Fair Fares or Financial Burdens?

A State-of-the-Art Review of Transit Fare Policy and Its Equity Implications

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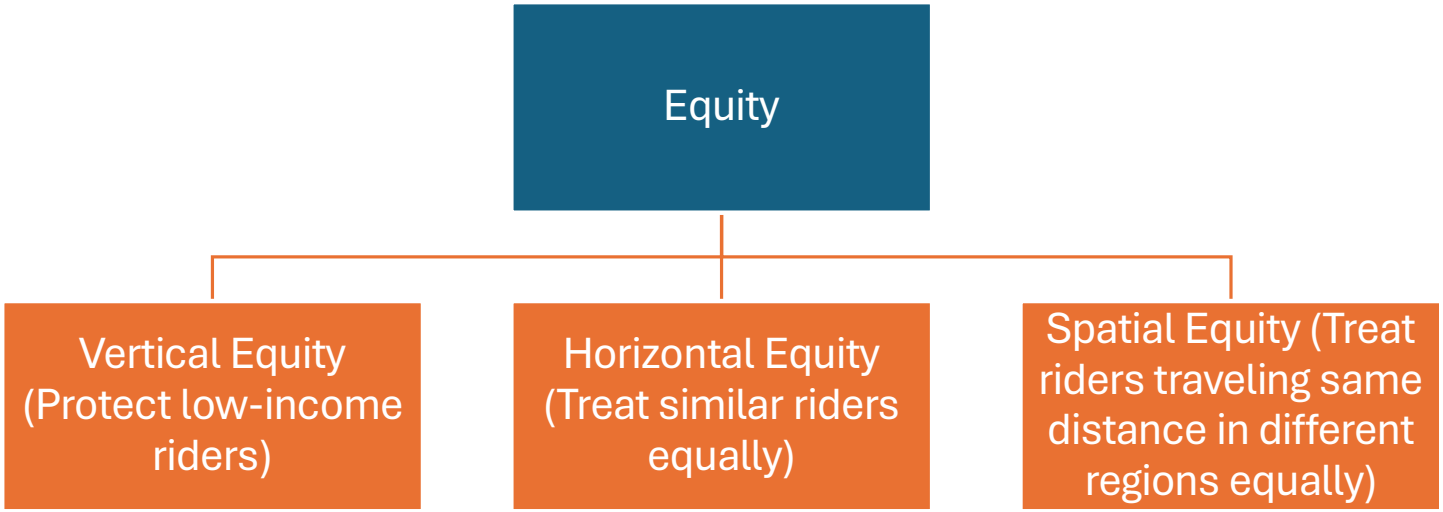
Fairness of Fares Through Equity Lenses



These three lenses recur across the literature and help assess whether a fare system distributes burdens fairly.

