SBMTD BusTracker App Redesign

FIGURE 1 Santa Barbara MTD Bus and App [1]

Prepared for:

Santa Barbara MTD Board of Directors

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Date:

March 14, 2025

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SBMTD BusTracker App Redesign

Dear Santa Barbara MTD Board of Directors,

We are a team of undergraduate students who have developed a proposal to redesign the SBMTD BusTracker app. We have identified elements we find ineffective about the current bus apps and surveyed UCSB students to enhance our understanding of the matter. Based on the feedback we gathered, we are focused on addressing two significant issues:

1. **Unpredictable bus schedules-** It is difficult to determine if the bus is running late or if they will arrive at all.
2. **Difficult Navigation-** The app is complicated to use, with hard-to-find schedules and route changes, and lacks accessibility features for users with disabilities.

The proposed redesign will aim to remedy the inconsistencies and difficulties navigating the current bus apps. In order to address these problems, we will implement software and interface solutions to improve user experience. To address the unpredictability of the bus schedule, we will introduce a notification system to inform users of delays and detours, including estimated times of arrival. This will also extend to schedule changes on holidays, ensuring that users are always updated in real-time. Additionally, the app will also include accessibility-friendly features along with real-time bus tracking and route displays, making it easier for users to plan their trips effortlessly.

By addressing these challenges obstructing the use of the BusTracker app, we hope to create a more reliable, user-friendly experience for UCSB students. Through these changes, we hope students will be encouraged to utilize the bus system with ease and confidence.

Sincerely,

Annie Wang, Jasmin Lin, Adanelly Chavez, Lucas Zhou
UCSB Engineering Students

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Executive Summary

This report addresses the issues that UCSB students may encounter with the Santa Barbara Metropolitan Transit District (SBMTD) bus system and the bus app that supports it. One issue with the current bus app is that there is no live location and time tracking, forcing users to guess where the bus is on the map and how far it is from their desired point. This results in confusion, especially when buses are off schedule by over an hour, leading to complaints about the system's unpredictability. Aside from tracking issues, there have been complaints about the bus app crashing, which further frustrates users.

Additionally, the SBMTD app is not accessibility-friendly and lacks features for users with visual, motor, or other impairments. A design that doesn't support students with disabilities ultimately fails to meet the needs of all users. These issues lead to confusion and frustration, causing students to turn to less sustainable transportation options, such as driving themselves, as an alternative. To address these issues, we propose developing a new bus app that incorporates the features currently lacking in existing options.

Introduction

This document examines the need for the redesign of the Metropolitan Transit District (MTD) bus system app for UCSB students. The proposed improvements aim to improve the app's functionality by enhancing user accessibility and sustainability. This report includes (1) a brief description of the project, (2) the scope of our activities during the study, and (3) an overview of the report format.

PROJECT DESCRIPTION

Our project is to create GauchoTransit, a new bus app with improvements that will help improve the UCSB communities' experience with the Santa Barbara Metropolitan Transit District (MTD) bus system. After conducting a field investigation into several bus system apps, we identified a number of issues with the current options. The apps we tested had several common problems including poor navigation, the absence of real-time bus tracking, and no notifications for bus delays, cancellations, and detours. These deficiencies in the bus apps make it difficult for students to effectively use public transportation, leading many to alternatives like Uber or driving themselves—an unsustainable choice for the individuals and the environment.

SCOPE OF STUDY

This project involved a detailed investigation of the different bus apps used by UCSB students, focusing on the following activities:

- Testing out the different bus apps students use for the MTD bus system
- Surveying UCSB students who use the UCSB bus system to gather feedback on the current bus app options
- Interviewing the MTD Services for Passengers With Disabilities to gain insights into the services they provide for students with disabilities and to explore how a bus app could better support these students in ways similar to the physical accommodations they offer
- Analyzing the collected data and developing conclusions and recommendations based on the findings

REPORT FORMAT

This report is structured to examine the need for redesigning the MTD bus system apps for UCSB students. It includes the following sections:

1. **Investigation:** This section discusses the issue and outlines the research methods
2. **Seeking Solutions:** A detailed presentation of the survey results and research into alternative app improvements.
3. **Conclusion and Recommendations:** Based on the research, this section presents the proposed redesign and its benefits.

