Pricing Of Urban Public Transit Systems with Multi-modal Character

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Abstract:

Fares for public transport systems are often a hot issue, whether in the developed (aka global North) or in developing countries (aka global South). Its determination, however, takes different paths. In GN cities, it boils down to a balancing act between cost recovery and affordability, aside from being limited to one or two modes. On the other hand, fare setting in GS cities is more complicated because there are several modes (rail, bus, minibus, paratransit, 2 or 3 wheeled modes) involved, confounded by many private operators in competition with each other, if not with one or a few state-owned transit entities. Four determinants are proffered as the fulcrum for deciding the pricing issue in GS cities, these are: operating cost recovery, intrinsic value of a trip, affordability of the service, and implementability of the chosen tariff. These are elaborated and applied on Metro Manila as a proxy for a GS city.

Keywords: fare-setting, transport fare regulation, multi-modal public transit, developing country

1. INTRODUCTION

All major cities of the world, whether located in the global North (GN) or global South (GS), face the same problem of determining the right transit fare. It is a perennial issue, for reasons of inflation, changing demand, modified routes, technology, urban growth and other factors. However, the pathway to a solution is unlikely to be the same – not the least of which is differing factor conditions.

The problem for GN cities is simpler, a balancing act between affordability and cost recovery by a competent metro-level transit authority. The tendency is towards the lowest fare that can be supported by a budgeted level of subsidy, for one or two modes - rail and/or bus, competing for market share against private cars.

The decision is not as easy for GS cities. There is a multitude of transit providers, thousands of small-scale private operators, a mix fleet of rail, bus, paratransit and micro transit modes. The service network is confusing and overlapping, a product of organic growth. Off-road transfer facilities are scarce, if not totally absent. Responsibility for putting order out of a chaotic situation is often split between national and local authorities, both of whom suffer from technical inadequacies.

Paradoxically, the subsidy levels for public transport in the GS are lower, if not absent altogether. Not by design, but by accident. Ironically, to solve the 'messy' situation, ODA experts – motivated by training and experience from their GN roots – prescribe schemes that would open the door to uncontrolled subsidy, and even bankruptcy.

2. THE PROBLEM of PRICING

What is the optimal mix of fares for different modes (rail, bus, mini-bus, paratransit) of public transit in a large urban city in a developing country?

It is a question that policy makers have grappled with and that researchers have only nibbled at. Economists are wont to advocate a laissez-faire policy. i.e., leave-it-to-market and to open competition. The latter was the default prescription under the so-called "Washington Consensus" – ethos prescribed and promoted by multilateral agencies for decades. This position has shifted somewhat over the last two decades, with a pronounced pivot towards a corporatized BRT system. Latter is the reflex prescription, although busways had more than 50 years of history.

The stark reality, however, is that market-determined fares have not gotten traction in all cities – whether GN or GS. Urban commuters need a stable rate to guide their daily commutes, not one that changed daily or hourly. Private transit operators also welcome a third-party arbiter, if only to avoid arguments on the streets. Government, of course, likes to play God and set the 'right' transit fares.

This paper posits four determinants in pricing across multiple transit modes: a) recovery of production cost, i.e., financial viability of the transit operators; b) intrinsic values of the trips carried by each mode with their respective overlapping market niches in a network; c) affordability of fares from the viewpoints of passengers and the subsidy provider; and d) implementation of the chosen tariff. Strictly speaking, the fourth one is not a variable in the fare-setting calculus, but an enabler, if not a constraint, for the chosen fare level.

3. RESEARCH METHODOLOGY

The default approach for researchers is to assemble as much relevant data as possible, apply rigorous statistical analysis, and derive conclusions therefrom. This is an accepted and time-tested methodology to explain or describe a phenomenon *after-the-fact*. This paper, however, is more prospective, addressing the complexity of determining appropriate public transit fares.

