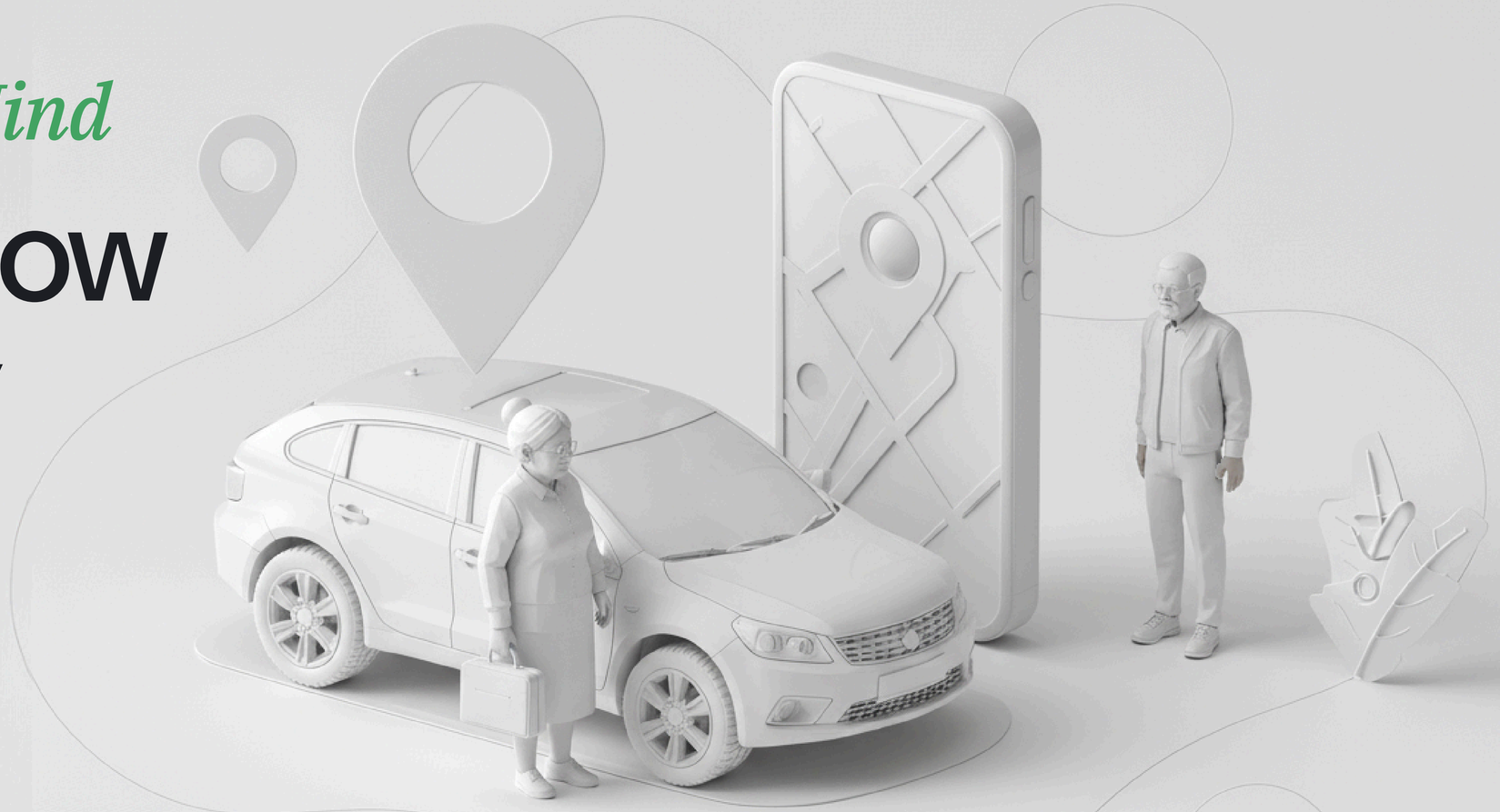
Designing with Accessibility in Mind

Sign-up flow for elderly users

Noroff UX Design Studies



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Overview

The Challenge

Design a mobile app for a government initiative that helps reduce carbon emissions by organising **carpooling** in areas with unreliable public transport. The app **connects people who own cars** with **elderly** users who occasionally need a lift to destinations such as hospitals, city centres, or shopping areas.

Goal:

Create an accessible, user-friendly **sign-up process** for older users (aged 70–85) who may have visual or motor impairments, ensuring clarity, simplicity, and compliance with WCAG 2.1 AA accessibility standards.

Roles:

Research, User Flow Mapping, Low-Fidelity Wireframes, Accessibility Analysis, High-Fidelity Prototyping, and Presentation Design.

Solution & Process:

Define the problem and understand the needs of elderly users through research and empathy-driven design. The process focuses on creating an inclusive user experience that supports individuals with vision impairments and other age-related challenges.
Apply universal design principles and ensure compliance with WCAG 2.1 AA accessibility standards, prioritising readability, clarity, and ease of interaction.
The design process involves ideation, rapid prototyping, and iterative testing to evaluate usability and accessibility at every stage.

Empathise

Our users

Our target user group — adults aged 70 to 85 who don't own a car and may occasionally need a lift — often face both physical and psychological challenges when interacting with mobile apps.

Physical Challenges Faced by Older Users

Reduced vision, slower reaction times, limited manual dexterity, and perhaps unfamiliarity with mobile apps and login flows. Some also live with mobility impairments, hearing loss or chronic conditions that affect their daily travel confidence.
According to the World Health Organization European Region, roughly 135 million people live with a disability, and the prevalence increases with age — older adults are much more likely to have functional limitations. In the UK for example, approximately 45% of adults over pension age report a disability

List of Physical Challenges

Technology anxiety

Older adults often report technology-related anxiety (fear of making mistakes, feeling incompetent, technophobia) when using new digital devices or services. A 2023 study found that negative self-perception of ageing (feeling "I'm too old/slow") is associated with greater technology anxiety, which in turn reduces intention to use digital public services.

