TARTA Mobility meets Bus Rapid Transit (BRT) Innovation:

Observations on modern community building

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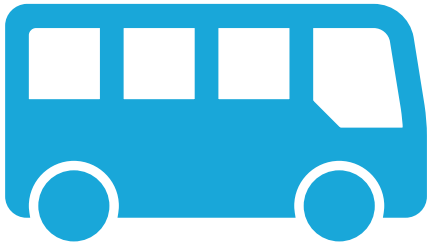
Agenda

- **Introduction**
  - Inspiration
  - What is BRT?
  - Does it fit in Toledo?
  - Why innovation matters in BRT
- **Innovations**
  - Intelligent Infrastructure
  - Modular design
  - Vehicle design
  - Automation
- **Implications**
  - Now vs. future
  - Low-hanging innovation
  - Community engagement around tech

Inspiration



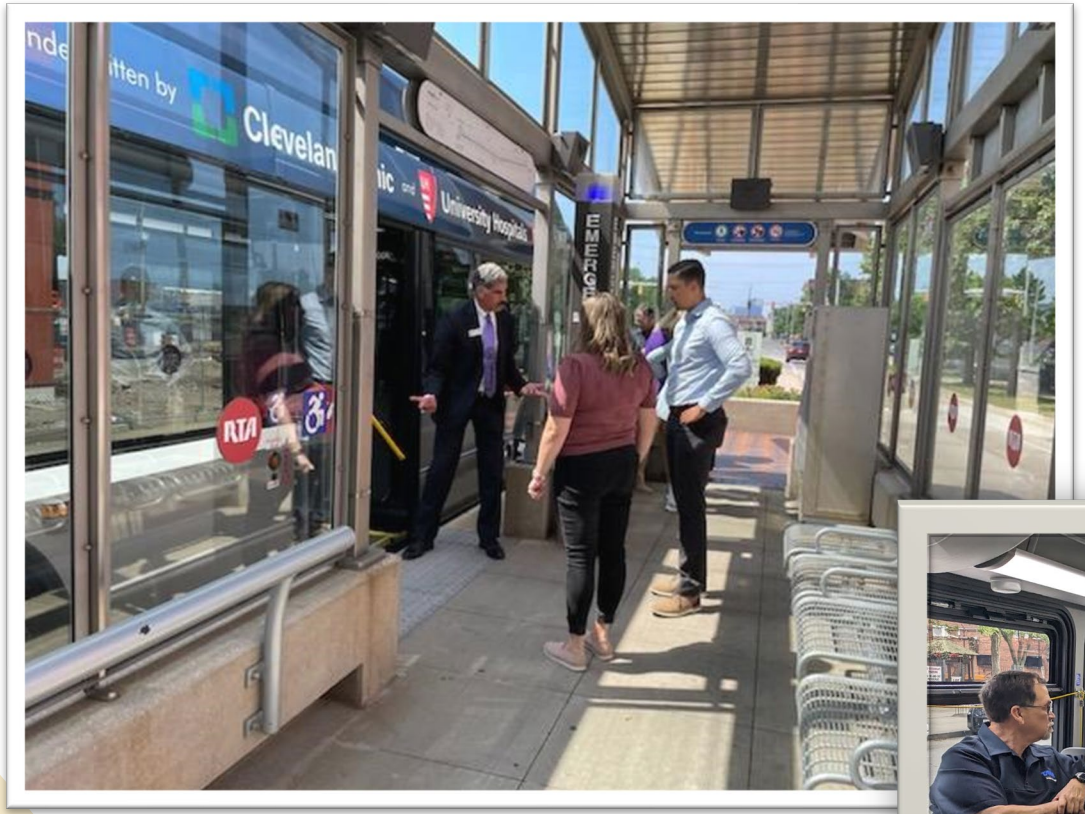
Jarrett Walker discusses updates to his seminal 2011 work “Human Transit:…” in a July 17, 2024 podcast on NextCity