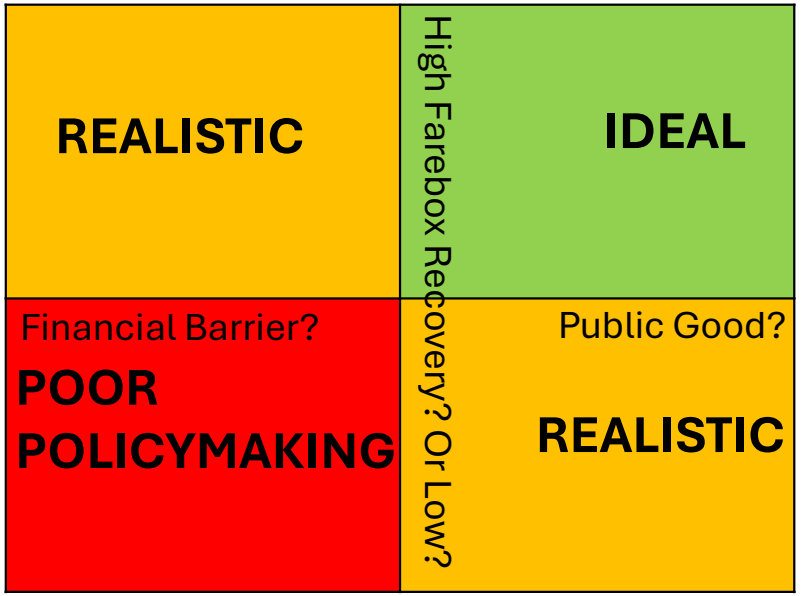
Why Fare Equity Matters

Fares determine who can afford to access jobs, school, and services

Low-income riders often bear disproportionate burdens

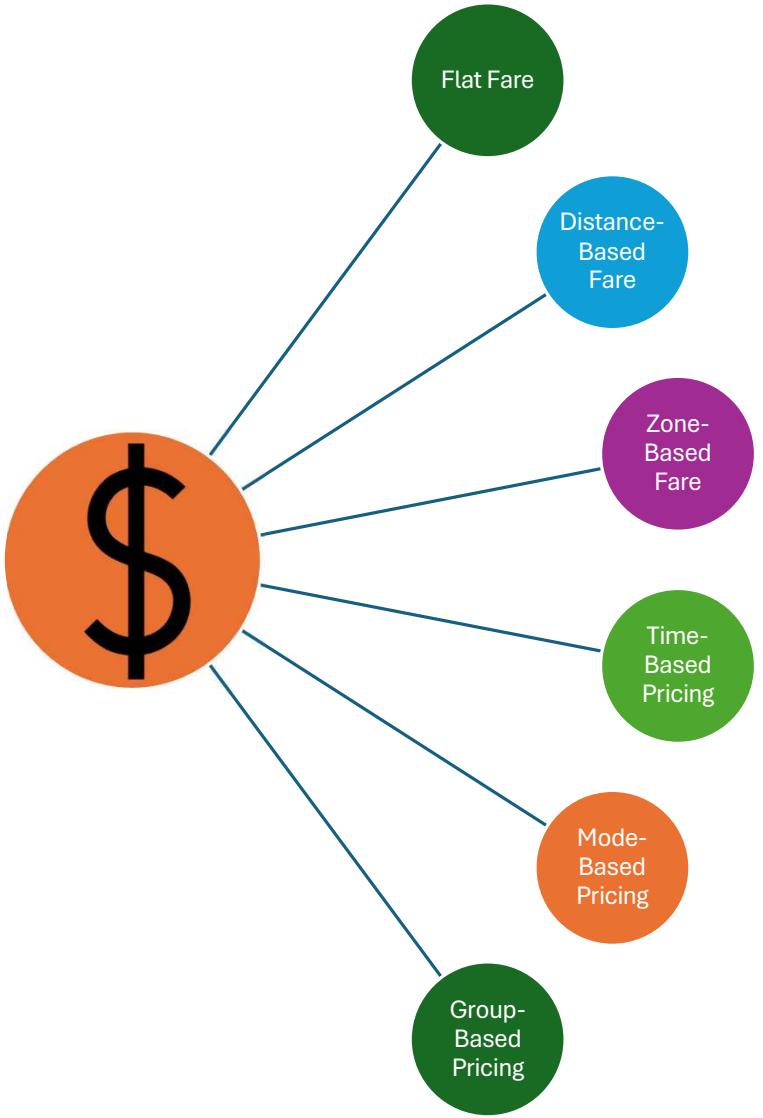
Travel patterns and urban form have changed, but fare structures haven't

Transit must remain financially viable while also equitable



Traditional Fare Models

- Is the fare fair?
  - Based on the benefits received by the trip-maker?
  - Based on the trip-maker's ability to pay?
  - Based on the cost to operate the trip?

