

# Human-Centered Mobility and the Benefits for Transit

March 28, 2017

# Welcome & Technical Items

- Please mute your phone or computer microphone
- Use the chat box for any technical or accessibility issues
- Email Jordan Snow ([jsnow@easterseals.com](mailto:jsnow@easterseals.com)) if you are having trouble accessing conference audio or chat

# Today's Agenda

- Introduction to NCMM – Jordan Snow, NCMM
- Human-Centered Mobility and Benefits for Transit – Liza Josias, AIR
- Daisy Wall, RouteMatch
- Implications for Mobility Management – Judy Shanley, NCMM
- Question and Answer Session

# National Center for Mobility Management

We Can Help You Make Connections

*The mission of the National Center for Mobility Management (NCMM) is to facilitate communities to adopt transportation strategies and mobility options that empower people to live independently and advance health, economic vitality, self-sufficiency, and community.*

[National Center for Mobility Management](#)



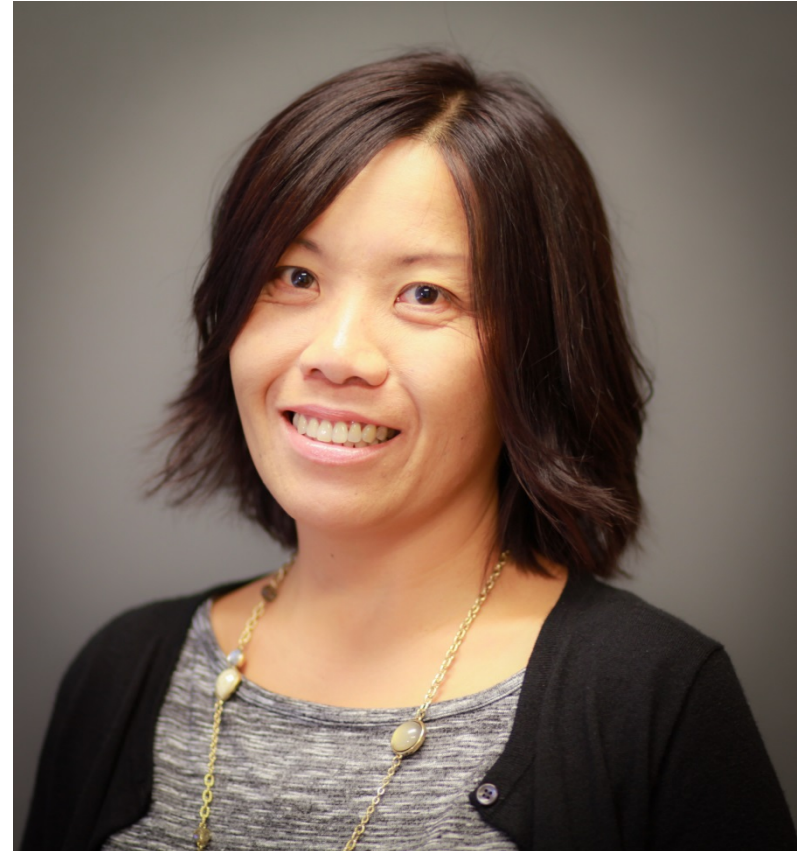
# About the NCMM

- National technical assistance center
- Launched in early 2013
- Jointly operated by three national organizations:
  - Easterseals
  - American Public Transportation Association
  - Community Transportation Association of America
- Cooperative Agreement with the Federal Transit Administration, USDOT

# Introducing...

Liza Josias

Senior Researcher  
American Institutes for  
Research



# Human-Centered Mobility and Benefits for Transit

Liza Josias

American Institutes for Research



March 2017

# Introduction

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- American Institutes for Research (AIR) is a not-for-profit firm that conducts social and behavioral science research.
- AIR has more than 30 years of projects supporting individuals with disabilities.
- Human factors engineers apply knowledge of human behavior to design systems, procedures, and equipment to improve human performance and reduce risks.
- Our clients include the Federal Aviation Administration, the Washington Metropolitan Area Transit Authority, and the Transportation Security Administration.





