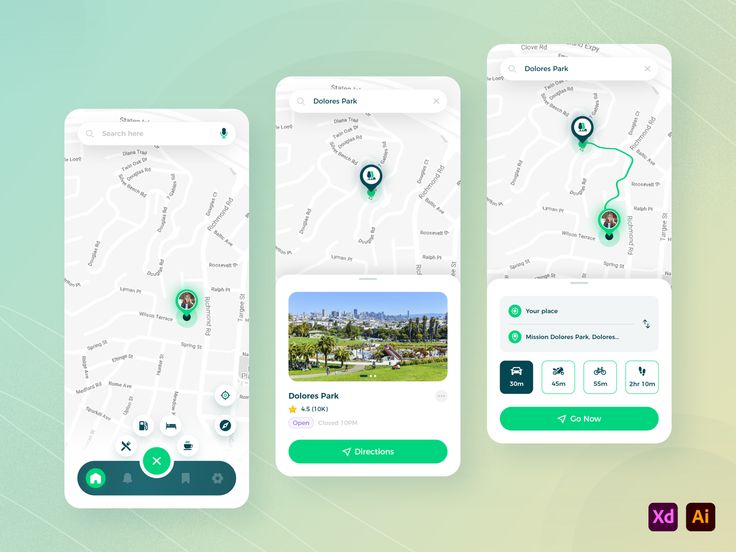
ADA-FRIENDLY NAVIGATION APP



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CSC 3150 – Systems Design – Dr. Andy Cameron

Document Name: Mai Tracy – System Proposal Part 1 – ADA Friendly Navigation App – v3

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Executive Summary

Tracy Mai is spearheading the ADA-Friendly Navigation App (ADAFNA). The proposed system for the ADAFNA aims to route physically disabled people into the world. Beyond routing physically disabled people outside buildings, the ADAFNA specializes in routing people into buildings through ADA-accessible ramps and ADA-friendly doors. Users can also see what rooms are ADA-accessible and where the elevators are in any building.

1.0 Introduction and Overview

## Problem Statement

Navigation apps have connected the world and people to their destinations. Growing vastly, navigation apps have adapted beyond drivers to bikers, walkers, bus riders, and even air transport. However, no defined path helps to support physically disabled people. Paths for walkers are exposed to stairs, and bike paths have rougher, trail-like terrain. However, all the paths leave users at the front of the building. This sparks a problem for physically disabled people, as their destination has not technically been reached. They now need to blindly go around the perimeter of the building, looking for an ADA entrance, delaying their arrival time.

The ADA-Friendly Navigation App will direct users throughout the full extent of their destination. This will include inside buildings, through ADA-friendly doors, and up ADA-friendly elevators. This navigation app will have a more accurate estimated time of arrival (ETA) based on the travel time of the physically disabled person.

## Project Vision and Scope

Through the ADA-Friendly Navigation App, our company strives to help all types of people discover the world, enriching everyone's lives with more experiences.

The ADA-Friendly Navigation App is a cell phone that fully routes physically disabled people to their destination through ADA-friendly pathways. The functionality of this app will route users throughout the insides of buildings, focusing on ramps, elevators, and ADA-supported doorways.

Complex data about estimated arrival time will be stored to accurately depict the arrival time of a physically disabled person.

## Requirements Summary

* All app routes must be entirely ADA-friendly inside and outside buildings.
* Rooms within buildings should be marked if they are ADA-friendly.
* Entrances that are ADA-accessible should be shown.
* If a route does not seem ADA accessible, the user should be notified.
* The application interface needs to be easy for the user to use.
* More details are in Section 4.0 Requirements Definition.

## Stakeholders and Their Interests

Users:

* Whether the app meets their needs and is thriving.

Finance Department:

* Provides monetary resources for the application.
* Overlooks budgetary insight to make sure that it is not exceeded.
* Researches and tracks the potential monetary growth of the app.

Product Managers:

* Responsible for keeping the development of the app on track and defining the features of the app.
* Ensures that the app is created to correctly align with the original vision, intent, and goals.

Legal Team:

* Processes application's legalities to ensure it complies with regulations, laws, and industry standards.

Business Executives:

* Ensures that all parts of the app and all other stakeholders work together cohesively to create the app.

Marketing Team:

* Focuses on selling the app and making it known.
* Stay updated with current marketing trends and competitors that may affect the creation or details of the navigation application.

Shareholders/Investors:

* The people who invested money to begin with that allowed the launch of the app's creation.
* Mostly focus on whether their money will result in a successful app.

Customer Support Teams:

* Handles and tracks users' questions and concerns about interactions and app usage.
* Can see areas of improvement based on users' feedback.

External Vendors/Partners:

* Researches and connects with the selling and posting of the app on various platforms, ex, App Store, Google Play Store, etc.
* May work with software firms, cloud service providers, etc., as necessary.

## Expected Costs and Benefits

**Business Benefits (Mostly Intangible):**

Customer Satisfaction and Loyalty Enhancement:

* The application's success will result in a growth of users and more consistent app usage.

Trusted Corporate Values:

* Since this app targets an overlooked demographic, the successful launch of this app can result in the company being viewed more positively and respected in the public eye.

Increased Cross-Team Organization:

* The creation of this app includes at least 9 stakeholders. A successful launch would mean that the teams could work and communicate together when necessary.
* Through each project, this one included, as more teams learn to work together, they will get better at it.

Long-Term Viability:

* If the app is successful and respected, users will trust and return to the company for similar products, creating customer loyalty for the company to survive long-term.

**Costs**:

* Putting on App Stores: $350/year.
* Creation of App Itself, Software Necessary, and Developers: $75,000.

## Constraints

Time Constraints:

* This project should take a year to create and launch from start to finish.
* If the project has a problem that may lead it over time, legalities and app functions that align with the original vision should be prioritized.

Budget Limitations:

* While the budget is ample to ensure that people are correctly compensated for their work, it is essential to stay within the budget.
* Things can be scaled down to fit the budget if one runs into a budget issue.

Technical Limitations:

* The budget chosen for the software development may put a restraint on what software the developers can use.
* If a necessary software is out of budget, scale the app down, and as resources grow through the app's success, the software can be purchased over time.

