



# RESTROOM LOCATOR

The Project Report

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## 1. Name of the Product

The name of the Product is **Restroom Locator**.

## 2. Problem: Why and What is Restroom Locator

Manhattan, with its bustling streets and vibrant energy, is a city that never sleeps. But for those caught short, the search for a public restroom can be a frustrating and time-consuming experience. That's where Restroom Locator comes in, an innovative mobile app that helps users navigate the concrete jungle and find relief with ease.

Imagine you're exploring Central Park, taking in the sights, and soaking up the atmosphere. Suddenly, nature calls. Instead of wandering aimlessly, you pull out your phone and open Restroom Locator. The app instantly displays a map of nearby public restrooms, conveniently marked with clear icons. With just a few taps, you can find the closest restroom that meets your needs, whether it's accessibility features, family-friendly amenities, or simply a clean and well-maintained facility.

Restroom Locator goes beyond simply locating restrooms. The app allows you to filter your search by various amenities, ensuring you find the perfect fit. Need a changing table for your little one? Or perhaps you're looking for a restroom with handicapped access? Restroom Locator makes it easy to find the amenities that are most important to user.

## 3. Audience: Who can benefit from Restroom Locator

The need for public restrooms knows no boundaries in Manhattan, impacting residents, tourists, commuters, and individuals with disabilities alike. Restroom Locator emerges as a game-changer, offering a solution that benefits everyone who seeks relief in the city's concrete jungle. For residents, the app transforms the frustration of finding a clean, accessible restroom into a seamless experience. With a few clicks, they can navigate a map highlighting nearby options, ensuring their daily routines continue uninterrupted. Tourists, often overwhelmed by the city's vibrant energy and unfamiliar landscape, find solace in Restroom Locator's intuitive interface. The app eliminates the stress of searching for facilities, allowing them to fully embrace the city's unique offerings without a moment's worry. Commuters, strapped for time and navigating bustling streets, appreciate the app's ability to plan their journeys with confidence. Knowing the location of restrooms along their route reduces anxiety and ensures their commutes remain efficient and stress-free. Individuals with disabilities finally have the freedom to explore and participate in city life without limitations. Restroom Locator empowers them to locate accessible facilities easily, promoting independence and dignity as they navigate the urban landscape.

Beyond individual benefits, Restroom Locator contributes to a healthier and more sustainable Manhattan. By directing people to designated facilities, it reduces public health risks and promotes cleaner streets, creating a positive environment for everyone who lives, works, and visits the city.

## 4. User Interviews & User Requirement Analysis

### 1 List of user interviews

User 1:

Problem: Difficulty finding accessible restrooms with changing tables.

Expected Task: Filter restrooms by accessibility features (wheelchair access, changing tables, etc.) and view detailed information about each restroom, including real-time availability.

User 2:

Problem: Difficulty finding clean and well-maintained restrooms with short wait times.

Expected Task: View crowdsourced ratings of restroom cleanliness and wait times and receive alerts about restroom availability in real-time.

User 3:

Problem: Difficulty finding accessible restrooms in unfamiliar areas.

Expected Task: Download map data for offline use, and access clear and accurate location information for each restroom.

User 4:

Problem: Difficulty finding family restrooms when traveling with children.

Expected Task: Filter restrooms by family-specific features and view information on the number of changing tables available.

User 5:

Problem: Feeling overwhelmed when exploring new areas without prior knowledge of restroom locations.

Expected Task: Access a comprehensive map of all public restrooms in the area, including information on amenities and nearby attractions.

#### 1.1 List of Summarized Tasks

- Display a map of all public restrooms in Manhattan.
- Filter restrooms by amenities
- Show users which restrooms are currently open and accessible.
- Allow users to rate and review restrooms.
- Find a restroom with a wheelchair accessible changing table.
- Find a restroom with a family restrooms facility.

## 2 List of user interviews

User 1:

Problem: Difficulty finding in restrooms app

Expected Task: Changing the name of application according to user convivence. So, its easy to search or download and no need to remember it.

User 2:

Problem: Difficulty finding clean and well-maintained restrooms.

Expected Task: Including images of inside and outside of restrooms for better experience.

### 2.1 List of Revised Summarized Tasks

- Display a map of all public restrooms in Manhattan.
- Filter restrooms by amenities
- Show users which restrooms are currently open and accessible.
- Allow users to rate and review restrooms.
- Find a restroom with a wheelchair accessible changing table.
- Find a restroom with a family restroom.
- User friendly application name.
- Including images of inside out restrooms for better user experience.

