

# Are Autonomous Vehicles the Fundamental Solution to Traffic Accidents?

Asst. Prof Kosuke TANAKA

Kyoto University

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# How Can We Reduce Traffic Accidents?

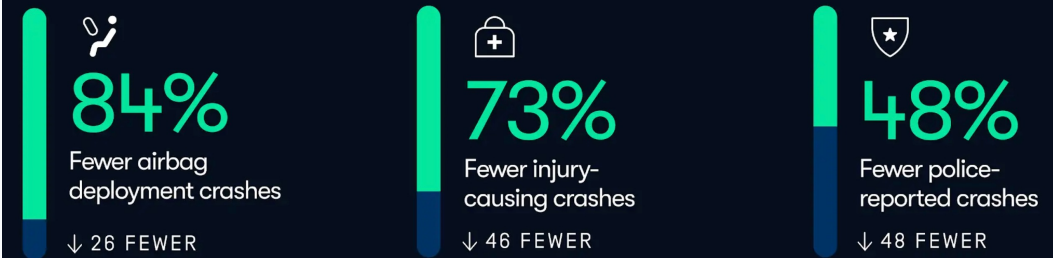
## Waymo claims that AVs can reduce impact of crash.

<https://waymo.com/blog/2026/01/a-commitment-to-transparency-and-road-safety>

- The event occurred when the pedestrian suddenly entered the roadway from behind a tall SUV, moving directly into our vehicle's path. Our technology immediately detected the individual as soon as they began to emerge from behind the stopped vehicle. **The Waymo Driver braked hard, reducing speed from approximately 17 mph to under 6 mph before contact** was made.
- To put this in perspective, our peer-reviewed model shows that a fully attentive **human driver in this same situation would have made contact with the pedestrian at approximately 14 mph**. This significant reduction in impact speed and severity is a demonstration of the material safety benefit of the Waymo Driver.

### Making roads safer for all, today

In our first 22 million miles:



compared to a human driving the same distance in the cities where we operate.

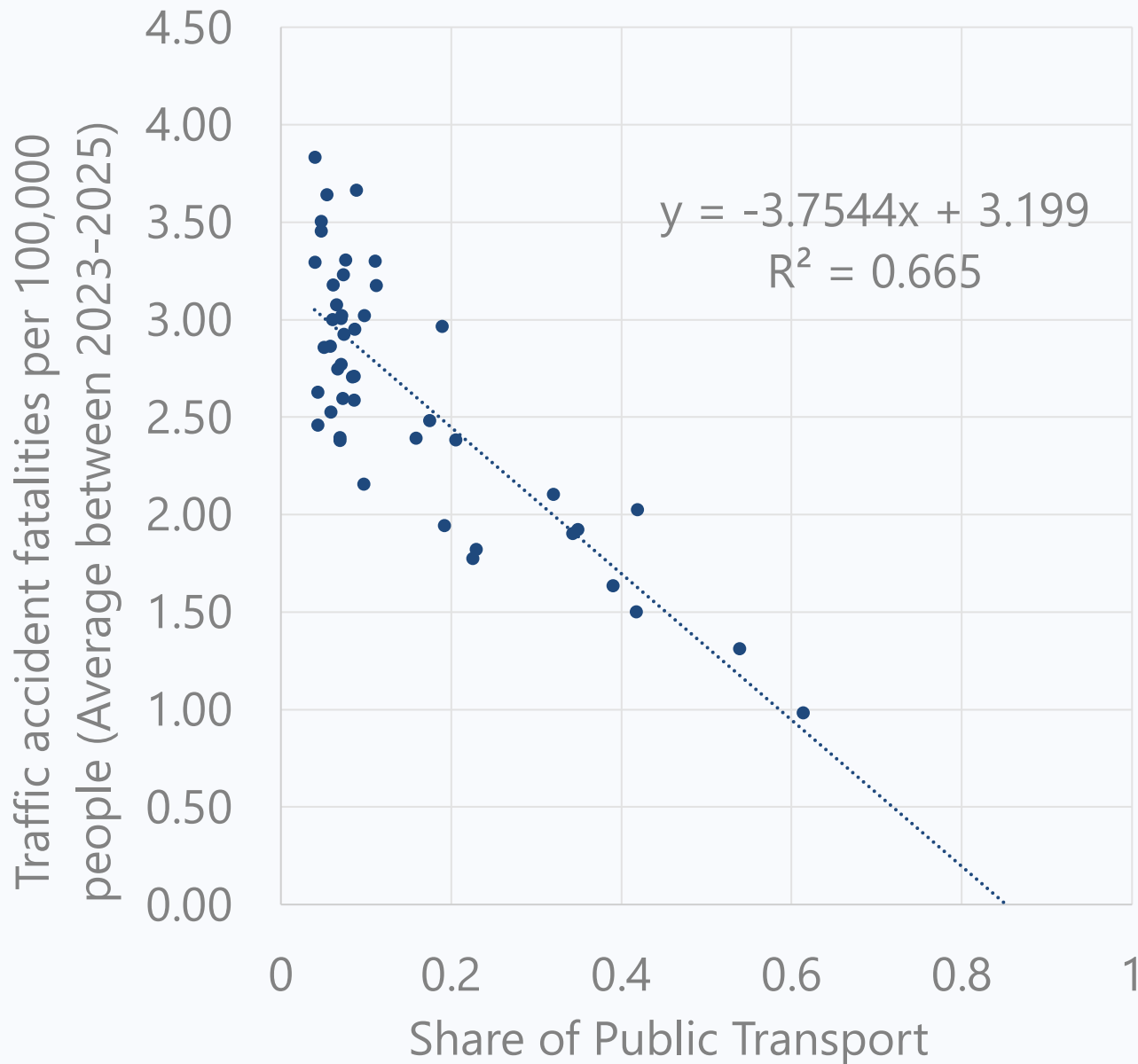
data source: <https://waymo.com/blog/2024/09/safety-data-hub/>

To reduce traffic accidents,  
we often focus on better roads and better vehicles.

But we already have a system that is much safer than private cars.  
It is almost fully automated.

That system is Public Transport.

