



In Progress Study: The Effects of Automation on the Public Transportation Workforce

Florida Automated Vehicle Summit
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TCRP Project J-11 / Task 34



Introduction

Agenda

- Research need
- Methodology and products
- Initial feedback from the transit industry
- Next steps

Michael J. Walk

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- Manager of TTI's Transit Mobility research program
- Expertise and Interests
 - Transit Performance and Financial Management
 - Process Management and Improvement
 - Bus Planning, Scheduling, Operations, and Maintenance
 - Applying Innovation and Technology to Address Transit Challenges and Improve Customer Service
- Father of 6



Aggie Spirit

Research Need

Why The Study?



- It's coming...
- Be prepared
- Transit workforce impacts not well-documented or understood
 - Type
 - Magnitude

Societal and Community Impacts and Benefits(?) – Transit Automation

- Increased safety
- Decreased operating costs
- Improved customer service
- Attract ridership
- Improve sustainability





Automation's Workforce Impacts Will Vary

- Transit agency type and size
- Public employees vs. private employees
- Positions / jobs

Potential Negative Impacts

- Needing additional training to succeed
- Job loss
- Undesired change in job responsibilities / duties
- Reduction in pay (guarantee or premium [e.g., overtime])
- Loss of desirable working assignments

Disparate Impacts Research on Drivers

- Blacks 3x more likely to be security guards, bus drivers, and taxi drivers than Whites
- 28% of bus drivers are Black (12% of U.S. population is Black)
- Lower educational attainment (93% have less than Bachelor's)
- More difficult to adjust / bounce back for
 - Lower income
 - Lower education
 - Minority

Potential Workforce Benefits

- Chance to learn new skills
- Reduced job stress
- Reduced job physical demands
- Increases in pay
- Improvements in working conditions
- More desirable working assignments



