



Navigating the Future

**Empowering Transit Workers in the
Age of AI and Automation**

Speakers



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The Impacts of Vehicle Automation on the Public Transportation Workforce

Making Connections 2024
National Transit Workforce Conference

November 12, 2024
TCRP Report 232

Research Approach



Use Cases



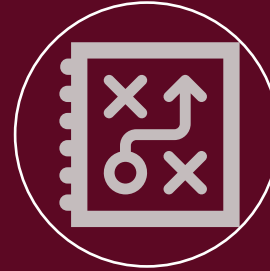
Front-Line
Employee
Survey



Planning
and Policy
Decisions



Job Impacts



Preparation
Strategies



Final Report



Use Case List



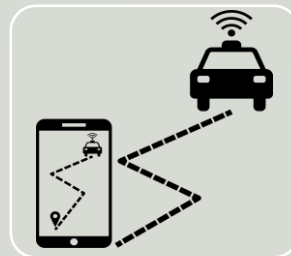
Use Case #1
Bus
Automation
for
Maintenance
and Yard
Operations



Use Case #2
Low-Speed
Automated
Shuttles
*For fixed-route
circulator or
feeder service*



Use Case #3
Automated
Bus Rapid
Transit



Use Case #4
Automated
Mobility on
Demand
(MOD)*
*For non-ADA
demand
response*



Use Case #5
Automated
Local Bus
Transit

* MOD: demand-responsive approach to mobility

Affected Bus Transit Jobs

Directly Affected Operations Jobs

- Bus operators
- Bus mechanics / maintenance technicians
- Bus service persons / fuelers / cleaners
- Dispatchers / controllers
- Road or street supervisors / traffic controllers

Automation impact
was **quantified**

Indirectly Affected Key Jobs

- Bus garage superintendent
- Bus operations trainer
- Maintenance trainer
- Parts clerk
- Operations and maintenance facilities maintainer
- Short-range transit planner / schedule maker
- Transit police officer

Automation impact
was **discussed**

Key Survey Take-Aways

Front-line transit employees have significant concerns

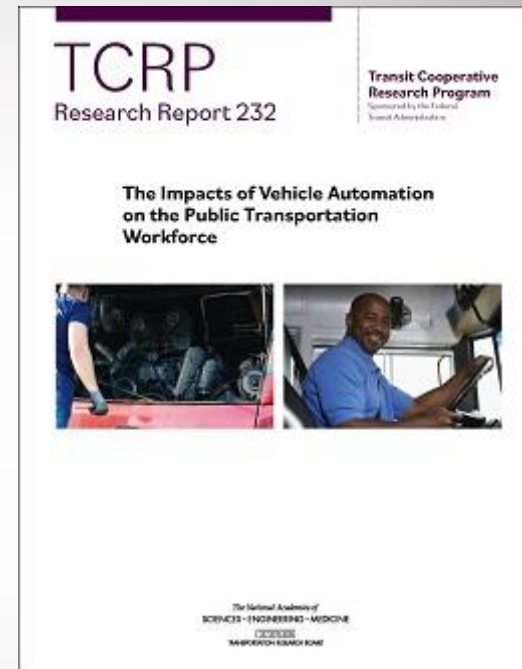
Concerns are perceived as much more likely to occur than potential benefits

Biggest concern is potential job loss

Most are skeptical that benefits would actually materialize

Full Detail Available In Report

- Outputs
 - Number of affected employees
 - Job gain (loss)
 - Number of remaining unaffected employees
- Grouping Levels
 - By use case
 - By agency type
 - By directly affected job
 - By adoption scenario
 - By operational model



Full Report and Attachments available at:
<https://www.trb.org/Main/Blurbs/182705.aspx>

Proposed Guiding Principles for Preparation and Mitigation

Take an employee-centric approach

- Involve current employees from the start
- Retain as many *current* employees as long as feasible (current working conditions, pay, benefits)

Prepare employees for success and advancement in automation

- Identify knowledge, skills, and abilities needed for transit automation jobs
- Provide assessments and training for employees to qualify for jobs

Create meaningful and similar alternative job opportunities (for employees who are displaced)

- Formalize procedures for displaced employees to qualify for alternative jobs

When necessary, provide off ramps

- Early retirement buyout programs(?)
- Support (training, financial, job search, etc.) for terminated employees