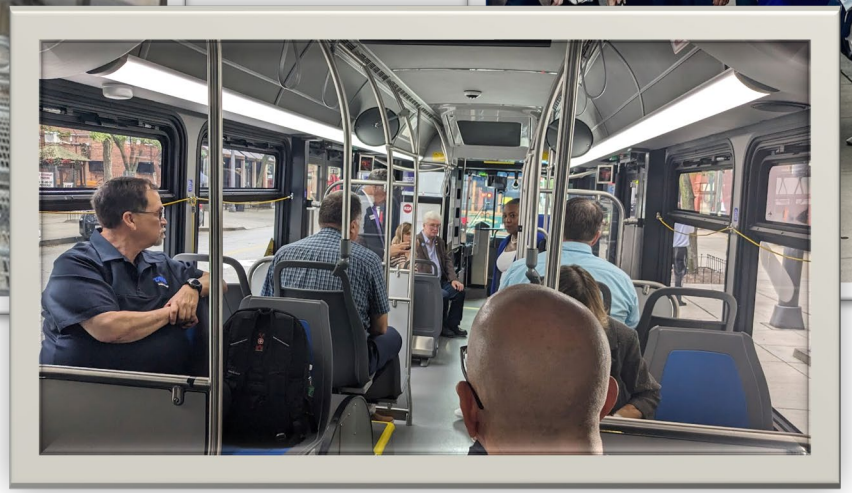
- Freedom (a concept that appeals to whole political spectrum)
- Freedom = Presence of choices (# of useful destinations)
- “The wall around your life” (what can you get to in 45 minutes?)
- Expand your freedom by putting more useful stuff in the space you are in (Land Use Planning!)
- In the most effective public transit, different people with different purposes and destinations find the same vehicle useful at the same time.
- **What is at stake when people are trapped by transport?**
- **What is the value of a highly reliable system?**

https://nextcity.org/podcast/the-future-of-human-transit (2024, July 17)

