Mobility Assistance for People with Cognitive Disabilities
Trade Study
SPEAKERS

MANDY BISHOP, PE
Program Manager, City of Columbus
mkbishop@columbus.gov

ANDY WOLPERT, PE
Project Manager, City of Columbus
adwolpert@columbus.gov

ALEX KAVANAGH
Technical Lead, HNTB
akavanagh@hntb.com
TODAY’S AGENDA

01 | PURPOSE OF THIS WEBINAR
   • Share concept development activities from Smart Columbus with mobility assistance stakeholders

02 | WEBINAR CONTENT
   • Smart City Challenge Overview
   • Smart Columbus Program Overview
   • Mobility Assistance for People with Cognitive Disabilities Project Overview
   • Stakeholder Q&A
   • How to Stay Connected

WEBINAR PROTOCOL

03 | • All participant lines have been muted during the webinar in order to reduce background noise
   • Questions are welcome via chatbox during the Q&A Section
   • The webinar recording and presentation materials will be posted on the Smart Columbus website
$40 MILLION
78 APPLIED • COLUMBUS WON
SMART CITY CHALLENGE
THE CITY OF COLUMBUS
ANDREW J. GINTHER, MAYOR
U.S. Department of Transportation
To empower our residents to live their best lives through responsive, innovative and safe mobility solutions.
MISSION

To demonstrate how an intelligent transportation system and equitable access to transportation can have positive impacts on every day challenges faced by cities.
OUTCOMES

SAFETY  MOBILITY  OPPORTUNITY  ENVIRONMENT  AGENCY EFFICIENCY  CUSTOMER SATISFACTION
PROJECT PHASES AND TIMELINE

WHERE WE ARE GOING

- **SYSTEMS ENGINEERING**
- **DEVELOP AND PROCURE**
- **DEPLOY, OPERATE AND MAINTAIN**
- **DATA COLLECTION/ANALYSIS**
- **SOLICIT/VALIDATE USER NEEDS | ENGAGE STAKEHOLDERS/PUBLIC | COMMUNICATE PROGRESS/PARTICIPATION OPPORTUNITIES**

- **AUGUST 2016**
- **AUGUST 2018**
- **APRIL 2019**
- **SEPTEMBER 2019**
- **JUNE 2020**
- **MARCH 2021**
USDOT PORTFOLIO

ENABLING TECHNOLOGIES
- CONNECTED VEHICLE ENVIRONMENT

ENHANCED HUMAN SERVICES
- MULTIMODAL TRIP PLANNING/COMMON PAYMENT SYSTEM
- SMART MOBILITY HUBS
- MOBILITY ASSISTANCE
- PRENATAL TRIP ASSISTANCE
- EVENT PARKING MANAGEMENT

EMERGING TECHNOLOGIES
- CONNECTED ELECTRIC AUTONOMOUS VEHICLES
- TRUCK PLATOONING
BACKGROUND
The Americans with Disabilities Act defines a person with a disability as a person who has a physical or cognitive impairment that substantially limits one or more major life activities.

Cognitive Disabilities include:

- Autism
- Down Syndrome
- Traumatic Brain Injury
- Dementia
- Attention Deficit Disorder (ADD)
- Dyslexia
- Learning disabilities
Current issues

- People with cognitive disabilities who wish to independently use public transportation must either qualify for paratransit services in accordance with the ADA, or be sufficiently independent to safely use fixed-route bus service
- Paratransit services are not as flexible as fixed-route

The cost of paratransit service continues to grow

- COTA has average fixed-route trip cost of $6.18. An average paratransit trip is $35.86.
- COTA offers free bus fares to paratransit customers as an incentive to use the fixed-route service
- Paratransit ridership has remained relatively unchanged at approximately 278,000 trips per year
BACKGROUND

Objectives

• Move certain paratransit riders to fixed route bus service
• Improve independence of travelers moving from paratransit to fixed route service
• Reduce COTA expenditures
• Understand user needs
  • Advocacy groups
  • COTA Mainstream
  • The Ohio State University faculty
  • Pre-vocational Integrated Education and Campus Experience (PIECE Program)
  • Caregivers