Recommendation

Upon receipt of this document, please review the proposed project and budget and double-check its viability. Make sure that all those involved thoroughly understand the system proposal. Afterward, be sure to approve the allocation of funds for the ADA-Friendly Navigation App. Once funds allocation has been completed, start work on the project.

Document Overview

The rest of the System Proposal will delve deeper into the details of the ADA-Friendly Navigation App. First, the approved Project Initiation Request (PIR) will be attached to give a rough overlook of other aspects of the app that still need to be mentioned. Following the PIR will be the Feasibility Assessment of the app. This section will analyze whether the creation of the application is feasible. Afterward, the Requirement Definition will outline the app's functional and non-functional requirements. These can also be known as non-negotiable deliverables. The Requirement Definition of the System Proposal focuses on the ADAFNA, outlining the functional, data, and non-functional requirements. The final large part of the ADAFNA is the Requirements Model, where the Use-Case Diagram and Descriptions are detailed. Then, the System Evaluation takes a glimpse into the future and what changes may come with the growth of the ADAFNA. A conclusion reflecting on the entire System Proposal rounds it. There are resources on the last few pages for understanding the system proposal and where the research originated. This includes the Appendices, the Glossary, and the Bibliography.

2.0 System Initiation

Project Initiation Request (PIR)

A copy of the original Project Initiation Request (PIR) that was approved.

PIR-00000 *[PIR Number to be assigned by the Project Office]* Project Initiation Request (PIR) – Level1 v2.0

Project Name: ADA-Friendly Navigation App Student Name: Tracy Mai

**0. General Project Information**

|  |  |
| --- | --- |
| **Project Name:** | ADA-Friendly Navigation App |
| **Two Sentence Request Description:** | This project plans to route physically disabled patrons directly to their destination, focusing on ADA-friendly routes. This will show wheelchair-friendly entrances and exits to buildings rather than having their route end at the front of the building when the ADA entrance may be on the other side. |
| **Requested Launch Date(s):** | 6/2/2024 |
| **Department(s) Affected by Project:** | Software Developers, Civil Engineers, Full-stack engineers |
| **Project's Customers:** | Physically disabled people and their friends and families |
| **Date Request Submitted:** | 4/16/2024 |

1. **Project Sponsor and Manager**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Project Sponsor** | |  | **Business Project Manager & Requestor** | |
| **Name:** | Andy Cameron |  | **Name:** | Tracy Mai |
| **Title:** | Professor |  | **Title:** | Project Manager |
| **Department:** | Computer Science - SPU |  | **Department:** | Research and Development |
| **Email:** | acameron@spu.edu |  | **Email:** | mait2@spu.edu |

1. **Business Problem or Opportunity: The motivation for this request**

| *The why and what?*  Our project came from the realization that ADA access into buildings and on sidewalks tends to be hidden. This negatively affects the worst people most, physically disabled people. These citizens of the world already have their lives harder as is, and finding an entrance or path for them to traverse should not be another problem for them to face. Our app will highlight and direct people to ADA-friendly paths.  The most significant need for this project would be knowing where the ramps and elevators are within buildings. Currently, most navigation apps direct people to the entrance. However, when the entrance is filled with stairs, our app will continue navigating the user to wheelchair-friendly access. Therefore, knowing where the ramps and elevators are in buildings is vital. The path for physically disabled patrons would also need to be tested and timed to give time estimates in the app. The timed portion of the app should be completed approximately 2 weeks before the final deadline. Finding the ramps and elevators in buildings must be completed 1 month before the final deadline. |
| --- |

1. **Justification, Impact, and Importance**

**Assumptions**

|  |
| --- |
| * *Include at least two. Add more rows to each table as needed.* |
| * Routes will need to be tested and timed by physically disabled people * After gathering ramp and elevator information, maps were re-routed in the app for ADA accessibility * Routes must be ADA friendly—wheelchair friendly and useable |

**Competitive Landscape / Context**

|  |
| --- |
| * *Include at least two* |
| * Google Maps—bike path, already avoid stairs and unfriendly to bike routes on sidewalks * Physically—buildings may not have the best or perfect ADA routes or may not have any ADA routes at all |

**Tangible Return, Opportunity, or Value One Time On-Going**

|  |  |  |
| --- | --- | --- |
| * *Include at least two. Estimate the best you can* | $ 0 | $ 0 |
| * Government to endorse * Growth of app usage across the nation | $5 M | $ 750,000  $ 300,000 |

**Intangible Benefits Impact or Value**

|  |  |
| --- | --- |
| * *Include at least two* | $ 0 |
| * Growth in value because of growth in business * Quality and Support | The business is growing because of the popularity and usage of the app  Being able to reach out to help and navigate more people |

1. **Product Requirements** 
   1. **Must Haves**

|  |
| --- |
| * + 1. *Include at least two. Add more rows to each table as needed* |
| * + 1. Visual ADA-friendly routes from the users' starting location until their ending location     2. App must also be detailed to work inside buildings, outside buildings, and on sidewalks |

* 1. **Could Haves** (Nice to Haves)

|  |
| --- |
| * + 1. *Include at least two* |
| * + 1. The best route for each type of transportation: wheelchair, etc.     2. Include which bathrooms are ADA-friendly in the building |

* 1. **Won't Haves** (Don't Do's, aka Out of Scope)

|  |
| --- |
| * + 1. *Include at least two* |
| * + 1. Don't change any existing routes for other forms of transportation; only focus on ADA-friendly routes     2. Won't have routes that "seem" to be ADA-friendly but are dangerous: bumpy roads, steep ramps, etc. |

1. **Project Costs (Operating and Capital: Onetime and Recurring) [Optional]**

**Labor Costs**

|  |  |  |  |
| --- | --- | --- | --- |
| **s** | **Team(s) Affected** | **Low (hrs.)** | **High (hrs)** |
| Analysis & Design |  | 0 | 0 |
| Development |  | 0 | 0 |
| Testing and Quality Assurance |  | 0 | 0 |
| Systems Integration |  | 0 | 0 |
| Deployment |  | 0 | 0 |
| Support and Maintenance |  | 0 | 0 |
| Sales and Marketing |  | 0 | 0 |
| **Total** |  | **0** | **0** |

| Comments:*Include notes here on the costs or how they can be estimated. (optional)* |
| --- |