Ideation

Design Response to User Challenges

To create an inclusive experience, the design directly responds to both the physical and psychological barriers identified during user research. The interface is simplified, accessible, and reassuring — helping older adults interact with confidence and ease.

Device choice

I created the design for a **smaller screen size (iPhone SE)** to ensure that the interface remains accessible, readable, and easy to navigate even on compact devices — a common choice among older users who prefer simpler, smaller phones.

Responding to Digital Anxiety

- Start with a gentle, guided onboarding that clearly explains each step.
- Offer progress indicators so users see how far they've come.
- Minimize the risk of mistakes — include clear undo and edit options.
- Avoid overwhelming forms; split into small, focused steps.
- Confirm every major action with simple, friendly messages.
- Reduce cognitive load: clean interface, minimal text, familiar patterns.
- Allow users to pause and return later without losing progress.
- Provide visible help or info icons rather than hidden tooltips.
- Build trust through secure, predictable interactions (no unexpected pop-ups).
- Use plain, readable language and avoid jargon.

Responding to Physical Challenges

- Use large, high-contrast typography and clear icons for readability.
- Avoid color-only indicators; rely on text labels and clear shapes.
- Design large touch targets (min. 44×44 pt) with generous spacing.
- Keep interaction simple — one main action per screen.
- Support system accessibility tools (voice dictation, screen readers, zoom).
- Use native input types (date pickers, phone pads) to minimize typing.
- Maintain consistent navigation and predictable layouts.
- Limit scrolling and gestures that require precision.

Structure of the Onboarding Journey

I divided the information gathering into smaller, manageable steps to accommodate older users with vision or attention challenges. After the account is created in Step 2, subsequent steps progressively complete the user's profile. This reduces cognitive load, minimizes typing effort, and provides a clear sense of progress through the onboarding flow.

Accessibility & UX highlights

- Each step focuses on a single cognitive task.
- Large buttons, minimal text per screen, strong visual contrast.
- Pre-filled fields for convenience (when possible).
- "**Save & Continue**" buttons are consistently placed and labelled.
- Progress indicator (e.g. "Step 3 of 5") for clarity.

1

Email

Check if user exists / choose method (local or Google)

No account yet, system just **validates email**.

2

Username + Password

Create credentials and verify identity

Account is created here (record with ID, email, username, password hash or OAuth token).

3

Personal info

Full name, address, phone number

Data saved to user profile linked to the new account

4

Travel locations

Starting location/address, destination address

Locations saved as user preferences or travel records

5

Travel dates & times

User setting up dates and time

Schedule data saved and linked to the same user profile

Conformation

Account has been created successfully

Travel Summary Screen

Users can review all their planned trips

Conformation

Registration was successfully completed

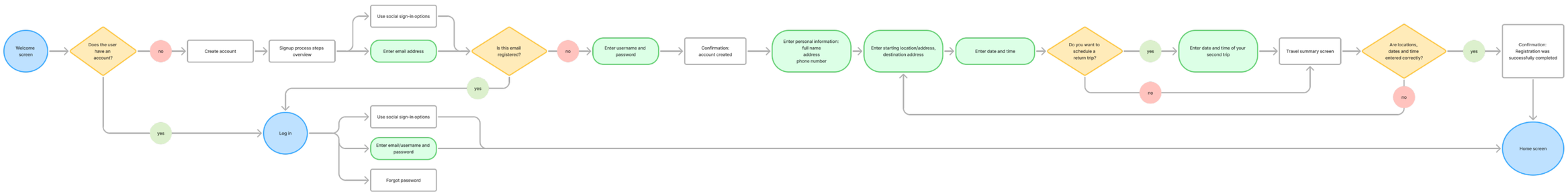
Step 1 differs from the original brief

Instead of starting with a username and password, I begin with the **email address**. For elderly users, this approach is clearer and reduces confusion — many may not remember if they already have an account or which method they used previously. The email is the only **reliable** piece of information that allows the system to check if the user already exists and to direct them either to sign in or to create a new account. This small change simplifies the onboarding process, lowers cognitive load, and prevents duplicate accounts.

User Flow

FigJam diagram

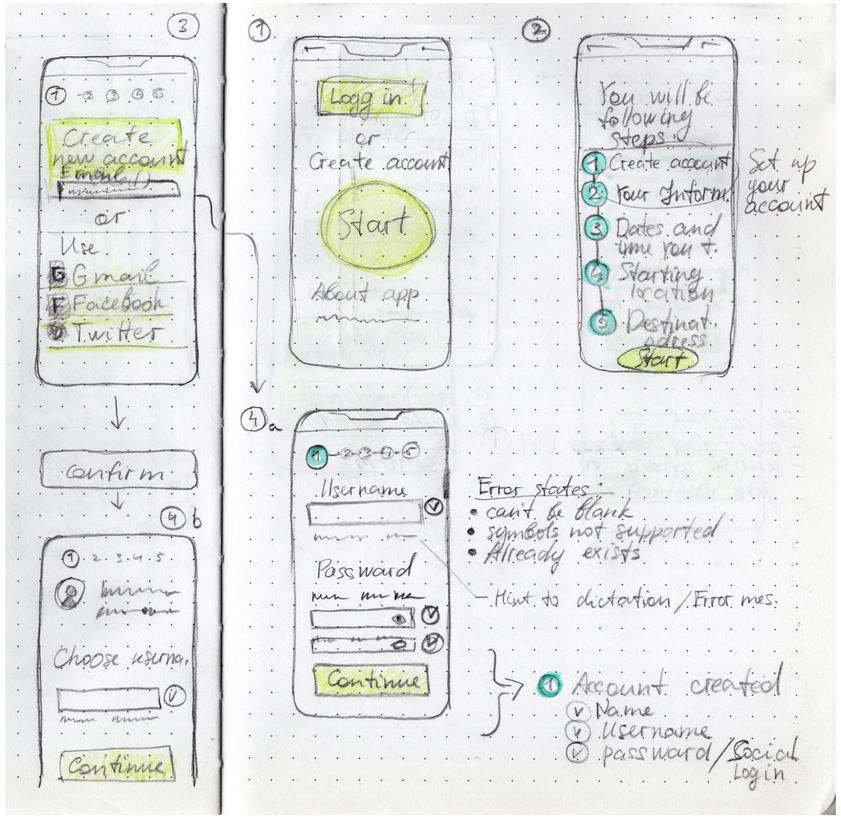
The user flow illustrates the complete sign-up journey, from the initial choice of sign-in method to confirmation. It defines each decision point and interaction, ensuring the process is logical, accessible, and easy to follow, especially for older users.