Summary

- **Directly affected operations workforce** effects vary widely based on the use case, adoption rate, operational model, and position
- Much more needs done to fully understand potential impacts and to prepare

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Technology and the Workforce

Kim Cosby
Strategic Policy Advisor

AFL-CIO Tech Institute

- **Worker voice in technology research and development**
 - Facilitating partnerships with universities (CMU Sector & Union Partnerships)
 - Partnership with NSF
- **Policy analysis & advocacy**
 - Federal investments
 - AI & algorithmic management
 - Workforce development
 - Lift up worker stories and impacts

Federal investments and workers

- CHIPS & Science Act
- Two priorities:
 - Workforce Development
 - Research & Development
- Investments in Apprenticeship and Pre-Apprenticeship Programs
- Working for America Institute (WAI) and DOL
 - Sector Table
 - Universal Workforce Readiness Curriculum

How does this inform our work

- Advocate for worker-centered language in proposed legislation
- Push for more oversight and guardrails in AI legislation
- Push for collective bargaining around technology
- Partnerships to expand the reach of workers

Corporate, Academic and R&D PARTNERSHIPS

- Framework neutrality agreement
- Co-creation: Worker input in development of AI
- Disrupt corporate-dominated research enterprise



Upcoming projects

- Labor Innovation & Technology Summit
January 7-8
Las Vegas
- Train the Trainer
- AI Speaker Series
- Pilot of the universal curriculum
- Tech Hubs implementation



MAKING CONNECTIONS 2024 BALTIMORE, MD | NOVEMBER
12

EMPOWERING TRANSIT WORKERS IN THE AGE OF AI AND AUTOMATION

JOHN LYONS- ATU
ARJAN VAN ANDEL-
GIRO

3 OF THE TOP 4 FACTORS DISCOURAGING TO APPLY IN TRANSIT RELATE TO WORK SCHEDULES



Factors	Percent of valid responses	How can scheduling practices contribute?
Poor pay and benefits	46%	Better pay for work performed
Inflexibility of schedules	29%	Create better work schedules Provide more flexible work hours Allow better vacation planning
Physical and verbal abuse from passengers	19%	
Long shifts; Feeling overworked	18%	Provide more choice on what service to operate
Safety and security issues	13%	
Hiring and training challenges	8%	
Lack of support and respect from management	5%	
Poor communication and transparency from management	1%	

Source: [APTA-Workforce-Shortage-Synthesis-Report-03.2023.pdf](#)

WHAT IS NEEDED TO PROVIDE MORE ATTRACTIVE WORK SCHEDULES



UNDERSTAND THE MOST STRESSFUL FACTORS FOR DRIVERS

What schedule parameters cause most stress? Breaks, layovers, runtimes, reliefs, etc.?

ANALYSE EXISTING DATA TO ADJUST WORK SCHEDULES

Use AVL data, Passenger counts, Fare collection data

Understand parameter change per time of day and per day!

CONTINUE TO IMPROVE

Make changes and analyze again

Continue to work with partners and academia

HOW TO MAKE WORK-LIFE BETTER FOR OPERATORS IN PUBLIC TRANSIT?



+ IMPROVE EMPLOYEE EXPERIENCE

Create friendlier schedules for operators, with realistic layover, feasible runtimes, and real time for meal breaks

+ OFFER FLEXIBLE SHIFTS

Balance work and personal commitments with flexible work schedules. Requires « *Outside The Box* » thinking.

+ PERSONALIZE WORK SCHEDULES

Create the best match for each individual request –time off, etc.), through personalized work rostering