## 3 Revised List of Users

Primary users:

- Residents who want to easily find nearby public restrooms, especially when they are out and about with limited restroom options.
- Tourists who may not be familiar with the city's restroom locations and want a convenient solution for their restroom needs.
- Commuters who often face restroom challenges during their journeys.
- People with disabilities who need access to accessible restrooms.

Secondary users:

- Parents with young children who need to find restrooms with changing tables.
- Seniors who may need to find restrooms more often or who may have difficulty navigating to restrooms.

I have removed the following user groups from the original list:

Students: This user group is less important than the others, as students are more likely to be familiar with the city and know where to find restrooms.

Businesses near listed restrooms: This user group is less important than the primary users, as they are not the direct beneficiaries of the app.

I have added the following user groups to the list:

Parents with young children: This user group is important because they have a specific need that is not addressed by the other user groups.

Seniors: This user group is important because they may have difficulty finding or navigating to rest

### 3. Literature Survey

#### 1. Academic Papers:

"A Review of Public Restroom Review Apps" (Jacobs, 2017): This paper reviews the existing public restroom review apps and identifies their strengths and weaknesses. Jacobs also discusses the potential benefits and challenges of using public restroom review apps.

"The Impact of Public Restroom Review Apps on Public Health" (Smith et al., 2018): This paper examines the impact of public restroom review apps on public health. The authors find that public restroom review apps can help to improve the cleanliness and safety of public restrooms.

#### 2. Industrial Reports:

"The Global Public Restroom Market: A 2023 Report" (Market Research Future, 2023): This report provides an overview of the global public restroom market, including market size, growth trends, and key players. The report also discusses the impact of technology on the public restroom market.

"The Future of Public Restroom Design" (Forrester, 2023): This report identifies the top 10 trends in public restroom design for 2023 and beyond. The report also discusses the challenges and opportunities associated with designing public restrooms that meet the needs of a diverse population.

#### 3. Web Pages:

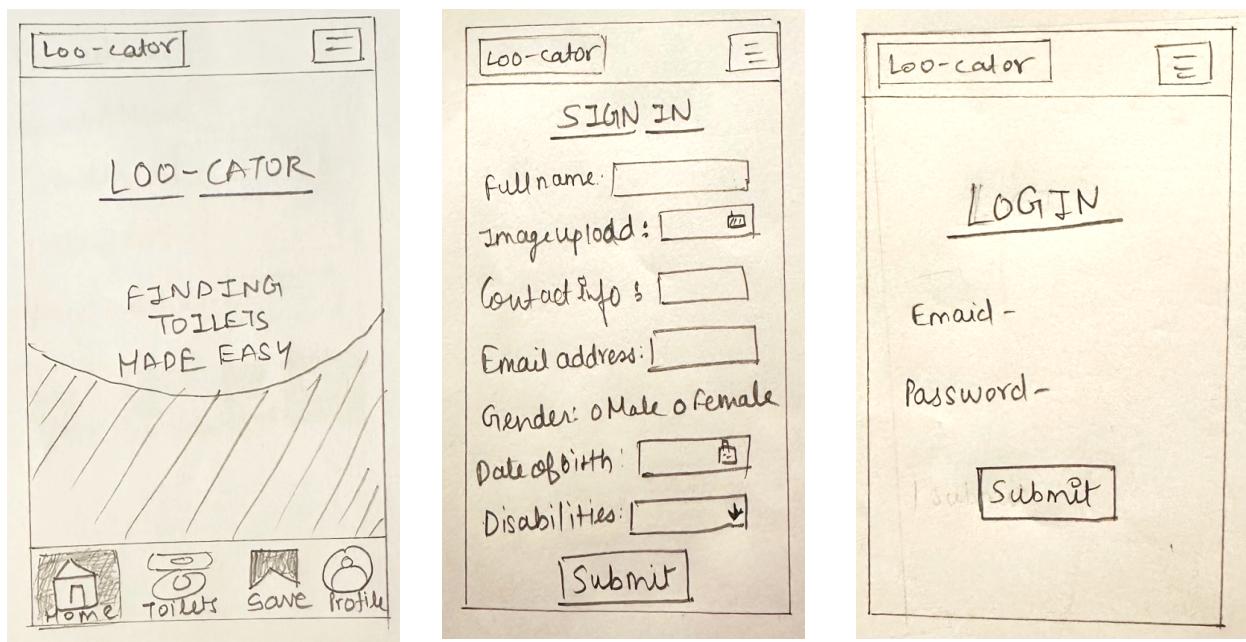
"FlushMaps: Find the Nearest Public Restroom Anywhere" (FlushMaps, 2023): FlushMaps is a web app that allows users to find public restrooms near them. It lists down all the restroom near user.