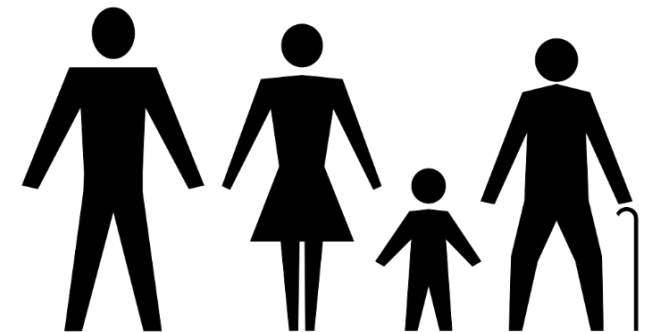
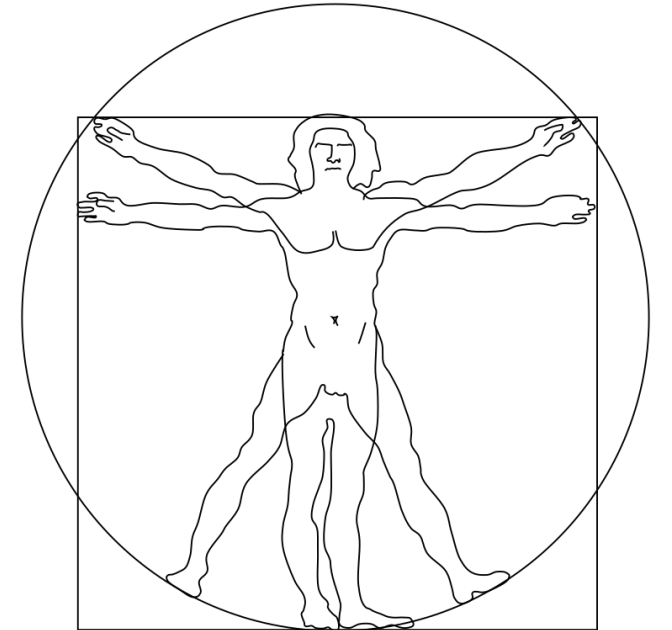
# Overview

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- What Is Human-Centered Design?
- Human-Centered Design in Context
- Framework for Applying Human-Centered Design
- Investigating, Analyzing, and Planning
- Benefits of Using Human-Centered Design
- Return on Investment From Human-Centered Design
- Data to Inform Human-Centered Design in the Mobility Context
- Resources

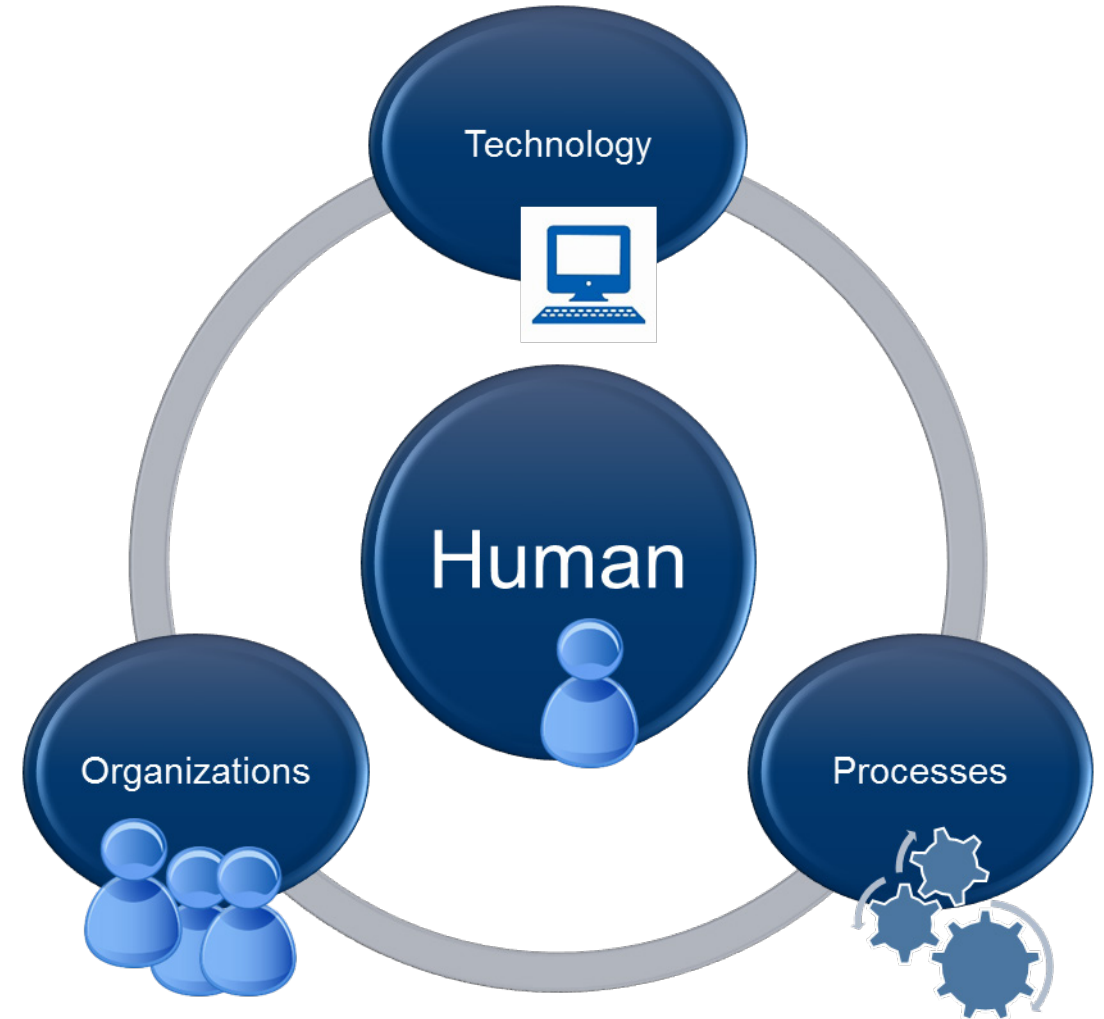
# What Is Human-Centered Design?