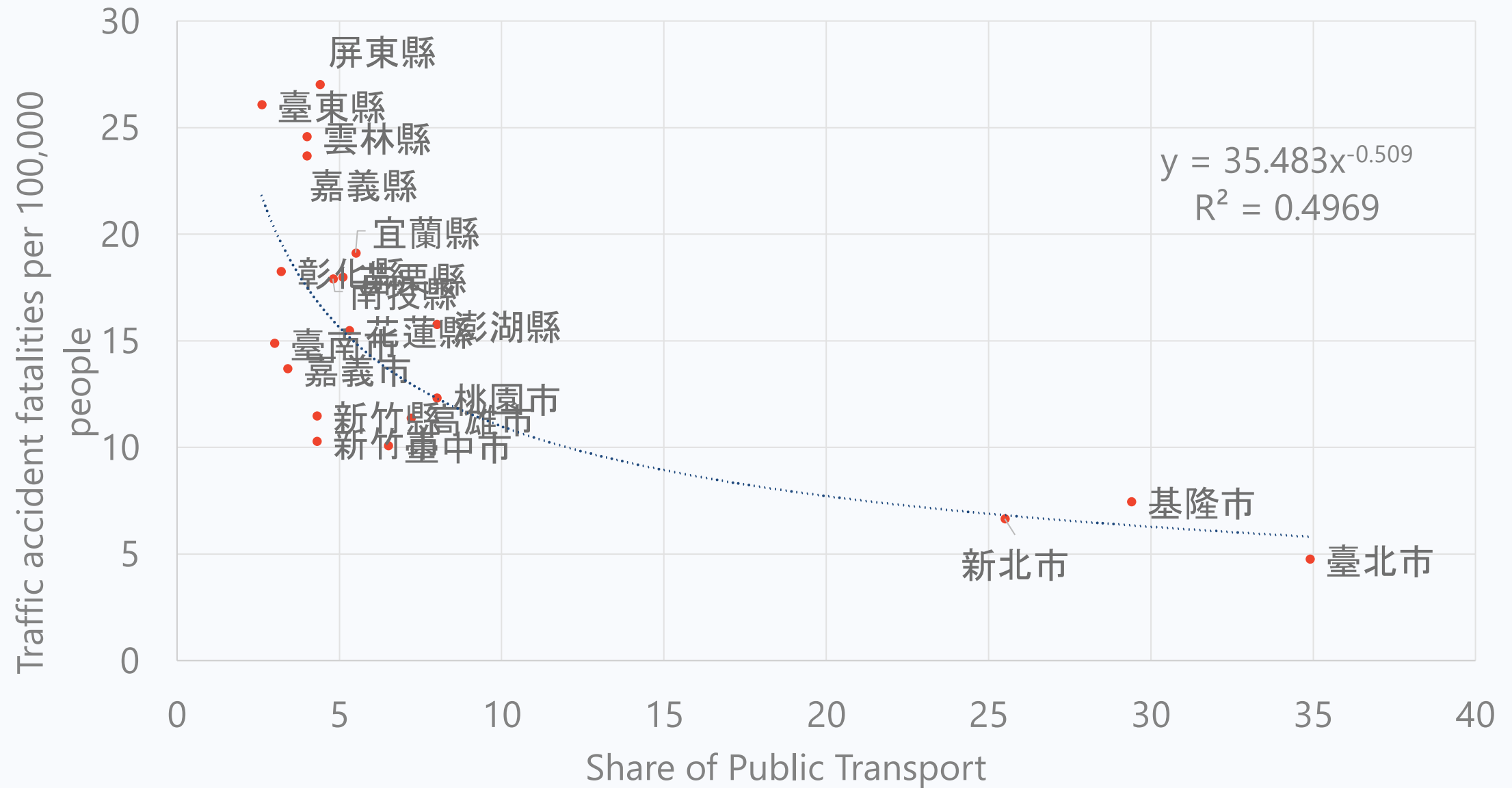
# Does Public Transport Reduce Traffic Accidents?