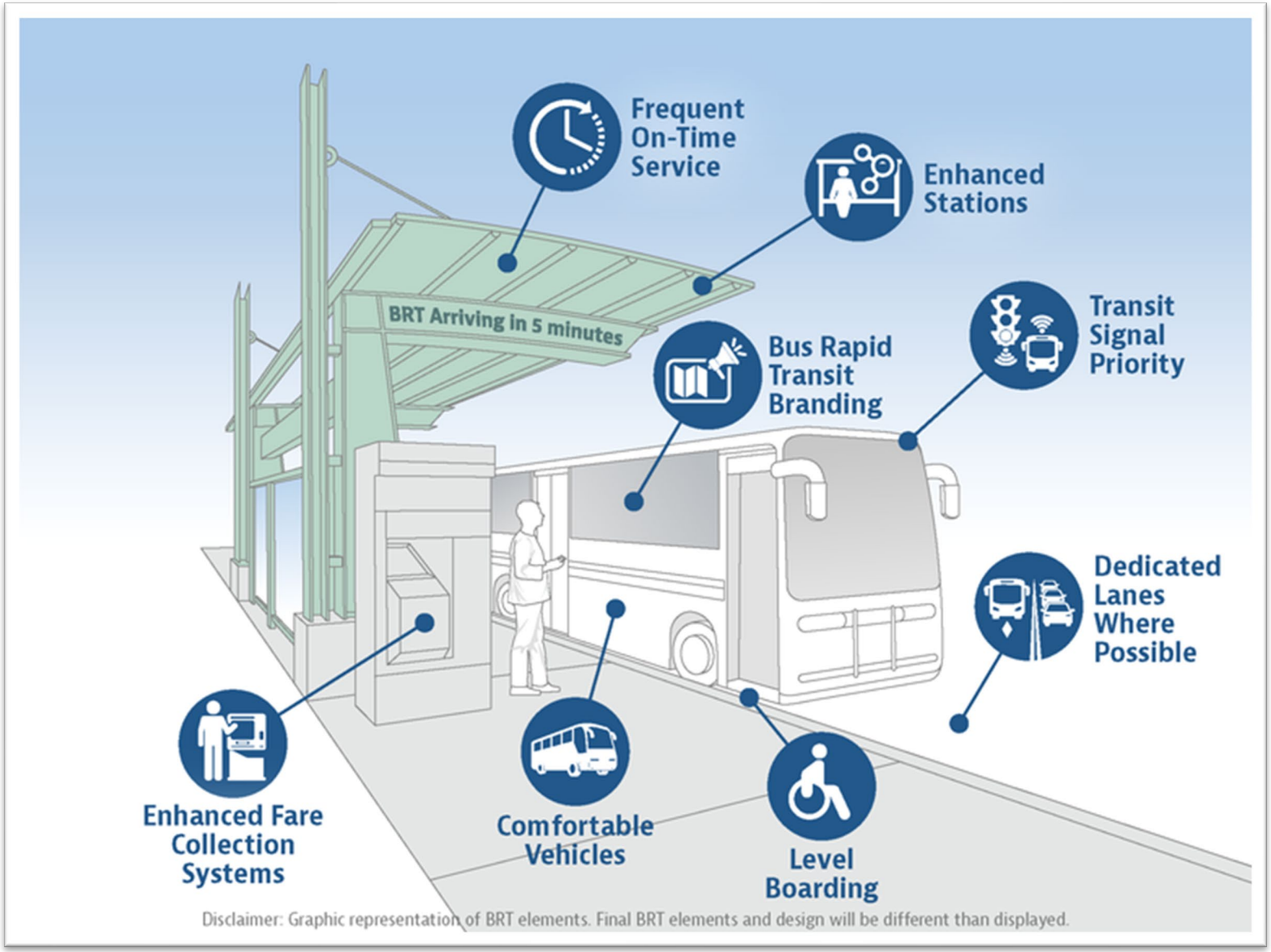
Toledo Planners visit Cleveland's BRT

August 2024



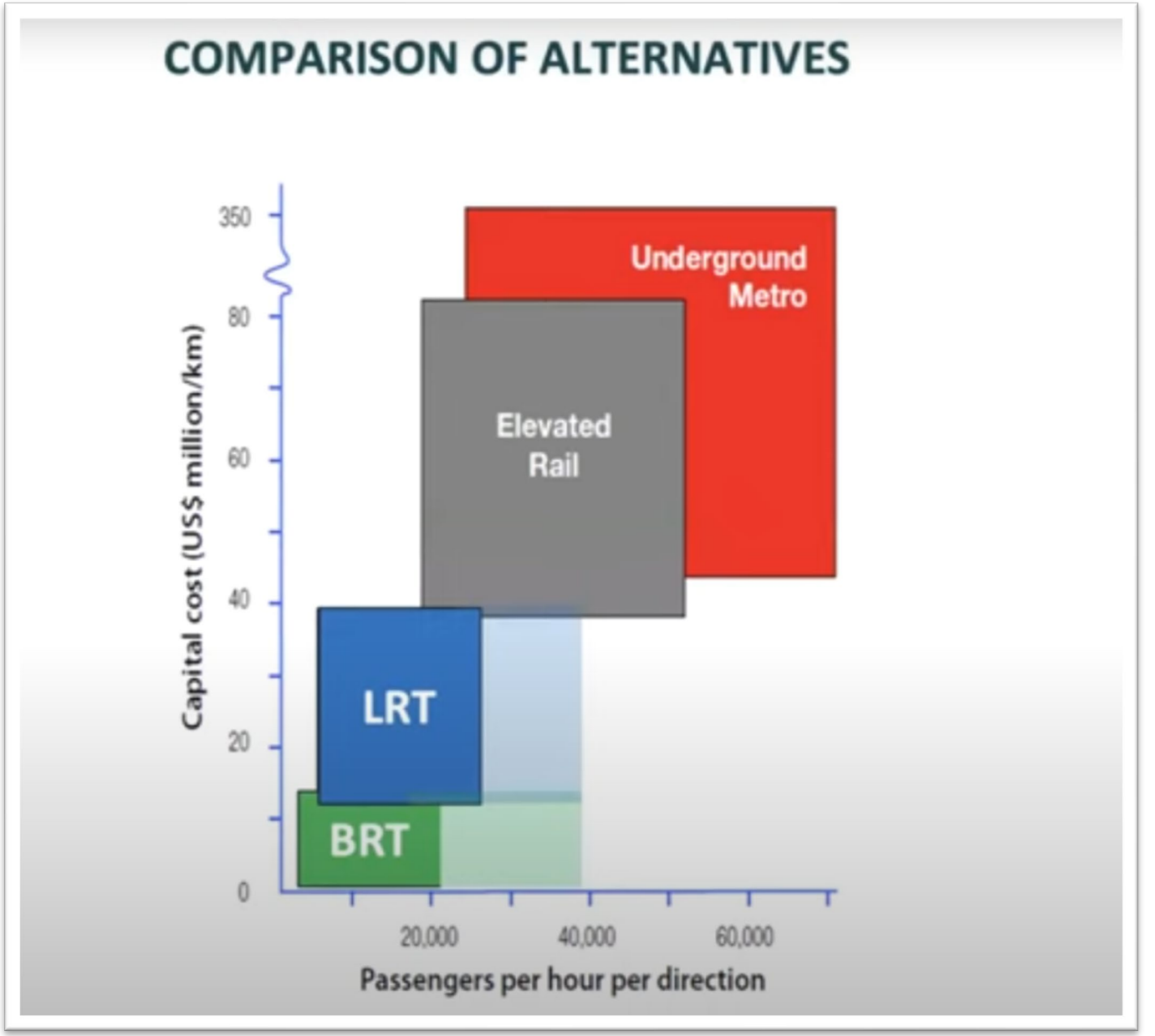


What is Bus Rapid Transit (BRT)?