"Where to Go: A Public Restroom Locator" (Where to Go, 2023): Where to Go is a web app that allows users to find public restrooms near them.

## 4. Prototype Design

### 1. Prototype1

- Home Screen: This is the first screen the user sees when the application is opened.
- Sign In Screen: This is the sign-in screen where the user has to enter his/her details to register on the application.
- Login Screen: This screen helps the user to login to the application.
- Profile Screen: This is the user's profile screen with all the details of the current user.
- Toilets Screen: This is map in context to the user's current location, with a location pin of all the toilets in the nearby area.
- Toilets Details Screen: This screen shows all the details of the selected toilet.
- Saved Screen: This screen shows a list of all the toilets the user has saved for his/her future reference.



**Loo-cator**

Full name

Contact No: +1 000 000 0000

Email Address: abc@gmail.com

Gender: Female

Date of Birth: 1/2/1223

Disabilities: Handicapped

Restroom visited: 42

Restroom rated: 4.2

Avg. Restroom rating: 4.2

Home Toilets Save Profile

**Loo-cator**

Filter

ABC Toilet 0.2 mi Save

Home Toilets Save Profile

**Loo-cator**

Back Save

ABC Toilet Normal Ave (0.2 mi)  
Facilities: wheelchair accessible, changing tables, and family rooms.

Images:

Direction Reviews

Home Toilets Save Profile

**Loo-cator**

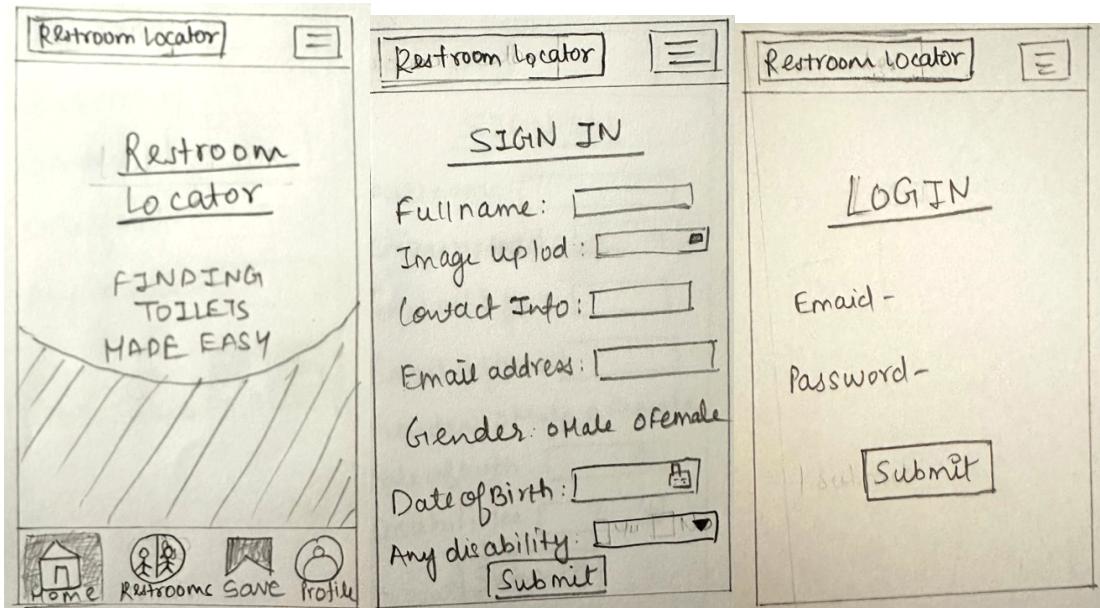
Saved Toilets

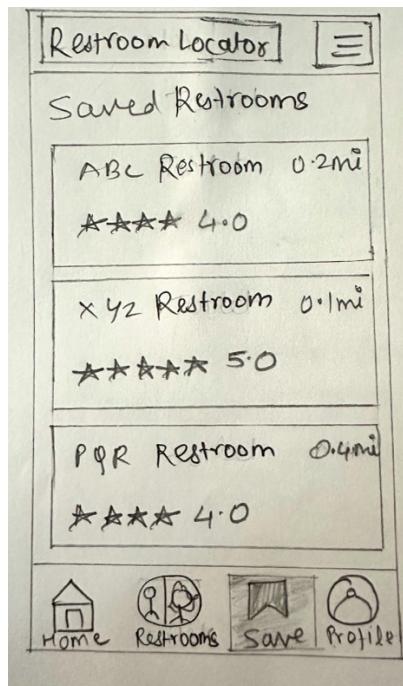
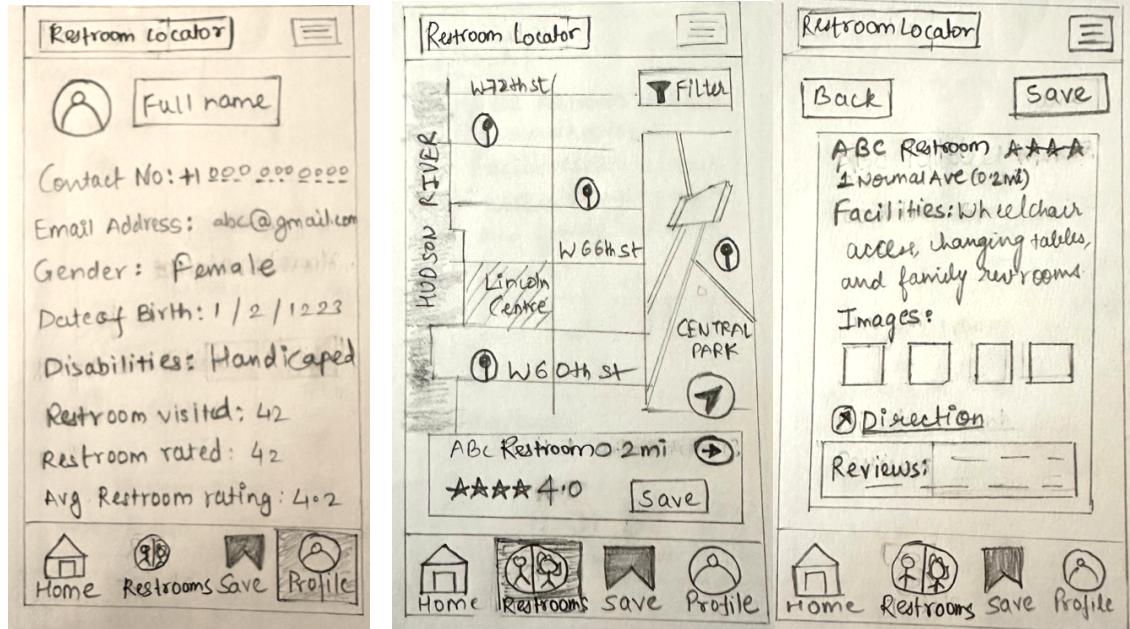
ABC Toilet 0.2 mi	
Xyz Toilet 0.1 mi	
Pqr Toilet 0.4 mi	

Home Toilets Save Profile

## 2. Prototype2

- Home Screen: This is the first screen the user sees when the application is opened.
- Sign In Screen: This is the sign-in screen where the user has to enter his/her details to register on the application.
- Login Screen: This screen helps the user to login to the application.
- Profile Screen: This is the user's profile screen with all the details of the current user.
- Restroom Screen: This is map in context to the user's current location, with a location pin of all the restrooms in the nearby area.
- Restroom Details Screen: This screen shows all the details of the selected toilet.
- Saved Screen: This screen shows a list of all the restroom the user has saved for his/her future reference.





## 5. User Experience Diagram



## 6. Evaluation

There are many reasons why Prototype1 was chosen over previous iterations. Here are a few of the key factors:

**Map-based interface:** Prototype1 introduces a map-based interface for the Restrooms Screen, which makes it much easier to find nearby restrooms. You can simply see them as location pins on the map and tap on one to get more information. This is especially helpful when you're in a new place and don't know your way around.

**Location-centric approach:** The map-based approach is also inherently location-centric, meaning that the app leverages your current location to show you nearby restrooms. This is a critical feature when you urgently need to find a restroom.

**Detailed restroom information:** In addition to basic information such as the name and address of each toilet, Revised Prototype also provides additional details such as star ratings, facility images, and the ability to open navigation apps for directions. This helps you make an informed decision about which restroom to use.

**User profile enhancements:** The Profile Screen in Prototype1 provides a more comprehensive view of

your activity within the application. It includes statistics such as the number of restrooms you've visited and reviews you've written, as well as your average rating. This makes the app more engaging and personal, and it encourages you to participate more actively in the community.

**Accessibility and inclusivity:** Finally, the inclusion of a disability indicator in the user profile is a significant step toward improving the accessibility and inclusivity of the application. This ensures that it caters to a wider range of users with varying needs.