A second, and more compelling option, is to scan available literature. It is citational canon to rely on journal publications. This method avoids the proverbial re-invention of the wheel. Surprisingly, this path yielded little at the end of the road.

The emergence of ChatGPT has opened other avenues. This paper chose three Large Language Models (LLMs): Microsoft's *Co-Pilot*, *DeepSeek* from China, and *Threads* by Consensus (not the Meta social media app). The latter is more specialized platform than the first two, positioning itself as an "AI-powered search engine for academic research".

3.1 A Few Harvests from Traditional Method

Scanning the development literature on price setting is like the old-fashioned search on a library's catalogue card, but digitally. There were many papers for railway transit pricing in GN cities. Illustrative is a paper about the City of Chicago (2024, Almagro, et.al) where car-trips are dominant; it came out with a railway fare close to zero in tandem with a reduction of bus services. It is from the vantage of an organized public city transport system, a.k.a. public transport authority (PTA), with unconstrained transit subsidy fund.

Multimodal pricing appeared in a doctoral dissertation (Terchini, 2012) that considered several factors but ended up with only a bus-mode analysis. The author probably assumed that other transit mode can be subjected to the same method, separately and without their combined effects. The closest research that dwell on multi-modality (ADL, 2022) argued for "different prices for different vehicles in the mobility system". It assumed that there exists a fare model with all modes in operation, which a PTA can use and arrive at a decision. But beyond that, it was mum.

3.1.1 Singapore: a GS City that became GN

Often cited as an exemplar of an integrated public transit system, Singapore was very transparent about its data-driven annual fare adjustment formula. As shown in Figure 1, five variables are used (PTC, 2023). The first three rely on impartial indices to measure increases in production costs; while the 4th is a measure of productivity improvements of which a portion (=0.1%) is given as a reward to the transit operator. The last one is akin to the X in the RPI-X price cap regulation (Rees and Vickers, 1995) popularized in UK.

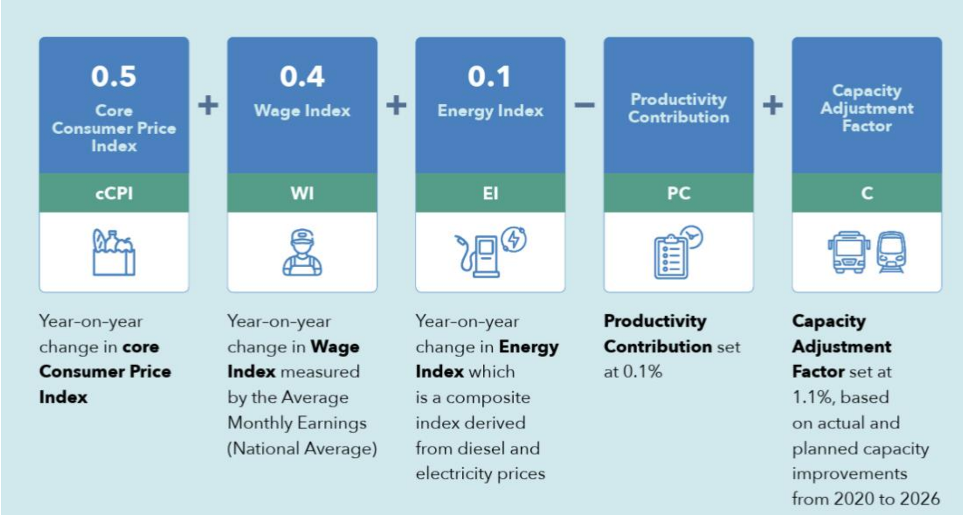

Figure 1 – Singapore's Fare Adjustment Method

3.1.2 Cape Town, South Africa

A paper on Cape Town (Botes, et.al, 2001) analyzed production costs by route and affordability of commuters by area. It started with 3 modes (rail, bus, and taxi) and came out with a recommendation for a higher bus than rail fares, anchored on recovery of operating costs, but ignoring the different value propositions of each mode. How this counter-intuitive result came about, when the cost of roadways is excluded from operating cost (unlike railways which internalizes track cost), is unclear.

