities, and streamlined services, AirEase transforms passive waiting time into a smoother, more enjoyable, and well-planned airport experience.

Navigating the Airport

To ensure a stress-free wayfinding experience, AirEase offers two navigation options: Standard Map and AR Map. The Standard Map provides a familiar, top-down airport layout, making it easy for travelers to locate gates, amenities, and key services.

However, for those who struggle with spatial orientation or feel lost, the AR Map Mode enhances navigation by using the phone's camera to overlay real-time, step-by-step directions onto their surroundings, guiding them precisely to their destination.

Below the map, quick-access icons allow users to instantly find essential locations such as shops, restaurants, bathrooms, and saved locations, eliminating the need to manually search for key services. Easabelle, the app's AI assistant, can also suggest routes based on urgency, whether a traveler needs to quickly reach their gate, locate a nearby restroom, or find a dining option with minimal detours.

By combining flexible navigation options, real-time assistance, and intuitive search features, AirEase empowers travelers to move through the airport with confidence and efficiency, reducing stress and confusion in unfamiliar environments.
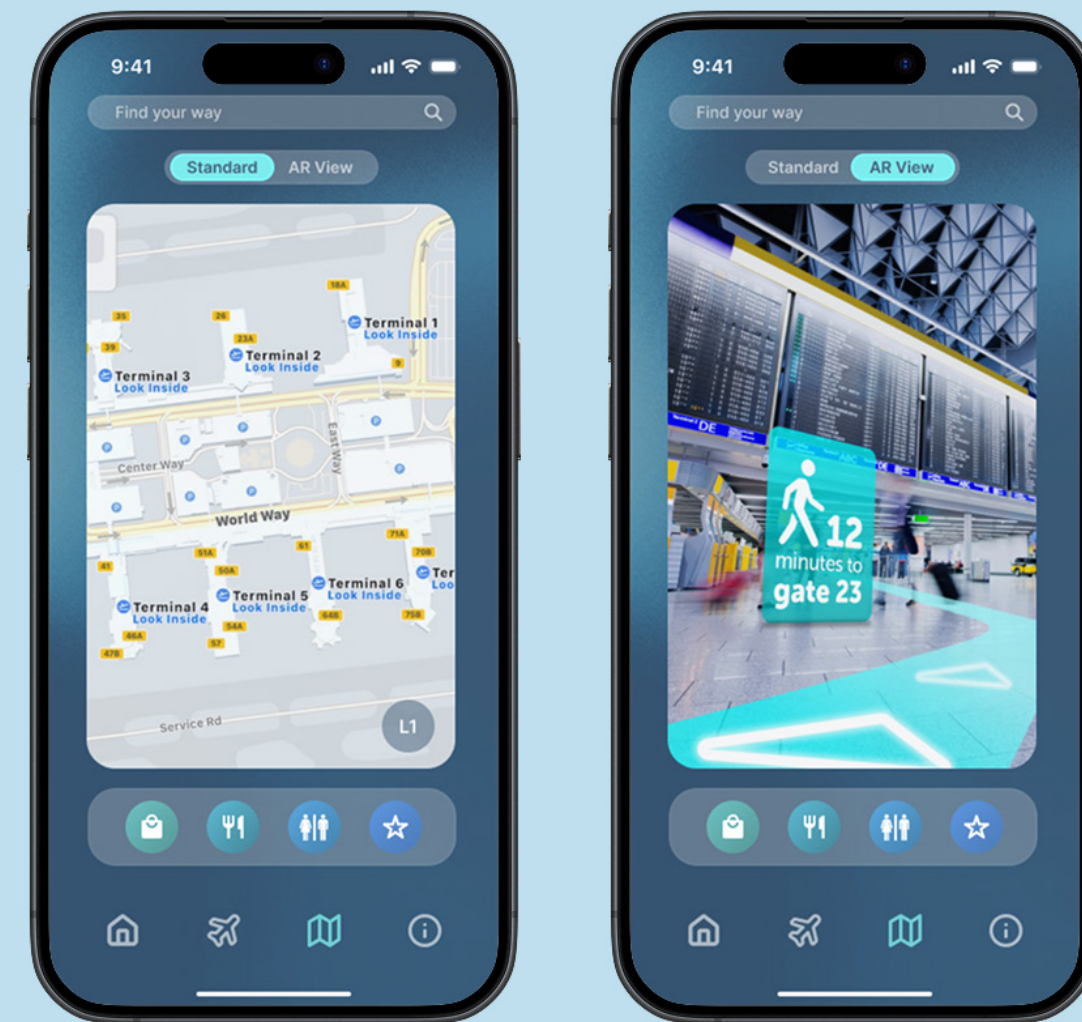
BLUEPRINT & FLOWCHART