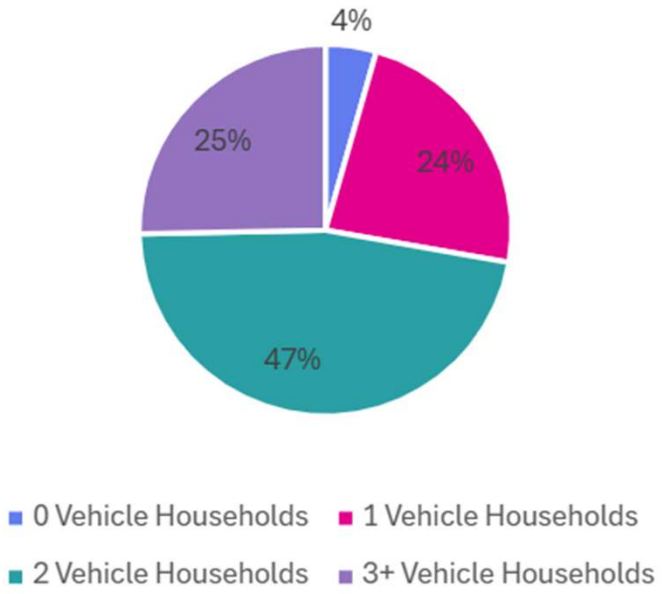


Zero-Car Households & Transit Dependence

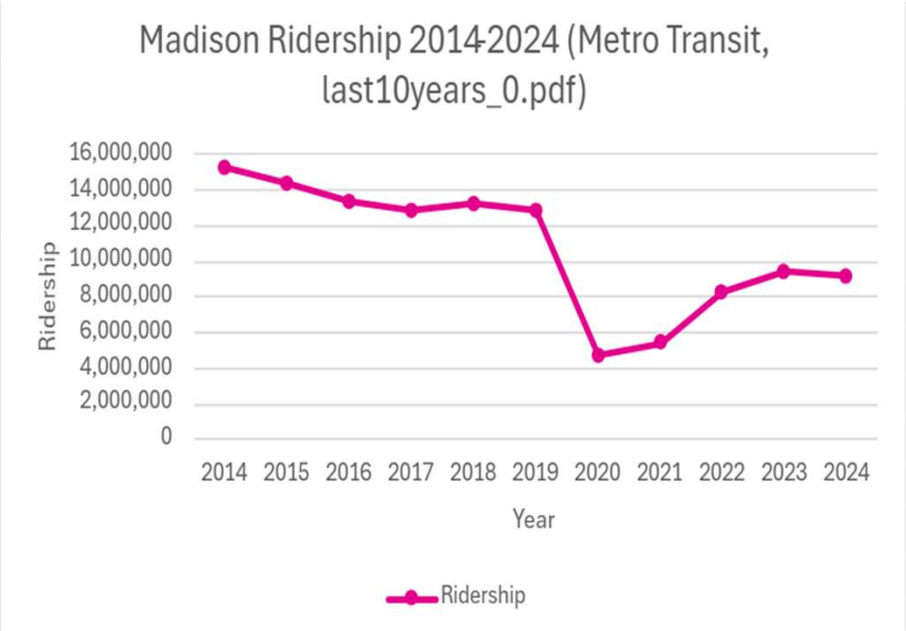
- Zero-car households disproportionately low-income
- Reliance on transit is highest among those with least alternatives
- Fare changes hit these groups hardest

Equity matters because certain populations- especially zero-car households- have no substitutes. A small fare increase for them is not equivalent for someone with private mobility.

Who Depends on Transit in Dane County, 2018? [Source:ACS 5Year Estimate ACSST5Y2018.S0802 -Data.csv]



