
Social OneBusAway: Connecting Teens Using Social Technology and Public Transit

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Abstract

The goal of this project is to understand the public transit needs of teenagers and to create technological solutions that encourage teenagers to have a more positive and practical social opinion toward public transit. In our research, we focused on teenage trip planning and social interaction while using public transit. We distributed a survey and conducted two focus groups with high school students in the Puget Sound area. We also interviewed one public transit expert for the transportation provider perspective. Results encouraged the implementation of a SMS (Short Messaging System) and an interactive smart-phone application. To evaluate the results, we created low fidelity prototypes—such as computer drawn wireframes—and conducted a usability evaluation.

Keywords

Public transit, bus, teenagers, social technology, mobile device

ACM Classification Keywords

H5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous.

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Introduction

Public transit is a form of transportation that allows teenagers to travel cheaply and quickly, though sometimes teenagers prefer to travel by car because of its shortcomings. OneBusAway—an online bus finder tool—attempts to relieve the issues with bus arrivals and departures by informing users the approximate times that a particular bus is either arriving or leaving. This paper discusses the possibilities of creating an extension to the OneBusAway application that will encourage teenagers to use public transit more despite public transit's shortcomings. We hope to design an application that connects teens using social technology and public transit.

Literary Review

Public Transit and Teenagers

From our research, we discovered that teenagers preferred to travel via personal car. In a research study conducted by the Transit Cooperative Research Program (TCRP), 73% of the participants said that their most preferred mode of transportation was the personal car while 55% of the participants preferred public transit [4]. Our research also showed that teenagers depended on adults for travel. Results from a similar study supported our findings by indicating that teenagers have limited independent movement and many rely on adults for most travel [1]. Teenagers mostly viewed public transit as possibly unsafe to use during late hours; unreliable because of possible traffic delays and potential bus accidents and /or breakdowns; and not as "cool" [4]. Still, there were some positive views, such as public transit being an inexpensive mode of travel, a viable way to travel for those teenagers who lacked a driver's license, and a good way to avoid parking availability issues [4].

Mobile Technology and its Social Aspects

Besides having the ability to function as a tool for making calls and browsing the World Wide Web, mobile devices can provide services such as banking, commerce, chat room, gaming, parking services, and others [3]. Advanced mobile phones use color LCD screens to offer interactive interfaces that transmit voice, text, video, music, and graphics [6]. Not only can users make calls, they can use SMS (Short Message Services) and they can send and receive text and photo messages [6]. Users can look up mobile content such as news, weather, sports scores, stock updates, games, music, e-mail, and surf the Web [6].

Users can also use the mobile phone as a way to stay connected with others while traveling [6]. Most of the teenagers from our study regularly use the mobile phone to communicate with friends and family. Results from two separate research studies support our findings by indicating that social groups and social media are an important aspect to a teenager's life [2] and social connection and communication are fundamentally important to teenagers [5].

Data Gathering

We decided that the most effective method to gather teenagers' thoughts and opinions regarding the current public transit system and OneBusAway—an online bus finder application—was to visit local high schools; where large concentrations of teenagers gather on a regular basis.

First, we conducted one focus group at a local high school in the Puget Sound area. Later, we returned to the same high school to distribute a survey. For the focus group, we invited eleven high school senior

students, to join us in discussing their experience with public transportation and their mobile communications behavior. From the eleven subjects, all but one owned a cell phone. We also introduced and demoed OneBusAway for the students. None of the participants in the focus group had prior knowledge of OneBusAway and OneBusAway's functions greatly impressed them. After the focus group was completed and the qualitative results analyzed, we created an anonymous survey and returned to the high school to distribute the survey to a larger group of students. We were able to obtain quantitative data from 61 survey respondents.

Data Analysis

Focus Group Data

From the focus group, we discovered that high school students receive low exposure to online bus riding tools such as OneBusAway; however, the students believed that such tools could potentially be very useful for travel planning. The students also revealed that riding buses was a liberating experience because the activity allowed them to stop relying on family members for transportation. We found that the students preferred to ride the bus with friends because they can socialize and provide navigational assistance to each other; but after the students obtained their driver licenses, they stopped riding the bus.

