Increasing Ridership of Fixed-Route Transit By Utilizing GPS-Enabled Cell Phones

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Travel Training . . .

. . . the Challenges . . . the Victories
The Challenges . . .

- Transportation is essential for independent living
- Individuals with mental/cognitive disabilities (14.2M Americans, 6.9% of pop.)\(^1\) often have problems with quick actions required by transit
- Paratransit is expensive ($25.30 per trip vs. $2.89 per trip, 2004 avg. for Florida)\(^2\) and can be restrictive to riders

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2 - National Transit Database (2005)
The Challenges . . . cont.

- Personalized attention is required to introduce riders to fixed transit (Travel Trainers (TT)/Instructors)
- TT has shown success and cost savings in studies\(^1\), but even after training many riders with cognitive disabilities still need to be prompted to initiate stops
- Need a method of remote “coaching” for riders

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A Solution . . . TAD

• Develop first navigation software for public transportation using GPS-enabled mobile phones
  – Alert user when to get off the bus
  – Simplicity is key!
• Develop Trip Management Tool
  – Website to manage trip itineraries by travel trainer and/or parents
  – Allow real-time tracking through website
  – Trigger alarm when rider deviates from planned route
• Could be used by any transit rider!
TAD Web Interface – Real-Time Viewing

Transit Riders Position (updated every 15 seconds)  Update Position

List of Transit Riders:
- Test1 User1: Active
- Test2 User2: Inactive

Create a New Trip  Edit an Existing Trip

To create a new trip:
1. Select a transit rider.
2a. Click on create new trip.
2b. Click on edit trip.
Create New Trip

End Stop Floribraska Av @ Nebraska Av

Transit Rider: Test1 User1

Segments:

1. Select agency:
   Hillsborough Area Regional Transit
2. Select bus route:
   Route 6
3. Select trip day:
   Wednesday
4. Select trip time:
   Hour: 11 am Minutes: 34
5. Select trip:
   trip: 0
6. Choose segment starting bus stop by clicking in the map.
7. Choose segment ending bus stop by clicking in the map.
8. Enter segment name:

Enter trip name:

Work to Home

Create Segment
Save Trip

Done
TAD Cell Phone Application

- Transit Rider Selects Trip That Was Planned On Website
TAD Cell Phone Application

On Bus…

Then the user hears: “Get Ready!”
TAD Cell Phone Application

Pull the Cord Now!

(+Sound and Vibration)

OK

Then: “Pull the Cord Now!”
Complexities to overcome...

Technology
- Complex software system
- GPS is very dynamic
- Testing in the field is different from lab!

Institutional
- Multiple organizations
- Restricted Access to GPS on new Cell Phones
- Updating bus route information
- Testing with special population
Proof-of-Concept Tests

- 6 special needs students from STAGES took trips to new destinations using TAD
- Selected bus stops around the USF area
- Designed primarily as a technology “proof-of-concept”
- Each rider responded to TAD prompts
Updating Route & Schedule Information

- **Google Transit** provides free trip planning tool to agencies.
- Agency has incentive to post schedule updates to a webpage so Google can update their system.
- TAD system can grab the same updates and use them!
- This feature also allows adding new agencies to TAD with the click of a button!
Adjusting Bus Stop Locations

**Bus Stop Form**
- Agency: Hillsborough Area Regional Transit
- Bus Route: Route: 5
- Day: Monday
- Hour: 9 am
- Minutes: 0

Click load trip after filling the form above

**Information Panel**
*The following information was selected:*
- Agency: 12
- Route: 5
- Day: MONDAY
- Time: 09:0
- Trip: 466081

**Modified Bus Stops:**
- Modified Bus Stops list:
  - MarkerID: 1649
  - Coords: (28.05809417412255, -82.41617202758789)
Optional AVL-based Features

- If the transit agency has an Automatic Vehicle Location system, additional functionality may be available to TAD:
  - Real-time Estimated Time of Arrival Information
  - Showing real-time vehicle position on website
New TAD Partners

- Testing with HART in Tampa Bay area has been successful
- Expanding TAD deployment opportunities with other transit agencies
New TAD Partners

• Partners will be asked to:
  – Format their data into Google Transit format (HASTUS and Trapeze both provide export tool)
  – Test TAD by their travel trainer as part of daily trips with trainees
  – Correct errors in any bus stop locations through TAD webpage
  – Provide Feedback to TAD research team
New TAD Partners

• CUTR will:
  – Provide adequate TAD orientation/demo/training sessions
  – Help transit agency with TAD integration
  – Monitor TAD and provide support during tests
  – Resolve any TAD technical issues as they occur
Questions?

Please contact Sean Barbeau if you’re interested in TAD Deployment!

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