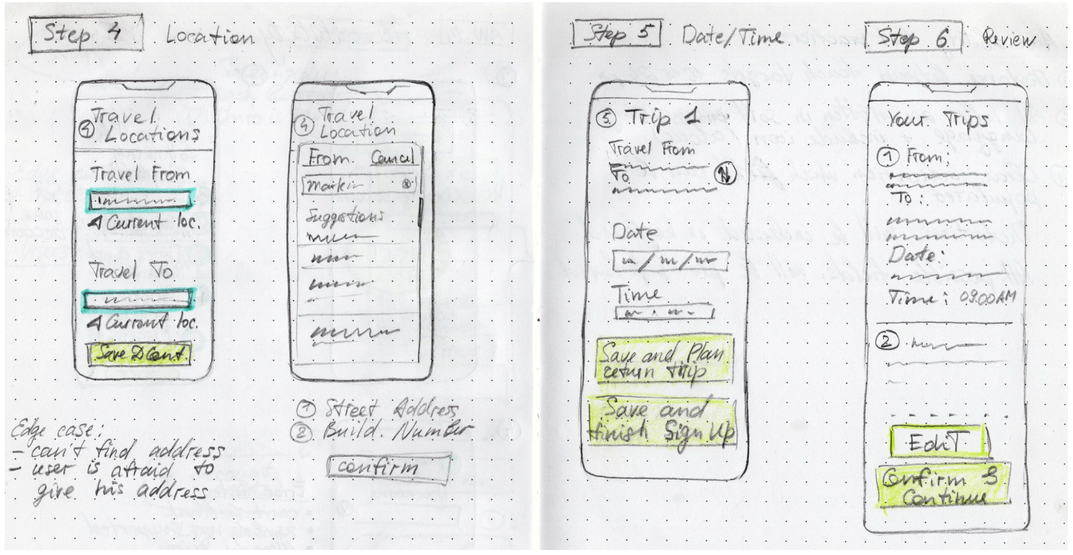


Wireframes

Early Hand-Drawn Wireframes

After defining the overall structure of the sign-up process, I began sketching the wireframes by hand. This stage allowed me to quickly capture ideas, explore different layouts, and identify potential friction points in the user flow. The sketches served as a foundation for moving forward with refined digital wireframes in Figma.