Many travelers—especially those unfamiliar with the process, traveling with children, or experiencing mobility challenges—struggle with where to go, what to do, and how to move efficiently through screening. To address these issues, AirEase provides real-time guidance, proactive reminders, and streamlined assis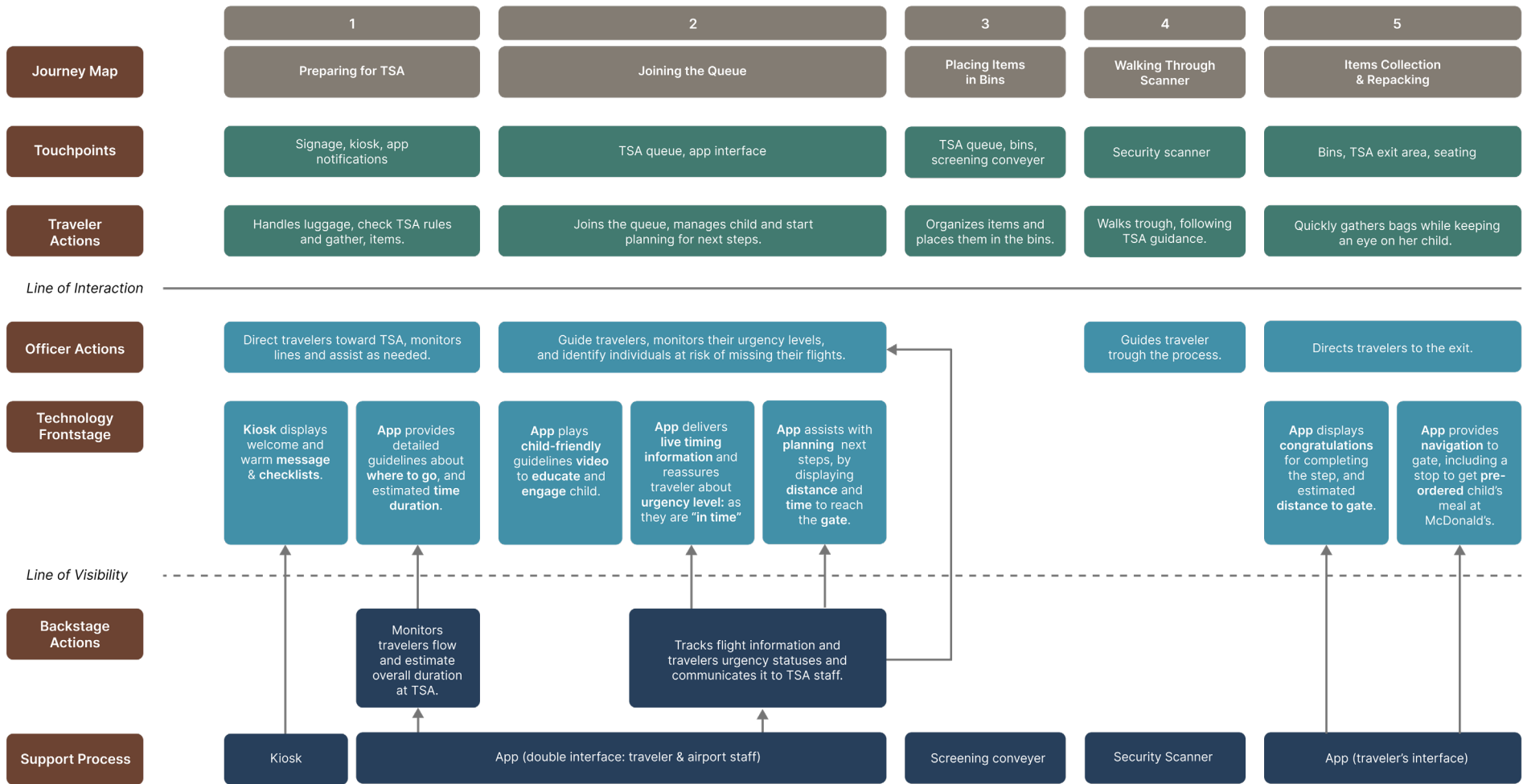tance to help users feel prepared and in control. The Service Blueprint and Flowchart work together to visualize how the app supports travelers at each stage of the TSA process, ensuring that digital interventions align with real-world pain points.