- Human-centered design (HCD) is a framework for building changes and systems around people's **capabilities, limitations, and needs**.
- Systems designed around people support how people think, move, and behave.
- Users—riders, employees—will have a more positive experience when systems are designed around them.



# Human-Centered Design in Context

- Design systems so that:
  - People are the **center** of design decisions.
  - Technology, processes, and organizations (including jobs, tasks, training) **support** how people perform activities.
- Design systems that support people's **limitations** and **capabilities**:
  - Limitations, such as memory, speed, accuracy, fatigue, and patience
  - Capabilities, such as the ability to adapt to different situations and the capacity to transfer knowledge and skills from one task to another



# Framework for Applying Human-Centered Design



## Key Principles for Applying Human-Centered Design

- Gather information about perspectives, capabilities, needs, and expectations of *different* users.
- Apply an *iterative* process.
- Involve *multidisciplinary* and *diverse* design teams.

# Investigating, Analyzing, and Planning

- Investigate:
  - Define users' needs in a human-centered—not solution-centered—way
  - Gather information about users and their needs. Human Factors Pie helps categorize different aspects of human interactions that need to be considered.
- Analyze:
  - Analyze people's activities in context.
  - Identify barriers to using the system.
  - Identify what works (the things that users like and use).
- Plan:
  - Apply knowledge of people's cognitive and physical abilities when developing design requirements.
  - Build systems where all the components work together.



Source: EUROCONTROL (2007)

# Benefits of Using Human-Centered Design

## Organization

- Reduce risk of errors
- Improve system safety
- Increase efficiency
- Improve Return on investment
- Enhance workforce productivity and satisfaction
- Reduce training costs
- Improve customer loyalty

## System Developers

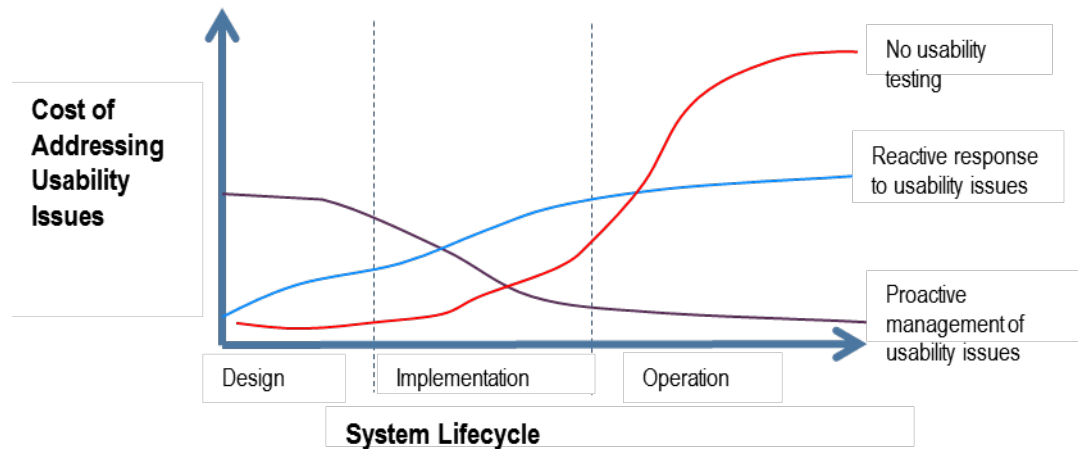
- Identify and address usability issues through redesign
- Reduce risk of late and costly fixes
- Improve user acceptance
- Reduce costs and time for fixing issues after implementation