Investigation

Background Information

The Santa Barbara Metropolitan Transit District (MTD) bus system is a reliable and energy-efficient transit service that stretches across Santa Barbara County to provide for South Coast residents, UCSB and SBCC students, commuters, and visitors. Currently, people who ride the MTD must utilize either Google Maps or some other transit apps to navigate the district.

The transit service is a vital tool for university students for a variety of factors, from getting to classes to running errands. UCSB students in particular are encouraged to utilize this as bus fares come at no cost as it is covered under tuition. However, UCSB students have been experiencing challenges regarding the use of the bus system. Students have reported problems such as delays extending past an hour or buses completely not showing up. Google Maps typically do not reflect changes in the bus schedule and the current timetable postings at the bus stops are up to a year obsolete. The SBMTD BusTracker App does not even display whenever a bus stops running. As a result, it is incredibly difficult for students to depend on the bus system due to its unpredictability. Below is a chart that highlights these problems, along with additional issues related to the current app designs and interfaces.

TABLE 1 Overview of Current Bus Apps and Their Issues [2]

Transit App	SBMTD BusTracker	Google Maps/iMaps
 **FIGURE 2** Transit App Icon and Interface [3]	 **FIGURE 3** SBMTD BusTracker App Interface [4]	 **FIGURE 4** Google Maps/iMaps App Interface [5]
• Lacks capability to plan a trip without paying for premium • Unclear on how to choose destination • Unreliable bus tracking	• Displays somewhat real-time bus location • Does not display when bus stops running • UI is user-unfriendly	• Determines which bus(es) to take to get to from A to B • Shows when a bus is delayed • Sometimes shares wrong information

Research Method

We primarily used a survey as our method of research. In the survey, we asked UCSB students various questions regarding how often they use the bus system, what problems they have, and what improvements they would like to see. We emailed the survey to the professor, who distributed the survey across all students in Writing 50E. Here is an outline of the specific questions we came up with:

1. How often do UCSB Students use the Bus System?
2. What are their main reasons for using the bus system?
3. What issues are the most concerning regarding the bus system?
   List of issues:
   - Difficulty tracking the bus in real time
   - Bus arriving late/not showing up
   - Missing/unclear information about detours
   - Difficulty finding routes/bus schedules
   - App crashing/difficult to navigate
4. How often have UCSB students experienced a bus that doesn't show up at the scheduled time, or at all?
5. Do UCSB students receive enough notifications about bus delays/cancellations/detours?
6. What features, listed below, would be most helpful for UCSB students who use the bus?
   - Real time bus tracking (time and location)
   - Notification about delays, cancellations, and detours
   - More accurate schedule w/ less frequent changes
   - Easier navigation + more user friendly features
   - Alerts when bus is close to destination
   - Ability to report problems
7. If none in #6 apply, what other features/improvements would UCSB students like to see?
8. Would UCSB students actually like to see a new bus app? (Y/N)

Additionally, we contacted the MTD Services for Passengers with Disabilities to explore how our app can better support students with disabilities [6]. While the Disabled Students Program (DSP) is dedicated to supporting students with disabilities within the classroom, MTD is better equipped to assist with public transportation. Based on their feedback, we came up with features that will make our app accessible to anyone with visual, motor, or other impairments.

Survey Results

This survey gathered responses from a sample of freshmen engineering students in the WRIT 50E class. A fair portion of the respondents depend on the bus to attend their daily classes—a clear indication that the bus system is a vital component for many UCSB students. Other students, typically those who live on campus, occasionally use the bus system to reach further parts of Goleta and run errands.