Input Fields and Accessibility

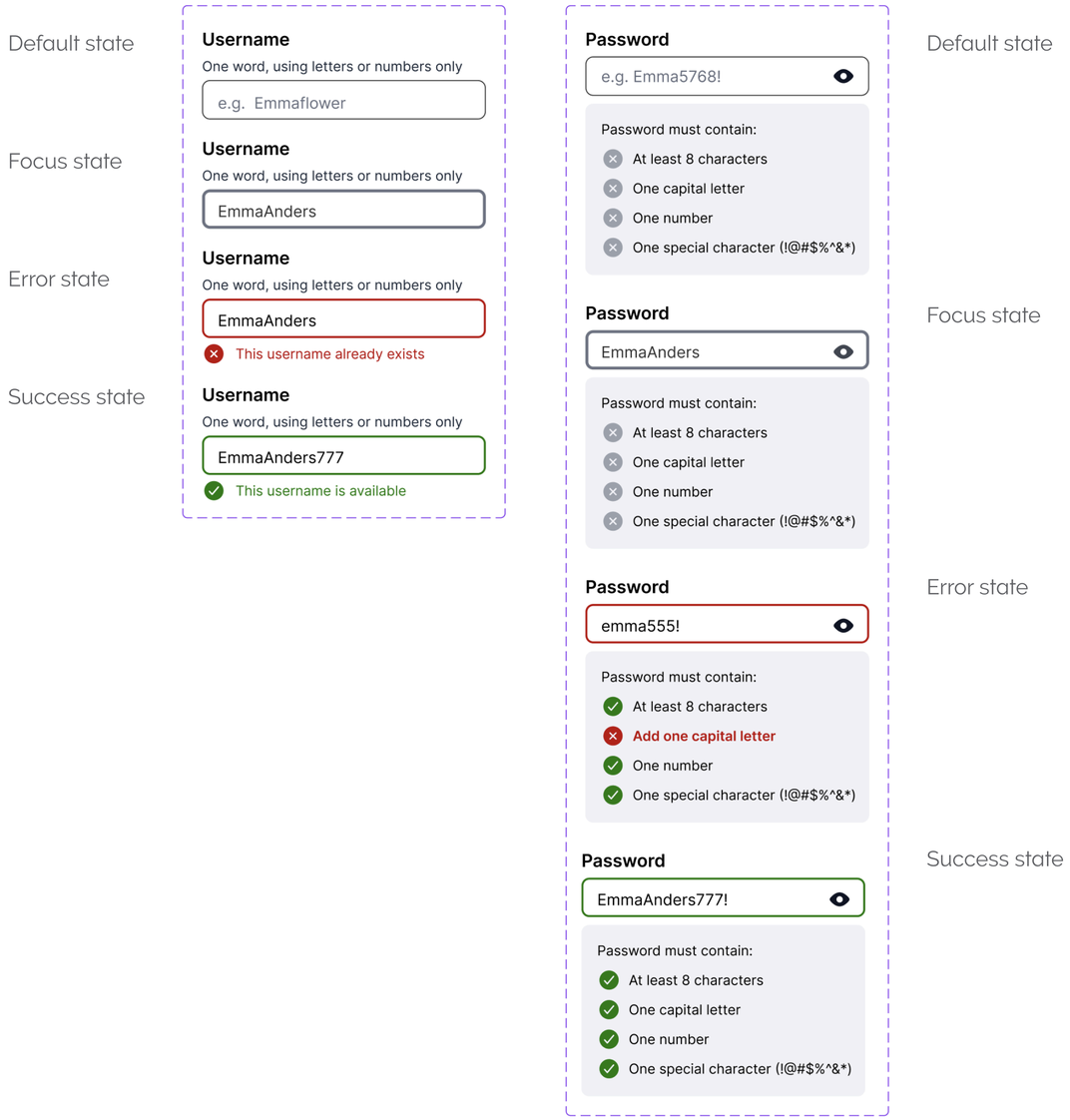
Figma Components

The sign-up experience depends largely on how easy it is for users to enter their information, understand feedback, and recover from errors. For elderly users, clarity, touch accuracy, and visible feedback are essential to reduce confusion and anxiety.

In my design, I focused on making every input field easy to read, tap, and understand:

- Each field has sufficient height to support accurate tapping.
- Font size is set to 16 px, improving readability for users with visual impairments.
- Error and success states are communicated through both text and color, ensuring accessibility for users with limited color perception.
- All colors and contrasts comply with WCAG 2.1 AA standards, guaranteeing that visual feedback is clear and distinguishable.

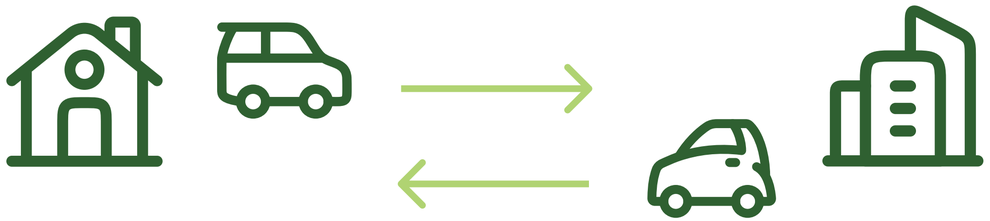
These refinements ensure that users of all abilities can confidently complete the sign-up process without frustration.

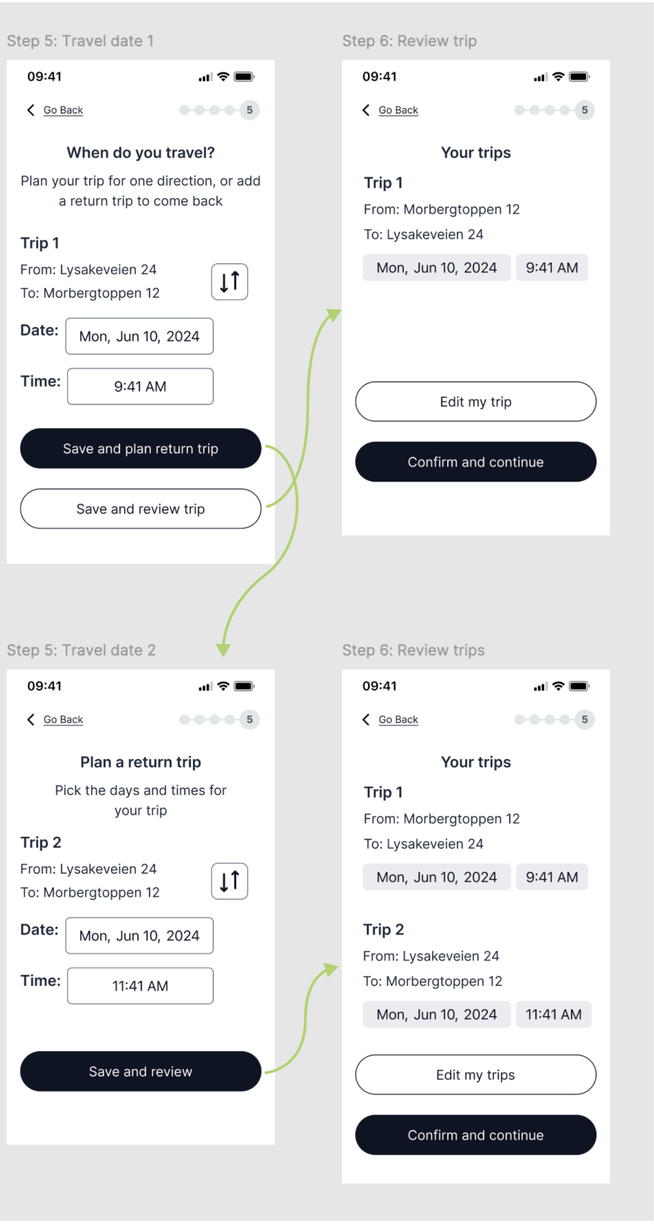


Planning Two-Way Travel

Older adults often travel both ways — for example, from home to the hospital in the morning and back home in the afternoon. For them, it's important to feel confident that the app will help them plan the entire round trip, not just one direction.