Research Method

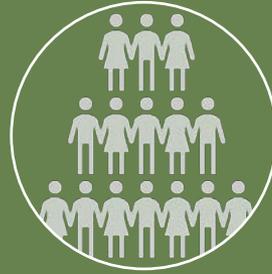
Research Approach



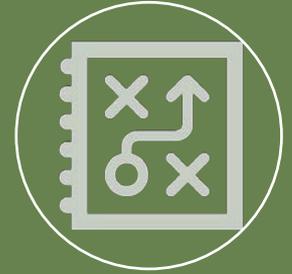
Use Cases



Planning and
Policy
Decisions



Job Impacts



Preparation
Strategies



Examples of Past Automation



Dockworkers



Warehousing



Manufacturing



Banking



Agriculture



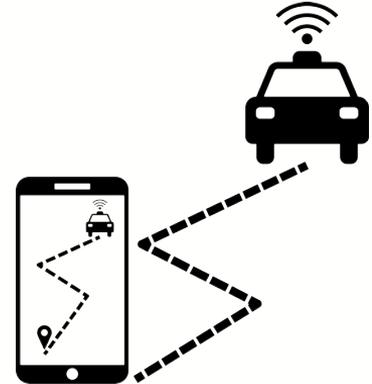
Retail



Aviation

Transit Vehicle Automation Use Cases

5 Transit Vehicle Automation Use Cases

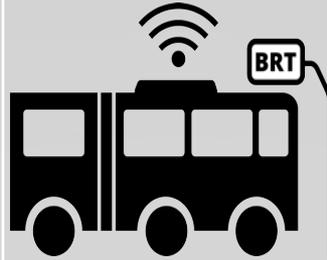




Bus automation for maintenance and yard operations



Low-speed automated shuttles



Automated bus rapid transit



Automated mobility on demand

- Operated by a private firm (e.g., Waymo)
- Operated by a transit agency



Automated local bus service

Key Study Assumptions

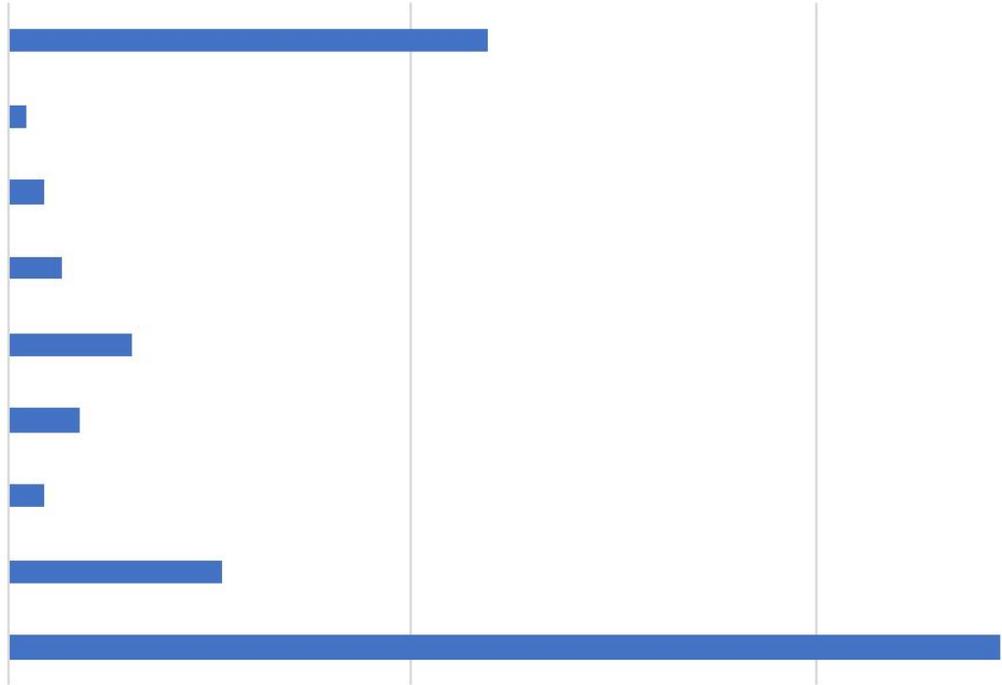
- Modeling potential impact
 - Assume jobs are not protected
 - Look for job increases, losses, and duty changes
- Automation ≠ Electrification



Industry Engagement Results

Front-Line Employee Survey

- Targets front-line and other directly-impacted jobs
- Perceived *benefits* and *concerns* for each use case
- ~115 responses (so far)



Benefits Anecdotes

- May reduce the stress of having drive in local traffic. Allow the Operator to spend more time with passengers.
- It would allow the development of a new position making the Operator of the vehicle more customer service than just being a driver.
- Reduce stress from confrontational passengers about service levels and timeliness.
- None. Its like asking a work horse what benefits it could see if the farmer is thinking of buying a tractor.

Concerns Anecdotes

- This would be the beginning to an ending. Kill the human race as we know it.
- Job loss.
- Reduction in system familiarization and customer contact, resulting in inadequate customer care/assistance elsewhere.
- Overall sense of foreboding that our jobs are being outsourced to computers and that we are not recognized or appreciated for the wealth of skills and customer care we bring to the occupation.

Concerns Anecdotes

Bus Operators do so much more than just navigate traffic, we **monitor the streets for potential hazards, identify potential passengers**, discern the difference between those hanging around a bus stop and those actually waiting for the bus, **accommodate those with special needs, make 'courtesy stops'** for elderly or those with children or other special situations, **make split-second decisions** in the interest of passengers and system integrity such as opening the bus doors even if not fully in designated stop zone yet, **negotiate snow banks and other weather-related issues** at each and every bus stop in the winter to ensure safety and efficiency, **help facilitate connections** to other routes by honking or flagging down another bus.... This is in addition to the **customer service/interaction**.

Industry Workshop Themes

- Agreement on need for increased technical skills for mechanics and technicians
- Uncertainty regarding operator role
 - Many felt keeping a full-time “behind the wheel” person was necessary (safety driver)
 - At least have full-time customer ambassador (capable of driving)
- Tendency to use automation for *new* services or routes
- Tendency to re-invest possible cost savings into *more service*

Next Steps and Staying Involved

- Front-line employee survey
tinyurl.com/TransitAutomation
by December 13, 2019
- Webinars (TBD—Feb. 2020)

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Questions



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