## Customers

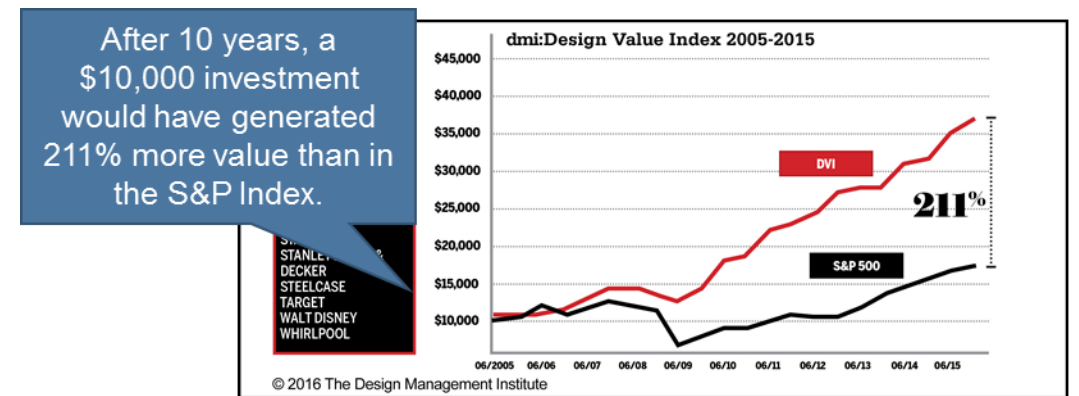
- Experience greater customer satisfaction
- Complete activities more efficiently
- Perform activities more safely
- Spend less time and effort learning to use the system
- Experience less frustration
- Be more loyal

# Return on Investment From Human-Centered Design

- During Design and Implementation:
  - Reduce the risk of time and cost overruns.
  - Reduce the cost of addressing late fixes.
  - Improve user acceptance rates.
- After Implementation:
  - Increase the revenue generated by the improved system.
  - Reduce costs by improving efficiencies.
  - Increase the volume of repeat customers.



Source: EUROCONTROL (1999)



Source: Design Management Institute (2015)

# Data to Inform Transit Organizations Applying HCD

People	Technology	Processes	Organization
<ul style="list-style-type: none"><li>• Satisfaction surveys</li><li>• Interviews</li><li>• Focus groups</li><li>• Observations</li><li>• Ridership data</li></ul>	<ul style="list-style-type: none"><li>• Data analytics</li><li>• Human factors evaluations</li><li>• Usability studies</li></ul>	<ul style="list-style-type: none"><li>• Safety data</li><li>• Customer service data</li><li>• Workflow processing time</li></ul>	<ul style="list-style-type: none"><li>• Staffing patterns</li><li>• Training costs</li><li>• Implementation costs</li></ul>

- **Caution!** Data analytics will only tell you what users DID do. It won't tell you what they **wanted** to do or **expected** to do.
- Different types of data should be used to develop insight and build a story.



# Resources

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AMERICAN INSTITUTES FOR RESEARCH®

# Introducing...

Daisy Wall

VP, Community  
Engagement

RouteMatch





**Routematch**  
MOBILITY WITHOUT LIMITS

# **Voices of Transit**

A Webinar Series Fostering Insightful  
Dialogue From Around The Industry

**“Human Centered Mobility and Benefits for Transit”**

Presenter: Daisy Wall, Routematch

# Introduction



- ▶ Routematch's mission is to **transform rider experiences** and **engage communities**.
- ▶ Provide **passenger transportation** technologies to more than **600** transit agencies.
- ▶ Team of 170 **passionate** individuals.
- ▶ FTA Sandbox, VTCLI & MSAA **grant recipients**.