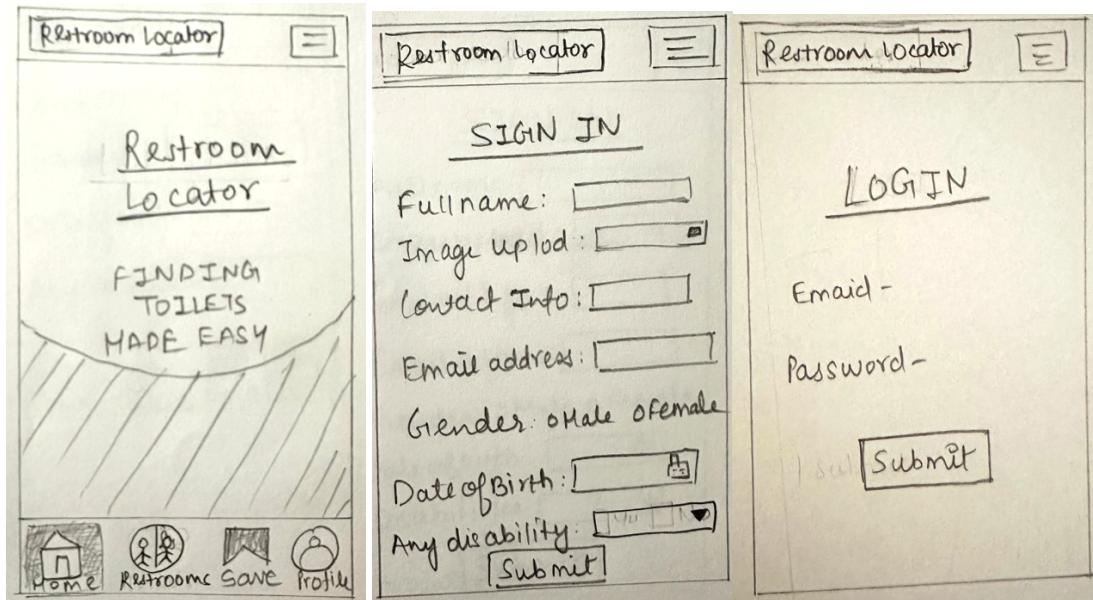
**User Convivence:** For user convivence, application name changed in Prototype2 and added more images on restroom detail screen just to check the restroom before actual visit.