BRT: High Quality Public Transport

- Connective
- Convenient
- Consistent
- Comfortable
- Cost Efficient
- Customer Friendly
- Clean



Institute for Transportation and Development Policy. (2024, May 15). About the BRT Standard - Institute for Transportation and Development Policy. Institute for Transportation and Development Policy - Promoting Sustainable and Equitable Transportation Worldwide. https://itdp.org/library/standards-and-guides/the-bus-rapid-transit-standard/about-the-brt-standard

Why does innovation matter in BRT?

- Public expectations for modern mobility
- Congestion, climate, labor shortages
- Connecting modes: ride-hailing, micro-transit, autonomous vehicles, first/last mile, safety

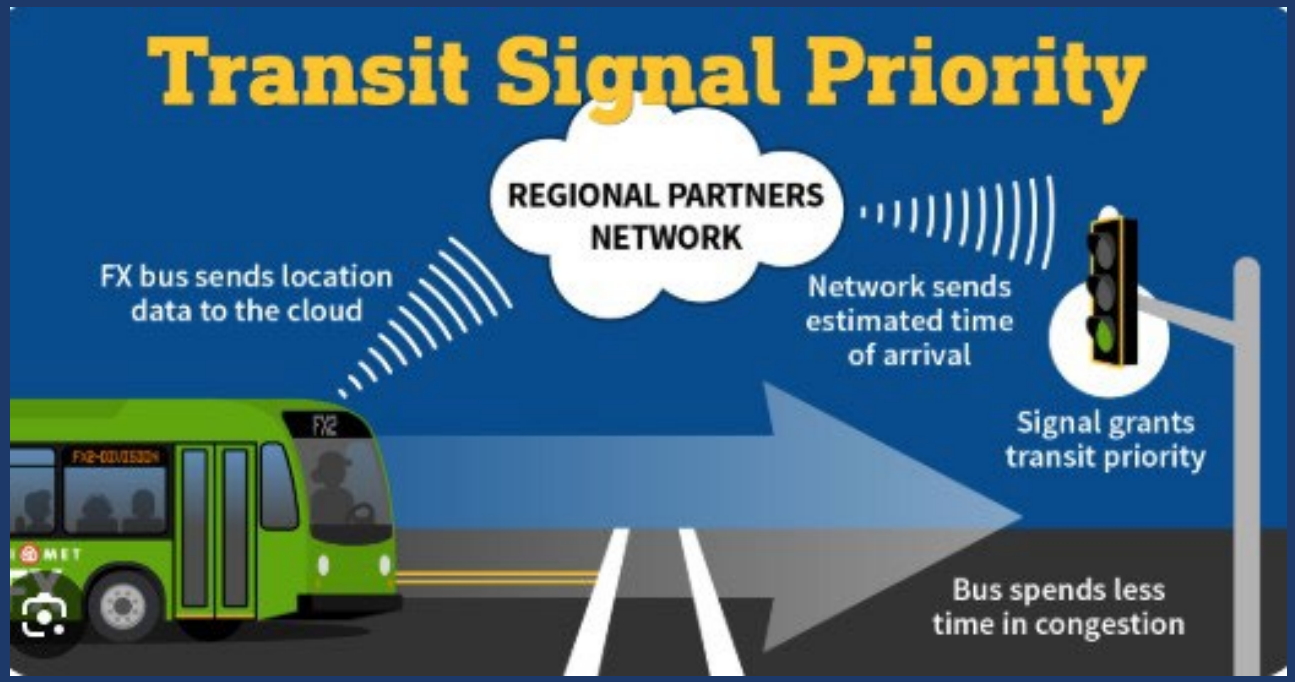
Intelligent Infrastructure

Miovision, GRIDSMART, and connected signal systems

Adaptive traffic signal priority (TSP) for BRT vehicles

Smart Intersection Technology:

“Smartphone for intersections” Core box concept includes signal control, camera access and analytics data for city traffic engineering

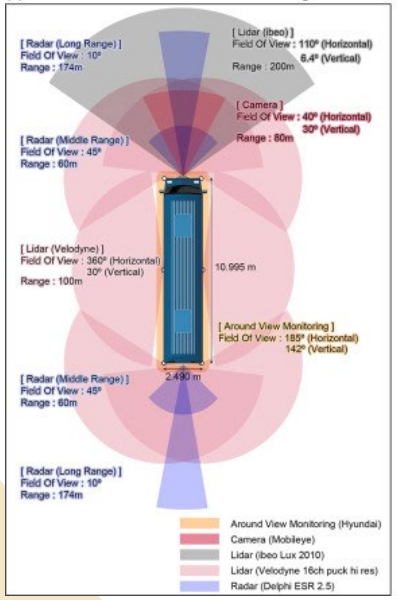


Intelligent Infrastructure

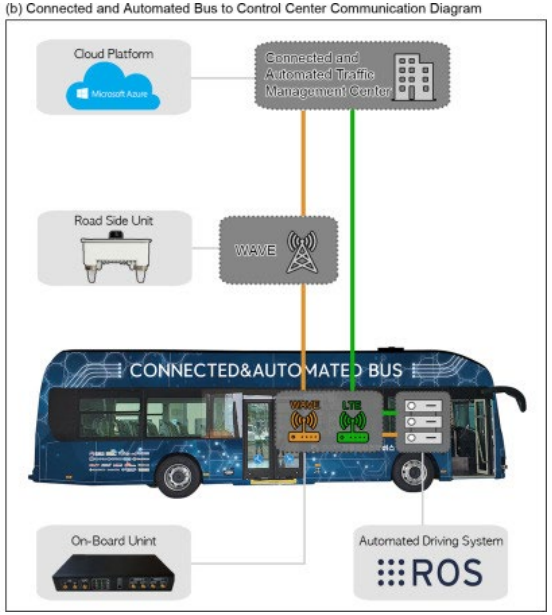
LIDAR, radar, and camera systems for curb alignment, pedestrian safety