**Capital Costs** (Equipment, Software, Licenses, …)

|  |  |  |
| --- | --- | --- |
| **Description** | **Quantity** | **Cost ($)** |
| *Item 1* |  | $ 0 |
| *Item 2* |  | $ 0 |
| **Total** |  | $ 0 |

| Comments: *Include notes here on what these are or how they can be estimated. (optional)* |
| --- |

**Maintenance Costs** (Costs after the product is live)

|  |  |  |
| --- | --- | --- |
| **Type** | **Hours / Month Low** | **Hours / Month High** |
| System / User Support | 0 | 0 |
| Business / Process Support | 0 | 0 |
| **Total Support & Maintenance** | **0** | **0** |

| Comments: *Optional.* |
| --- |

3.0 Feasibility Assessment

**Introduction**

The following part of the System Proposal is a Feasibility Assessment for the ADA-Friendly Navigation App. The analysis will cover the feasibility of the project's technical, resource, schedule, organizational, legal, and contractual aspects. The rating scale for the feasibility will be good, medium, and low. The rating scale to describe the risks will also follow the same scale as the feasibility.

**Feasibility** **Analysis**

**Technical Feasibility:**

* The technical feasibility of the ADA-Friendly Navigation App is **feasible**.

*User familiarity with the ADAFNA is low-risk*

* Smartphones are commonly used in society, but basic training and usage will make the app more familiar to the user.
* The user interface design will be simple and easily digestible to ensure the app is easy to use.
* A tech support team is prepared to answer questions and help non-tech-savvy people.

*Analyst familiarity with the application area for the ADAFNA is a low-risk*

* No app supporting navigation of the disabled people's community currently exists.
* The marketing team's research has projected success in the ADAFNA.
* The marketing team is used to promoting new items to ensure the success of the ADAFNA.

*The development group's familiarity with the target technology to create the ADAFNA* *is a medium-risk*

* The development team has created mobile applications in the past and is confident in building the ADAFNA.
* The development team has yet to build a navigation phone application but has gradually learned about them to create the application.
* The development team is working with new navigation software to stay updated with today's technology.

*The project size is considered a medium risk.*

* The project team will include about ten to fifteen people.
* Business and legal parties will be involved to ensure that things follow laws and industry standards.
* The project timeframe is set at a year after this system proposal passes. This should be enough time to create the minimal viable pro.

*The project structure for the ADAFNA* *is good.*

* There are many stakeholders and teams to ensure everything is handled, from marketing and development to law.
* The project timeline of 1 year should be an adequate amount of time.
* Communication between all the different teams is streamlined to ensure that development and progress in all teams stay on track.

*The compatibility of the ADAFNA* *with the existing technical infrastructure should be good.*

* The technical infrastructure is already set up to work with mobile applications; adding the ADAFNA will be no problem.
* The phone application stores are already set up for the application to be uploaded and ready for download once the development is finished.
* Headquarters and servers are prepared for the release date when significant downloads will occur.

**Resource Feasibility:**

The Resource Feasibility is good. The development, marketing, and other teams are well-stocked and trained for the ADA-Friendly Navigation App. The budget is set adequately for the teams to purchase the necessary hardware, software, and environment. The development team has been trained in the software to build the application. Everything needed to create and develop the ADAFNA is already in the company's possession.

**Schedule Feasibility:**

This Schedule Feasibility is good. The timeline for this project is one year. All the teams, marketing, law, development, etc., were consulted when determining the deadline. Upon their input and reasoning, everyone agreed that one year is viable for creating the ADAFNA. All resources should be readily available at the start of the project. Since the launch of the app does not have many "set in stone" events, there are few consequences to slippage.

**Organizational Feasibility:**

The Organizational Feasibility of the ADAFNA is relatively high. The problem of physically disabled people not having ADA-friendly directions to their destination has not yet been solved. This app would be an incredible solution and align with the company's mission.

The proposal has already been well received through word of mouth from members of the physically disabled community. Executives and employees of the company fully support the creation of this app. Not creating this app would only result in physically disabled people *staying* more disconnected from the world. This app can be easily integrated into people's lives and will be free for all to use.

**Legal and Contractual Feasibility:**

The ADAFNA is feasible legally, with medium risk. The risk related to personal privacy infringement is low. Compliance requirements are necessary since the ADA-Friendly Navigation App must follow ADA regulations. The app is made for physically disabled people, so following ADA regulations is imperative. The application will allow users to mark their home address. This may have potential privacy concerns, but the data is not being stored to be linked to the direct person.

**Additional Comments**

* The Marketing Department believes that the ADA-Friendly Navigation App is a monumental project and will help people who otherwise go ignored.
* There is no other app like the ADAFNA, and its debut will bring something new to the market.

**Conclusion**

The feasibility of this project is good and has low risk, as stated throughout the feasibility report. Any dangers and worries have already been addressed in the report. The ADA-Friendly Navigation App is projected to be very successful once it is released and will help the growth and culture of the company.

4.0 Requirements Definition

Search and notification services are some of the system services within the ADA-Navigation Friendly App. Behavioral Properties within the application include quick responsiveness, excellent reliability, great scalability, and easy usability.

**Introduction**

The following section will cover the functional, data, and non-functional requirements of the ADA-Friendly Navigation App. Functional requirements are specific functions that interact with the user and must be in the final product and creation of the ADAFNA. This includes making sure that all routes are ADA accessible and such. Data requirements are those relating to data or the databases that are interacted with in ADAFNA. Non-functional requirements are necessary for the application; users do not actively interact with the functions. These non-functional requirements are essential because even though the user does not actively interact with them, they are crucial for the application to run smoothly.