Madison Transit Ridership, 2014–2024



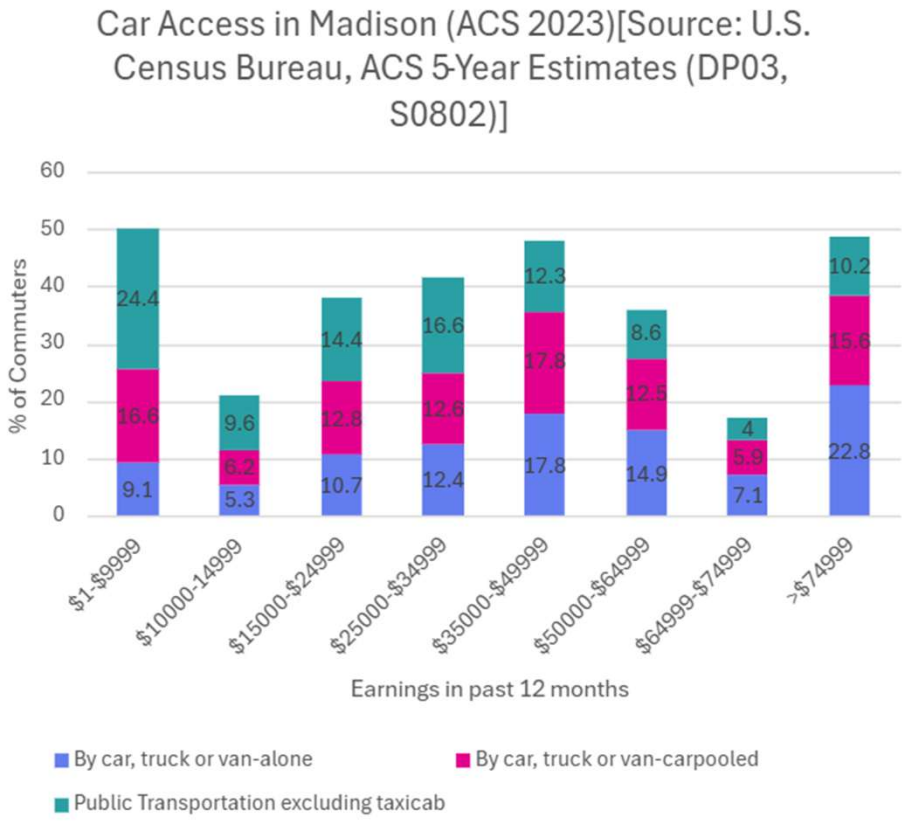
- Long-term ridership decline pre-COVID
- Sharp collapse in 2020
- Slow, incomplete recovery
- Reflects national hybrid-work travel patterns

These trends weaken peak/off-peak pricing logic and highlight why fare structures designed for 9-to-5 commuters no longer match current demand.

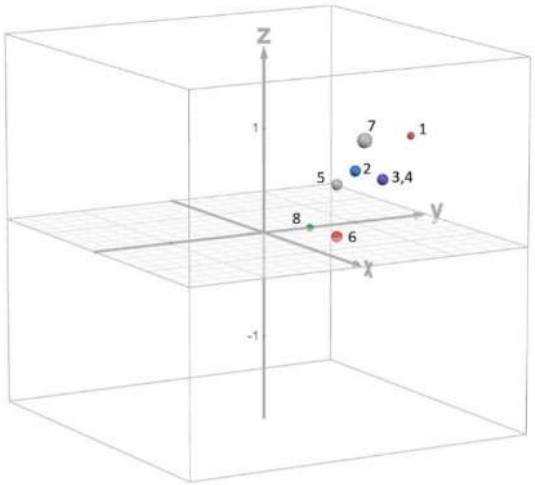
Car Access Falls Dramatically with Income

- Income strongly predicts car ownership
- Low-income riders most exposed to fare burdens
- Supports vertical equity lens

This reinforces that fare design has to account for ability to pay- not just benefits received, i.e., distance traveled.



Why Traditional Fare Models Fall Short



1	Flat Fare
2	Distance-Based Fare (uncapped)
3	Distance-Based Fare (capped)
4	Zone-based Fare
5	Off-peak Discount/Time-Based Pricing
6	Mode-Based Pricing
7	Group-Based or Targeted Fare Structure
8	Uncapped Distance-Based with Off-peak Discount

Comparison of cost burden distribution across common fare structures

- Is the fare fair?
  - Based on the benefits received by the trip-maker? - x axis
  - Based on the trip-maker's ability to pay? - y axis
  - Based on the cost to operate the trip? - z axis

- Flat fares → regressive cost per mile
- Zone-based pricing → penalizes suburban low-income riders
- Passes → require high upfront cost
- Assumes monocentric cities + peak commuters
- Administrative friction excludes actual need-based riders

Many of these models were built on assumptions from the 1980s–2000s, not today's evolving polycentric travel or hybrid work patterns.