Driver-assist for level-boarding, narrow lane navigation

(a) Connected and Automated Bus Sensor Configuration

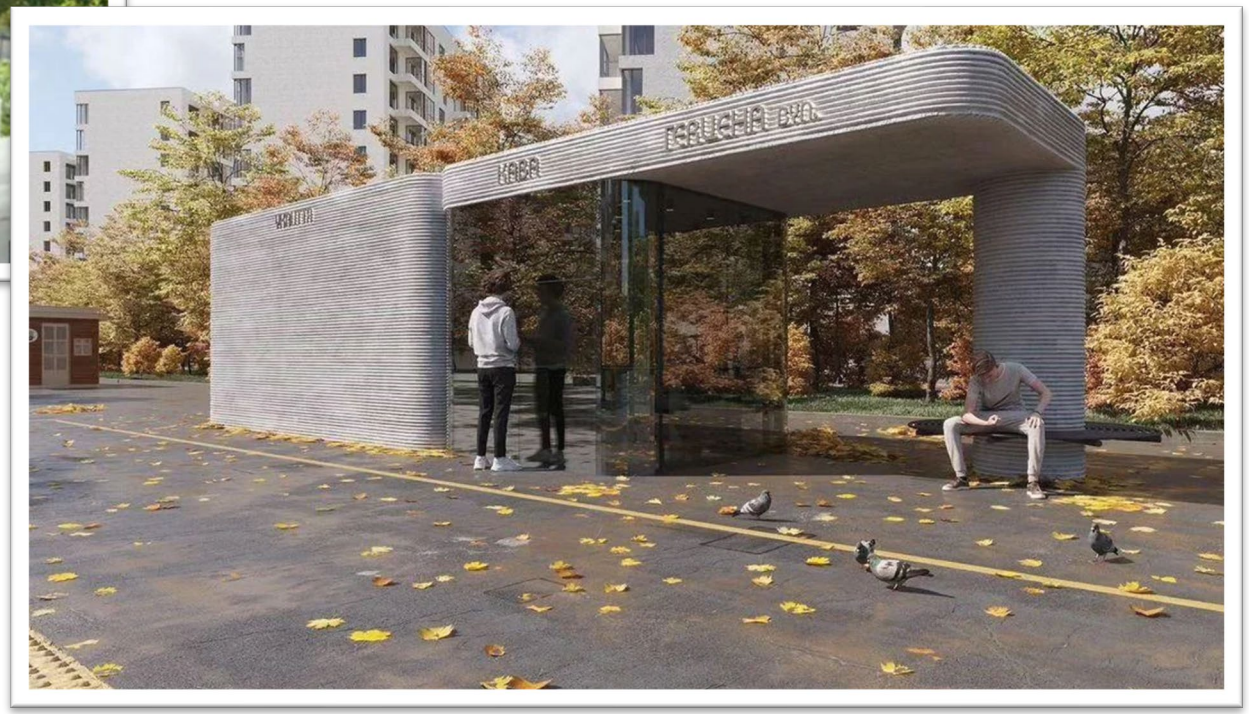


(b) Connected and Automated Bus to Control Center Communication Diagram



Modular BRT Station Design

- Faster Construction Timelines
- Reduced Disruption
- Accommodate Special requirements



Modular BRT Station Design

Prefabricated Stations

Working internal amenities

Adaptive Platform Technologies

Level-boarding modules, adjustable-height curbs

Retrofitting legacy stops for accessibility, aid in road diets

ZICLA, (Vectorial, Zipper, Zebra Family, Pointer) Fabricated from upcycled waste

Combining simplified platform building with pre-fab stations

Intelligent Amenities

Solar power, integrated Microgrids, Real time arrival signage

Intelligent Amenities

Easily transportable Smart benches with solar charging ports, WIFI access, real-time arrival, air quality sensors

Rail-like BRT Vehicle Design

High-capacity, sleek designs mimicking light rail

Low floors, wide doors, walk-through interiors

Electric Vehicle Innovation

Integration with renewable energy sources

Depot and in-route fast charging

BRT- specific operator enhancements

Augmented reality (AR) dashboards

HMI (Human-Machine Interface) for safety and efficiency

Operational Innovation & Automation

Automated Bus Yards

Driverless depot navigation, automated charging, washing

Yard management software integrating with fleet operations

Operational Innovation & Automation

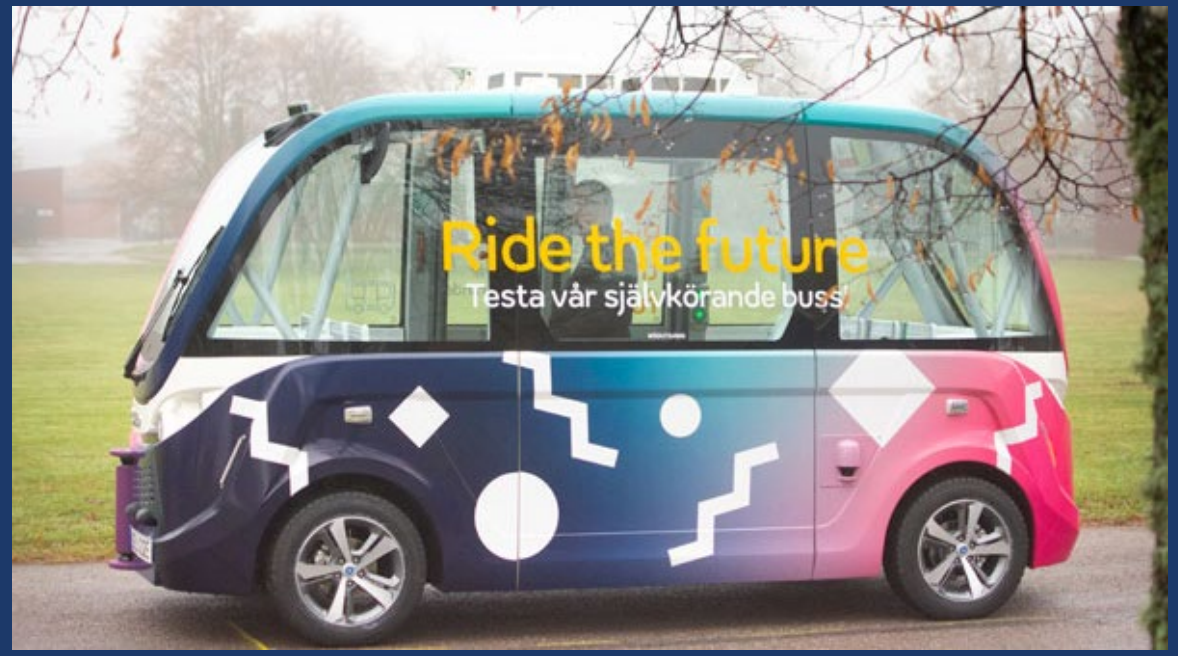
Semi- and Fully Autonomous BRT Pilots

Level 2-4 autonomous buses in controlled BRT corridors (Examples: Singapore, China, Sweden)