The Service Blueprint offers a structured overview of both user actions and backend processes, showing where AirEase integrates into the journey to enhance efficiency. Meanwhile, the Flowchart maps out every possible TSA outcome, ensuring that whether a traveler moves smoothly through security or encounters unexpected delays, the app provides guidance tailored to their needs. Together, these tools illustrate how AirEase creates a more predictable, stress-free TSA experience, reducing frustration and uncertainty for all travelers.

AIR EASE BLUEPRINT

The airport navigation app guides travelers with real-time updates, AI navigation, and multilingual support, reducing stress at TSA and baggage claim. Fixing GPS issues, complex steps, and accessibility with Wi-Fi tracking and voice guidance will improve usability. Future upgrades like AR maps and biometric check-ins can enhance convenience.

	1	2	3	4	5
Journey Map	Preparing for TSA	Joining the Queue	Placing Items in Bins	Walking Through Scanner	Items Collection & Repacking
Touchpoints	Signage, kiosk, app notifications	TSA queue, app interface	TSA queue, bins, screening conveyer	Security scanner	Bins, TSA exit area, seating
Traveler Actions	Handles luggage, check TSA rules and gather, items.	Joins the queue, manages child and start planning for next steps.	Organizes items and places them in the bins.	Walks trough, following TSA guidance.	Quickly gathers bags while keeping an eye on her child.

Line of Interaction

Officer Actions	Direct travelers toward TSA, monitors lines and assist as needed.	Guide travelers, monitors their urgency levels, and identify individuals at risk of missing their flights.		Guides traveler trough the process.	Directs travelers to the exit.
Technology Frontstage	**Kiosk** displays welcome and warm **message** & **checklists**.	**App** provides guidelines about **where to go**, and estimated **time duration**. / **App** plays **child-friendly** guidelines **video** to **educate** and **engage** child. / **App** delivers **live timing information** and reassures traveler about **urgency level:** as they are **"in time"** / **App** assists with **planning** next steps, by displaying **distance** and **time** to reach the **gate**.			**App** displays **congratulations** for completing the step, and estimated **distance to gate**. / **App** provides **navigation** to **gate**, including a stop to get **pre-ordered** child's meal at McDonald's.

Line of Visibility

Backstage Actions		Monitors travelers flow and estimate overall duration at TSA.	Tracks flight information and travelers urgency statuses and communicates it to TSA staff.		
Support Process	Kiosk	App (double interface: traveler & airport staff)	Screening conveyer	Security Scanner	App (traveler's interface)

AIR EASE FLOWCHART

The Flowchart visualizes the different paths a traveler may take during TSA screening, ensuring AirEase provides support at every stage. Whether a traveler moves through security smoothly or faces delays, the app offers real-time assistance. Features like virtual queueing, reminder notifications, and live guidance help reduce stress and confusion.

