Green Paper: Proposed Direction for Transit Persuasion

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For our SI682 Interface and Interaction Design project, we are working towards the goals of the CHI 2007 student design competition,[1] which seeks to increase use of pubic transportation. After an initial evaluation, we restate the CHI problem in the following terms: to motivate people who might otherwise drive for any given trip to use an alternative option, such as ridesharing, public transit, walking, or bicycling.

Proposed Solution

Our initial evaluation of the problem revealed two main themes that reduced public transit utilization: first, a lack of timely, sufficient, and clear awareness of public transit options and their comparative costs, and second, social issues that discourage some segments of a society from using public transit.

We considered a number of ideas addressing these themes. Our initial attempt at a solution addressed the first theme with an interactive route mapping kiosk with accompanying website. For the second theme, we considered ways to increase social interaction in shared transit with the hope of creating community. As we revised our idea, we sought to move any attempt to provide information to shortly before or during the moment when the user makes a decision about how to get somewhere. We could most reliably and practically identify this moment in scenarios where the user turns to a computer for travel information. We propose to intervene at this point to provide information that increases a user's awareness of alternate travel options and helps them compare the relative costs.

The interventions are only able to help when the user has not already made a decision (i.e., for unique or new trips). For trips that are routine the choice of transit mode is suppressed, and we seek to help the user reconsider these choices. To do so, we propose a website that helps facilitate social

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experiences through alternate transportation and can also assist users with tracking the costs and benefits of their behavior.

Intervention

The intervention component of this project begins when a user installs one or more software plug-ins. The plug-ins interact with the user's web browser and personal information manager (PIM). When the user schedules an appointment in his or her PIM or uses an Internet mapping site in a web browser, the user is offered alternative public transportation routes, along with information that allows the user to compare the costs, time required, carbon emissions, and calories burned for each transit method. Plug-ins for PIMs retrieve directions (both transit and driving) for saved appointments and these would then be synchronized to smart phones, PDAs, or other user devices. We do not limit this to buses, subways, and trains, but also intend to make an API that will enable rideshare services to integrate with the service, though we do not necessarily plan to help organize rideshares within the product.

The same API the plug-ins use would also be available to third parties (eg: Google, Yahoo). One way these third parties could use the API would be to scan the content of email messages for addresses and offer transit information in context, much as Gmail currently implements links to mapping and driving directions in messages. All routing data would be publicly accessible through APIs, encouraging third party development and integration into future applications. Our goal is to enable each transit provider to integrate their data with limited additional work – the amount that could be funded with a modest federal grant, for example.

We expect that some users will install the application without any incentives; these are the users who generally feel that they should drive less but think they could use the reminder. There may also be benefits associated with shared computers (e.g. when one person installs the program and it

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[1] CHI 2007 Student Design Competition. http://www.chi2007.org/submit/designcomp.php

reminds others). Other users will need to be encouraged to install the application, and we can imagine partnerships with transit providers or community stakeholders (e.g. local businesses) to offer incentives, such as transit vouchers or local business discounts.

This intervention mechanism is consistent with a 1998 Transportation Research Board study[2] and a 2004 Portland pilot project[3] showing that individual marketing can be highly effective at increasing transit ridership, especially for the duration of the marketing campaign. We attempt to deliver similar results at a lower cost and infinite duration through the intervention mechanism. Additionally, we consider that providing general information about a behavior's environmental benefit is not effective in persuading users to change their behavior; instead, information shown frequently at the time of decision, with feedback, has been shown to be more effective.[4]

Retention and Increasing Utilization

Intervention is just one part of the solution, and we believe the plug-ins and API service need a website to back them up. As users begin to incorporate more transit options into their travel decisions, they may use this integrated travel planner rather than driving-oriented mapping services. Additionally, the website may become a social hub. We are uncertain about which features fit best; some possibilities include social ridesharing (ridesharing among your connections and friends of connections), a facility for organizing transit-related activities (e.g. a book of the bus club on an express route), and information that helps you track your progress towards reducing emissions, saving money, or burning calories.

Proposed Lo-Fidelity Prototyping Plan

We plan to create five storyboards demonstrating interaction with the proposed system (both plugins and website). We will use these storyboards as a starting point for conversations with prospective users about how this product does or does not fit into their daily routine. Based on what we learn from this, we will create an interaction flow diagram. We will then expand this into a lo-fidelity prototype. We do not currently have a detailed plan for hi-fidelity or experience prototyping, though our inclination is an approach that emphasizes experience prototyping, as this better evaluates whether or not our service can actually increase use of alternative transportation.

Discussion Questions

In addition to seeking discussion on the overall proposal (i.e. is this the right solution?), we are interested in feedback on a number of specific questions:

- How can we best prototype this experience during the duration of SI 682? CHI places a high premium on field trials.
- Is there a risk the plug-in could seem like mal-ware? If so, how do we avoid it?
- What information and features are most likely to influence users' transportation decisions?
- This idea may seem mundane compared to some other ideas (c.f. *undersound*[5]). Is this a liability with CHI judges?
- We have chosen a rather broad set of target users for this product. Is this a reasonable choice?

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[2] Transportation Research Board (1998). "Individualized Marketing: Implications for Transportation Demand Management," *Transportation Research Record*, 1618, pp 116-121.

[3] City of Portland Office of Transportation (2004), "Travel Smart." http://www.portlandonline.com/transportation/index.cfm?c=dgdha.

[4] Stern, P C (1999, December). "Information, Incentives, and Pro-Environmental Consumer Behavior," *Journal of Consumer Policy* 22(4), pp 461-478.

[5] Bassoli, A; Brewer, J; and Martin, K (2006). "undersound: Music and Mobility Under the City," *Ubicomp 2006.* Available from http://www.undersound.org/.