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Mobility-for-All: Community Access through Intelligent Mass Transportation Systems

The Mobility-for-All project is exploring mobile technologies and architectures that lower barriers to community access and independence for persons with cognitive disabilities. We are collaborating with disability communities, urban planners, innovative technology companies, and transportation system designers to understand and address problems faced by travelers with cognitive disabilities and their caregiver communities.

Mobile Support for Persons with Cognitive Disabilities and their Caregiver Communities

Our research team surveyed mass transportation systems in major US cities and identified several barriers to learning and navigating public transit systems. Major barriers include: difficulty reading and comprehending maps, schedules, labels and signs; locating appropriate landmarks; and understanding the abstract concept of time. These barriers are challenging for many travelers, but are especially daunting for those with cognitive disabilities. These challenges present opportunities to design new navigational approaches that benefit travelers with



Mobility-for-All mobile prototype and caregiver display

cognitive disabilities, as well as the general public.

Our research has resulted in a technical architecture and prototype components that leverage Global Positioning System (GPS) technologies now being introduced to manage bus fleets in major US cities.

The Mobility-for-All architecture:

- provides mobile, contextualized, personalized, “just in time,” multi-modal (visual, auditory, or tactile) prompts;
- reduces cognitive loads by focusing memory and attention on critical tasks including which bus to board, when to get off, and where to go next - much like caregivers do as they train new users;
- communicate special user needs (e.g. a destination or needed connections; physical access needs; etc.) to system operators so bus system operators can provide assistance; and
- allows caregivers or family members to monitor trip progress, detect errors, and offer assistance - while maintaining privacy.

The Mobility-for-All (MfA) project is one of several Cognitive Levers (CLever) research projects sponsored by the Coleman Institute for Cognitive Disabilities. CLever projects are developing socio-technical systems that support community independence and social inclusion for people with cognitive disabilities and caregiver communities.

The National Science Foundation (NSF) recently awarded a Small Business Innovative Research (SBIR) grant to MfA technology partner AgentSheets Inc. to develop “Mobility Agent” technologies and services that support people with cognitive disabilities traveling independently on public transportation. SBIR research results are available at: http://www.agentsheets.com/about_us/documents/Mobility%20Agents%20Flier.pdf



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