AI-driven dispatch and scheduling

Dynamic reallocation of vehicles based on real-time demand

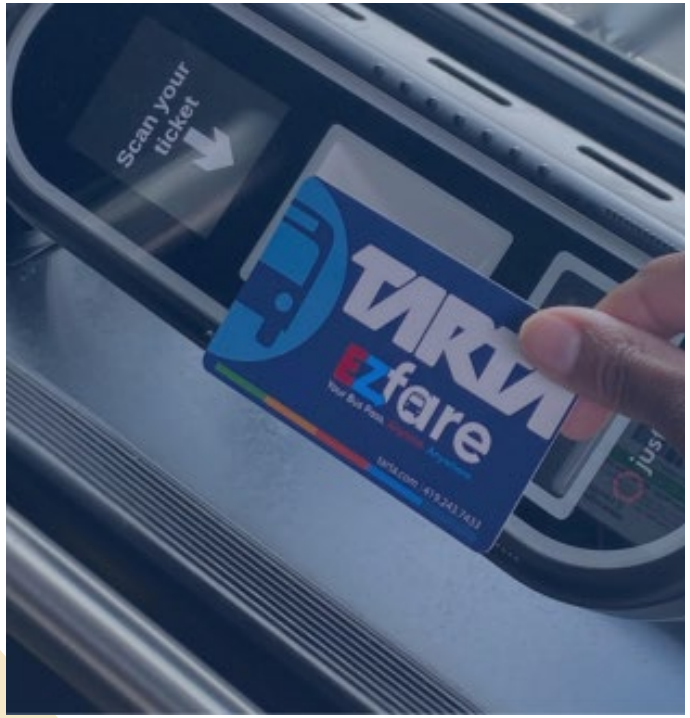
Predictive maintenance powered by AI analytics



