**OneBusAway: Results from Providing Real-Time Arrival**

**Information for Public Transit**

**Written By: Soumit Das**

**Roll no: MT2013151**

Public transit systems play an important role in combating traffic congestion, reducing carbon emissions, and promoting compact, sustainable urban communities.

OneBusAway, a set of transit tools focused on providing real-time arrival

information for Seattle-area bus riders. This paper represent results from a survey of OneBusAway users that show a set of important positive outcomes: strongly increased overall

satisfaction with public transit, decreased waiting time, increased transit trips per week, increased feelings of safety, and even a health benefit in terms of increased distance

walked when using transit. The societal benefits of public transportation are numerous .Public transit provides mobility to those who cannot or prefer not to drive.

Towards this goal, there are two principal reasons for providing better transit traveler information: to increase satisfaction among current riders; and to increase ridership, especially

among new or infrequent transit users and for nonpeak hour trips. These are two key priorities for many transit agencies. It has been shown that transit traveler information can result in a mode-shift to public transportation. This stems from the riders’ ability to feel more in control of their trip, including their time spent waiting and their perception of safety. Real-time arrival information can help in both of these areas. In addition, it has been found that providing real- time information significantly increases passenger feelings of safety.

King County Metro. A 2006 survey of King Country Metro riders identified a number of key areas of dissatisfaction for area riders, including the top two: 26% of riders were dissatisfied with their wait time when transferring, while 19% were dissatisfied with personal safety when waiting for the bus after dark. In addition, in a 3-month period prior to the survey, 42% of riders said they had experienced problems with on-time performance of buses.

OneBusAway was created to address some of these issues and out of frustration with existing transit tools.

Initial Development Initial work on OneBusAway was started as a personal project of the first author, a frequent bus rider, who was fed up with the usability of existing tools provided by the regional transit agency. The agency has actually had real-time tracking capabilities for its buses since the late 90s and provides web and SMS (through an SMS-to-email gateway) access to arrival information. However, these tools were very difficult to use when riders were actually

waiting at a stop, primarily due to providing no way to use posted stop ids to quickly access information for a stop and the resulting complexity of information lookup.

The new set of tools provided by OneBusAway improved on these original tools in a number of ways. First, the proper mapping between stop id and real-time arrival was constructed

so that users could quickly access information using a stop’s posted id. Second, multiple interfaces were developed to promote greater access to information. In addition

to a standard web interface (www.onebusaway.org), an interactive-voice-response (IVR) phone interface, an SMS interface, an iPhone-optimized web interface, and a very basic

text-only web interface were added so that a user could easily access information using a variety of devices. For a range of mobile devices, from a basic cellphone to a powerful

smart phone or something in between, there was an appropriate interface available. Additionally, in September 2009 OneBusAway released a native iPhone application that includes automatic localization of the information presented using the phone’s GPS capabilities. (This was in beta test at the time of the survey.)

The standard web interface allows a user to search for stops by route, street address or map area. that details like indication of direction of travel at a particular stop make it easier for a user to distinguish between multiple nearby stops, such as when two stops are directly across the street from each other. Real-time arrival information includes details about the route, destination, and time remaining until departure. In addition to the real-time arrival information, a full schedule in stem-and-leaf format is provided for each stop.

The iPhone-optimized and text-only-optimized web interfaces offer similar functionality with formatting appropriate for the target device. Both interfaces allow a user to enter

a stop id to quickly receive arrival information, or to search for a stop using a search tree that narrows results based on the route, destination of travel, and street location of the target

stop, allowing stop lookup when the posted stop id is missing or the user is not physically at the stop.

**Iterative Design:**

These interfaces were informally evaluated in the summer of 2008 with a number of students and heavy transit users. After integrating feedback from these users, the OneBusAway

website was launched with pointers to the various tools for accessing information The design of the various tools, along with development of new features, has been further shaped by feedback from users over the past year.

**Method:**

To evaluate the effects of using the OneBusAway system, they developed two user surveys. The first, primary survey was engineered to query users about their usage of OneBusAway and how OneBusAway had changed their overall perception of public transit, including issues of satisfaction, utility, perceived wait time,frequency of travel, safety, and other factors, through a standard online survey.

**Survey Result:**

A total of 488 respondents took the survey during five days in August of 2009. OneBusAway developer gathered basic demographic information about survey respondents, including gender, age, annual income, and number of children in household. Overall,respondents were 70% male. Age ranges of respondents included 18-24 (18%), 25-34 (55%), 35-44 (17%), 45-54 (7%) and 55 or older (3%). Annual household incomes were under $20k (8%), $20-40k (16%), $40-60k (18%), $60-80k (16%),$80-100k (18%), and over $100k (24%). A total of 13% of respondents reported having children in their household.