• Functional assessment of existing applications

• Evaluation and field study of existing applications
  • PIECE program

• Finalize Trade Study
# USER NEEDS

<table>
<thead>
<tr>
<th>ID</th>
<th>Evaluation Criteria</th>
<th>User Class</th>
<th>Priority</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAPCD-UN001-v01</td>
<td>Phone-based application (Android and IOS)</td>
<td>Traveler</td>
<td>Essential</td>
</tr>
<tr>
<td>MAPCD-UN002-v01</td>
<td>Knowledge of real-time transit info (COTA GTFS)</td>
<td>Traveler</td>
<td>Essential</td>
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<tr>
<td>MAPCD-UN003-v01</td>
<td>Voice and turn-by-turn directions</td>
<td>Traveler</td>
<td>Essential</td>
</tr>
<tr>
<td>MAPCD-UN004-v01</td>
<td>Ability for the traveler to speak to the caregiver (safety)</td>
<td>Traveler</td>
<td>Essential</td>
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<tr>
<td>MAPCD-UN005-v01</td>
<td>Ability to send alerts to the caregiver (passive monitoring)</td>
<td>Caregiver</td>
<td>Essential</td>
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<tr>
<td>MAPCD-UN006-v01</td>
<td>Ability to track an individual (active monitoring)</td>
<td>Caregiver</td>
<td>Essential</td>
</tr>
<tr>
<td>MAPCD-UN007-v01</td>
<td>Caregiver experience*</td>
<td>Caregiver</td>
<td>Essential</td>
</tr>
<tr>
<td>MAPCD-UN008-v01</td>
<td>WCAG 2.0AA standard / 508 compliant</td>
<td>Traveler</td>
<td>Essential</td>
</tr>
</tbody>
</table>
TRADE STUDY
TRADE STUDY

Used to evaluate complete or near complete end-to-end solutions

- Requirements, capabilities and design well established
- V-Model Systems Engineering process was not followed
- Trade Study documented the capabilities of the available solutions

Source: City of Columbus
TRADE STUDY

Weighted scoring based on:

- Satisfying essential items
- Desirable items (additional features above and beyond essential)
- Deployment readiness
- Costs
THE OHIO STATE UNIVERSITY
WEXNER MEDICAL CENTER

ENGAGEMENT
WAYFINDING AND TRANSPORTATION APP DEVELOPMENT

A collaboration between the City of Columbus, The Ohio State University and AbleLink Technologies

OLIVIA VEGA
Occupational Therapy Student, Doctorate of Occupational Therapy Program
vega.76@buckeyemail.osu.edu
Better support individuals with cognitive disabilities by:

- Improving community integration via public transportation over private shuttling
- Increasing wayfinding independence and decreasing the need for caregiver support
- Enhancing safety while navigating the community
Several beta tests of individuals with physical and/or cognitive disabilities using available navigation apps

2017: Nisonger Center PIECE internship program
- 4 interns tested 3 different apps
- Reported on user preference, caregiver preference and overall satisfaction

2018: Similar study with focused on AbleLink’s WayFinder app
- Reported on user satisfaction, caregiver satisfaction and observations of barriers while using the app
PIECE STUDY MISSION

Gain a better understanding of:

• Each individual’s abilities
• Previous experiences
• Environmental factors
• App features affect on the success and usability of WayFinder technology

Source: OSU
PIECE STUDY LOGISTICS

- 8 participants
- 3 job coaches assisting
- 8 Android smartphones (each with app)
- 25 routes on Ohio State’s Campus
- 1 route off-campus: Franklin Park Conservatory to Tim Hortons
- Using Ohio State Campus Area Bus Service (CABS) and Central Ohio Transit Authority (COTA) buses
• 2 participants had used a smartphone
• 1 participant had used COTA mainstream
• 2 participants had used COTA fixed routes with a staff member
• Majority of participants used staff, other non-emergency medical transportation, or family
PIECE STUDY LOGISTICS

• First: interns trained on how to use a smartphone
• Next: interns accompanied by job coaches and a staff member from OSU in completing a programmed route
• Participants and job coaches paired, then a satisfaction survey completed
  • Surveyed on app performance and perceived quality on route information
• Job coaches trained on creating a manual route and provided feedback on this experience
What worked:

• The app increased the feeling of access to the community
• The app worked with their personal skill sets
• Increase in confidence with independent travel
• Increase intern skill set regarding technology, mobility, and safety

Source: City of Columbus
FOCUS GROUP SUMMARY

Challenges and opportunities:

• More hands-on training time
• One-on-one training preferred
• More safety features needed within an app
• Participants would rather keep doing what they’re doing over doing something new
• Further research needed on the specific skills to use this type of technology for independent wayfinding
Olivia Vega, S/OT
• Doctorate of Occupational Therapy Student at Ohio State University
• vega.76@osu.edu