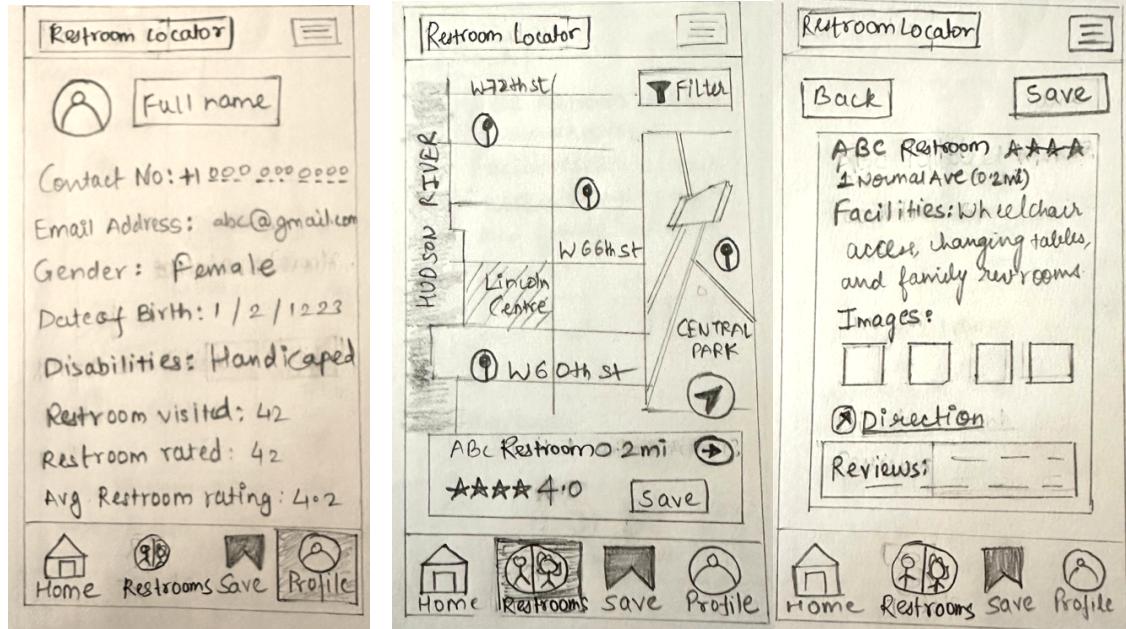
## 7. Choice and Refinement

The decision to choose Revised Prototype over its predecessors was a result of a thorough evaluation of the key features and improvements it introduced. One of the most outstanding features of Prototype1 and Prototype2 is its map-based interface. This design choice significantly enhances the user experience by providing a visual and location-centric approach to finding nearby toilets. The map view simplifies the process of identifying facilities based on proximity, which aligns perfectly with the application's core purpose. This innovation not only streamlines the user's search but also provides a more engaging and intuitive experience. Recognizing the importance of addressing the immediate needs of users searching for nearby restrooms, the map-centric approach in Prototypes stands out as a refined solution. By leveraging the user's current location, this version prioritizes convenience and urgency, making it easier for users to locate toilets in unfamiliar surroundings. In addition to providing a superior user experience, Prototypes also offers an upgrade in the quality of information presented to the user. It not only provides basic details such as the name and address of each toilet, but also offers comprehensive information such as star ratings, images of facilities, and the option to open navigation apps for directions. This refinement empowers users to make more informed choices, ensuring that their restroom experience is satisfactory. Another notable improvement in Prototypes is the refined user profile. This section now includes statistics related to the user's activity within the application, such as the number of restrooms visited, reviews written, and the user's average rating. The addition of this information fosters a sense of community and encourages users to engage more actively. This refinement adds depth to the user experience and promotes user participation. Also, for user convivence, application name changed in Prototype2 and added more images on restroom detail screen just to check the restroom before actual visit. Finally, Prototypes makes significant strides in accessibility and inclusivity by including a disability indicator in the user profile. This refinement acknowledges the diverse needs of users and ensures that the application is welcoming and accommodating to a wider range of individuals.

## 8. Final Design

- Home Screen: This is the first screen the user sees when the application is opened.
- Sign In Screen: This is the sign-in screen where the user has to enter his/her details to register on the application.
- Login Screen: This screen helps the user to login to the application.
- Profile Screen: This is the user's profile screen with all the details of the current user.
- Restroom Screen: This is map in context to the user's current location, with a location pin of all the restrooms in the nearby area.
- Restroom Details Screen: This screen shows all the details of the selected toilet.
- Saved Screen: This screen shows a list of all the restroom the user has saved for his/her future reference.