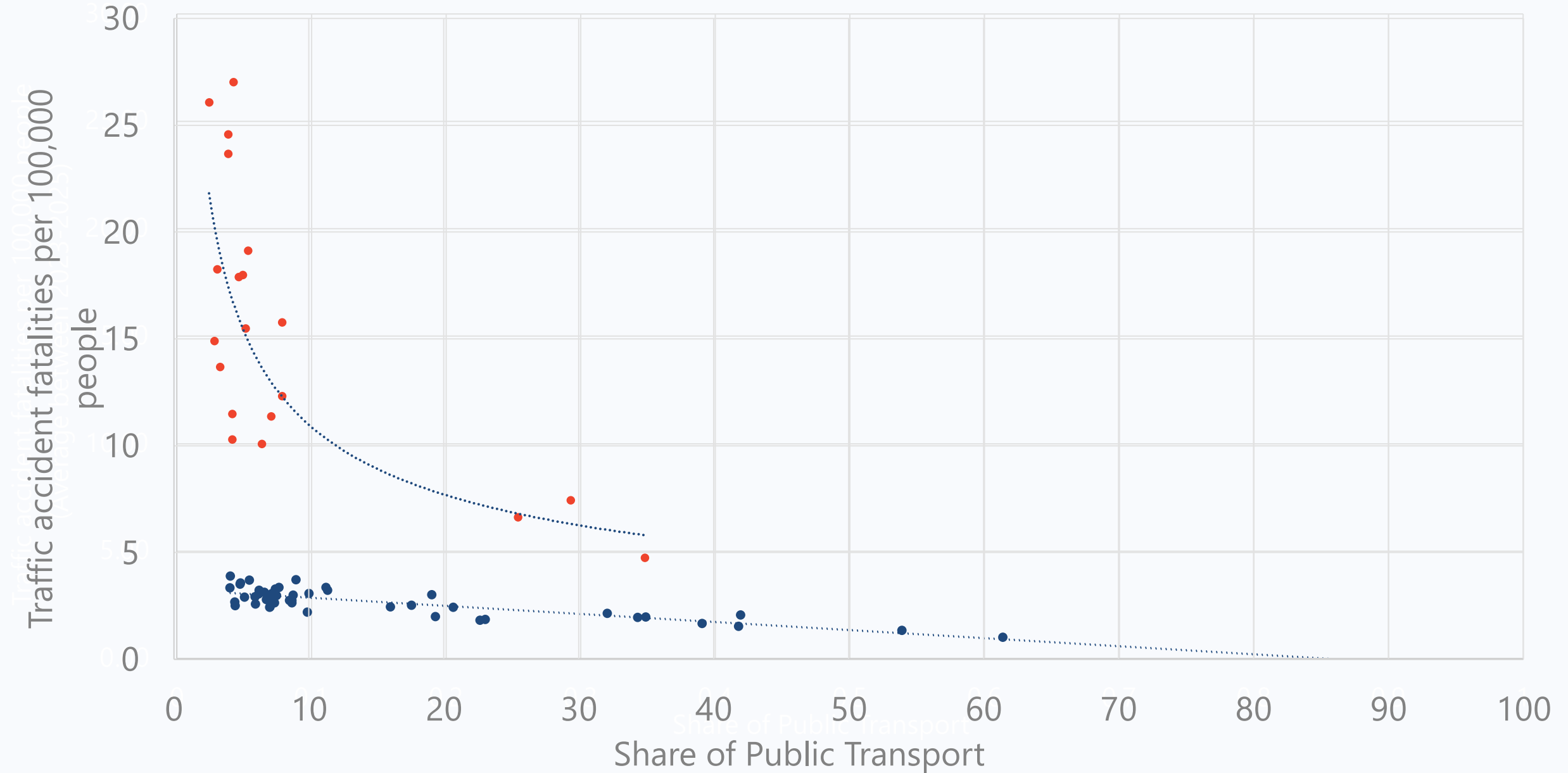
## Simple and strong evidence

- Traffic deaths are strongly related to PT share.
- In Japan, about 3,000 people die in road accidents each year.
- If PT share rises by 10 percentage points, about 370 lives may be saved each year.
- PT share alone explains 66.5% of the variation in traffic deaths.
  - Many factors affect traffic accidents

# Does Public Transport Reduce Traffic Accidents in Taiwan ?

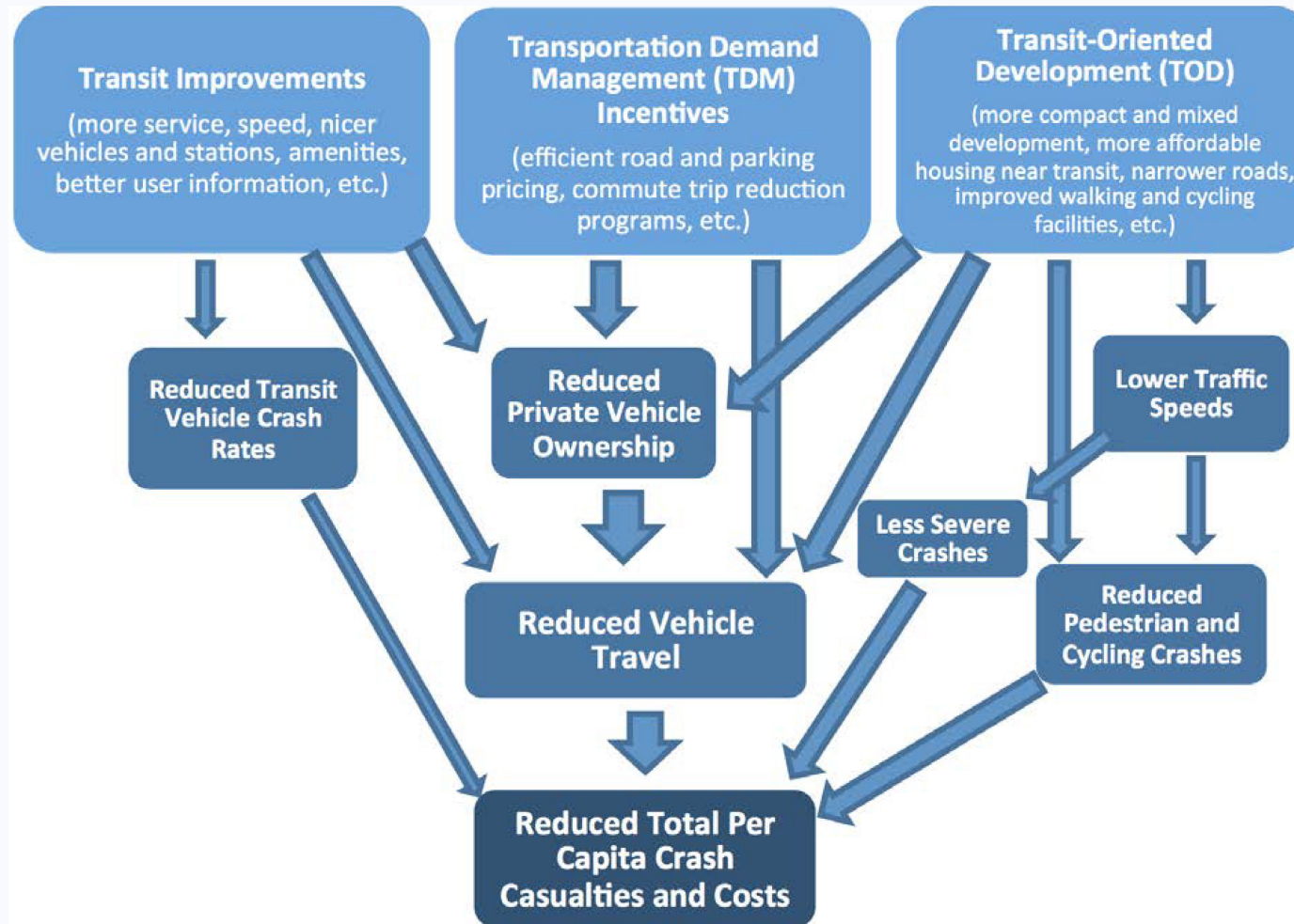


# Shown on the Same Scale



## The **Hidden** Traffic Safety Solution: Public Transportation

- APTA (American Public Transportation Association)
- Litman, T. (2014). A new transit safety narrative. *Journal of Public Transportation*, 17(4), 114-135.



# TPASS Helps Public Transport, but Safety Is Missing

## Official messages on TPASS

- Main focus is carbon emissions.