Beginning/End

Traveller Actions

App Assistance

Question

Airport Environment
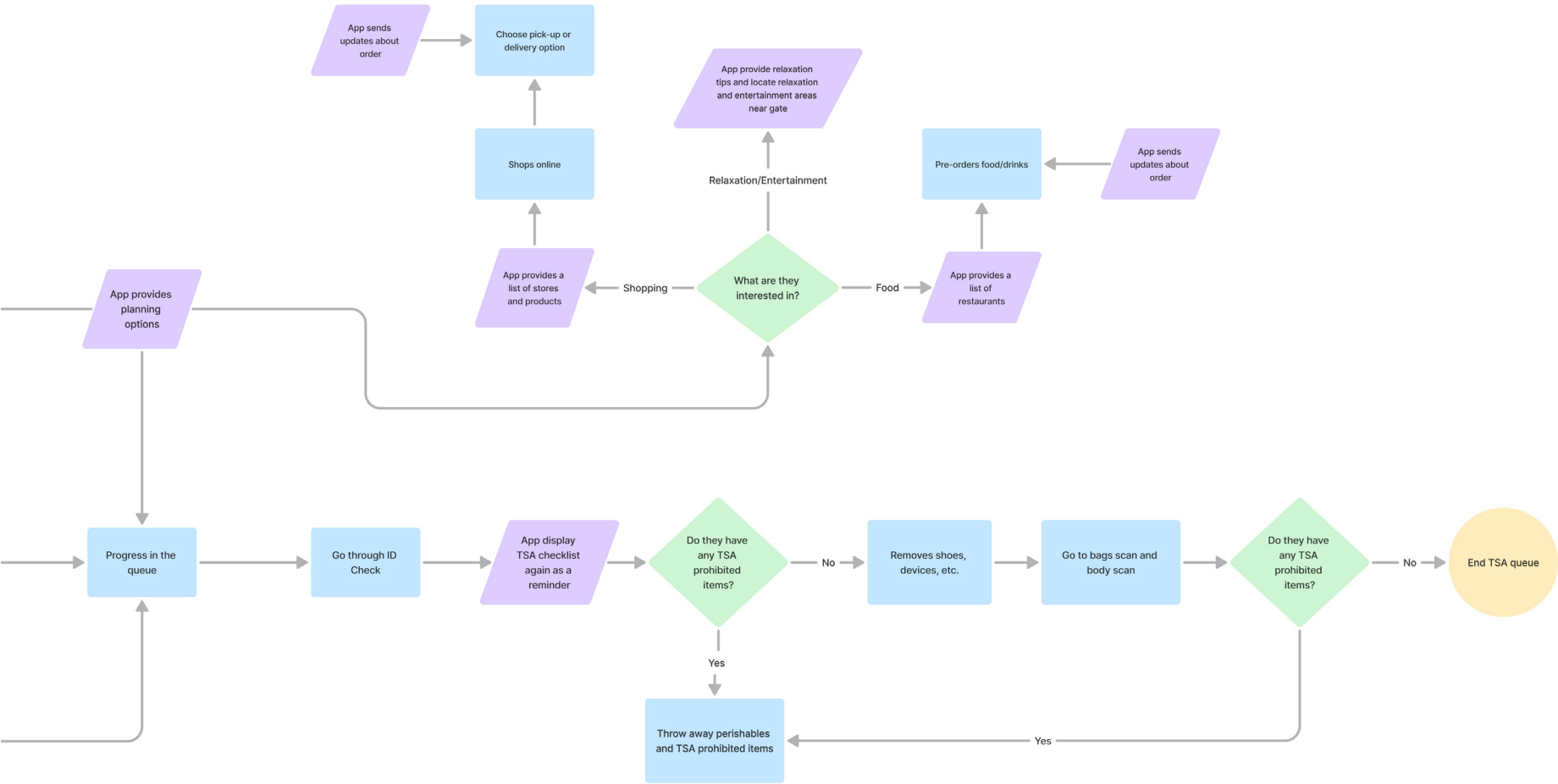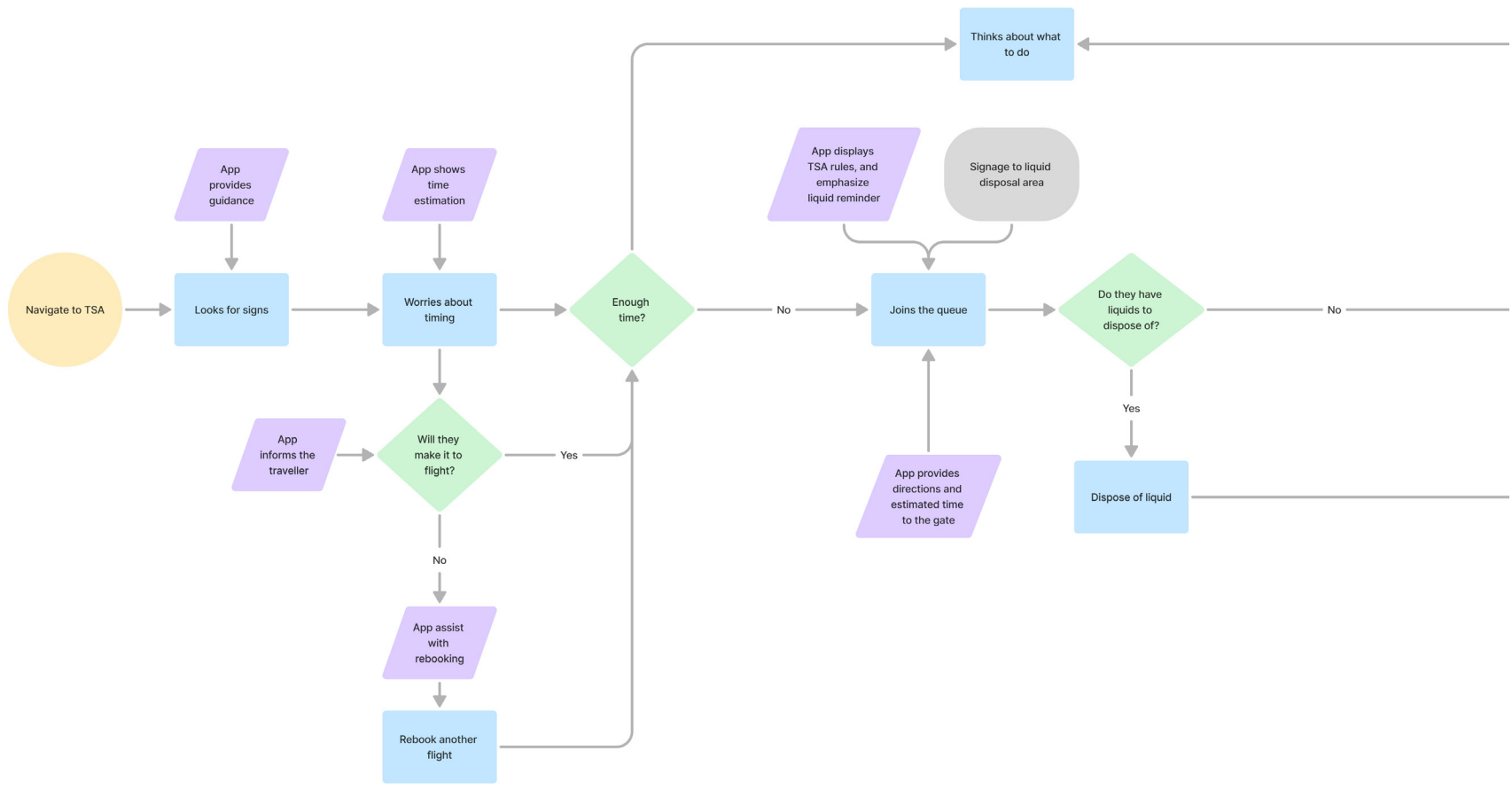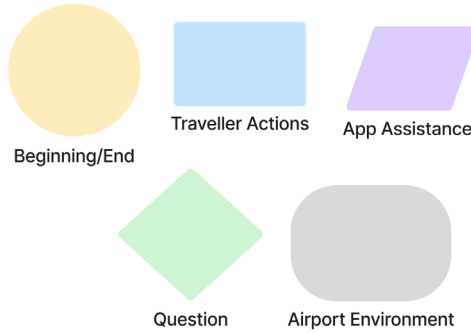
Additionally, the Plan Ahead feature allows users to pre-order food, shop online, or reserve relaxation spaces while waiting in line, making the process feel more efficient. By addressing both logistical challenges and traveler comfort, AirEase ensures a seamless and proactive TSA experience.