**Understanding Key**

Every functional, data, and nonfunctional requirement relates to use cases, as explained in Section 5. The use case ID will be bolded at the beginning of each requirement. This table shows the name of each correlating use case.

|  |  |
| --- | --- |
| **Use Case ID:** | **Use Case Name:** |
| UC-1 | Normal Usage of the App |
| UC-2 | Initial Log Into App |
| UC-3 | Use Saved Addresses |
| UC-4 | Use Random Addresses |
| UC-5 | Show ADA Accessible Rooms and Elevators |
| UC-6 | Save Addresses |
| UC-7 | Choose/Change ADA Type of Path |
| UC-8 | Show ADA Warnings |
| UC-9 | Route to Destination |
| UC-10 | Help Page |

**Functional Requirements**

1. ADA Accessibility Outside
   1. **UC–7:** When navigating routes outside, every pathway must be 100% ADA accessible. This includes smooth pathways instead of rocky ones that would make it hard to traverse.
   2. **UC-7:** Ramps must be made sure that they are safe for wheelchairs. Just because ramps exist does not mean they are all safe and ADA-approved.
   3. **UC-7:** The navigation app will never show a path that the physically disabled person is unable to take.
   4. **UC-8:** Possible slippery pathways should be marked with warnings inside the application.
2. ADA Accessibility Inside

2.1. **UC-5:** The ADA-Friendly Navigation App should also show all ADA transport methods in and around the building. This includes ramps, elevators, wide doors, etc.

2.2 **UC-8:** Warnings should be presented if a route is not entirely ADA-accessible.

2.3 **UC-9:** The application must not stop routing just outside the building. The application will route inside the building through ADA-accessible entries through elevators and directly to the destination.

1. ADA Rooms and Entrances

3.1 **UC-5:** The ADAFNA should show ADA-friendly rooms in the building. This includes bathrooms, rooms, offices, etc. This is to ensure that the wheelchairs can fit through the doorway.

3.2 **UC-5:** The application must also show which doors can be opened with a button or open automatically to ensure that the user does not get to a door and is unable to use it.

3.3 **UC-8:** Warnings should be posted if rooms or entrances are not ADA accessible or if they are unsure.

1. Best Route Dependent on Disability

4.1 **UC-7:** The app must have built-in routes depending on physical disability and capabilities; examples include routes for wheelchairs, leg supports, arm supports, etc.

4.2 **UC-7:** An option should also allow users to include and exclude specific routes, such as routes with or without stairs and with or without ramps. This will enable users to attempt other routes if they desire to do so.

1. Saving Routes

5. 1 **UC-3:** The app should save routes and destinations for the user if they are used often and give the user options to organize their routes.

5.2 **UC-3:** Home, school, and work addresses can be saved into the application so the user does not have to constantly search for them.

**Data Requirements:**

1. **UC-3:** Information for this use case can be accessed from the Saved Address and General Map databases, depending on the user.
2. **UC-4:** Newly saved addresses through this use case will go into the Saved Addresses Database.
3. **UC-5:** Information for this use case can be accessed from the Saved Address and General Map databases, depending on the user.
4. **UC-6:** Newly saved addresses will go into the Saved Addresses Database through this use case.
5. **UC-7:** Information about ADA pathways can be accessed through the Saved Address and General Map databases, depending on the user.
6. **UC-7:** The database will store separate routes for the ADAFNA since no other API or app has created ADA-accessible apps.
7. **UC-8:** Information about ADA warnings and corresponding pathways can be accessed through the Saved Address and General Map databases, depending on the user.
8. **UC-9:** Depending on the user, the destination and routing information can be accessed in both the Saved Address and General Map databases.

**Non-functional Requirements**

1. Operational Requirements:

1.1 **UC-1:** The app will have different visual functions, like night and dark mode.

1.2 **UC-1:** An essential, straightforward front-end will help users interact easily with the application.

2. User Interface Requirements:

2.1 **UC-2:** Make the email login linked to other email forums.

2.2 **UC-9:** The application will also have written instructions for users who cannot hear.

2.3 **UC-9:** Notification Service will tell users when they have reached their destination.

2.4 **UC-9:** The application will have a voice option to tell the user the directions.

3. Performance Requirements:

3.1 **UC-1:** Search services and the application's responsiveness should be able to load routes quickly to the user with a time goal of less than 1.0 seconds.

4. Security Requirements:

4.1 **UC-3:** The application will not store people's names or personal information about the destination.

4.2 **UC-3:** Destinations can be stored about how the user uses them; however, they will not be traced back to the user’s identity.

4.3 **UC-3:** Strong security measurements will be put on the database to protect everyone's information.

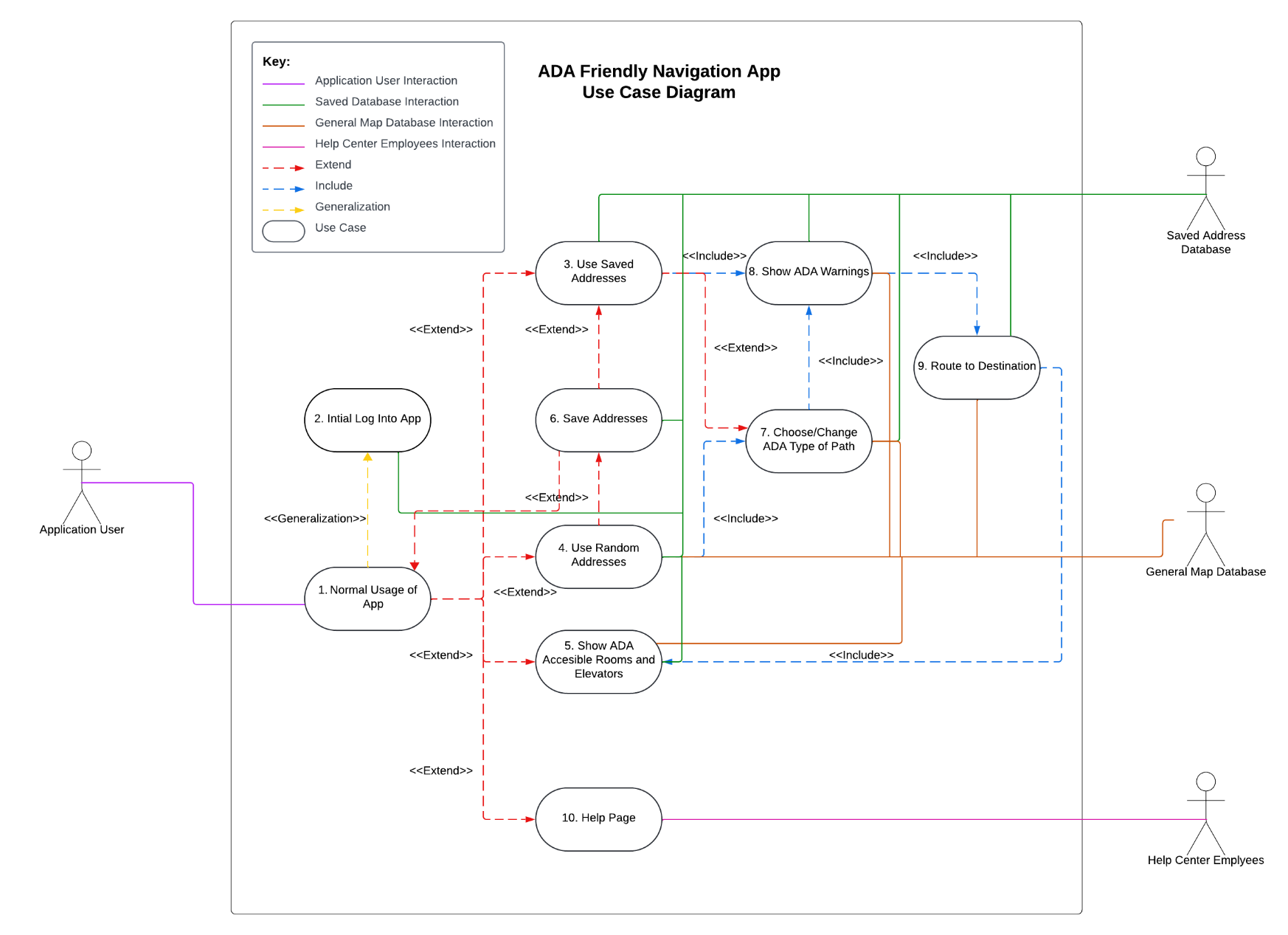
5. Legal Requirements:

5.1 **UC-5, UC-7, UC-8:** Every route, room, etc., that the app presents should be ADA accessible or follow the user’s request and ADA legalities.

5.0 Requirements Model

**Introduction**

The Requirements Model will include the Use-Case Diagram and Use-Case Descriptions for the ADAFNA. The Use-Case Diagram illustrates how different parts of the system interact with one another. These interactions and the use cases are more detailed and defined in the Use-Case Descriptions.

**Use-Case Diagram **

**Use-Case Descriptions**

|  |  |  |  |
| --- | --- | --- | --- |
| **Use Case Name**: Normal Usage of App | | **ID**: UC-1 | **Importance**: Must Have |
| **Primary Actor**: Application User | **Use Case Type**: Detail, Essential | | |
| **Supporting Actors:**  Application User | | | |
| **Stakeholders and Interests**:  Investors/Shareholders/Business Owners:  Since they invested their money into the business, they would want to know how the ADAFNA performs overall.  Marketing Team:  Based on the popularity of the navigation app, the marketing team can go forward with their strategy to reach more people and gather more users for the ADAFNA. | | | |
| **Brief Description**:  The Application User opens the ADAFNA through UC-1, the Normal Usage of the App. After completing UC-1, the Application User can access the entirety of the ADAFNA's capabilities. | | | |
| **Trigger**:  **Type** (mark one): \_\_X\_ External \_\_\_ Temporal | | | |
| **Relationships**:  **Association**:  This use case only interacts with the Application User directly.  **Include**:  **Extend**:  There are many extensions once the Application User completes UC-1 since they can now access all capabilities of the ADAFNA.   1. The Application User can access and use their saved addresses (UC-3). Depending on whether the Application User is logged in with their email, these may be locally or globally saved. 2. The Application User can route themselves to any random unsaved address.   (UC-4).   1. The Application User can see all ADA-accessible rooms and elevators at their current location (UC-5). 2. The Application User can access the help page for any questions (UC-10).   **Generalization**:  The Application Users can log into the app with their email to save the addresses they use often and access it across all devices (UC-2). The Application User would only need to log into the app once and will automatically stay logged in. The Application User can access everything that (UC-1) can, so it inherits everything from UC-1. | | | |

|  |
| --- |
| **The Normal Flow of Events**:   1. The Application User needs to be routed to their destination. 2. The Application User opens the ADAFNA and can access its functionalities (UC-1). 3. The Application User accesses the functionalities through any of the extensions listed above. |
| **Sub-flows**: |
| **Alternate/Exceptional Flows**:  Extensions and Alternate Flows from Step 3 of Normal Flow of Events:   * 1. The Application User accesses their saved address (UC-3).   2. The Application User is routed to their destination (UC-9).   3. Details after UC-3 are in UC-3's Description.   3.20 The Application User wants to go to a new place that is not in their saved addresses  (UC-4).   * 1. The Application User chooses the ADA-accessible route they prefer (UC-7)   2. The Application User is routed to their destination (UC-9)   3. Details are in UC-4's Description.   3.30 The Application User wants to see the ADA-accessible rooms and elevators in their current location.  3.31 The Application User accesses UC-5 to do so.  3.40 The Application User needs help using the ADAFNA.  3.41 The Application User goes to the help page to get their question answered  (UC-10). |
| **Special Requirements:**  Performance   1. Search services and the application's responsiveness should be able to load routes quickly to the user with a time goal of less than 1.0 seconds.   User Interface   1. The app will have different visual functions, like night and dark mode. 2. A basic, straightforward front-end will help users interact easily with the application. |
| **To do/Issues:** |