<https://english.ey.gov.tw/Page/61BF20C3E89B856/f9a52fff-e1e2-4a9b-89ff-d417afd86974>

### TPASS, Happiness Bus deliver affordable, accessible transportation

Date: 2023-07-20

Source: Department of Information Services, Executive Yuan

Premier Chen Chien-jen on Thursday received briefings from the Ministry of Transportation and Communications (MOTC) on the status of the TPASS monthly commuter card policy and the Happiness Bus rural transportation policy. The premier directed the MOTC to assist more counties,

### Cabinet approves 2026-2029 extension of TPASS program

Date: 2025-12-04

Source: Department of Information Services, Executive Yuan

At Thursday's weekly Cabinet meeting, Premier Cho Jung-tai received a Ministry of Transportation and Communications (MOTC) briefing on the Executive Yuan's TPASS program, including its results and subsequent implementation. The premier said that since the launch of the program in July 2023, TPASS passes have been purchased 19.133 million times and utilized on public transportation 1.456 billion times, with service satisfaction reaching 85%.

Premier Cho pointed out that overall public transport ridership in 2024 grew by 27.4% from 2022, indicating the initiative's success in boosting public transport usage, reducing carbon emissions and footprints, and fostering a more environmentally friendly society.

The premier further said that the Executive Yuan has approved the extension of the MOTC's TPASS monthly travel pass program for 2026 to 2029, along with its NT\$36.38 billion (approximately US\$1.2 billion) budget, and has submitted the 2026 budget proposal to the Legislative Yuan for deliberation. The aim is to broaden the initiative's user base and encourage greater public transportation usage, thereby supporting the nation's goal of net-zero carbon emissions.

ing services for TPASS—a new travel pass allowing one month of multiple modes of public transport—as soon as possible. The premier and agencies to continue integrating public and private resources to services, which provide accessible demand-responsive transport for remote areas will allow all citizens to feel the government's strong support for

, over 560,000 passes have been purchased and the passes have been used nearly 17 million times to date, illustrating the public's embrace of it. In addition to easing people's financial burdens, TPASS is encouraging public transport, facilitating energy savings and carbon reduction, and deconcentration in urban areas.

Bus policy is advancing transportation equality and transportation in rural communities, a key policy priority since the beginning of President Tsai. People living in remote areas benefit from this high-quality and caring service. The infusion of private-sector resources and the adoption of public-private partnerships encourage local residents to remain in and serve their communities, and rural revitalization, the premier said.

# TOD Is Safer Than AOD Today

TOD: Transit-Oriented Development

AOD: AV-Oriented Development

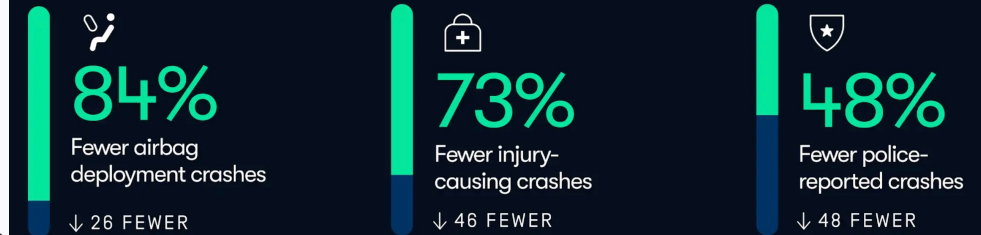
- AVs may improve vehicle safety.
- But TOD already reduces car accident.
- In the future, AOD and TOD may become closer in safety.
- Even then, TOD still has other advantages.

data source: <https://waymo.com/blog/2024/09/safety-data-hub/>

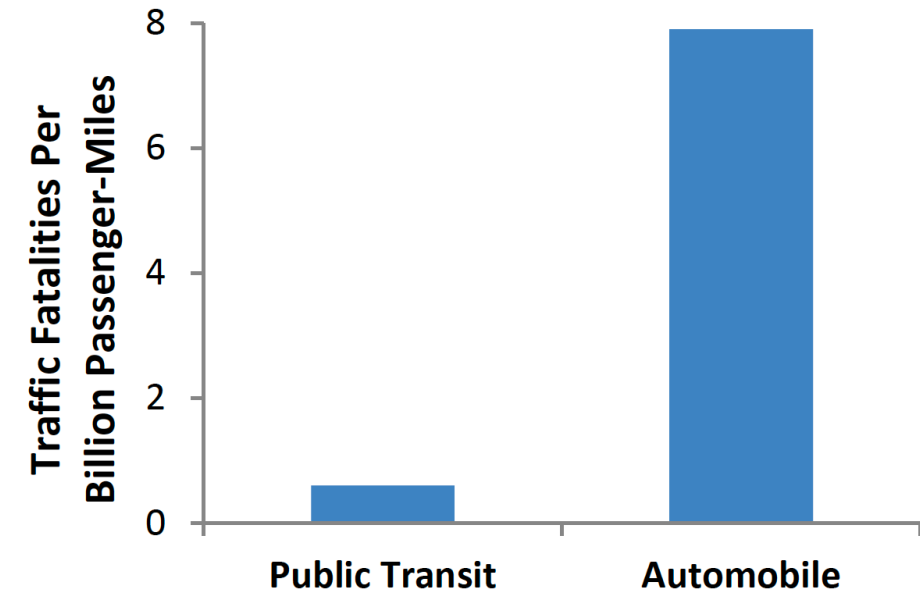
data source: <https://www.vtpi.org/safer.pdf>

Making roads safer for all, today

In our first 22 million miles:

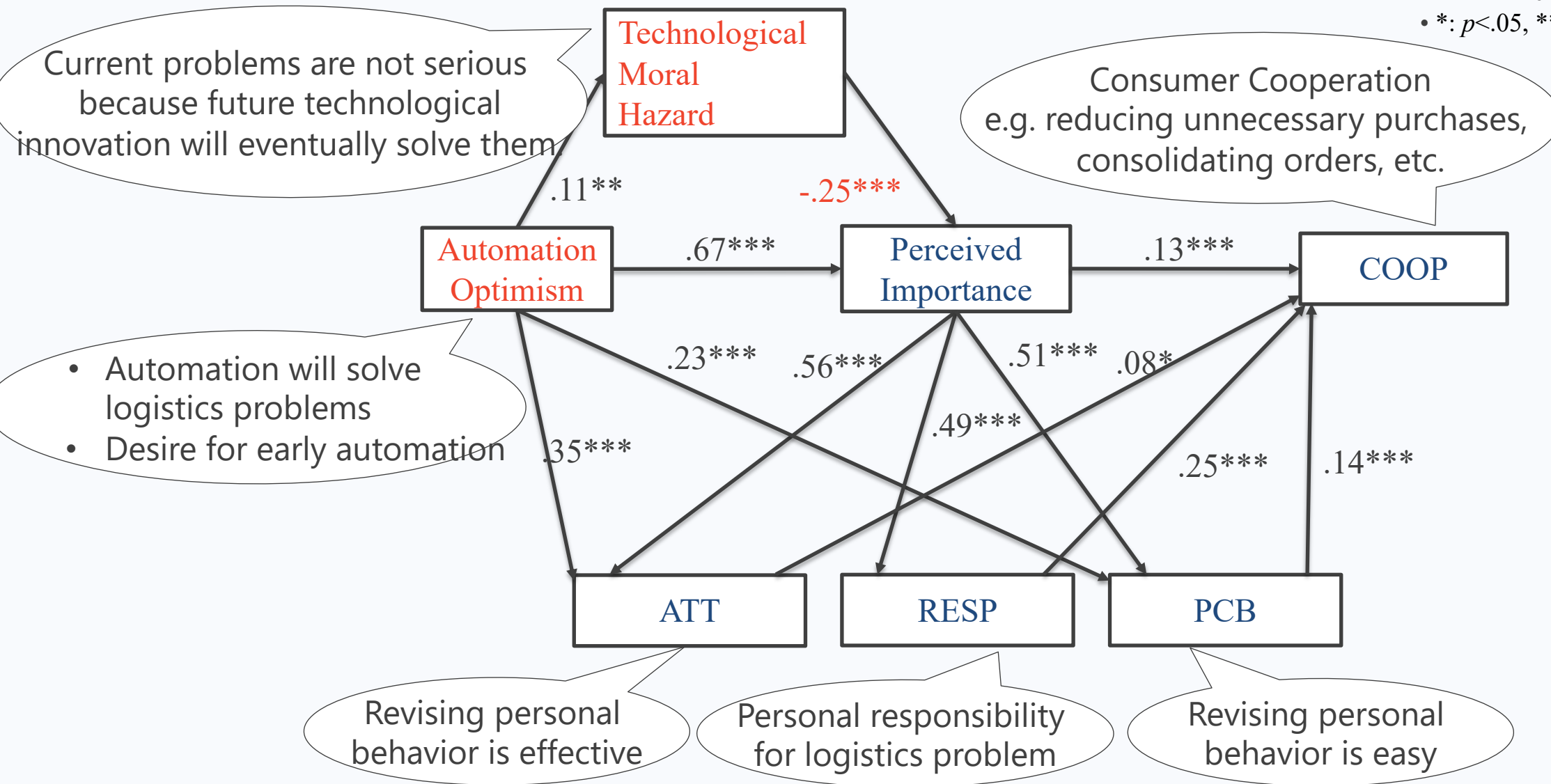


compared to a human driving the same distance in the cities where we operate.



# My Latest Research: Automation Optimism and Moral Hazard

- N = 720.
- All coefficients are standardized.
- Model fit indices:  
CFI = 0.991, RMSEA = 0.063,  
SRMR = 0.023.
- \*:  $p < .05$ , \*\*:  $p < .01$ , \*\*\*:  $p < .001$