To address this need, the design keeps the two main addresses (set in the previous step) visible and easy to switch between when choosing dates and times. This allows users to quickly set a morning journey one way and then define the return trip without re-entering information. Clear buttons such as "Save and plan return trip" or "Save and review trip" give reassurance that both trips are safely recorded, helping older users feel secure and in control of their travel plans.



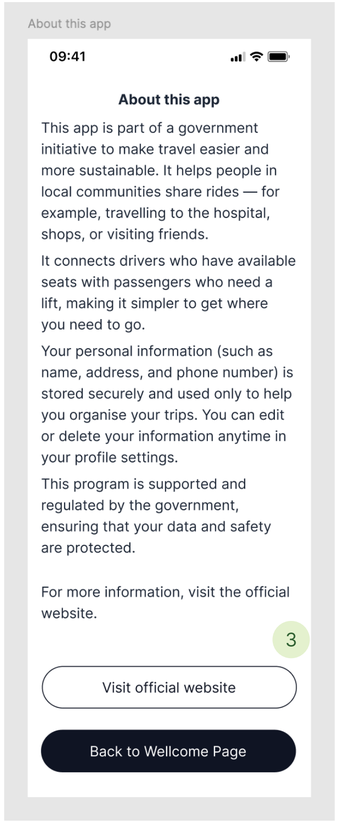


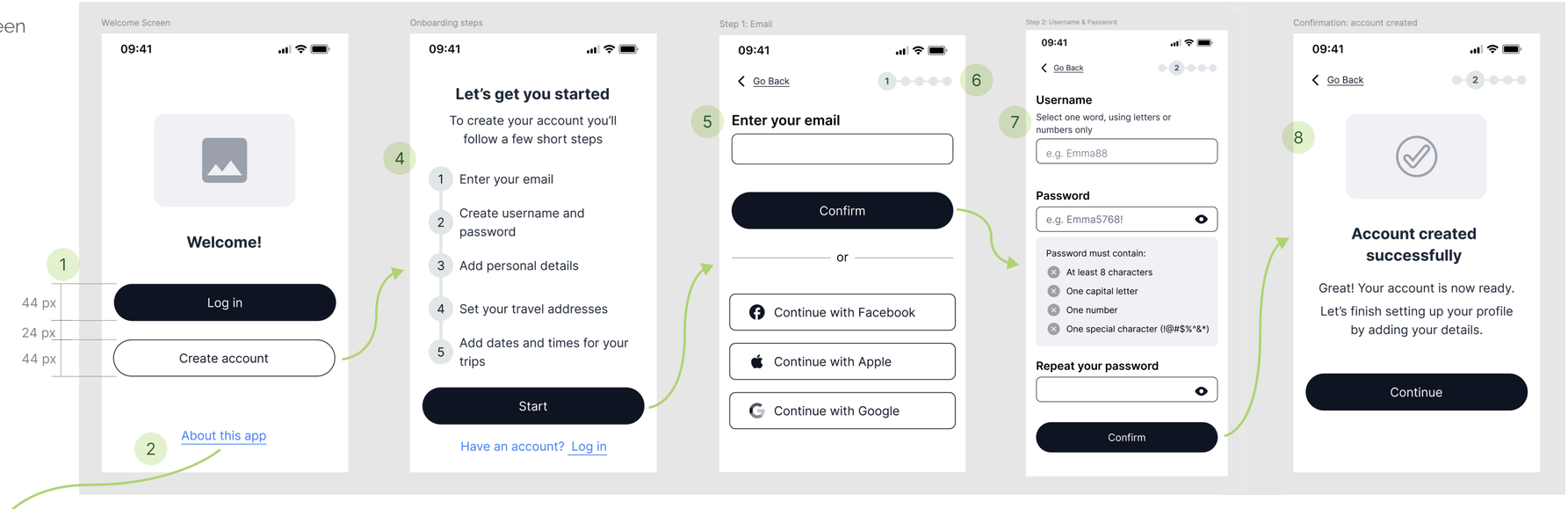
Digital Wireframes Part 1:

Applying Best Accessibility Practices

[Figma wireframes]

In my design process, I used the smallest screen size, **iPhone SE**, as a reference.





Simple, step-by-step flow

- The sign-up process is broken into short, focused steps, reducing cognitive load.
- Each screen communicates one clear task, preventing overwhelm.

1. **Buttons** have generous padding and clear visual hierarchy (primary vs secondary), tap targets follow Apple's minimum 44×44 px guideline for comfortable interaction, with 24 px spacing between them to support accessibility and prevent accidental taps
2. To reduce anxiety and build trust, I added a small **"About this app" link** (link text is visually distinguished by color). It provides clear, friendly information that the program is government-supported, it explains what the app does and how personal data is handled. For older users who may be cautious about sharing information, this transparency helps them feel safe and reassured before signing up.
3. **Two large buttons** give users simple, reassuring choices, following accessibility and clarity standards for elderly users.
4. Introducing **all sign-up steps** in the beginning, making the process understandable and predictable.
5. **Form field labels** are always visible, use large text size, and maintain high contrast for readability.
6. **A step indicator** (progress tracker) clearly shows which stage of the sign-up process the user is currently on, helping them stay oriented and confident.
7. **Helper text** is placed below input fields to give short, clear explanations about what kind of information is required and how to format it correctly. This approach reduces uncertainty, prevents input errors, and supports users with limited technical experience.
8. **Confirmation screen** verifies that the account has been created successfully, providing positive reassurance and building user confidence before continuing. At this point, the account is already created on the back end, which allows users to **safely** continue filling in their information — even if the internet connection is temporarily lost.