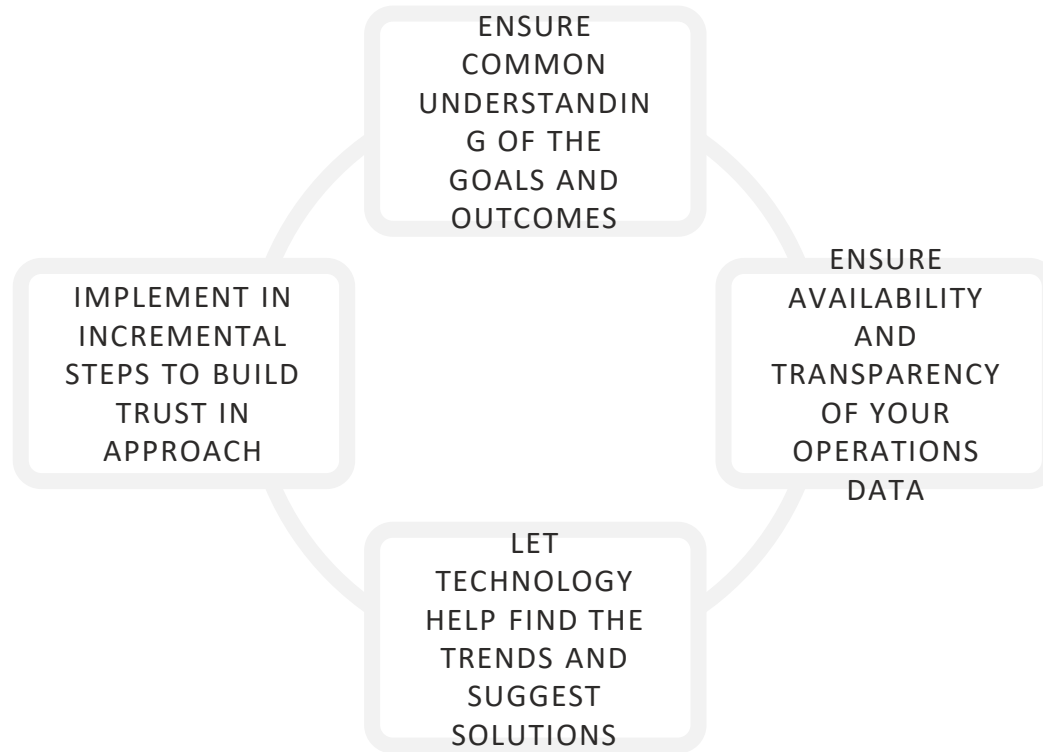
+ EMPOWER YOUR DRIVERS

Enable operators with bidding, vacation planning and work exchanges anywhere and anytime

A person wearing a white glove is interacting with a futuristic control panel. The panel features a screen, a keyboard, and various buttons. The background is a blurred industrial or laboratory setting. The text is overlaid on a dark teal background.

IMPROVING THE WORK
EXPERIENCE THROUGH
TECHNOLOGY AND CHANGE
MANAGEMENT

TECHNOLOGY IS A TOOL...YOU STILL DECIDE WHAT THE OUTCOMES SHOULD BE



INDYGO'S EXAMPLE: BETTER OPERATOR Q OF LIFE THROUGH 4-10'S WEB BIDDING, ROSTERING



AN INCREMENTAL COOPERATIVE PROCESS

PRE-2020

5/8TH'S, CAFETERIA
3 BIDS PER YEAR IN
PERSON
PAPER

Aging workforce

Training classes paused

Service reductions

Competition for drivers

2020-2023

INCREMENTAL IMPLEMENTATION
OF 4/10'S
ROSTERING
WEB BIDDING

Close cooperation Union and Management

Established a working group of operators

Collaboration for enhancements and issue resolution

POST-2023

100% ROSTER
100% WEB
14 ANNUAL BIDS
REGULAR VACATION
HOLIDAYS
VACATION EXB

Awards are immediately visible to operators after distribution of runs

Reduces stress by only seeing what's available

Operators can view Bid anywhere/not tied to location

Transparency and decline in schedule complaints

Saves time and eliminates human error

Reduces labor resources

WHAT'S NEXT?



PREFERENTIAL BIDDING, AI SUPPORT TO DESIGN FRIENDLIER SCHEDULES, YOUR COOPERATION



De Lijn (Belgium, 2'250 buses, 400 Light rail vehicles, 8'000 employees)

Why not work for De Lijn?



- A gross hourly wage of 18.7764 euros
- Meal vouchers worth 8 euros per day worked

As a driver, you can manage your own planning via Personal Work Schedule (PWR). This allows you to tailor the work schedule to your private life. You can choose which days and weekends you want to work the following month. You can also specify your preferences for the type of service and the depot you want to work in. It is also possible to swap services with a colleague.

- 20 statutory vacation days + additional days off
- Extra-legal benefits such as double holiday pay, end-of-year bonus, group insurance and hospitalization insurance
- Possibility of bicycle leasing
- Free Mobib card for you and your family for the entire Belgian bus, tram and metro network
- All kinds of benefits from external cultural and commercial partners
- Numerous opportunities for growth



A Bold Proposal for Block Runs: A Proof of Concept with the Chicago Transit Authority

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JOIN US TO MAKE IT HAPPEN



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