# Which City Do You Want to Live In?

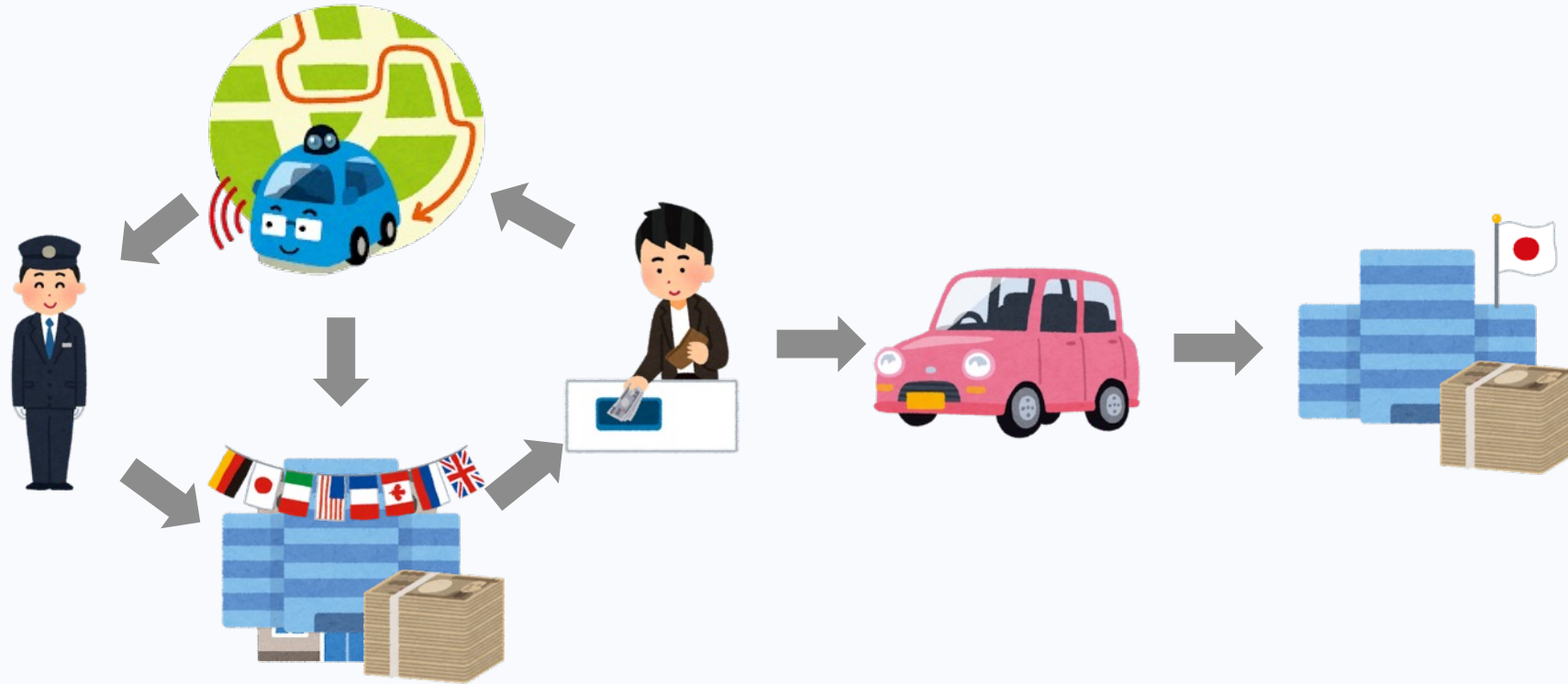


Generated by Gemini

## People do not seek only functionality

- This discussion took place in the 1950s between Le Corbusier and Jane Jacobs.
  - Le Corbusier proposed a functional city centered on cars.
  - Jacobs criticized his idea that was too functional. She argued that cities need diversity, with many kinds of people, many kinds of buildings, and small streets.
- Today's "Walkable City" is based on these context.
- Many people tend to imagine a functional city as the city of the future.

## Who earns money from your trip ?



- AVs will become an automatic money suction machine?

When put your child in car avoiding dangerous streets, then....

Original (cropped)

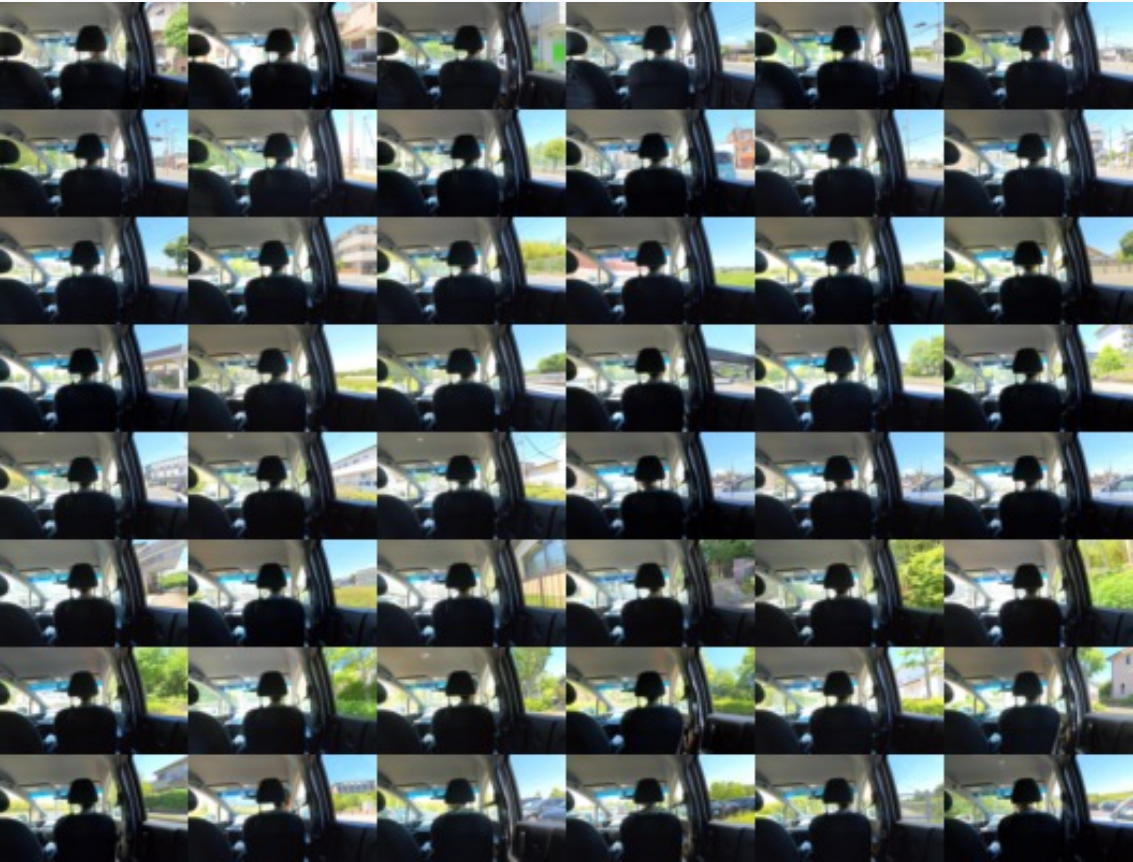


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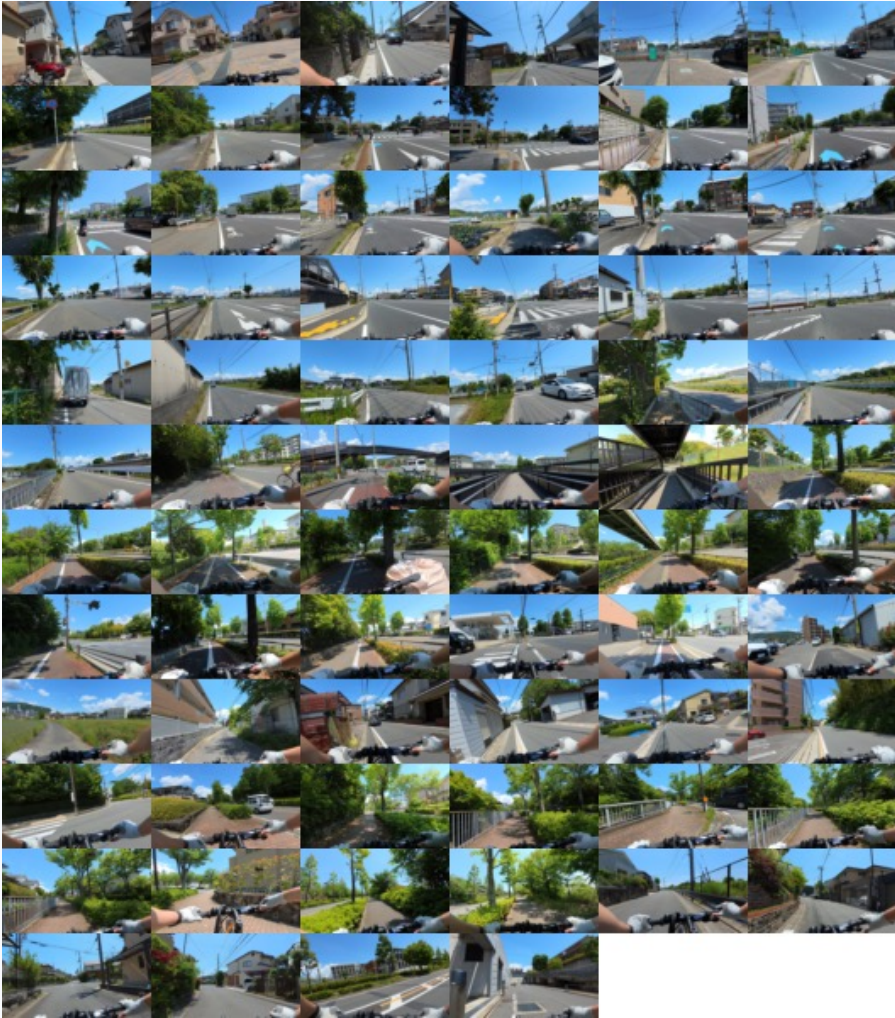