3.1.3 Istanbul, Turkiye

While downplaying the multi-modal dimension, a paper (Devici, et.al., 2016) on optimal transit fare proposed an analytical hierarchy process for the city's PTA. The process sets passenger satisfaction and financial balance as objectives to be maximized, constrained by inflation rate, labor costs (drivers, administrative staff, maintenance staff etc.) and fuel costs. It proposes putting weights to different factors, a method that invites application of a multi-objective optimization model.

3.1.4 European Cities

Prost (2018) explored reforms in urban transport pricing policies in OECD countries, with and without road pricing for cars. It concluded that a deliberate lowering of public transport fares (with increasing subsidy) is only a second-best approach, and that road pricing is best accompanied by higher PT prices especially during peak hours. It is an economist recipe for discouraging trips – by car or public transit – during period of highest demand. An implicit assumption is that demand is elastic.

3.2 What's AI's Take?

Nowadays, the use of AI in research is becoming mainstream. Microsoft Co-Pilot (Microsoft, nd) is one of them. Sought for answers, it came out with several factors to consider in fare setting:

1) Operating costs – covering such items as fuel, maintenance, staff salaries, and other operational expenses.
2) Ridership levels – higher ridership leads to lower fares as the cost is spread across more passengers, while lower ridership may necessitate higher fares.
3) Economic factors – inflation, cost of living, and average income levels in the city are considered to ensure fares are affordable for majority of residents.
4) Subsidies and funding – State's instruments to pay for the gap between revenues and expenses.
5) Service quality and coverage – higher quality and more extensive services justify higher fares.
6) Environmental goals – transit is seen to reduce traffic congestion and lead to decarbonization, which are external effects.
7) Equity and accessibility – fares should be fair and affordable to low-income residents, and the service available to people with dis-abilities.
8) Technological advancements – adoption of digital payment systems can impact fare structures and collection methods.

3.3 DeepSeek's Answer

DeepSeek (Tenable, 2025) came out with similar factors as Co-Pilot's, and more. The unique factors it identified are:

1) Political considerations - Politicians are often influenced by the need to maintain public support or to be popular, leading to decisions that keep fares low to the point of unviability.
2) Competition and alternatives – pricing in the presence of competing modes (mini-buses, ride-hailing services, jeepneys, tricycles, etc) can influence modal split.
3) Regulatory institutional framework - the legal and regulatory environment can dictate how fares are set, including whether fare adjustments require public hearings. The fare-setting body often lacks the capacity to undertake comprehensive and quantitative analyses.
4) External and donor influence – a situation where donor agencies effect fare policies as part of funding agreements, often with a focus on the donor's pet advocacies, such as sustainability and social equity.

The preceding resonate with the author's own experience in fare setting. The influence of politics is unavoidable.

3.4 Threads – Another AI

Probably, the closest solution to the problem at hand was revealed by Threads (Schroeder, 2024). It outlined four mathematical methods to determine a fare structure that balances conflicting objectives like affordability, revenue generation, and demand management.

3.4.1 Multi-objective optimization

Each objective can be assigned weights based on their importance. Thus

1. (R): Revenue generated by fares.
2. (U): User satisfaction or affordability.
3. (E): Environmental benefits (like reduced emissions).
4. (w1, w2, w3): Weights representing the priority of each objective.

Policymakers can then estimate fare levels that balance the trade-offs between the three competing goals.

3.4.2 Demand elasticity

This is based on the theory that fare prices affect ridership. Lower fares may increase ridership but reduce per-user revenue. Higher fares may deflate ridership but increase revenue per user. The goal is to find the "sweet spot" where total revenue and ridership reach an optimal balance. Unfortunately, elasticity changes with trip purpose and time of day.

3.4.3 Game Theory

Game theory models the interactions between different stakeholders (e.g., users, operators, and regulators). It helps explore strategies where no party can improve their position without negatively affecting others.