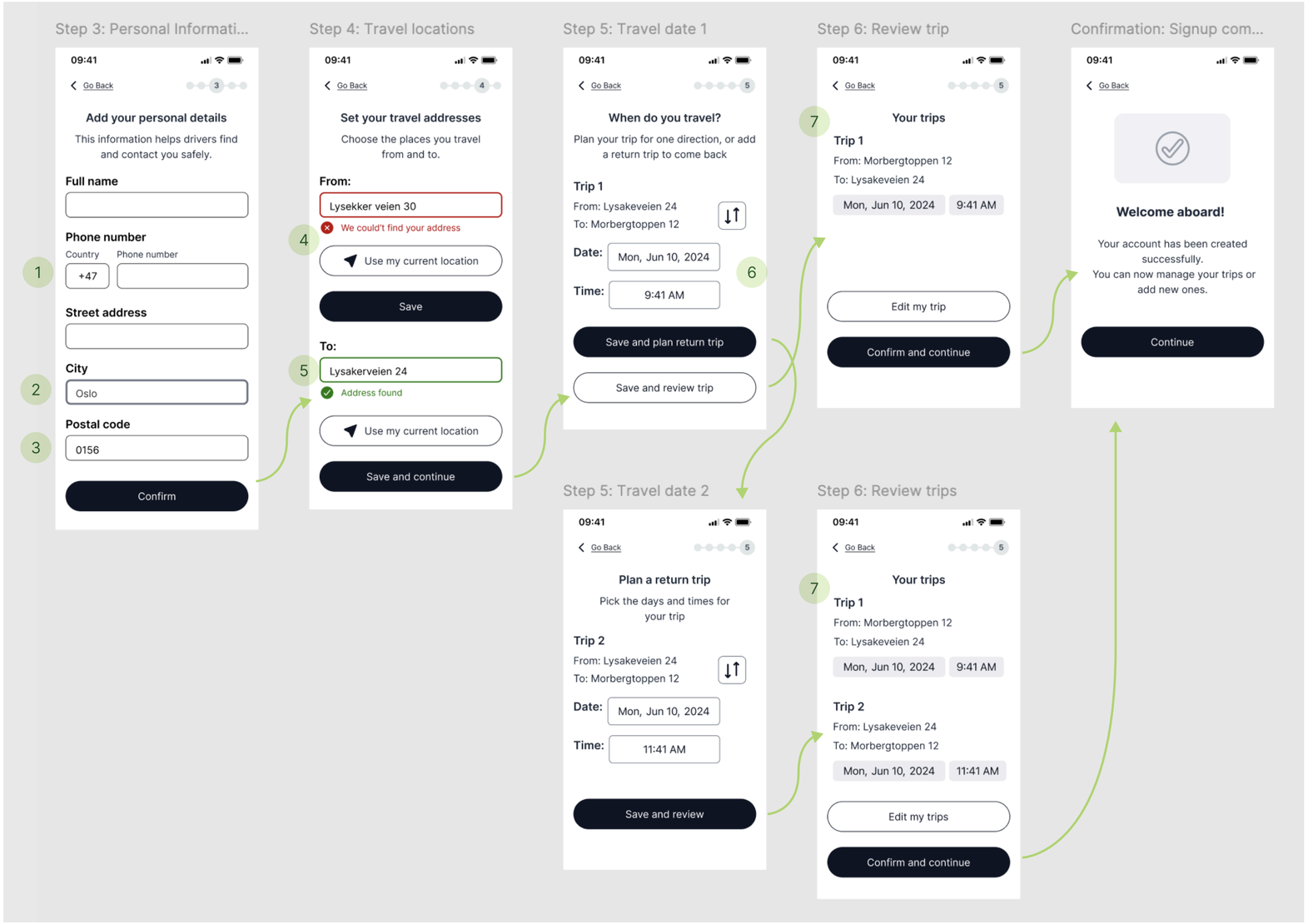
Digital Wireframes Part 2:

Applying Best Accessibility Practices

Figma wireframes

1. **The country code** in phone number is pre-filled but still editable.
2. All fields where possible include **auto-suggestions** to minimize typing and spelling mistakes.
3. **The postal code** auto-fills when a city is selected, with an option to edit manually. It also provides an additional check to detect if the city name was entered incorrectly.
4. **Positive and calm feedback** messages replace error-heavy language (e.g., “Please check spelling” instead of “Invalid input”)
5. **Validation** is real-time and descriptive (e.g., “Add one capital letter,” “Passwords match”). Both success and error messages include **color and icon indicators** to make feedback quickly recognisable and accessible
6. **Date and time** input fields are 44 px hight and use the device’s built-in date and time pickers, ensuring familiar interaction patterns, larger touch targets
7. **The summary screen** displays all planned trips with addresses, dates, and times. Date and time fields appear in a non-editable state, clearly indicating review mode. This screen provides a complete overview before proceeding, reducing user anxiety and building confidence.