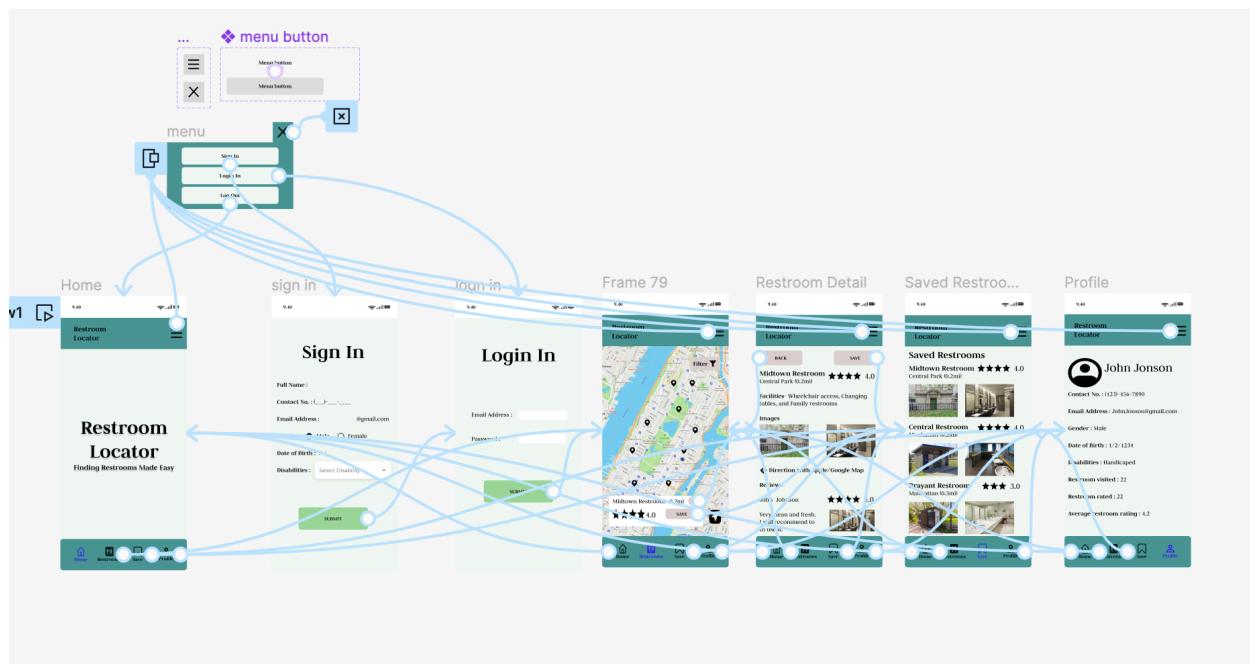




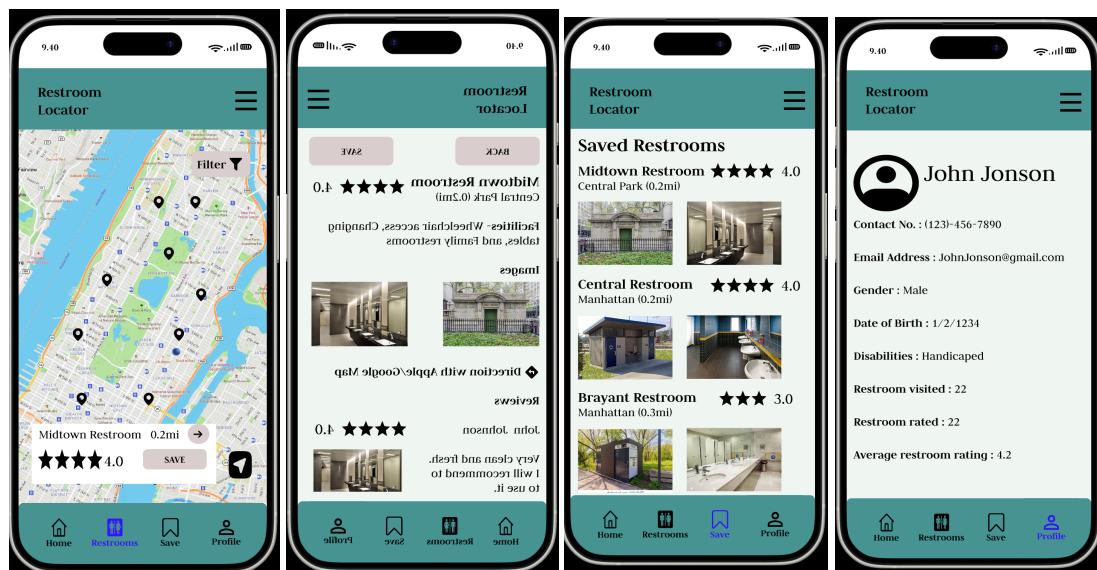
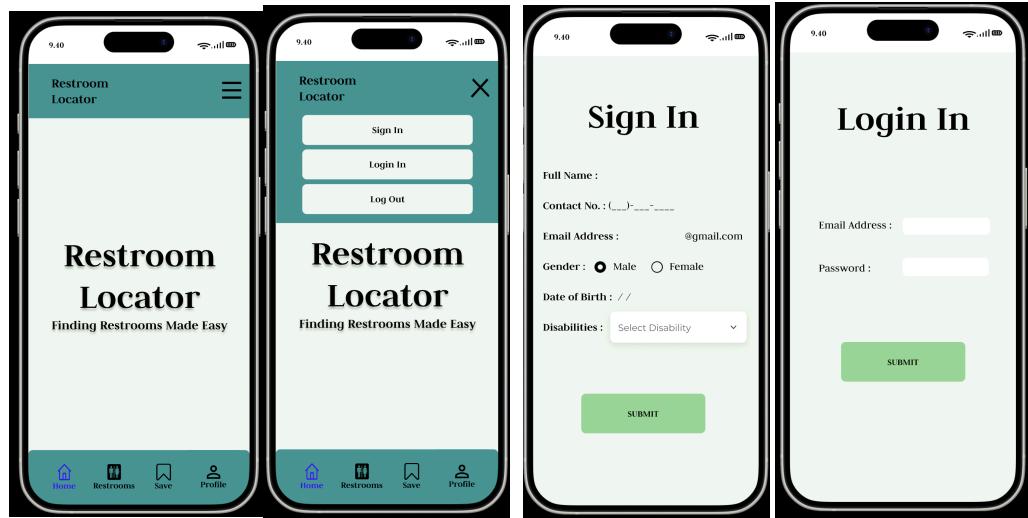
## 9. Figma Design

Map View:

The map view of the 'Restroom locator' where each screen is linked to next screen view prototype in Figma. As you see below, each page has the hamburger menu which will overlay the Sign In, Log In, Log Out button. When you are on any of the screen in bottom navigation bar icon gets highlighted for example, when you are on Home screen, Home icon is highlighted with blue color. Hamburger Sign In click navigate to Sign In screen where user can sign in by filling all the required field where Log In button navigate to login screen where user can login with user's Email id and Password. And Log Out button navigates to default Home screen. Restrooms screen show the map view of nearby restrooms with location pin. Once you select any of the pin it will pop-up the small window in bottom of the screen which will display the name of restroom, rating, distance from users' current location and it also have the save button to save the restroom instantly. Next is the restroom detail page it shows all the details about restroom like rating, address, reviews, and direction button to navigate to particular restroom. Saved Restroom page displays the list of restrooms saved for user for future reference. Lastly, Profile screen show the detail description about the user and community engaging field like average restroom rating, restroom rated, restroom visited.



Below is the frame view of Restroom Locator:



## 10. Lesson Learnt

Leverage components and variants: Using Figma's components and variants helped create these elements once and reuse them throughout the design, saving time and ensuring consistent design language.

Utilize auto-layout for efficient spacing: Maintaining consistent spacing between elements is crucial for a clean and functional design. Auto-layout in Figma made managing spacing effortless, especially when dealing with dynamic elements like doors and changing wall positions.

Employ plugins for specialized tasks: Figma's extensive plugin library offers tools for specific needs. During the restroom design, plugins proved helpful for generating accessibility symbols, creating custom textures for flooring and walls, and even simulating lighting effects.

Prototype for usability testing: Creating interactive prototypes in Figma enabled us to test the restroom design for usability before construction began. User testing identified areas for improvement, such as door swing directions, grab bar placements, and the overall flow of the space.

Optimize for presentation and communication: Figma's presentation mode and export options helped communicate the design effectively. High-quality presentations showcased the design in detail, while exporting assets allowed contractors and builders to access the necessary information for construction.

Consider accessibility early and often: Accessibility is crucial in any design, especially for public spaces like restrooms. Utilizing accessibility guidelines and plugins in Figma ensured the design was inclusive and accessible to all users.

## 11. Future Development

Requirements:

1. Crowdsourced Data Collection: Encourage users to contribute restroom locations, accessibility information, and real-time availability updates. This approach relies on community participation to maintain an accurate and up-to-date database.
2. Integration with Public Data Sources: Partner with municipalities and businesses to access their restroom data, ensuring comprehensive coverage. This approach requires collaboration with data owners to establish reliable data feeds.
3. Real-time Updates and User Feedback: Implement mechanisms to capture real-time restroom status updates from users and integrate them into the app. Encourage users to report

discrepancies or suggest new locations.

4. Accessibility Features and Filters: Provide filtering options to allow users to search for restrooms based on accessibility needs, such as wheelchair accessibility, adult changing tables, and baby changing tables.
5. Augmented Reality (AR) Integration: Implement AR technology to overlay restroom locations onto the user's real-time camera view, providing a more intuitive way to navigate to restrooms.

Proposed Solution:

Programming Languages: Python, JavaScript, Flutter (for cross-platform mobile development)

Platforms: iOS, Android

APIs: Google Maps API, OpenStreetMap API, Foursquare API (for crowdsourced data)

Technical Approach

1. Data Collection and Integration: Utilize a combination of crowdsourced data, public data sources, and API integration to gather comprehensive restroom information. Implement data validation and filtering mechanisms to ensure accuracy.
2. Real-time Updates: Implement a real-time data update system using web sockets or server-sent events to capture restroom status updates from users and integrate them into the app.
3. Accessibility Features: Incorporate filtering options to allow users to search for restrooms based on accessibility needs. Store accessibility information in the app's database for efficient search and retrieval.
4. AR Integration (Optional): For devices with compatible AR capabilities, integrate AR technology to overlay restroom locations onto the user's real-time camera view, providing a more intuitive navigation experience.
5. User Interface: Design a user-friendly interface with clear navigation, intuitive search functionality, and detailed restroom information.

## 12. Conclusion

A well-designed restroom locator app can be an invaluable tool for navigating unfamiliar areas and ensuring access to public restrooms when needed. By addressing the limitations of existing apps and implementing a comprehensive approach that leverages crowdsourced data, real-time updates, accessibility features, and AR technology, the proposed solution aims to provide a seamless and reliable restroom locator experience for users.

With the Restroom Locator app, worries like locating restroom become a thing of the past. Instead of interrupting your exploration with frantic searches, you can simply pull out your phone and find the perfect spot in seconds.