What Research Shows

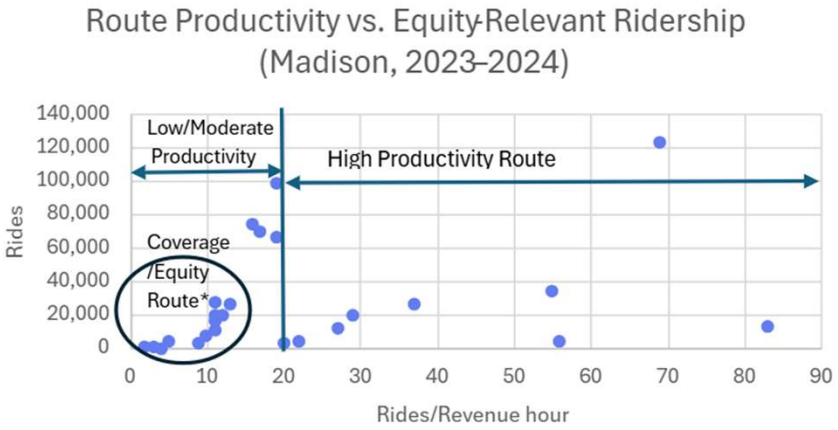
- Flat fares are simple but regressive (Brown 2018)
- Zone boundaries often misalign with suburban poverty (Zhou 2019)
- Pass-based discounts exclude riders who can’t pay up front (De Silva 2022)
- Means-based programs fail when admin burden is high (TCRP 182)
- Fare capping reduces liquidity barriers (TCRP 160)
- Fare-free systems help but require stable funding (TCRP 237)

Across studies, the consistent pattern is that without careful design, fare policy can unintentionally deepen inequity.

Productivity vs Equity-Relevant Ridership (Madison Example)

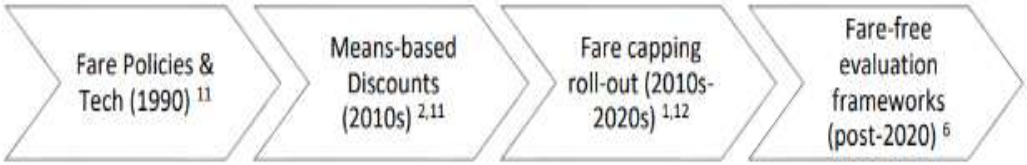
- High-productivity = UW Campus routes
- Coverage/equity routes = low rides/h but essential
- The lower-density outer neighborhoods of Madison-South Madison, East Madison, North Madison, and the Sun Prairie corridors
- These area have lower car access, distances are longer, and transit dependence is higher

This is where fare policy and service planning intersect. Coverage routes may score low on productivity but are critical for equity. Fare design must recognize this dual role.



*Performance threshold set by transit agency TransLink in Vancouver, Canada, for its weekday midday service

E	McKee – Capitol Square
F	Junction – Capitol Square
G	South Transfer Point – Independence
H	Westfield – South Transfer Point
J	Westfield – Brooks
L	Femrite – Sherman
O	South Transfer Point – Brooks
P	Independence – Portage – Hayes
R	Junction / South Ridge – Capitol Square
S	Sun Prairie
W	Sun Prairie
81	Latenite Campus