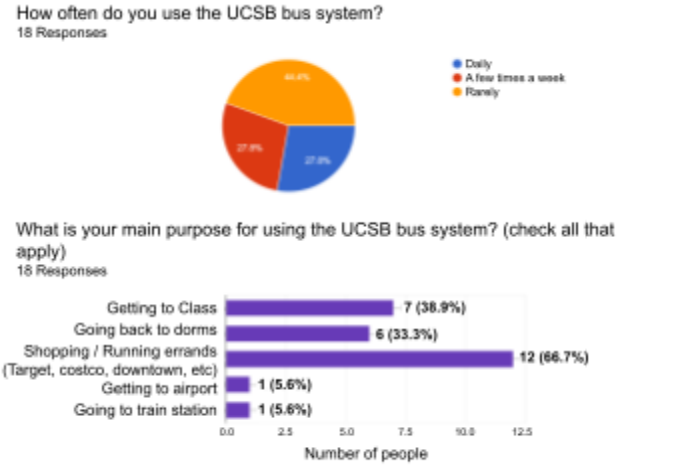

FIGURE 5 Survey Results: UCSB bus usage frequency and purposes [7]

Since this survey was conducted solely with WRIT 50E students, it may not be representative of the entire population at UCSB. Since this sample consists mostly of first-year students, it may not consider the students that live off campus in Isla Vista or elsewhere.

On top of those who live off campus, a number of students live in Santa Catalina Residence Hall. Without a bike, these students most likely would depend on the bus system as well. As a result, more people than we anticipated may utilize the bus system.

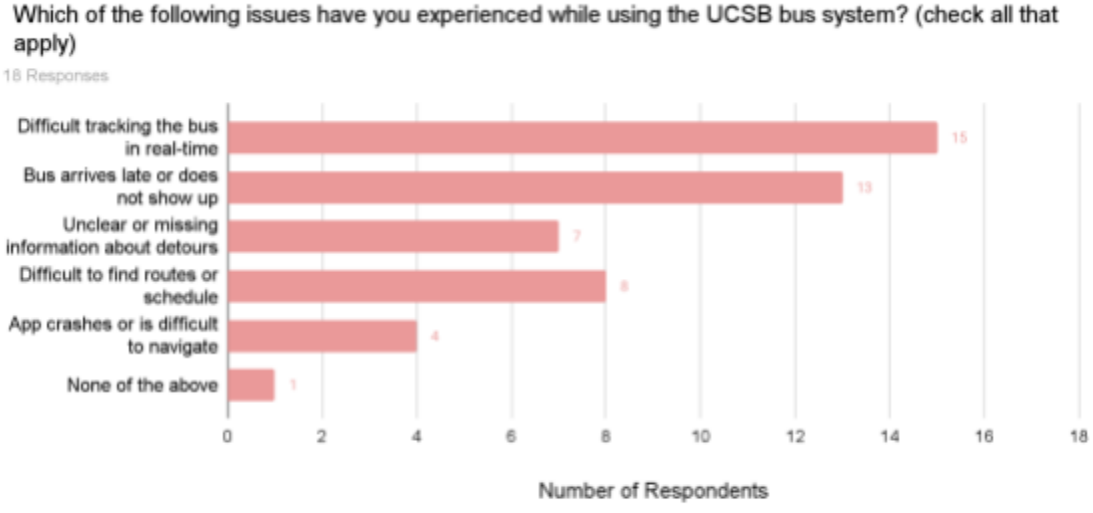

FIGURE 6 Common issues experienced while using the UCSB bus system [8]

By the skewed right trend in **Figure 7**, it is evident that there is discontentment with the bus system. Only one person found no issue in navigating the bus system; the rest of the respondents found trouble utilizing the service. Through the results that are shown in **Figure 6**, we can pinpoint a few of most significant issues people experienced:

1. Difficulty tracking the bus in real-time (83% of Respondents)
2. Bus arrives late or does not show up (72% of Respondents)
3. Difficulty of finding updated routes and/or schedules (44% of Respondents)

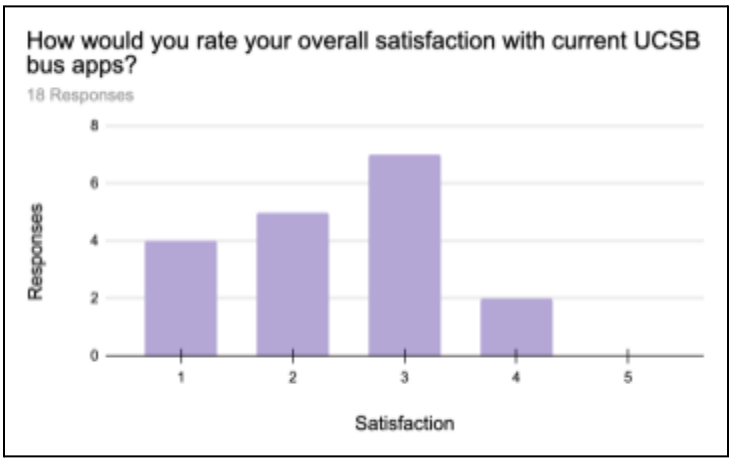

FIGURE 7 User satisfaction with the current bus apps [9]