3D PROTOTYPING

To create a more comfortable, engaging, and inclusive airport environment, we developed 3D models and renders that visualize how redesigned gate areas can better serve travelers. Airports are traditionally designed for efficiency, often prioritizing functionality over passenger comfort. However, long layovers, delays, and extended waiting times can make the gate experience exhausting and stressful. By incorporating thoughtfully designed spaces such as sleeping pods, an interactive art gallery, and a dedicated children's play area, the gate area is transformed from a passive waiting zone into a dynamic, multi-functional space that accommodates different traveler needs.

This section of the process book highlights the importance of prototyping environments that foster well-being, engagement, and accessibility within airports. These 3D renders help visualize our service design solutions, allowing us to demonstrate how strategic space planning can improve relaxation, entertainment, and stress reduction for all travelers. By integrating these spaces near the gate, we ensure passengers remain close to their boarding area while having opportunities to rest, explore, and unwind. These visual models serve as a crucial bridge between concept and implementation, helping stakeholders understand the value of human-centered airport design and how these enhancements can create a more seamless and enjoyable travel experience.
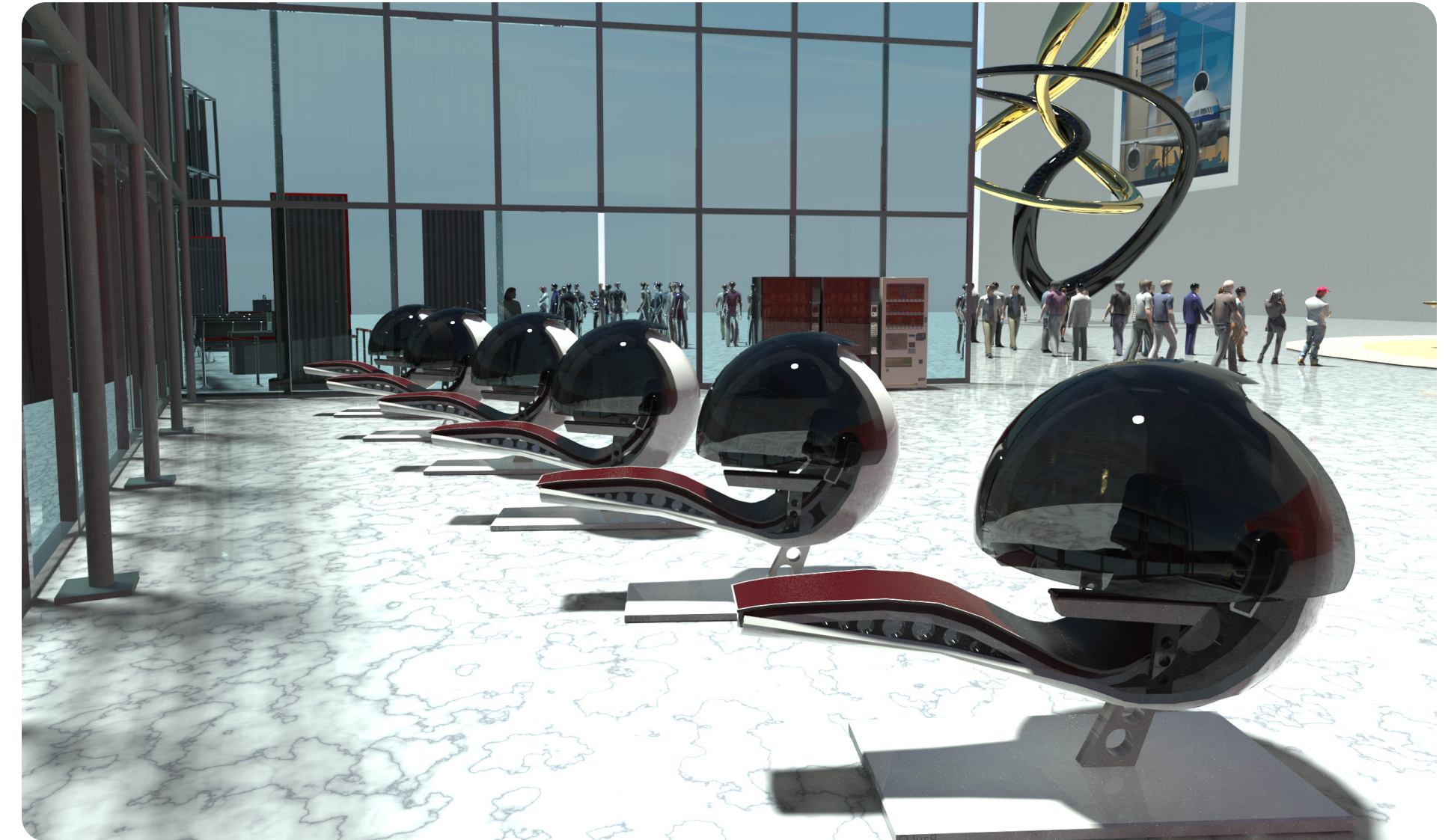
## Sleeping Pods: Prioritizing Rest & Well-Being

Traditional gate seating often lacks comfort, especially for travelers facing long layovers or delays. To address this, we incorporated sleeping pods right next to standard seating—providing a private, quiet space for rest while ensuring travelers remain close to their boarding area. These pods offer a calm retreat, catering to weary passengers, business travelers, and those needing a moment of relaxation before their flight.