Most of the students in our focus group preferred to communicate by using their mobile phones for texting rather than for making phone calls. Some students explained that for long conversations, they tended to use phone calls; while to obtain short information or quick answers, they tended to use texting.

Survey Data

RIDING THE BUS

We found that 50.85% of the responding students indicated that they "rarely" or "never" take the bus while 49.15% showed that they "sometimes" or "always" take the bus. We also discovered the following from those who said they "sometimes" or "always" take the bus: 93.48% said that knowing when the next bus will arrive is important; and, 82.98% said that when they do ride the bus, they ride with friends.

We also noticed that 65.96% of our respondents cited "not having a car" as a reason why they rode the bus.

TRIP PLANNING

We found that 66.67% of respondents implied that they never use any trip planning websites or applications. However, 60.98% said that they "plan ahead" if they are riding with friends. Respondents also revealed that the most common methods they "often" or "always" use for trip planning were analyzing posted schedules available at bus stops (57.78%) and asking friends for travel recommendations (47.73%).

MOBILE AND SOCIAL CONTEXT

We learned that most respondents owned regular cell phone (which we define as cell phones with only basic capabilities such as calling and texting). 55.74% of respondents owned regular cell phones while 27.87% owned smart-phones (which we define as cell phones with basic capabilities and more—such as internet service, mobile applications, etc). 11.48% of the respondents admitted that they do not have a cell phone.

We asked respondents to describe how they would communicate with friends when they are planning to get together for social gatherings:

Percent (%) Respondents	Communication Method
60.66%	Text Messaging
55.74%	Voice Calling
39.34%	Personal Face-to-Face Communication

Table 1: Displays the percent respondents who use a specific communication method for planning for social gatherings.

We found that for 80.33% of our respondents, their social lives involved the same social group most of the time. Furthermore, according to our survey:

Percent (%) Respondents	Size of Social Group
42.86%	2 – 5 People
34.69%	6 - 8 People
12.24%	9 – 12 People
10.20%	13 or More People

Table 2: Displays the percentage of respondents who interact with a specific social group size.

Finally, 48% of the respondents that do not ride the bus said that they are “likely” or “very likely” to ride the bus if they can ride with friends.

Design

Using the data collected and analyzed from the first focus group, we designed two wireframes—one reflecting a SMS (Short Message Services) interface and the other an iPhone application.

We created a SMS wireframes because a high percentage of teenagers from our study use text messaging as their most common communication method. The reason behind the iPhone application is because we believe that technology is moving forward at a rapid rate and smart-phones will soon be the dominate device in the near future

For the first wireframe, we decided to design an extension to the current OneBusAway application by creating a socially inviting feature that uses a “friends list.” We decided a “friends list” was necessary for the social aspect of OneBusAway.

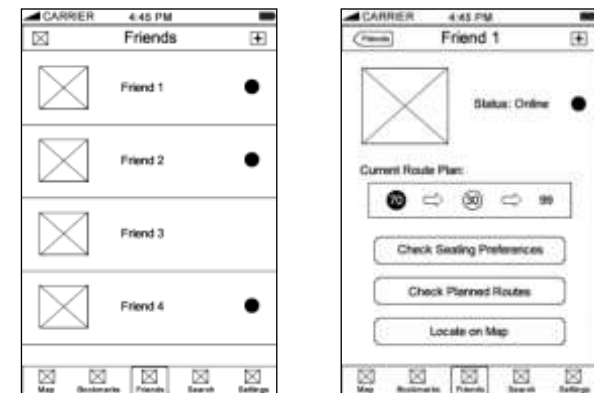


Figure 1: The “Friends” tab displays the friends list” and displays friend information such as the friend’s current route plan, current bus, and current location.

Next, we designed a system for regular mobile phones. The second wireframe details an online interface where users enter their information and have the system return that information when requested while the users are traveling.