|  |  |  |  |
| --- | --- | --- | --- |
| **Use Case Name**: Initial Log Into App | | **ID**: UC-2 | **Importance**: Should Have |
| **Primary Actor**: Application User | **Use Case Type**: Detail, Real | | |
| **Supporting Actors:**  Saved Address Database | | | |
| **Stakeholders and Interests**:  Database Management Team:  The Database Management Team would want to be notified when there is a new user to keep track of the database.  Investors/Stockholders/Business Owners:  While this team would only be notified that sometimes a single user joins, they would most likely want updates to know how the ADAFNA performs. | | | |
| **Brief Description**:  The Application User's initial log into the ADAFNA with their email account to allow the saved addresses to be accessed across all devices.  If the Application User chooses not to log in to the ADAFNA, the user can still save addresses. However, the saved addresses will only be stored on their local device. | | | |
| **Trigger**:  **Type** (mark one): \_X\_\_ External \_\_\_ Temporal | | | |
| **Relationships**:  **Association**:  Users who log into the application interact with the Saved Address Database to save their addresses globally.  **Include**:  **Extend**:  **Generalization**:  The Initial Log Into the App (UC-2) generalizes from the Normal Usage of App (UC-1). This means that UC-2 inherits everything from UC-1. After the Application User completes UC-2, they can complete all the capabilities of UC-1. | | | |
| **The Normal Flow of Events**:   1. The user wants to keep track of their saved destinations. 2. The user completes UC-2 by logging in with their email into the app. 3. The user will never need to log into the app again. The app will continue to function as a logged-in user. 4. The user completes any extension available from UC-1 since it generalizes and inherits from.   UC-1. | | | |
| **Sub-flows**: | | | |
| **Alternate/Exceptional Flows**: | | | |
| **Special Requirements:**  Operational Requirements:   1. Make email login link with other email forums, | | | |
| **To do/Issues:**   1. Connect ADAFNA's interface to make the email login link with other forums. | | | |

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| **Use Case Name**: Use Saved Addresses | | **ID**: UC-3 | **Importance**: Must Have |
| **Primary Actor**: Application User | **Use Case Type**: Detail, Essential | | |
| **Supporting Actors:**  Saved Address Database | | | |
| **Stakeholders and Interests**:  Security Teams:  The saved address can be personal information, mainly because people save their home and work addresses. The Security Team should make sure that the data is being stored safely. | | | |
| **Brief Description**:  The Application User accesses the saved addresses to be routed to their final destination. | | | |
| **Trigger**:  **Type** (mark one): \_X\_\_ External \_\_\_ Temporal | | | |
| **Relationships**:  **Association**:  The Application User interacts with the Saved Address Database using saved addresses (UC-3).  **Include**:  **Extend**:  The extension from Use Saved Addresses (UC-3) is UC-7, Choose/Change ADA Type of Path. This allows the user to edit their path depending on their preference.  **Generalization**: | | | |
| **The Normal Flow of Events**:   1. The Application User wants to reach a destination they have saved. 2. The Application User accesses the saved address (UC-3). 3. After the user defines their preferred ADA-accessible path, the application shows the users according to ADA warnings. 4. The Application User is routed to their destination. | | | |
| **Sub-flows**: | | | |

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| **Alternate/Exceptional Flows**:   * 1. After the user chooses their destination from their saved addresses, they can select or change their ADA path.   2. The ADA route warnings will appear, and the event flow will continue to number 4 of the Normal Flow of Events.   3. If the user keeps their preferred ADA path, the ADAFNA will send ADA warnings immediately. |
| **Special Requirements:**  Security Requirements:  1. The application will not store people's names or personal information about the destination.  2. Destinations can be stored about how the user uses them; however, they will not be traced back to the user’s identity.  3. Strong security measures will be implemented in the database to protect everyone's information.  Data Requirements:   1. Saved addresses accessed with an email login are stored separately in the Saved Address Database. |
| **To do/Issues:** |

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| **Use Case Name**: Use Random Addresses | | **ID**: UC-4 | **Importance**: Should Have |
| **Primary Actor**: Application User | **Use Case Type**: Overview, Essential | | |
| **Supporting Actors:**  General Map Database | | | |
| **Stakeholders and Interests**: | | | |
| **Brief Description**:  The Application User uses unsaved addresses to be routed to their final destination. | | | |
| **Trigger**:  **Type** (mark one): X\_\_\_ External \_\_\_ Temporal | | | |
| **Relationships**:  **Association**:  The Application User interacts with the General Map Database using Random Addresses (UC-4).  **Include**:  **Extend**:  The Application User can add the unsaved address to their saved address folder.  **Generalization**: | | | |
| **The Normal Flow of Events**:   1. The Application User wants to go to a destination that is not saved (UC-4). 2. The Application User chooses the type of ADA pathway they prefer (UC-7). 3. The Application User receives coordinating ADA warnings about their route (UC-8). 4. The Application User is routed to their destination (UC-9). | | | |
| **Sub-flows:** | | | |
| **Alternate/Exceptional Flows**:   * 1. Since the destination is unsaved, the alternate flow is if the user saves the original address (UC-6).   2. Then, the address would be saved (UC-3).   3. Then, the events would continue from Step 2 of the Normal Flow of Events. | | | |

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| **Special Requirements:**  Data Requirements:   1. Information for unsaved addresses will be accessed and used from the General Map Database. |
| **To do/Issues:** |

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| **Use Case Name**: Show ADA Accessible Rooms and Elevators | | **ID**: UC-5 | **Importance**: Must Have |
| **Primary Actor**: Application User | **Use Case Type**: Overview, Essential | | |
| **Supporting Actors:**  Saved Address Database  General Map Database | | | |
| **Stakeholders and Interests**:  Building Owners/Contractors:  Since one functionality of the ADAFNA is to Show ADA Accessible Rooms and Elevators (UC-5), building owners want to be contacted to ensure this information is available to everyone. | | | |
| **Brief Description**:  The user would want to learn about ADA-accessible rooms and elevators at their current destination or one they are going to. | | | |
| **Trigger**:  **Type** (mark one): \_X\_\_ External \_\_\_ Temporal | | | |
| **Relationships**:  **Association**: Saved Address and General Map Database   * Either could be accessed to show ADA-accessible rooms and elevators for the user, depending on the user.   **Include**:  **Extend**:  **Generalization**: | | | |
| **The Normal Flow of Events**:   1. The user wants to access the ADA-accessible rooms and elevators inside their destination. 2. The user accesses this information in the ADAFNA. 3. The user can be routed to the rooms or elevators. | | | |
| **Sub-flows**: | | | |
| **Alternate/Exceptional Flows**: | | | |

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| **Special Requirements:**  Legal Requirements:   1. Every route, room, etc., that the app presents should be ADA accessible or follow the user’s request and ADA legalities.   Data Requirements:   1. Information for this use case can be accessed from the Saved Address and General Map databases, depending on the user. |

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| **To do/Issues:**   1. Make sure building owners list ADA-accessible rooms and escalators available. 2. Alternatively, building owners can make the map or floor plan accessible and mark ADA-accessible rooms and escalators. |