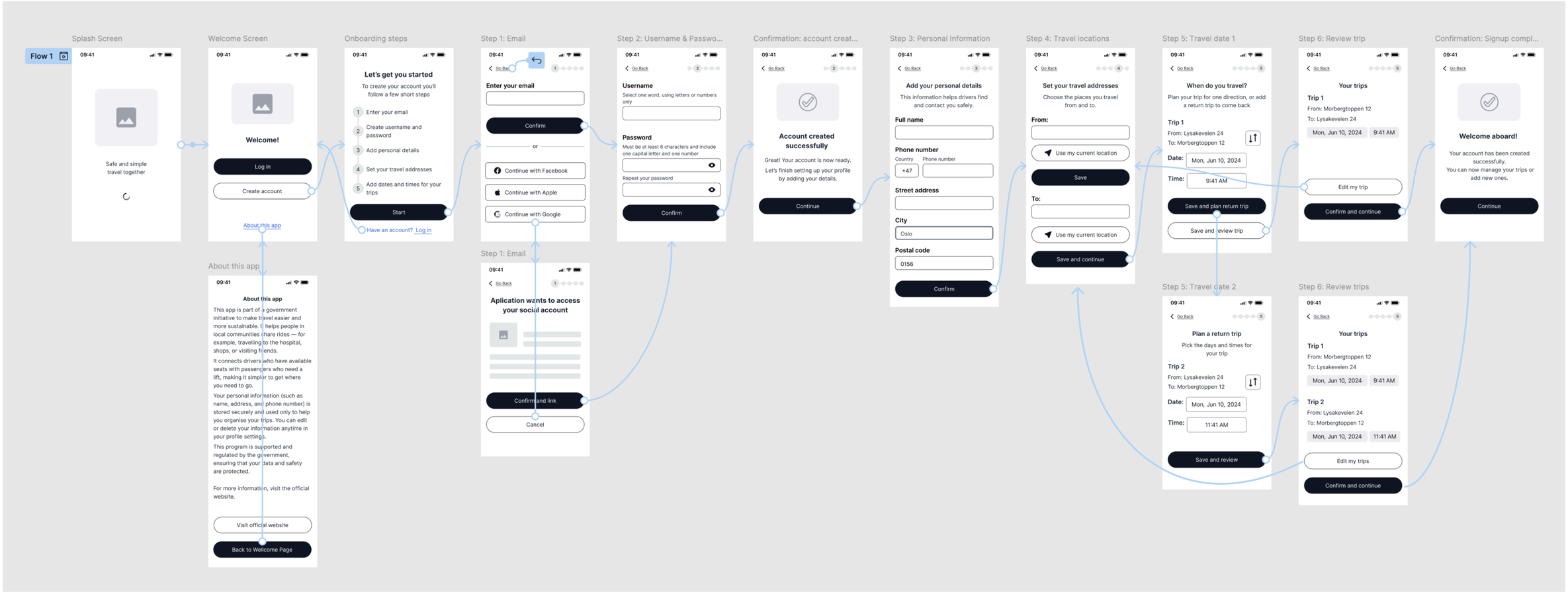
Dictation functionality has been considered in the design, but since it is already part of native mobile accessibility features, no additional in-app solution was added.



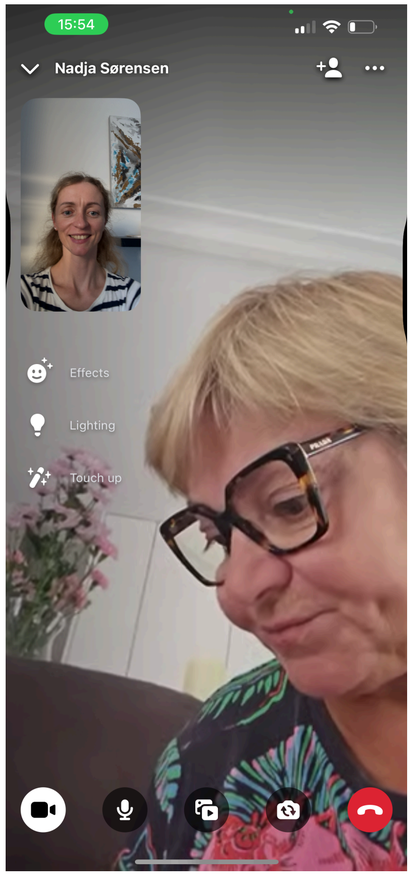
Wireflow

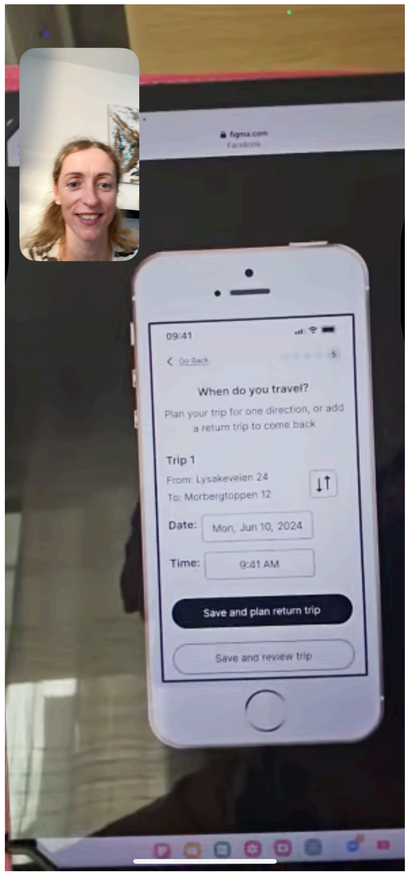
[Figma wireframes]

[Figma prototype]



Usability Testing





Testing the Prototype with an Older User

Figma prototype

To evaluate the accessibility and clarity of the prototype, I conducted a remote usability test with my mother-in-law (66 years old) via a video call. She opened the prototype on her tablet while we discussed her experience in real time.
Although she speaks Ukrainian and Norwegian, and the prototype was in English, she was able to understand the overall flow easily. A few unfamiliar words required short translation, which highlighted the importance of language simplicity in accessible design.

Her feedback was very positive:

- The signup pattern felt familiar and intuitive.
- Buttons, input fields, and text were large and easy to read, even without glasses.
- The confirmation messages were giving a sense of progression and reassurance.