Users setup travel information on a website via the user's OneBusAway account. New users must register their phone number, create a password, and provide an email address. Each account has bookmarks which refer to the mobile texting for OneBusAway.



Figure 2: The bookmarks page.

Once the user is traveling, they can use the trip planner by texting the stop number, the bookmark nickname, stop number to stop number, bookmark to bookmark, or vice versa.

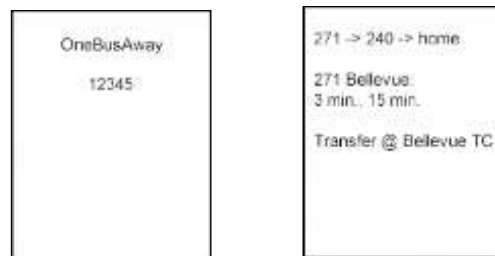


Figure 3: Texting the bookmark nickname returns the user's trip planner information.

We considered implementing a social system for regular mobile phones, but it is extremely difficult considering the limited text-based functionality regular phones have. Thus we took the feedback we received from the first focus group and decided to make an improved trip planner for the regular mobile phones.

Wireframes Evaluation

Usability Focus Group

After finishing the wireframes, we had the opportunity to return to the high school and present them to the participants in the previous focus group. The wireframes received positive feedback in general for good flow and logical content. However, the participants were able to identify a few flaws in the reasoning of our mental model of the system.

The participants were enthusiastic about the social aspect of a "friend list" system and agreed that it would be better if it merged with an existing social networking service such as Facebook. They also addressed a number other minor functionality issues that seemed to conflict with teenage behavior, such as using email as the primary mode of managing contacts. The participants indicated that they seldom use email as a major medium of communication and it made more sense to use a phone number based account for managing contacts.

For the regular mobile phone wireframe, the participants felt that the design flowed well and was intuitive to use. However, the wireframe had a number of minor issues that detracted from the overall experience. The main problem seemed to be purely

semantic; users felt that they misunderstood certain terms in the context of the system only until we explained the definitions. Other issues included the ability to search a route number and return a map highlighting the route and the bus stops it serves.

In addition to the high school focus group, we also presented our wireframes to a public transit expert. The expert agreed that a "friends list" feature was a great way for teenagers to socialize and that the incentive of possibly "busing with friends" may encourage more teenagers to ride the bus, thus boosting teenage public transit ridership. The expert also suggested that we should consider the possibility of incorporating "secondary split routes" into our trip planner. A secondary split route results from the event where friends riding on the same bus for the first portion of the trip later "split up" to ride on different buses for the second portion of the trip.

Conclusion and Future Work

To teenagers, riding on public transit as a potential social activity is favorable. Most teenagers feel that riding with friends can greatly influence their decision to use public transit. As a result, we created a method for teenagers to socialize via public transit. We designed two mobile wireframes that received positive feedback. In the future, we plan to create high-fidelity prototypes from our wireframes and conduct usability tests on our prototypes. We would like to implement a working version of our prototypes and merge the implementation with the OneBusAway application.

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Appendix

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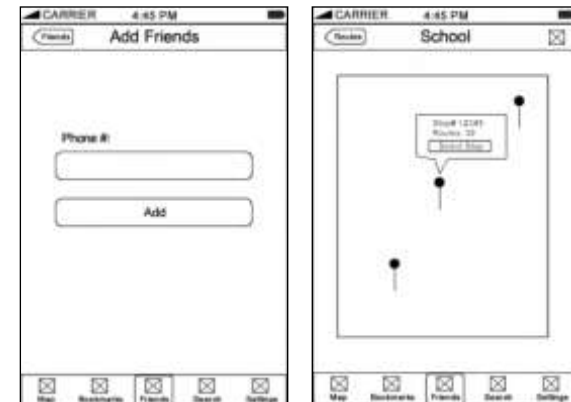
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More iPhone Wireframes



More Regular Mobile Phone Wireframes