Implications

Now vs. Future

Low hanging innovations for TARTA



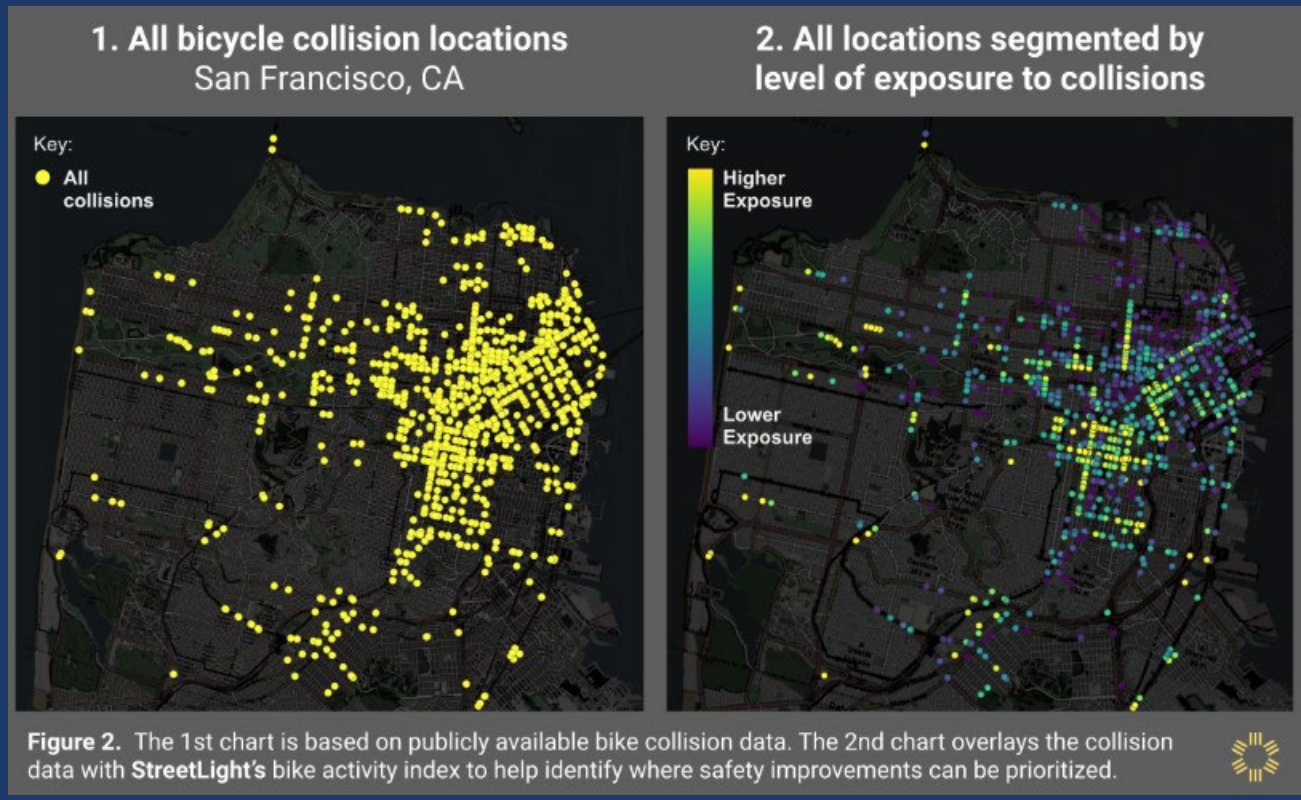
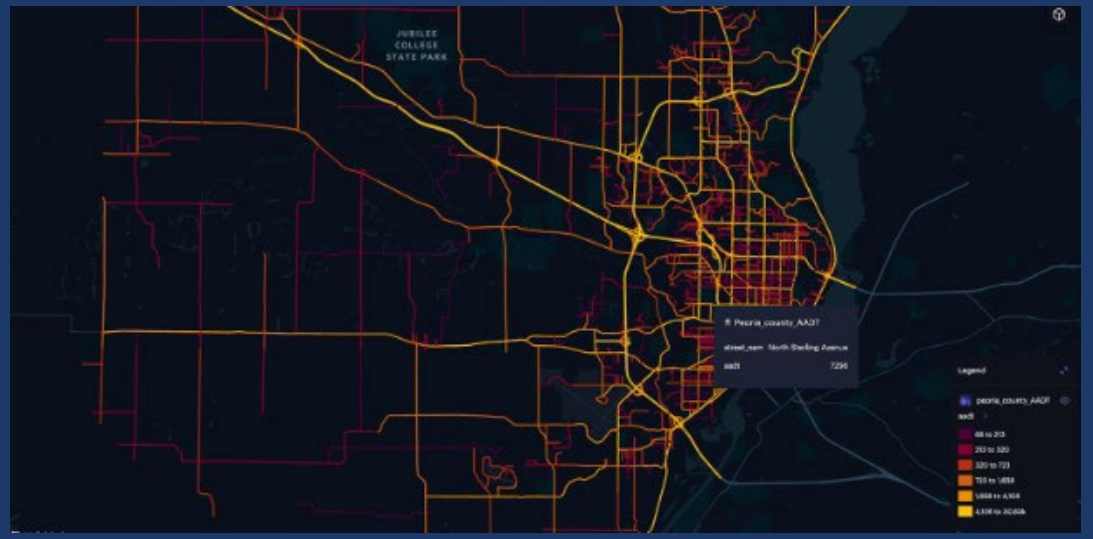


Figure 2. The 1st chart is based on publicly available bike collision data. The 2nd chart overlays the collision data with **StreetLight's** bike activity index to help identify where safety improvements can be prioritized.

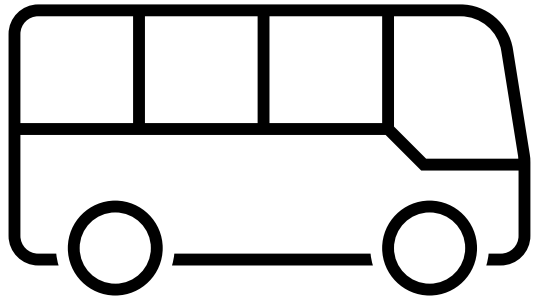
Implications

Community Engagement around Tech adoption

Partnering with consultants



Questions?



DROMOS

- Innovative Munich Germany based mobility firm who applied for the TARTA BRT Study
- See link below for concept
- https://youtu.be/EsNhVjLxlKQ?si=s_VjY1MEkmdO9Cat

Legally, Dromos is considered a "specialized rail system" and thus, its level 2+ autonomy function is fully sufficient for regulatory approval