A series of photos along a route.

### on Car

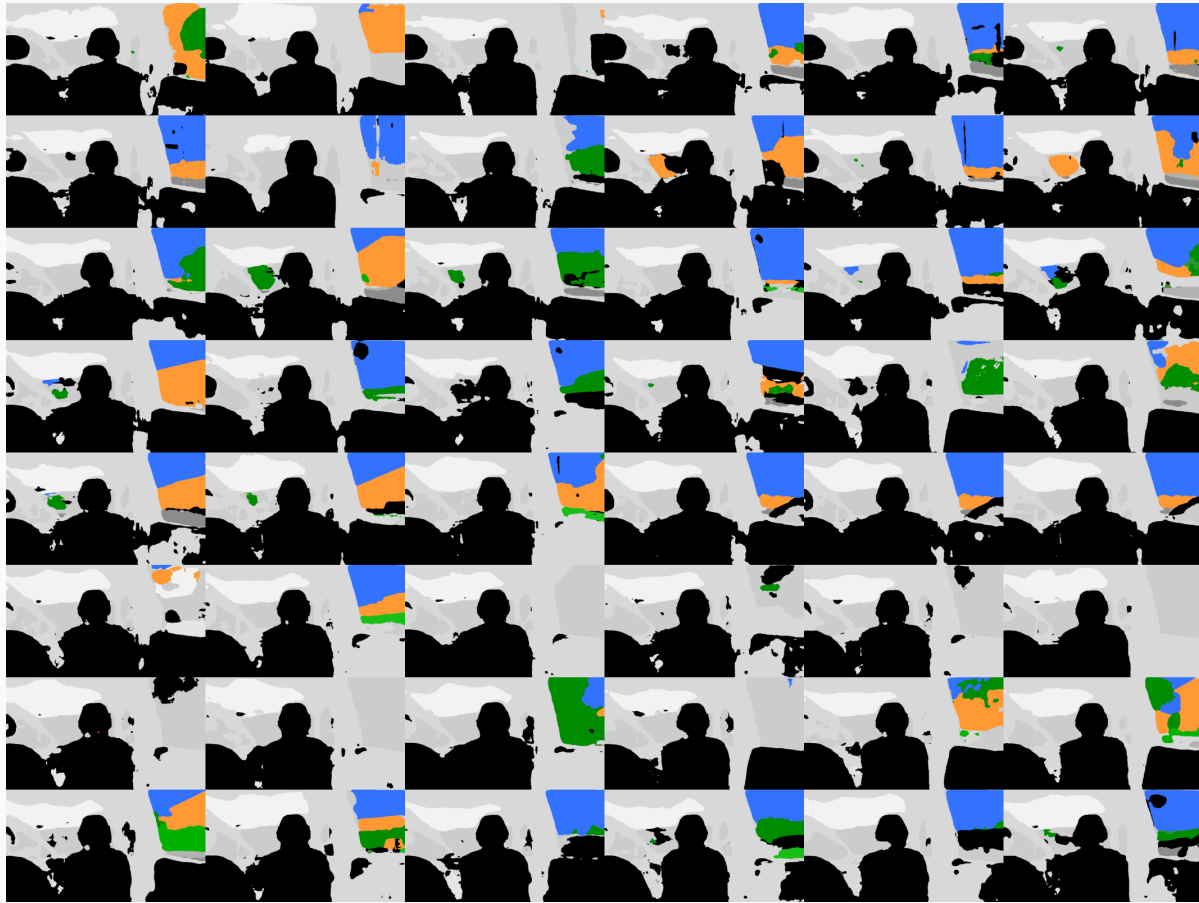


### on Bicycle

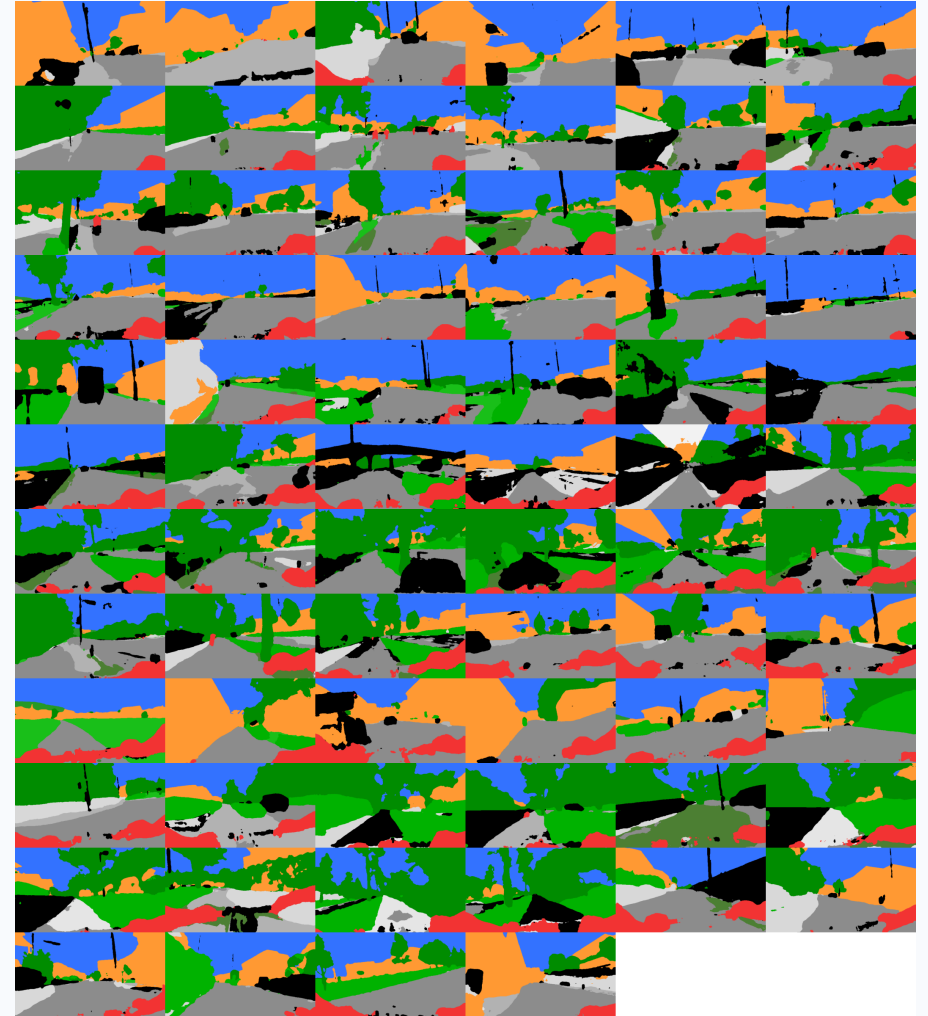


The segmentation results.

on Car

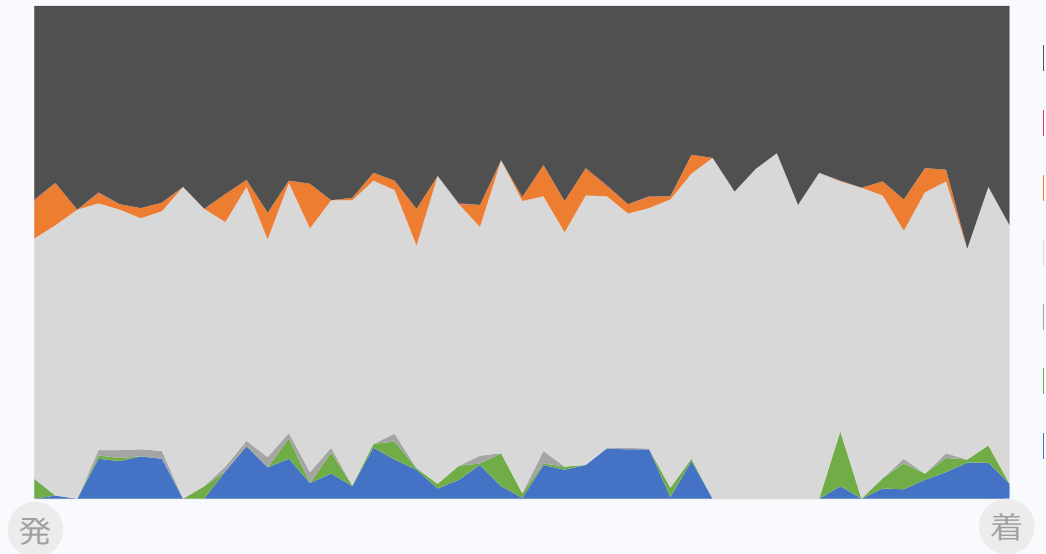


on Bicycle

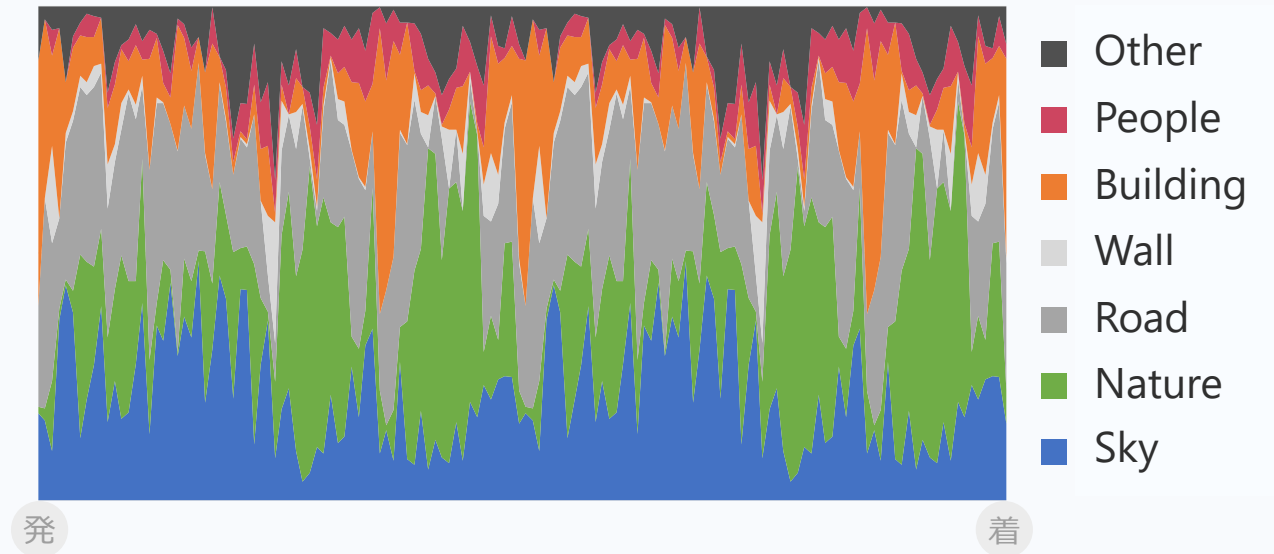


# Time-series changes in the segmentation results

## on Car



## on Bicycle



# Conclusion

We should not leave the future of our cities to technology.

Nor should we design our cities based only on what technology companies want.

**We need a clear vision of our own.**

- AVs reduce traffic accidents (AOD solution)
  - AVs seem to be very attractive.
- Shifting to PT also reduce traffic accidents (TOD solution)
- Safety is only one goal of our society
- TOD is better than AOD in many other ways:
  - e.g. energy efficiency, local economy stimulation, health etc.