Additionally, we asked questions that focused on issues that we thought were prominent at the time. Regarding the issue of a bus being significantly delayed or not showing up at all, 89% of respondents said that they have experienced a bus no-show at least once. As indicated in **Figure 8**, only two out of eighteen respondents experienced no delays or no-shows. Solely one person said that they received enough notifications about delays, cancellations, or detours. 22.2% of respondents felt like they did not receive enough notifications. In fact, a majority of 55.6% of respondents did not receive notifications at all, as seen in **Figure 9**. These results fortify our idea that the bus's unpredictable time tables and lack of bus information are a persistent issue, generating a lack of trust in the service and difficulty for people to navigate the bus system.

FIGURE 8 Occurrences of late or missing UCSB buses [10]

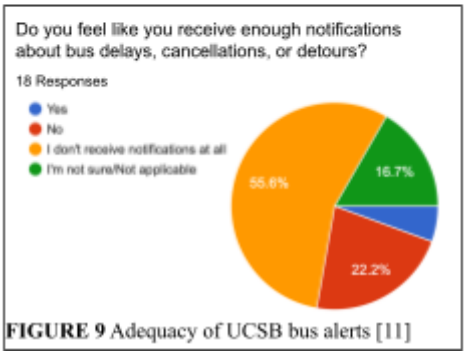

FIGURE 9 Adequacy of UCSB bus alerts [11]

Lastly, we asked what aspects were most important in a new UCSB bus app. As indicated in **Figure 10**, the top few features WRIT 50E first-year students wanted to see are listed below:

1. Real-time bus tracking (83% of Respondents)
2. A display of accurate bus service times (67% of Respondents)
3. Active notifications about bus delays, cancellations, or detours (61% Respondents)
4. Alerts for when the bus is approaching one's location (61% of Respondents)

Furthermore, one person voiced that the current app is overall unfriendly to use; the slow nature of the app leaves users in a difficult position to navigate the app. The app often struggles to load, compounding onto the trouble of navigating the bus system. As for improvements, according to Figure 11, 94.4% of respondents are willing to try a new bus app with the enhancements mentioned in the survey.