**A BRIDGE**  
connecting individuals  
with opportunities



**A CHOICE**  
towards social &  
environmental  
responsibility



**A COMMITMENT**  
to inclusivity & providing  
access for all



**A CHANCE**  
to create new,  
meaningful connections  
& interactions

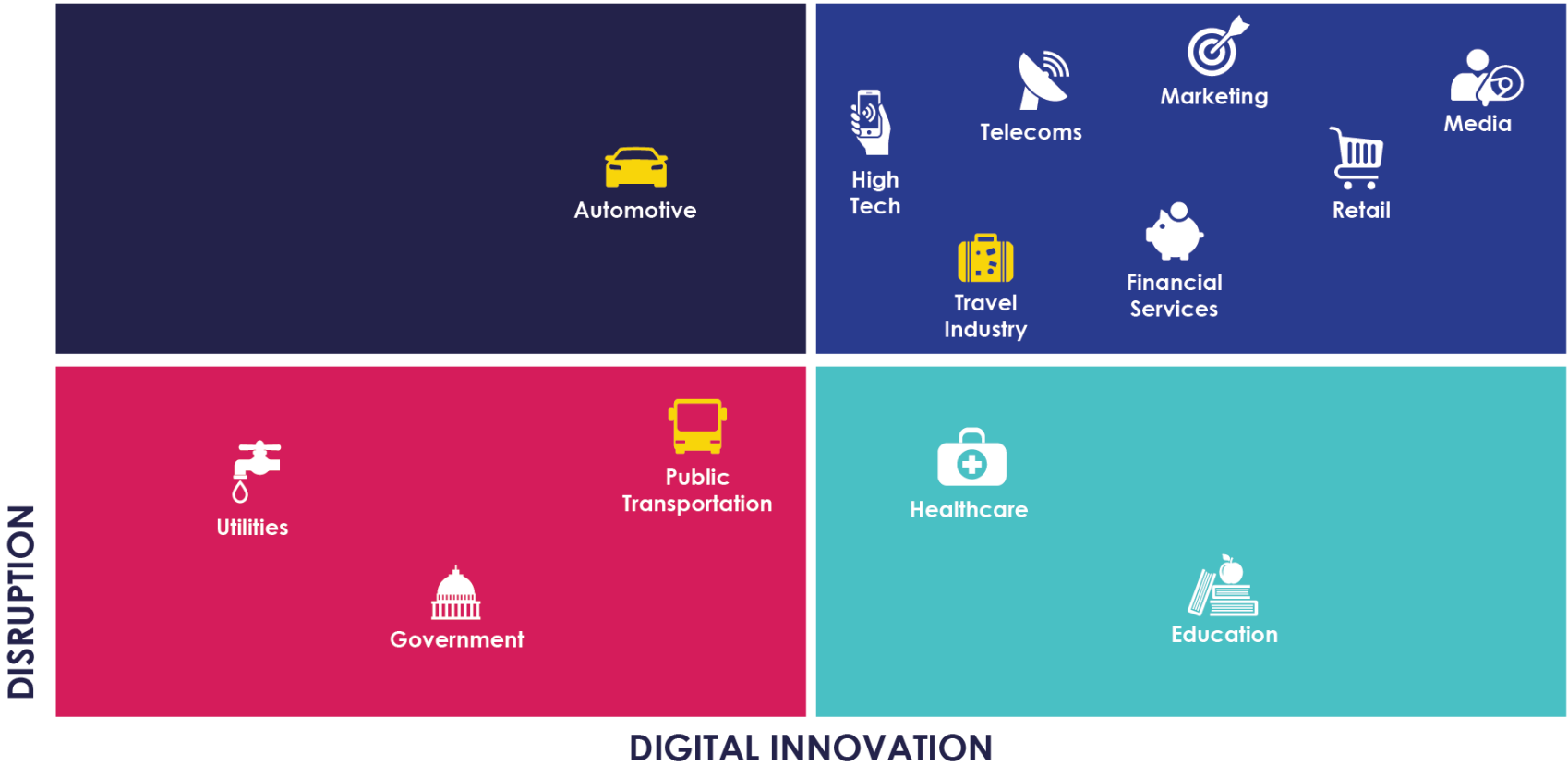
# Overview



- ▶ Why is a **human** factors approach relevant to **transit** now?
- ▶ Common challenges for both **disabled** and **choice** riders
- ▶ **First mile last mile** case example & how a human factors approach fits in
- ▶ **Student riders** case example & how a **human factors** approach fits in
- ▶ Elevating the **rider experience**
- ▶ A few more **thoughts** from the **field**

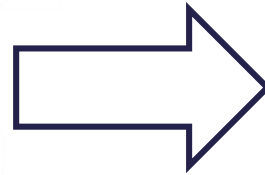


# Customer Expectation = Personalization



Source: Deloitte, "Disruptive Trends for Smart Mobility" - March 2015

# Mobility = More Choices





# Common Challenges for Disabled Riders.



- ▶ Lift operation and safety while vehicle is boarding, departing and en route
- ▶ Crime
- ▶ Insensitive drivers
- ▶ Difficult to use
- ▶ Need help getting on transportation/"Having no one whom to depend on"
- ▶ Trip planning
- ▶ Equipment does not fit transportation
- ▶ No service



Source: "Transportation Patterns and Problems of People with Disabilities." The Future of Disability in America. Institute of Medicine (US) Committee on Disability in America; Field MJ, Jette AM, editors. Washington (DC): [National Academies Press \(US\)](https://www.nationalacademies.org); 2007.