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| **Use Case Name**: Save Addresses | | **ID**: UC-6 | **Importance**: Should Have |
| **Primary Actor**: Application User | **Use Case Type**: Detail, Essential | | |
| **Supporting Actors:**  Saved Address Database | | | |
| **Stakeholders and Interests**:  Saved Address Database Security Team and Engineers:  This team would typically stay updated with the Saved Address Database to make sure that the security standards keep users' addresses protected in the database. | | | |
| **Brief Description**:  Users want to save originally unsaved addresses and do so with UC-6, Save Addresses. Then, if they want to continue to their destination, the Application User would continue onto UC-3 and use Saved Addresses. | | | |
| **Trigger**:  **Type** (mark one): \_X\_\_ External \_\_\_ Temporal | | | |
| **Relationships**:  **Association**:  The Application User interacts with the Saved Address Database when the user saves addresses (UC-6).  **Include**:  **Extend**:  There are two extensions from UC-6, Save Addresses:   1. The extension from saving the originally unsaved address (UC-6) is that the user can choose to be routed to the destination of the newly saved route from the Use Saved Addresses, UC-3. 2. The user can use all the functionalities within the Normal Usage of App (UC-1).     **Generalization**: | | | |
| **The Normal Flow of Events**:   1. The Application User wanted to save originally unsaved addresses. 2. They do UC-6, Save Addresses. 3. They can then be routed to their destination (UC-9) or access other functionalities inside the Normal Usage of App (UC-1). | | | |
| **Sub-flows**: | | | |

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| **Alternate/Exceptional Flows**:  There are two alternate flows, as explained in the relationships above.   * 1. The Application User chooses to be routed to their destination, continuing on.   UC-3, Use Saved Addresses.   * 1. The user chooses their preferred ADA path.   2. The Application User receives ADA route warnings.   3. The user is routed to their destination.   4. The Application User decides not to be routed to their newly saved address.   5. The Application User wants to use other functionalities of the ADAFNA.   6. The Application User does so with UC-1, Normal Usage of App.   7. Any details following this are within UC-1's description. |
| **Special Requirements:**  Security Requirements:  1. The application will not store people's names or personal information about the destination.  2. Destinations can be stored about how the user uses them; however, they will not be traced back to the user’s identity.  3. Strong security measures will be put on the database to protect everyone's information.  Data Requirements:   1. Newly saved addresses will go into the Saved Addresses Database through this use case. |
| **To do/Issues:** |

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| **Use Case Name**: Choose/Change ADA Type of Path | | **ID**: UC-7 | **Importance**: Must Have |
| **Primary Actor**: Application User | **Use Case Type**: Detail, Essential | | |
| **Supporting Actors:**  Saved Address Database  General Map Database | | | |
| **Stakeholders and Interests**:  Civil Engineers:  Since the ADAFNA offers ADA-accessible paths, civil engineers want to clarify their ADA pathways and ensure they are up to standard. | | | |
| **Brief Description**:  The Application User wants to choose their ADA pathway from random unsaved addresses or change the path of a currently saved address and does so with UC-7, Choose/Change ADA Type of Path. | | | |
| **Trigger**:  **Type** (mark one): \_X\_ External \_\_\_ Temporal | | | |
| **Relationships**:  **Association**:  Saved Address and General Map Database:   * Either could be accessed for users to choose their preferred ADA pathway.   **Include**:  **Extend**:  **Generalization**: | | | |
| **The Normal Flow of Events**:   1. The Application User wants to choose their ADA pathway to their destination. 2. Whether the destination is from their saved or unsaved addresses does not matter. 3. The Application User is shown ADA warnings correlating to their pathway (UC-8). 4. The user is routed to their destination (UC-9). | | | |
| **Sub-flows**: | | | |
| **Alternate/Exceptional Flows**: | | | |

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| **Special Requirements:**  Legal Requirements:   1. Every route, room, etc., that the app presents should be ADA accessible or follow the user’s request and ADA legalities.   Data Requirements:   1. The database will store separate routes for the ADA-Friendly Navigation App since no other API or app has created ADA-accessible apps. 2. Information about ADA pathways can be accessed through the Saved Address and General Map databases, depending on the user. |
| **To do/Issues:** |

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| **Use Case Name**: Show ADA Warnings | | **ID**: UC-8 | **Importance**: Must Have |
| **Primary Actor**: Application User | **Use Case Type**: Overview, Essential | | |
| **Supporting Actors:**  Saved Address Database  General Map Database | | | |
| **Stakeholders and Interest:**  Legal Team:  The legal team would be on standby to double-check that ADAFNA follows compliance and legalities before it reaches people from the ADA organization themselves.  ADA Coordinators and Compliance Team:  Since the ADAFNA is made to be ADA-accessible, there are ADA Coordinators who would want to make sure that the ADAFNA is following ADA compliance. | | | |
| **Brief Description**:  ADA warnings appear once a user has chosen their preferred route to keep the user aware of what their pathway might look like. | | | |
| **Trigger**:  **Type** (mark one): \_\_\_ External \_X\_ Temporal | | | |
| **Relationships**:  **Association**:  Saved Address Database and General Map Database —  Both could be accessed to show the ADA warnings.  **Include**:  **Extend**:  **Generalization**: | | | |
| **The Normal Flow of Events**:   1. The Application User chooses their destination and preferred ADA pathway (UC-7). 2. The ADAFNA notifies the user with ADA warnings corresponding to their pathway   (UC-8).   1. The user is routed to their destination (UC-9). | | | |
| **Sub-flows**: | | | |
| **Alternate/Exceptional Flows**: | | | |

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| **Special Requirements:**  Legal Requirements:   1. Every route, room, etc., that the app presents should be ADA accessible or follow the user’s request and ADA legalities.   Data Requirements:   1. Depending on the user, Information about ADA warnings and corresponding pathways can be accessed through both the Saved Address Database and General Map Database. |
| **To do/Issues:** |