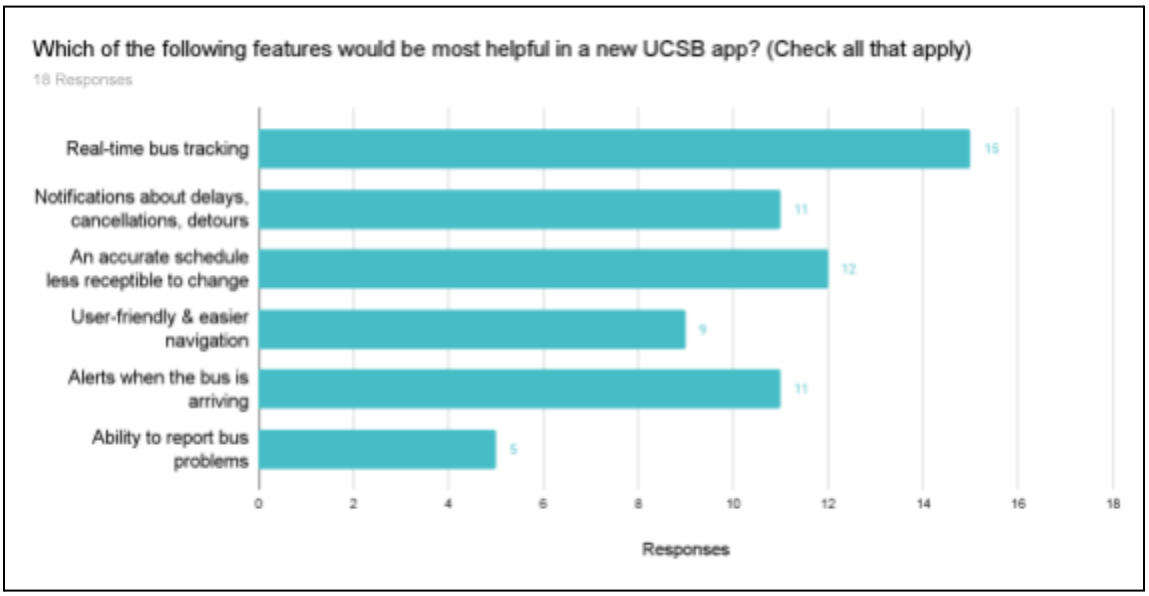

FIGURE 10 Preferred features for a new UCSB bus app [12]

All in all, it is evident that there are glaring issues within the bus system. Now knowing the most pressing matters and what UCSB students hope to see in a new app, we can design a new app to make the transit service more accessible and convenient to navigate.

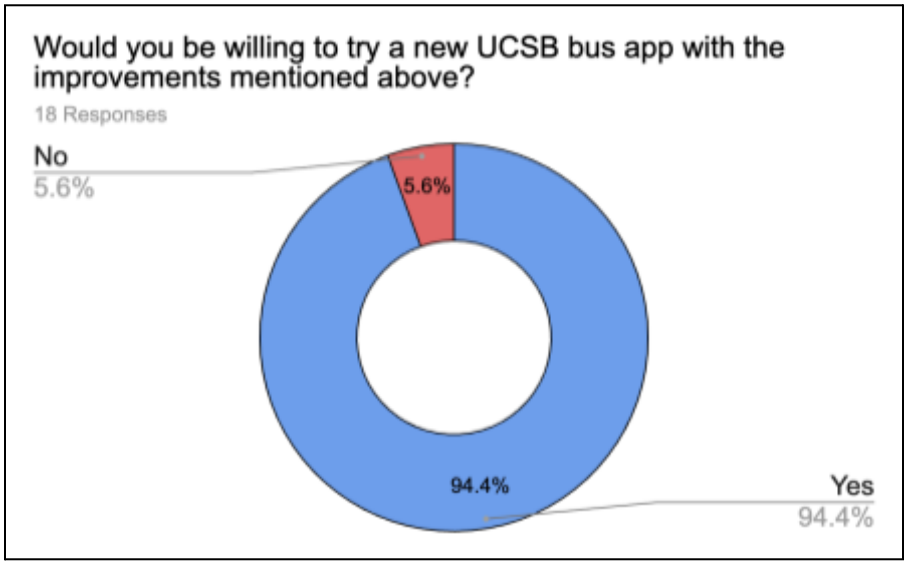

FIGURE 11 Student interest in a new and improved UCSB bus app [13]

Proposed Solution

In response to the issues we identified above, we propose the development of a new, more user-friendly, and accessible bus app. This new design will focus on providing accurate, real-time information, improving the accessibility of the app, and ensuring all students can easily navigate the UCSB bus system. The new design will include the following key features:

1. **Reliable live tracking and notifications for delays & detours**
   Our new app will include real-time bus tracking, allowing students to view the exact location of buses on their route. Additionally, the app will send push notifications to alert students about delays, detours, bus schedule changes, and reminders for when to pull the stop cord. This feature will reduce uncertainty and ensure students can plan their commutes effectively and confidently.

2. **Live bus route display**
   Unlike current apps that only show static schedules, our app will provide route lines for each bus, showing live updates of bus locations along the route. This feature will help students track buses more accurately and estimate the best time to head to the bus stop.

3. **Favorite and Frequent Locations**
   The app will allow users to “heart” or favorite their most frequented locations, such as campus buildings, dormitories, or popular spots around UCSB. Once marked as a favorite, these locations will appear easily accessible in the app settings and home screen.