Children's Playground: Fun Waiting for Families

Designed with family travelers in mind, the children's playground provides a safe, engaging space for kids to play while waiting for their flight. Positioned next to the art gallery, it allows parents to enjoy the exhibits while keeping an eye on their children. By incorporating interactive structures, sensory play elements, and digital engagement, the space helps reduce travel stress for families and creates a more inclusive airport environment.
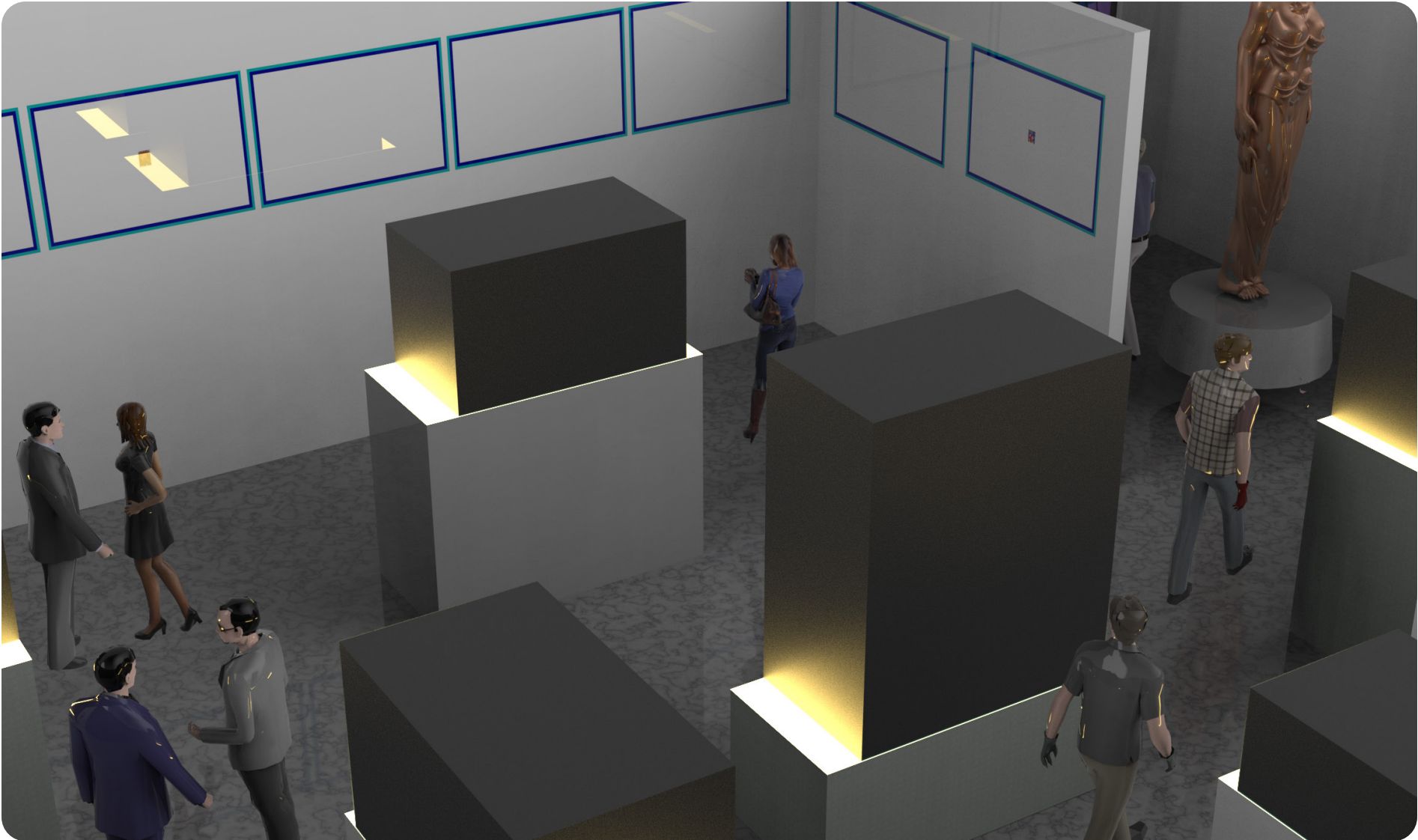

Art Gallery: Enriching the Travel Experience

Located near the gate, the art gallery introduces an element of culture and creativity, turning idle waiting time into a meaningful experience. Travelers can explore a curated collection of sculptures, paintings, and AR-enhanced art by scanning the paintings with their phones, offering a moment of inspiration and relaxation before their journey. The space encourages engagement beyond passive waiting, enhancing the overall airport experience.

AIREASE VISION VIDEO

To bring our concept to life, we created a vision video showcasing how AirEase enhances the airport journey. This promotional video highlights the key selected features such as real-time navigation, TSA assistance, AI-powered recommendations, and relaxation options, demonstrating how the app reduces stress and improves accessibility for all travelers. The video illustrates AirEase in action, emphasizing its role in transforming airports into more efficient, inclusive, and traveler-friendly spaces.