Even so, it is worth noting that the 488 respondents who took the survey are nearly 10% of the daily OneBusAway user base.One interesting finding from the initial survey was that users

reported walking more as a result.then they developed a shorter second survey that asked for specific details about connections between OneBusAway and changes in walking behavior.

The survey also asked respondents which OneBusAway tools they used.The ratio of web users to phone users in the survey is 7.0 while the ratio in actual usage is 6.8. The ratio of web vs. SMS for the survey is 8.4 and 9.0 in actual usage. These ratios show a reasonably close match in usage ratios between the survey and actual OneBusAway usage.

**Satisfaction With Public Transit:**

In this survey, they asked survey respondents whether their overall satisfaction with public transit had changed as a result of using One-BusAway. 92% of respondents stating that they were either somewhat more satisfied or much more satisfied with public transit as a result of using One-BusAway. This is a remarkably strong effect from adding alternatively inexpensive technology to public transit.

The most common response, mentioned by 38% of respondents, concerned how OneBus-Away alleviated the uncertainty and frustration of not knowing when a bus is really going to arrive.

The next most common response, mentioned by 35% of respondents, concerned how OneBusAway increased the ease and flexibility of planning travel using public transit,

whether it be a question of which bus to take or when to catch it.In this survey,they asked survey respondents if there had been a change in the amount of time they spent waiting for the bus as a result of using OneBusAway. Among respondents, 91% reported spending less time waiting, 8% reported no change, and less than 1% reported an increase in wait times.

**Access to Schedule Information**

In this survey,they also asked respondents how they typically find bus departure time information. While some 16% of respondents reported using the published schedule provided by the transit agency in either paper or online form, a full 73% of respondents indicated that they used OneBusAway to find out when the next bus will actually arrive, without consideration of the published schedule. The remaining 10% used some combination of the two, or else existing trip planning tools. This shift away from traditional static schedules has some important

policy implications, presented in a later section.

**Perception of Personal Safety:**

In this survey they asked users how their perception of personal safety had changed as result of using OneBusAway. While 79% of respondents reported no change, 18% reported feeling somewhat safer and 3% reported feeling much safer.

they additionally asked respondents whose feeling of safety had changed to describe how in a free-form comment. Of such respondents, 60% reported spending less time waiting at the bus stop as their reason, while 25% mentioned that OneBusAway removed some of their uncertainty. Respondents specifically mentioned waiting at night (25%) or at

unsavory stops (11%) as potential reasons they might feel unsafe in the first place. Respondents also described using OneBusAway to plan alternate routes (14%) or to help decide on walking to a different stop (7%) in order to increase feelings of safety.

**Walking to a Different Stop:**

In this survey they asked survey respondents how likely they are to walk to a different bus stop based on information from OneBus- Away. While some 19% of respondents reported no change in their walking habits and 3% reported they were less likely to walk to a different stop, a full 78% reported they were more likely to walk to a different stop. We had not expected

such a significant response regarding increased walking in the original survey, which is why we undertook the second survey to provide more detail about how and why walking

habits had changed.

In the followup survey, they asked again how likely respondent sare to walk to a different bus stop based on information from OneBusAway, and had an almost identical response

(79% as more, 19% as no change, and 2% as less). We next asked respondents where they walk when they walk to a different bus stop. The most popular choice was to a stop on a different route, while stops further along or further ahead on the current route were picked less frequently.they also asked respondents to classify why they walked to a different stop. Responses, that finding a faster route to their destination is the most popular reason. On average, OneBusAway users surveyed estimate that they walk 6.9 more blocks per week than before using OneBusAway (SD=8.2), with a median value of 5 blocks.

Several respondents commented about OneBusAway not only increasing their walking, but decreasing the stress involved with the walk, especially the threat of being passed

by the bus while in between stops.

Other users commented as well that they were using One- BusAway to decide whether it was worth getting on a crowded, standing room-only bus or if they should wait for the next bus in a few minutes that will be mostly empty. Like predicted arrival time, the number of available seats on a bus is another important piece of information which they’d like to

make more visible in transit systems. they have already talked with agencies about allowing drivers to note when their vehicles are full in an automated way so that riders can avoid a

packed bus.

**CONCLUSION**

In this paper, we have presented the results from a survey evaluation of OneBusAway, a set of tools specifically providing access to real-time arrival information for public transit

and improving the usability of public transit in general. The results of this survey are that respondents have an overall increase in satisfaction with public transit, make more transit

trips on a weekly basis, spend less time waiting for transit, have increased feelings of personal safety when using transit, and often walk further when using transit. These outcomes

are all positive in terms of increasing the use of transit to reduce traffic congestion, reducing the environmental impact of transportation, and encouraging the development

of compact, livable communities.