Carmen DiGiovine, PhD, ATP/SMS RET
• Occupational Therapy, Assistive Technology Center, Rehabilitation Science and Technology Center
• digiovine.1@osu.edu
• 614.293.7876
WAYFINDER APP

DAN DAVIES
Founder and President, AbleLink Smart Living Technologies, LLC
dan@ablelinktech.com
WayFinder: An accessible Smart Phone program for providing multimedia prompts to individuals with cognitive disabilities for navigating public transit systems.
PERSON-CENTERED CUSTOM ROUTES SUPPORT RIDING THE BUS AND ACCESSING THE COMMUNITY INDEPENDENTLY
ROUTES CAN BE CREATED USING MOBILE APP

Route Builder

ROUTE LIST

Grandma's House

Going to Work

Route Title:

Grandma's House

Button Talk Audio

Record  Play

Route Instruction Audio:

Record  Play

Route Image:

Camera

Library

Default

Add First Location
NOTIFICATIONS AND REAL-TIME LOCATION UPDATES FOR PROVIDING PEACE OF MIND TO FAMILY AND CAREGIVERS
AUTOMATED NOTIFICATIONS DURING ROUTE
WAYFINDER ROUTES CREATED USING GOOGLE MAPS

Bus 25 to Work

Location Title: Get on my Bus
Location Image
Repeat Audio

Location Number: 3
New WayPoint
Delete Waypoint

Route Title: Bus 25 to Work
Route Image
Route Selection Audio
Route Text Audio

Date Created: 2018-03-06 11:01:22
Save Route
Cancel Changes
Find this Location
CLOUD-BASED SMART ROUTE LIBRARIES
COTA PUBLIC LIBRARY & PIECE PROGRAM PRIVATE LIBRARY
CLOUD-BASED SMART ROUTE LIBRARY
DOWNLOAD ROUTES TO WAYFINDER
ADDITIONAL NEW WAYFINDER FUNCTIONALITY

- COTA SMART Route Library
- Web-based ROUTE Builder for COTA
- Real-time location tracking
- Performance data collection & interface to SCOS
  (e.g. route, date, time, on-trip performance, diagnostics)
- Interface to COTA’s GTFS and GTFS (real-time) data to provide information to WayFinder users
Relationship to the Smart Columbus Operating System
TRIP DATA/DATA DICTIONARY

- Starting a particular route
- Completing a route
- Canceling a route before completion
- Pausing a route
- Resuming a route
- Loss of GPS connection
- Reacquisition of GPS connection
- Leaving the travel corridor for the route
- Reentering the travel corridor for the route
- Requests for assistance by the traveler
- Downloading a route with mode of travel used
- Caregiver updates and communications
WHERE WE GO FROM HERE

Participant Recruitment and IRB approval
October 2018 – December 2018

Test Plan
December 2018 – January 2019

Training
March 2019 – April 2019

Go Live
April 2019 – April 2020
PUBLIC COMMENTS NEEDED

Public comment period:
- September 19th to October 3rd

Where to find it:
1. View the Trade Study and Interface Control Document at: https://smart.columbus.gov/projects
2. Click Mobility Assistance
3. Click here for direct link to Trade Study
4. Click here for direct link to Interface Control Document

How to comment:
1. Please email comments to: kldepenhart@columbus.gov
2. Subject line: MAPCD Comments
3. Include your contact information
4. State whether or not you represent a vendor interest
STAY CONNECTED

USDOT SMART CITY CHALLENGE PROGRAM INQUIRIES:
Kate Hartman, Chief - Research, Evaluation and Program Management Intelligent Transportation Systems Joint Program Office
Kate.Hartman@dot.gov

SMART COLUMBUS INQUIRES:
Alyssa Chenault, Communications Project Manager anchenault@columbus.gov

Upcoming Smart Columbus Webinars:
• Essentials of the operating system (SCOS)
• Smart Mobility Hubs
• Prenatal Trip Assistance
• Overview of Emerging Technologies: Connected Electric Autonomous Vehicles and Truck Platooning

Webinar recording and materials will be available at itsa.org and smart.columbus.gov
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Contact:
SmartColumbus@columbus.gov

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Columbus.gov/smartcolumbus
@SmartCbus
QUESTIONS?
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