4. **Accessibility-friendly Features**
   We recognize the importance of making this app accessible to all students, including those with disabilities. Our app will feature adjustable font sizes, adjustable contrast visuals, keyboard navigability, and a text-to-speech option to cater to students with visual, motor, or other impairments. These features were developed with the help from the MTD Services for Passengers with Disabilities to ensure they provide the most effective support. Users will be able to access these features through the “Accessibility” section in the app’s settings, where they can customize and turn on the features that best suit their needs.

5. **User-friendly Interface and Navigation**
   Our app will have a simple, intuitive interface, so that students can easily access information without the unnecessary complexity.

By incorporating these features, students will be able to use the UCSB bus system with ease, confidence, and convenience.

Testing the Proposed Design

Before implementing our proposed design changes to the MTD Bus System apps, it is crucial to test the design's feasibility and ensure they meet the desired standards of usability and efficiency. The following tests outline the plan for testing these changes:

1. **Bus System Testing:** We will consult with experts in public transportation systems and bus routes, such as MTD staff, to ensure the accuracy of bus schedules and tracking. These experts will provide feedback on the reliability of the suggested routes, stops, and real-time updates.
2. **Prototype Testing**: We will organize a group consisting of 30 diverse UCSB students, both occasional bus users and participants from the Disabled Student Program (DSP). First, these students will be asked to use the bus with the tools at present, such as the SBMTD BusTracker App or iMaps and Google Maps. Then, the same group will use the bus system with the new app during their regular commute to ensure authentic feedback on the app's functionality, navigation, and overall user experience. Taking their experiences with and without the app into consideration, we will gather suggestions on the design, features, and accessibility, with particular attention to how well the app meets the needs of students with disabilities.

Costs

The development of the app would require a skilled development team including software engineers and app developers. The cost of a professional development team ranges from **$80,000** to **$180,000** [14]. An alternative to hiring a professional team would be to take SB Hacks, the UCSB Hakathon, as an opportunity to engage students in the development process of the app [15]. By presenting the app as a challenge in the hackathon, we can reduce costs as the work would be carried out by volunteers (students and developers participating in the event). In this case, the primary cost would involve any needs for hosting the challenge, such as prizes, materials, and potential mentorship from experienced developers, which would range from **$1,000** to **$3,000.**

Why Us

Our bus app is preferable over our competition because it combines the **best features** pulled from existing bus apps and **adds features** that we surveyed to be lacking among the UCSB student populace.

Existing transit information includes sources such as bus maps at stations, **iMaps** for buses, **Transit** (an existing bus app), and the **SBMTD BusTracker**. Some features that we liked about these apps is that they occasionally have **live tracking** which allows you to see where the bus is on its route along with displaying the routes of the different bus lines on the app in different colors. In addition, the iMaps bus feature allows you to plan your trip ahead of time. However, none of these bus apps are reliable or notify you about route changes, such as detours that the buses are going to take when they are late, or accounting for when they do not show up. In addition to that, live tracking is not always available, and for new bus riders, it is not always clear when to get off or which line to take.

We can address these concerns by making toggle options on the bus for certain locations that have those **notifications** to remind you to **pull the stop cord** along with notifications for **trip changes and delays**. Since our surveys revealed that the most common places for students to be riding the bus are Target, downtown, North Hall, and dorms, it would make the most sense to add these locations in the app first.

With these **accessibility changes**, our bus app would be much easier to use than our competitors, especially for people who are new to the public transit system in Santa Barbara. With being able to easily navigate to some of the most commonly traveled places and improved tracking and notifications, our app will combine the best of existing features with innovations.

Conclusion and Recommendations

This section includes the major conclusions and recommendations from our study of the UCSB MTD Bus System Apps.

CONCLUSIONS

This report analyzed the current state of the MTD Bus systems used by UCSB students and identified key areas for improvement. The following conclusions were drawn from observations, surveys, and research:

1. **User Experience Issues:** The current bus apps lack real-time bus tracking and notifications for delays, cancellations, or route changes. Without these features, students face uncertainty and difficulty in planning their commutes, leading to frustration and reliance on other unsustainable transportation options such as driving themselves or taking Ubers.
2. **Accessibility Limitations:** The current MTD bus system apps do not adequately support students with disabilities. They lack key accessible features such as easily adjusted interfaces, making it difficult for students in DSP to use the app effectively.