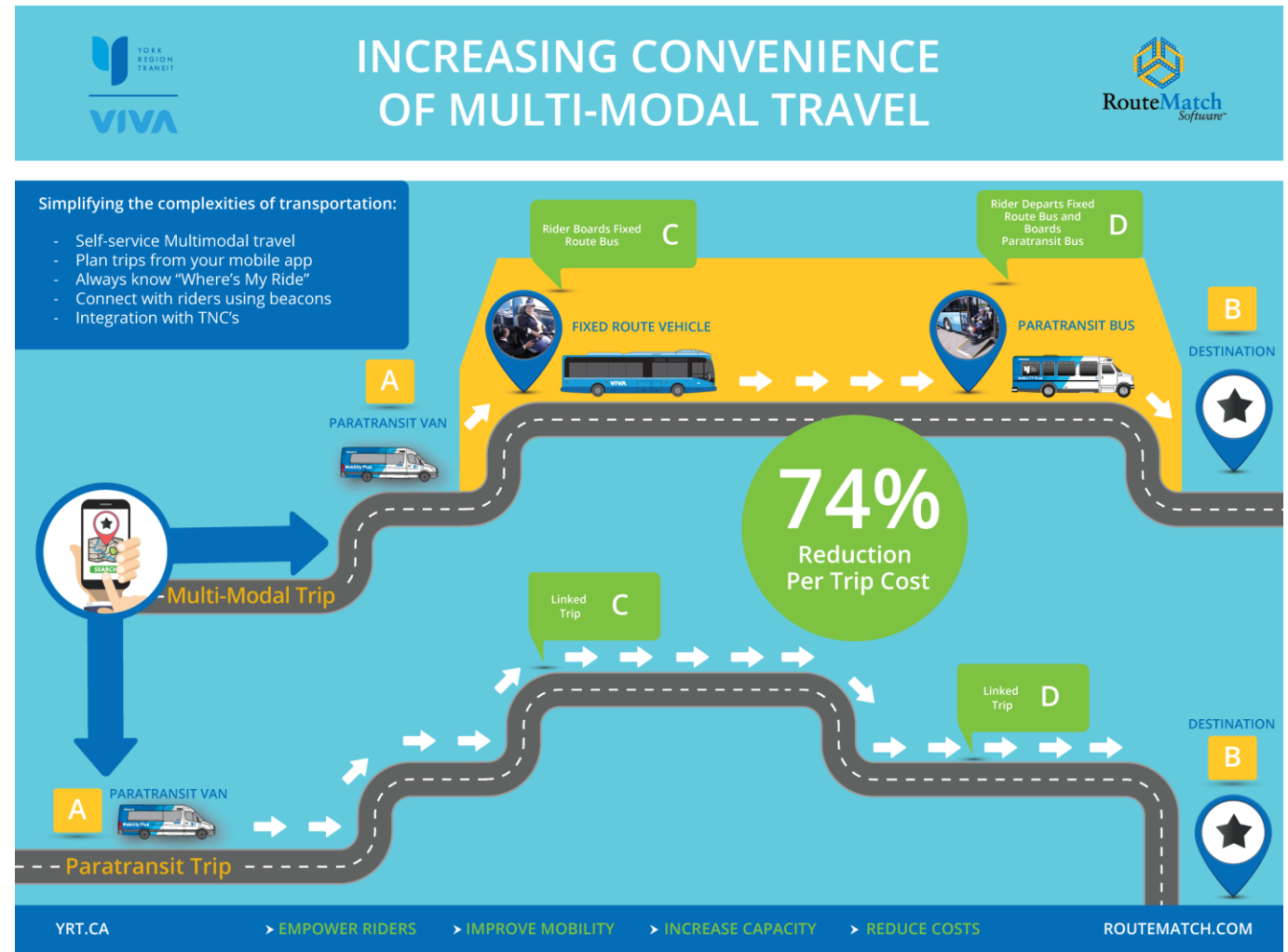
<https://www.ncbi.nlm.nih.gov/books/NBK11420/>

# First Mile, Last Mile Case Example



## York Region Transit

- ▶ Each customer has his own distinct profile”.  
All passengers have needs.
- ▶ Planning is key.
- ▶ Use your existing resources.
- ▶ Human-factors approach + operational efficiency
- ▶ Technology can help.



# Common Challenges for Choice Riders.



- ▶ Unreliability, especially when stuck in vehicle or during connections/transfer points.
- ▶ Getting picked up in 10 minutes or less./Long wait at transfer stop.
- ▶ Delays at point of origin.
- ▶ Missed departure due to wrong real time traveler info.
- ▶ Unable to board due to overcrowding.

Source: <http://www.governing.com/blogs/view/gov-reasons-riders-abandon-public-transit.html>

*"Passengers' Perception of and Behavioral Adaptations to Unreliability in Public Transportation"* in November 2016, Transportation Research Board annual meeting.- Berkeley's Department of Civil and Environmental Engineering



# Student Riders Case Example



## West Virginia's Tri State Transit Authority and "The Green Machine"

- ▶ Go where customers are, not where we think they are.
- ▶ Get creative.
- ▶ Follow their lead.
- ▶ Be willing to make adjustments to serve the need.