What if the traveler is running late?
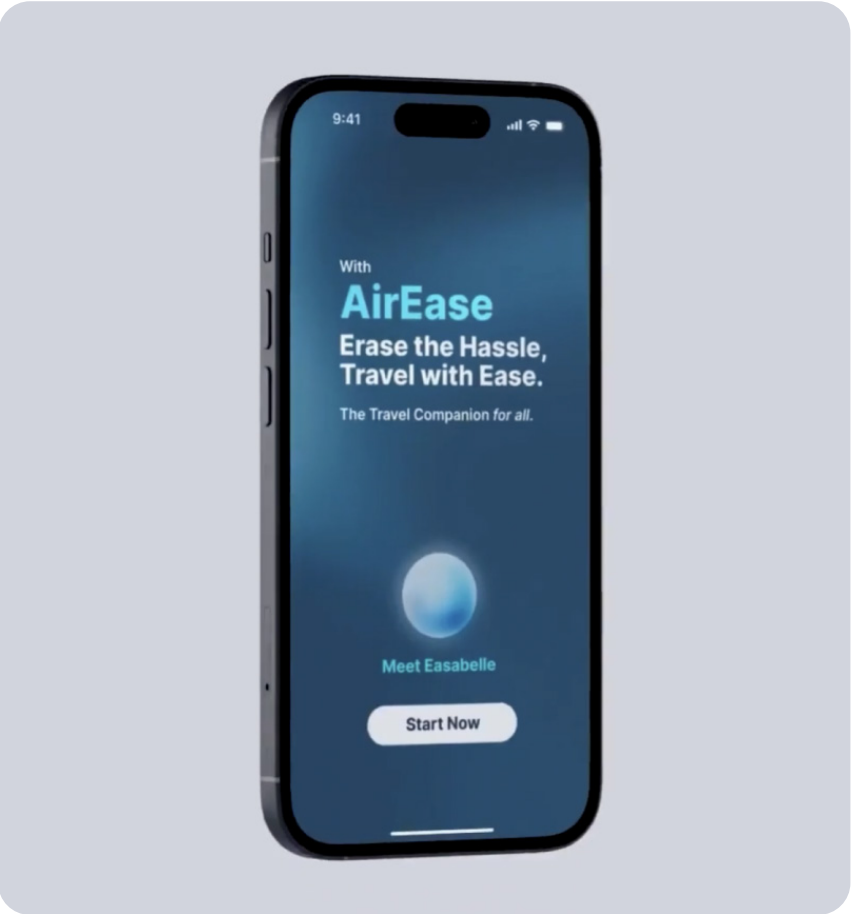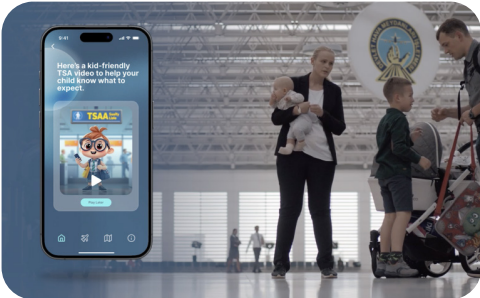
FUTURE OPPORTUNITIES

Throughout our design process, we identified several opportunities that we were unable to fully explore due to time constraints and resource limitations. While our current solution enhances the traveler experience, deeper research and iteration could further refine and expand its impact.

One key area we would have liked to explore further is the role of airport staff, particularly TSA agents, and their backstage operations. Understanding their workflows, challenges, and decision-making processes could have helped us design a system that seamlessly integrates with their existing protocols rather than introducing friction.

Another opportunity lies in optimizing TSA queue organization based on flight urgency. By exploring ways to dynamically manage security lines—prioritizing travelers with imminent departures while maintaining fairness for all passengers—we could enhance efficiency without compromising security.

Finally, additional rounds of prototyping would have allowed us to test and validate (or invalidate) key concepts more rigorously. Real-world testing with travelers and airport staff could have provided deeper insights into usability, feasibility, and potential pain points, ensuring that our design solutions were both practical and impactful.

These opportunities remain valuable directions for future iterations of AirEase, opening the door for continued innovation in airport service design.

CONCLUSION

This project has been a comprehensive exploration of how service design, technology, and spatial planning can work together to create a more inclusive and stress-free airport experience.

We began by conducting case studies based on our own airport experiences, identifying common pain points travelers face. Using these insights, we developed paper prototypes to explore potential challenges and solutions. To deepen our understanding, we utilized the Value Proposition Canvas to develop a diverse set of user personas, ensuring our design approach was inclusive of different traveler needs— including a foreign traveler facing language barriers, a single mother with a child, and an elderly couple with limited mobility. We then used LEGO prototyping to simulate their journeys, identifying key stress points and determining which phases of the airport experience needed the most intervention. Building on these insights, we conducted service staging to test how the AirEase app prototype could provide real-time support throughout a traveler's journey. To bring our design to life, we visited Savannah Airport to record real-world

video demonstrations, showcasing how AirEase assists users in navigating the airport, managing TSA procedures, and reducing travel stress.

Beyond digital solutions, we also prototyped physical spaces through 3D modeling, visualizing how redesigned gate areas—featuring sleeping pods, an interactive art gallery, and a children's play area—can transform waiting zones into engaging, comfortable environments. By integrating human-centered design principles, we have reimagined the airport as a space that prioritizes accessibility, convenience, and traveler well-being.

This process book captures our journey from problem discovery to solution development, demonstrating how design thinking, iterative prototyping, and real-world testing can drive meaningful improvements in airport experiences. As air travel continues to evolve, projects like this reinforce the importance of balancing efficiency with human-centered solutions, ensuring that airports are not just transit hubs but welcoming and inclusive spaces for all travelers.

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