RECOMMENDATIONS

Based on these conclusions, we recommend the following actions to improve the bus app experience in UCSB:

1. **Improve the User Experience:** Creating an easy-navigating bus app that provides accurate, up-to-date tracking of buses and notifications for delays, cancellations, and route changes. Push notifications will keep users updated on any service change so they no longer have to wait with uncertainty or miss buses, improving the overall experience of using the UCSB bus system.
2. **Improve Accessibility:** Incorporating accessibility features such as text-to-speech compatibility, keyboard navigability, and adjustable text size. These features will make it easier for users with visual, motor, or other impairments to navigate the app independently and have equal access to public transportation at UCSB.

FUTURE APPLICATIONS

Based on the performance of our proposed design, if successful, meaning getting a significant increase in surveyed ease of usability of the busing system with a significance level of 5%, we could implement this interface to other UC Campuses with public transit. In doing this, we hope to expand our scope of impact to improve the lives of UC students all across the West Coast.

References

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[2] A. Chavez, J. Lin, A. Wang, L Zhou. (2025, March, 14). *Overview of Current Bus Apps and Their Issues* [Personal Table]

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[7] A. Chavez, J. Lin, A. Wang, L Zhou. (2025, March, 14). *Survey Results: UCSB Bus Usage Frequency and Purposes* [Personal Photo]

[8] A. Chavez, J. Lin, A. Wang, L Zhou. (2025, March, 14). *Common issues experienced while using the UCSB bus system* [Personal Photo]

[9] A. Chavez, J. Lin, A. Wang, L Zhou. (2025, March, 14). *User satisfaction with the current bus apps* [Personal Photo]

[10] A. Chavez, J. Lin, A. Wang, L Zhou. (2025, March, 14). *Occurrences of late or missing UCSB buses* [Personal Photo]

[11] A. Chavez, J. Lin, A. Wang, L Zhou. (2025, March, 14). *Adequacy of UCSB Bus Alerts* [Personal Photo]

[12] A. Chavez, J. Lin, A. Wang, L Zhou. (2025, March, 14). *Preferred features for a new UCSB bus app* [Personal Photo]

[13] A. Chavez, J. Lin, A. Wang, L Zhou. (2025, March, 14). *Student interest in a new and improved UCSB bus app* [Personal Photo]

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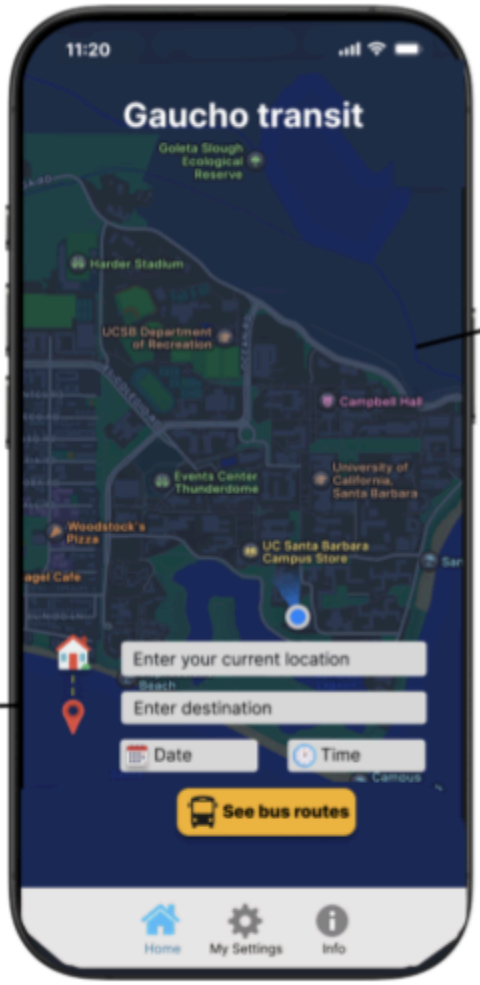
Appendix A