Timeline showing Fare Structure Evolution

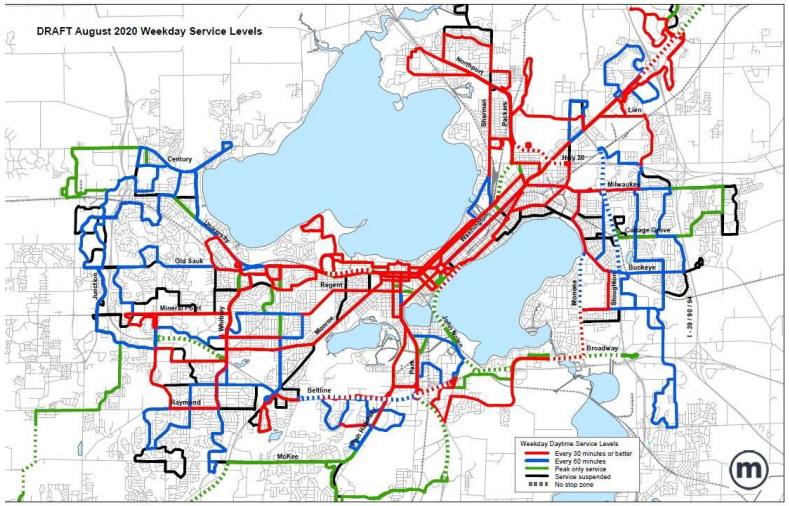
Emerging Tools for Fairer Fare

- Automated fare capping (daily/weekly/monthly)
- Tiered means-based discounts
- Fare-free pilots with dedicated funding
- Integrated verification through SNAP/WIC/Medicaid
- Smartcard/Account-based back-end simplifies administrative burden
-

Technology now allows us to design equitable systems without adding friction or revenue loss.

Applying Equity Principles Locally

- 4% zero-car households (2018) → fare burden matters
- 50% of Transportation riders have earnings less than $25000 in 2023
- Suburban + equity coverage routes → require equity lens
- Metro Transit already uses account-based Fast Fare with daily/weekly/monthly caps and a half-price program for low-income riders, youth, seniors, and riders with disabilities



- Opportunity: multi-category influenced reasonable caps, i.e., low-income young group pricing vs low-income elderly group pricing
- Opportunity: better data sharing with social programs

This is where research meets practice. The same equity issues described nationally appear clearly in Madison's data.

Conclusions

- Legacy fare models assume outdated travel patterns
- Low-income, zero-car, and suburban riders bear disproportionate burdens
- Modern tools (fare capping, means-based discounts) show strong equity benefits
- Effective fare policy must balance:
  1. Financial Viability
  2. Affordability
  3. Adaptability to hybrid work + spatial change
- Cross-program coordination and better data integration are essential

Fare policy is no longer just a revenue mechanism- it is a mobility justice tool.

Future Research / Innovation Opportunities

Explore models best reduce administrative burden

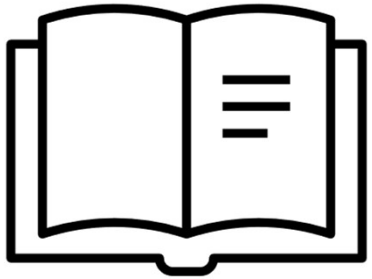
Long term revenue impact of Fare Capping +Fare-free initiatives

Redrawing of zones based on better understanding of suburban transit economics

Explore institutional frameworks that supports cross-sector coordination mechanisms the best

Pandemic or any other shock resilience pricing strategies

References



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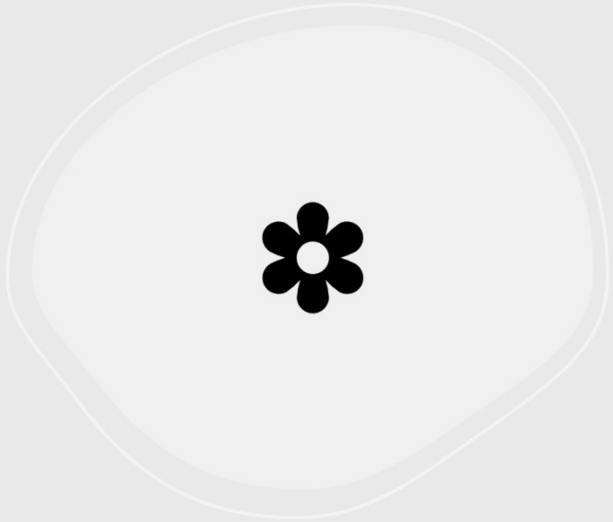

Thank You

Questions?