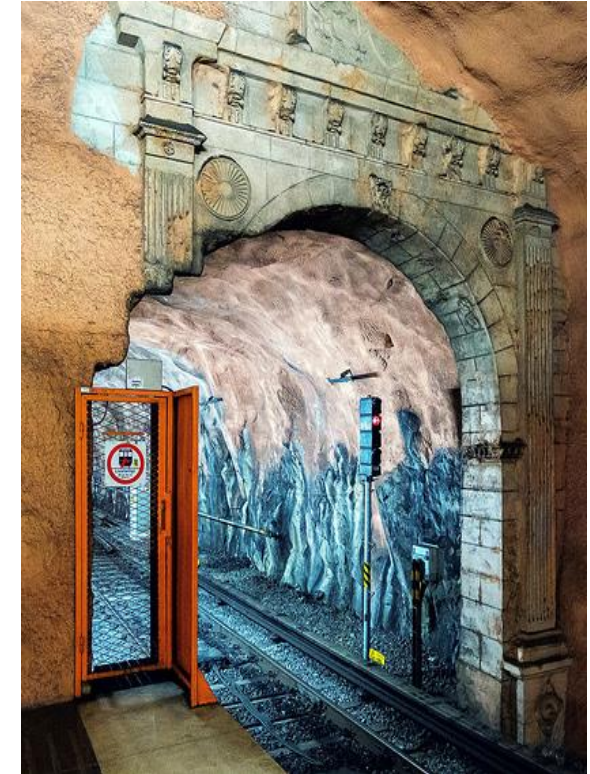
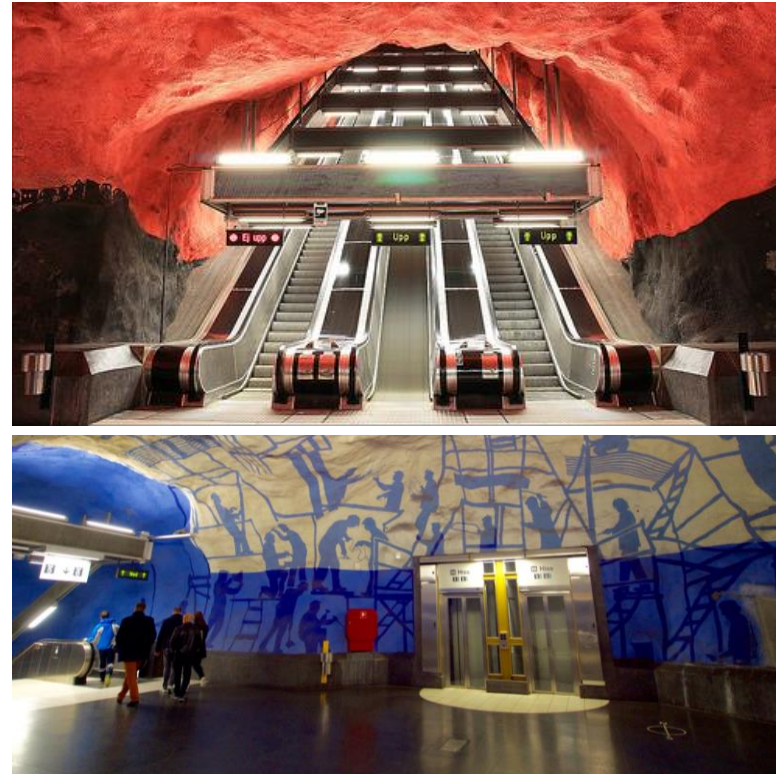
# Elevating the rider experience.



Chicago & Northwestern Train  
Parlor- 1940's

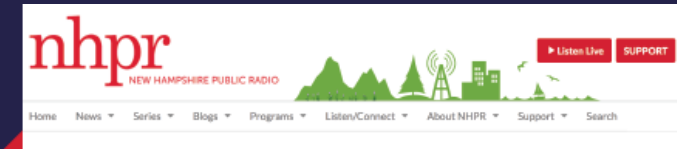


Stockholm Public Transport- Today



# A few more thoughts.....

- ▶ Bring staff into the fold.
- ▶ What's a rider's plan B?
- ▶ Leverage ideas and technologies from other industries and daily life.



## Nashua Buses Find New Way to Avoid Getting Lost -- in Translation

By TED SIEFER • JUL 4, 2016

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For the growing immigrant communities in southern New Hampshire, the language barrier poses many challenges, from schools to public transit. The city of Nashua has come up with a novel way to help city bus drivers communicate with passengers with limited English abilities.