Gaucho Transit at a Glance

Appendix B

Home Page: Main Interface

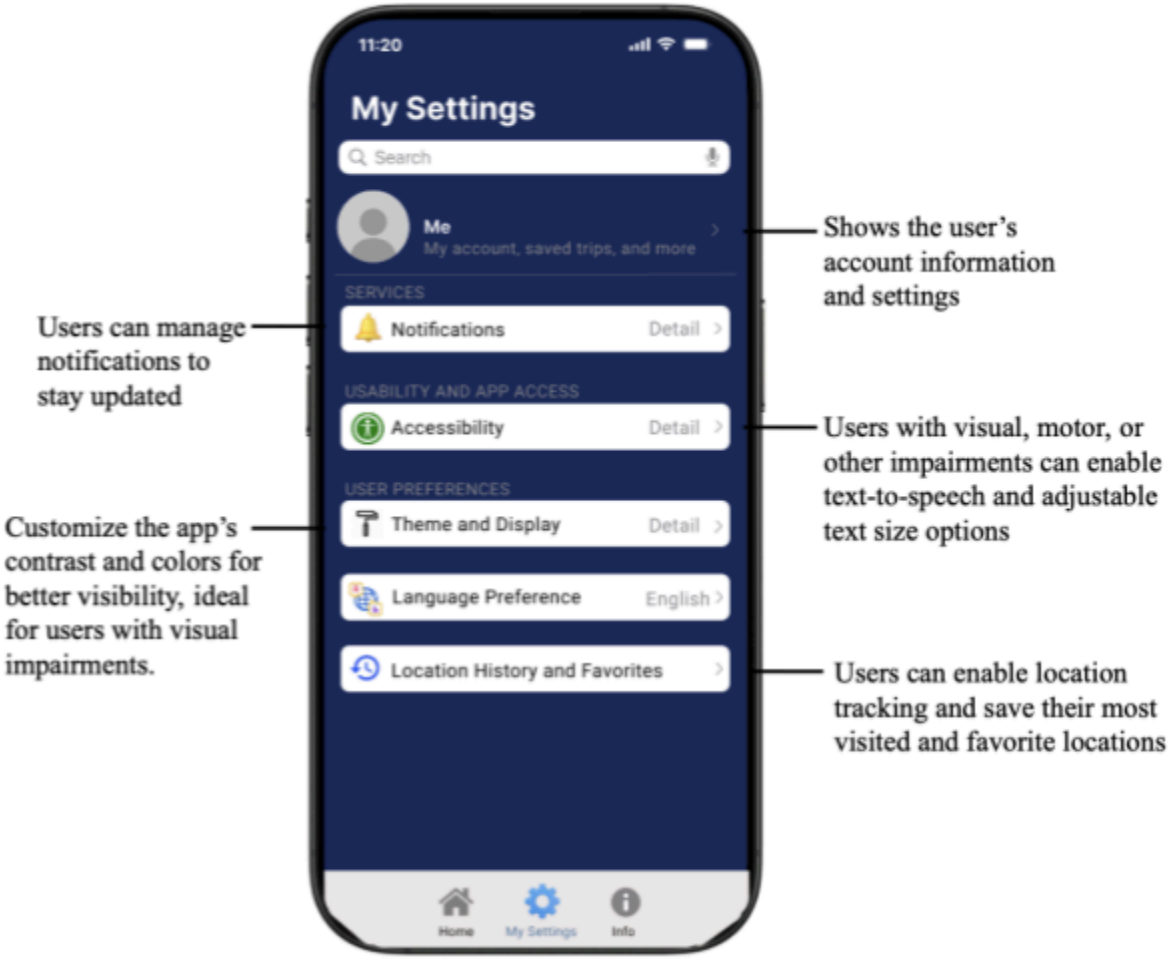


Displays the map along with the user's current location

The user plans their commute by entering their current location, destination, and desired date and time to view bus routes based on these preferences.

Appendix C

Settings Page: Customizations and Preferences



Appendix D

Information Page: Customer Service and Contact Information

Appendix E

Home Page in Use: Example of User Journey

Shows the bus route and tracks the bus in real-time. A moving bus icon updates as it travels along the route.

Displays the user's current location and desired destination, along with the number of stops, travel time, and bus fare.

Shows what bus the user should board, its time of arrival, and departure time. Other bus options are also listed in case the user misses the scheduled one.

Appendix F

Notifications: Example of User Alerts and Updates