This short test confirmed that the design choices around size, readability, and clear feedback effectively support older users and those with mild visual or language challenges.

Design Iterations

Accessibility Expandable Menu

As a part of my enhanced design, I introduced an expandable accessibility menu positioned at the top of the screen. It is designed as a high-contrast touch point with a recognizable accessibility icon, ensuring that it is easy to locate and activate.

The menu allows users to:

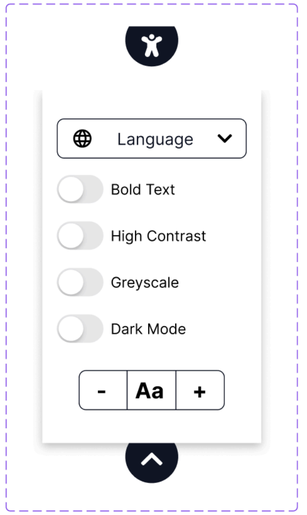
- Change the language of the interface
- Enable bold text for improved readability
- Switch to high-contrast or greyscale modes for users with visual sensitivity or color blindness
- Activate dark mode to reduce eye strain and glare
- Adjust the font size to make text smaller or larger for better legibility

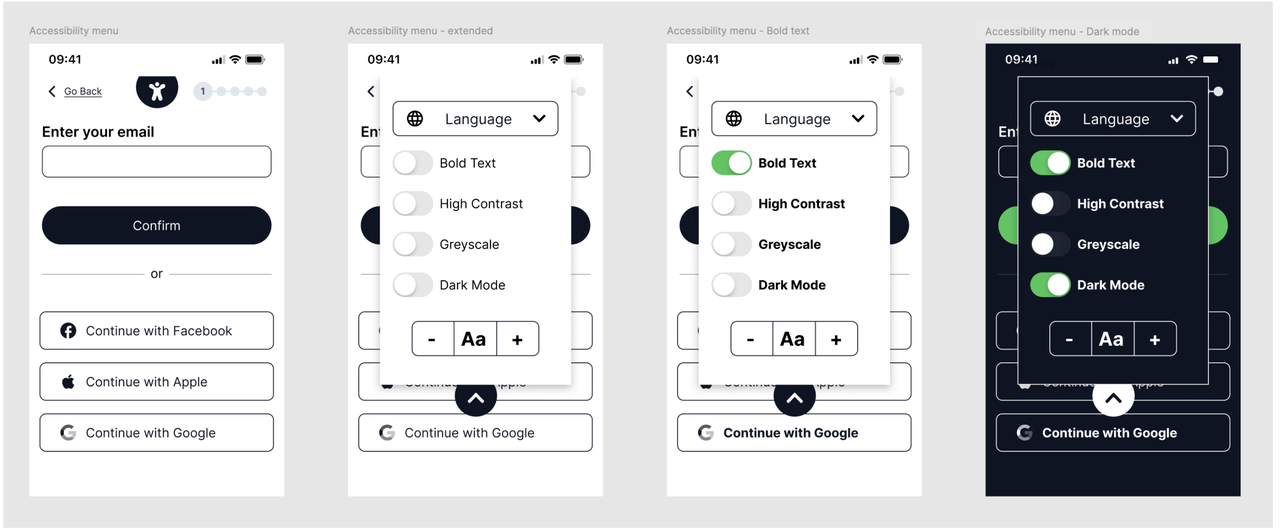
These options address a wide range of vision challenges, such as reduced contrast sensitivity, color perception difficulties, or light sensitivity, ensuring that every user can adjust the interface to their comfort level.

The accessibility menu remains visible and available throughout the entire sign-up process, allowing users to modify their preferences at any time.

Default state

Expanded state





Takeaway

Summary of Learnings and Design Reflections

Understanding the User

This project focused on elderly users aged 70–85 with vision impairments and limited digital confidence. Through my own observations and usability testing, I learned that clarity, reassurance, and predictability are essential for building trust. Using simple language and familiar interface patterns proved effective in reducing anxiety and improving task completion, aligning with Jakob's Law and Nielsen Norman Group research on usability and recognition.

Key Accessibility Principles (POUR)

These principles guided my design decisions throughout the process, ensuring that the interface remains accessible, intuitive, and reliable for users with different abilities.

- **Perceivable** – All essential information is visible and easy to read. The design uses high color contrast, 16 px font size, and clear text labels, ensuring users with reduced vision can perceive all content.
- **Operable** – Interactive elements follow Apple's 44×44 px tap target rule, with 16 px spacing between them. Buttons and input fields are easy to tap, and all actions can be completed without precise motor control.
- **Understandable** – The sign-up process is broken into simple, predictable steps with clear instructions and confirmation messages, helping users stay confident and oriented. Language is plain and avoids technical jargon.
- **Robust** – The design follows WCAG 2.1 AA standards, ensuring compatibility with assistive technologies such as screen readers or system-level accessibility tools like dictation.

Key Learnings

Accessibility is not a feature but a core design mindset — it improves usability for everyone.

Small changes such as contrast adjustments, text clarity, and step-by-step flows create a meaningful difference for users with visual challenges.

Designing inclusively requires continuous testing, empathy, and alignment with WCAG, Apple HIG, and Nielsen Norman guidelines.

This process strengthened my understanding of inclusive design as both ethical and practical, ensuring that technology remains approachable and empowering for all users.

References

Resources

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Image References

- AI-generated using Adobe Firefly. Prompt: “Subtle background, all objects look realistic, car, big mobile device with a map, old lady and old man on the right with a travel bag, isometric view.”
- All photographic materials are sourced from https://unsplash.com/ and used in accordance with the Unsplash License.