That's how, on a recent weekday, bus driver Kevin Boyle managed to talk with a Spanish-speaking passenger who only knows a few words of English.

Boyle asks the woman where she's headed. A second or two later, a tablet computer, perched next to the fare box and equipped with the Google Translate app, pipes up.

The app also displays the Spanish text, and the woman, standing with her little boy, reads the screen.

There's been lots of talk lately about how smartphone apps like Uber are "disrupting" traditional modes of transportation. Nashua offers the case of an old-line transit agency embracing an app for its own purposes. It allows drivers and non-English speaking passengers talk to each other, in a way, through the app's almost real-time translations.

And it's not just a matter of convenience. Nearly all public transit agencies receive federal funding and are therefore required to comply with federal laws prohibiting "discrimination based on race, color, and national origin."

Kristi Gillette, Nashua's transit

operations supervisor, says Federal Transit Administration rules require agencies to provide translation services.

"We have to do our best to make sure when they get on the bus, we have an option for them, we can meet their needs," Gillette says. "Before we had Google translate, the city had a translator; we had one available as a dispatcher and we had the translation services available to us, but there's a time delay with that."

Gillette was joined on a recent ride-along by Raymond Blethen, the general manager for First Transit, the contractor that runs the system.

The idea of using Google Translate came from Blethen, who had used the app in his own travels. Tablet computers are already installed on all Nashua city buses — so it was just a matter of downloading the app.

"It doesn't fix everything," Blethen says. "You still need to have those other resources, translators. But it's another source to help you do the translation and communicate with people you may not be able to normally."

There have been reports of Google Translate being used in all kinds of settings, from business meetings to emergency rooms. But its official

use by a transit agency appears to be a new one. Nashua doesn't have any kind of formal relationship with Google. The tech giant did not respond to an interview request.

Of course, the app isn't perfect. But Kevin Boyle, the bus driver, says it generally gets the job done.

"It's amazing, when it translates from the Spanish to the English," Boyle says, "it picks it up perfectly. But English to Spanish, with the slang, they way we talk with our English, some us from are from Boston or New York or wherever we're from, we tend to have to slow down a little so it understands what we're saying."

Blethen says he thinks the translation app — or another like it — could become fixtures on buses. He recently spoke about Nashua's use of the app at a meeting of the New Hampshire Transit Association.

"I was talking about it with some of my colleagues there," he says. "And I think some those transit systems, they thought it was a very good idea. They were kind of shocked they didn't think of it themselves. I think they'll all be adding it in the next couple months, all the ones that have tablets on the buses."

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**Thank you!**

Webinar

# Introducing...

Judy Shanley, PhD

Co-Director, NCMIM

AVP, Education and Youth  
Transition

Easterseals, Inc.





# Implications for Mobility Management

- Mobility management is an approach to **designing and delivering** transportation service
- Starts and ends with the **customer**
- Establishes a community vision in which the **entire transportation network works together**
- Delivers the transportation options the **best meet the community's needs**

*Why is human factors information important to mobility management?*

# Who is a mobility manager?

- A problem solver
- An advocate for those who need transportation
- A facilitator of groups
- A teacher, communicator and cheerleader



# What does a mobility manager do?

- Understands the population they're advocating for
  - Environmental scan, inclusive planning, and solicitation of feedback
- Builds networks
  - Transportation providers and planners
  - Workforce development and educational agencies
  - Healthcare agencies
  - Elected officials



# Customer/Rider Implications for Human Factors Data

- Enhance engagement of customers
- Improve rider satisfaction
- Increase ridership and the use of mobility options



# System/Service Implications for Human Factors Data

- Improve alignment between mobility services and rider conditions
  - Reduce inefficiencies in services that are incompatible
  - Better use of scarce resources
  - Improved perception by public because of improved efficiencies of service delivery
- Enhance rationale for creating a network with increased service options to fill gaps
- Diverse mobility service providers may join networks

# Tap into Resources



[National Center for Mobility Management](#)



[National Aging and Disability Transportation Center](#)



[National Rural Transit Assistance Program](#)



[ACL Transit Planning 4 All](#)



# Take Advantage of Our Resources

- Webinars, Newsletters, Products
- Mobility Management & Information Practices Database (MMIP)
- Technical Assistance – ask your liaison
  - [Link to Liaisons](#)

# Thoughts, Ideas, Questions?

- Please use the Q&A module to submit questions
- Conversation starters
  - Do you have an example of how you've used human factors information in your own practice or community?
  - What are your perceived barriers to accessing and using this type of data?
    - Financial?
    - Procedural?
- Ask away!



# Thank you!

When the meeting ends you will be taken to [our evaluation](#).

We appreciate your feedback!



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