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| **Use Case Name**: Route to Destination | | **ID**: UC-9 | **Importance**: Must Have |
| **Primary Actor**: Application User | **Use Case Type**: Detail, Essential | | |
| **Supporting Actors:**  Saved Address Database  General Map Database | | | |
| **Stakeholders and Interests**:  Investors/Stakeholders/Business Owners:  This group would be invested in completing users being routed by the app. Based on the ADAFNA's ability to route people, the ADAFNA can become more successful and benefit the stakeholders listed. | | | |
| **Brief Description**:  After going through UC-1 through UC-8, the user is routed to their destination (UC-9). | | | |
| **Trigger**:  **Type** (mark one): \_X\_ External \_\_\_ Temporal | | | |
| **Relationships**:  **Association**:  Saved Address and General Map Database   * Either could be accessed so their user can be routed to their destination.   **Include**:  **Extend**:  **Generalization**: | | | |
| **The Normal Flow of Events**:   1. The Application User enters the ADAFNA (UC-1). 2. The Application User chooses their route (UC-3 or UC-4). 3. The Application User clarifies their preferred ADA pathway (UC-7). 4. The Application User receives ADA warnings related to their destination (UC-8). 5. The Application User is routed to their final destination (UC-9). | | | |

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| **Sub-flows**:   * 1. The user chooses an unsaved address as their destination (UC-4) and does not save the address.   2. They continue onto Step 3 of the Normal Flow of Events from UC-4, Use Random Addresses.   3. The user chooses an unsaved address as their destination (UC-4) and saves it (UC-5).   4. They continue onto Step 3 of the Normal Flow of Events from UC-3, Use Saved Addresses.   2.30. The user chooses to use an address from their saved addresses (UC-3).  2.31. They continue onto Step 3 of the Normal Flow of Events from UC-3, Use Saved Addresses. |
| **Alternate/Exceptional Flows**: |
| **Special Requirements:**  Operational Requirements:   1. The application will have a voice option to tell the user the directions. 2. The application will also have written instructions for users who cannot hear. 3. Notification Service will tell users when they have reached their destination.   Data Requirements:   1. The information about the destination and routing to it can be accessed in both the Saved Address Database and General Map Database, depending on the user. |
| **To do/Issues:** |

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| **Use Case Name**: Help Page | | **ID**: UC-10 | **Importance**: Should Have |
| **Primary Actor**: Application User | **Use Case Type**: Overview, Essential | | |
| **Supporting Actors:**  Help Center Employees | | | |
| **Stakeholders and Interests**:  Investors/Stakeholders/Business Owners:  The Help Page is where users will raise their concerns and questions. It would benefit the stakeholders above significantly to know how the users interact with ADAFNA and what they like or need clarification on. This is vital to learn how the application can be improved.  ADAFNA Application Developers:  Questions may arise about the user interface of the ADAFNA. These concerns will be brought to the developers' attention so that they can improve the app.  Support/Help Center Team:  Since the Help Center will be answering questions from the users, they are invested in helping users get their questions and concerns answered. | | | |
| **Brief Description**:  The Help Page has general commonly asked questions where users can get their questions answered. If the Help Page does not have the answer to the user’s question posted, then the user can send their question directly to the Help Team, which is also accessible from the Help Page. | | | |
| **Trigger**:  **Type** (mark one): \_X\_ External \_\_\_ Temporal | | | |
| **Relationships**:  **Association**: Help Center Employees who answer questions from the Help Page.  **Include**:  **Extend**:  **Generalization**: | | | |
| **The Normal Flow of Events**:   1. The user opens the application and has questions to be answered (UC-1). 2. The user navigates to the Help Page to find the answer to their question (UC-10). 3. If the answer to their question is not directly posted, then the users can directly contact the Help Center to get their question answered. 4. The user’s question gets answered. | | | |
| **Sub-flows**: | | | |
| **Alternate/Exceptional Flows**: | | | |
| **Special Requirements:** | | | |
| **To do/Issues:** | | | |

**6.0 System Evolution**

As the System Proposal for the ADAFNA currently stands, many must-have and should-have requirements exist. The budget was created just for the MVP. It is natural that as time goes on, software and hardware updates will be necessary to carry more users and data. The future of the ADAFNA could also support languages other than English. The future expansion of the ADAFNA will allow it to grow into a standard known tool such as Google Maps, possibly even integrating with Google Maps to allow the ADA-accessible path to be another one added to Google Maps' current path options: drive, transit, walk, bike, and plane. As the ADAFNA grows, the mission must stay the same: to help all types of people discover the world. This value must stand forever with the ADA-Friendly Navigation App.

7.0 Conclusions and Recommendations

Through the System Proposal for the ADA-Friendly Navigation App, the goal of the app is clear: to help everyone discover the world, focusing on those who are physically disabled. The ADAFNA strives to create ADA-friendly routes that are available for all to access. These routes will route users straight to their final destination following their ADA pathway. Users will see ADA-accessible rooms and elevators inside any building. Helping people of all capabilities to discover the world.

The System Proposal has walked through every aspect of the ADFNA. Through the introduction and overview, explain the project vision, stakeholders and interests, the expected costs and benefits, and the constraints. Following that was the initial Project Initial Request. Afterward, a feasibility assessment based on technical, resource, schedule, organization, legal, and contractual feasibility shows how feasible the project is. The document's functional, data, and non-function requirements were then outlined to clear the deliverables in the MVP of this project. The requirements were detailed more thoroughly in the use-case diagram and descriptions. Lastly, were the future goals of the ADAFNA as it grows.

The ADA-Friendly Navigation App is a technology with the purest intent to help people. Through reading the System Proposal, the readers should have a complete understanding of the ADA-Friendly Navigation App. The last step is to create and implement this new technology.

# **Appendices**

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# **Glossary**

ADA: Americans with Disabilities Act

Association: General relationship between classes

Data Requirements: Requirements relating to the data or database of the system

Extend An optional functionality that could be added to the base use case.

Feasibility: capable of being done or carried out

Generalization: When one use case inherits everything from another use case

Include: When one use case must include another use case

Infrastructure: the underlying foundation or basic framework (as of a system or organization)

Non-Functional Requirements: Requirements of the system that do not impact its functionality

PIR: Project Initial Request

Physically disabled: limitation on a person's physical functioning, mobility, dexterity, or stamina

Stakeholders: one who is involved in or affected by a course of action

System proposal: a comprehensive document that outlines a system's objectives, requirements, functionalities, and design

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