3.4.4 Machine Learning and Simulation

Advanced methods like machine learning can simulate various fare scenarios using real-world data. These tools evaluate how changes in fare structures impact overall efficiency, accessibility, and revenue.

While the preceding methods bring us closer to a reasonable transit tariff, it still falls short. The first begs the question on how to quantify U and E. The demand-elasticity model will result in several “sweet spots” with more than one mode in a route, aside from ignoring the non-price factors affecting modal choice. The 3rd and 4th methods can provide reality checks on what might be, but requires prior ‘educated’ guesses for inputs.

Overall, quantitative models are too wonky for the typical transport regulating entities in a GS city.

4. DISTILLATION INTO FOUR DETERMINANTS

It can be posited that Structural Equation Modeling can be applied to reduce the 12 into 4 determinants. The author opted to skip that process in favor of deductive inference.

Rather than juggle “12 balls in the air”, this paper reduced them into four determinants - to be addressed sequentially, if not iteratively.

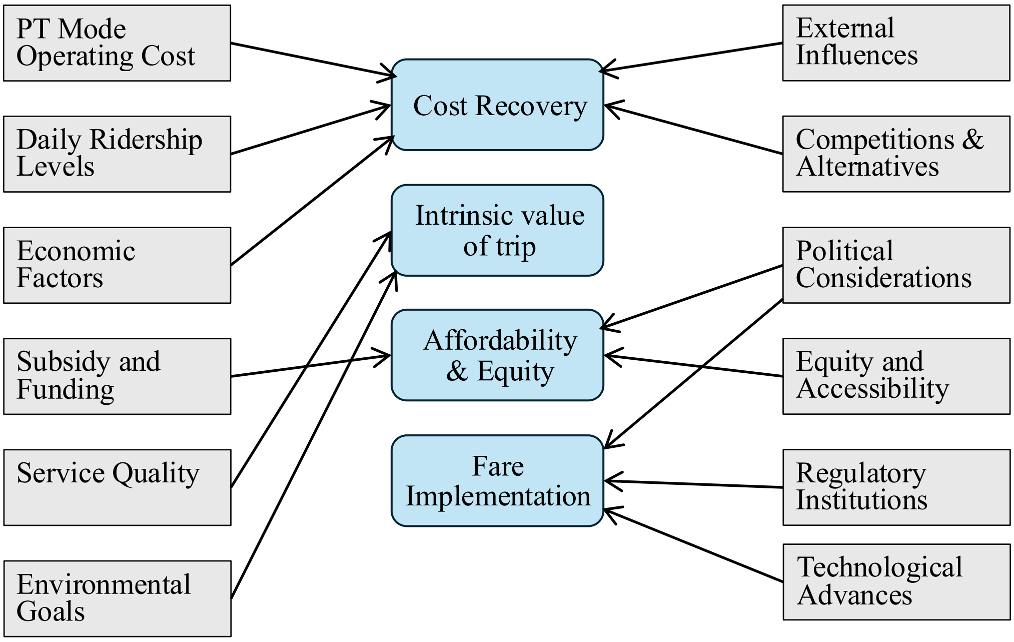

Figure 2 – From Twelve to Four Factors

Demand elasticity was recommended by Threads as an additional factor in pricing. It can be discounted. Data is not easily available and the precision that maybe achieved is not worth the efforts of: separating work-related trips (which are often inelastic) from non-essential trips (which are more elastic), recognizing the differential sensitivities of income groups in different parts of the city, factoring the presence or absence of substitutes in several routes, and cross-elasticities between PT modes.

4.1 Cost Recovery

In whatever context, a transit provider must recover its operating cost - either from the farebox and/or other sources (non-fare and/or public subsidies). There may be some minor debates as to what comprise operating costs and capital recovery. Nevertheless, cost recovery is basic.

For road-based modes, such as buses and lower capacity modes, the cost of the roads is not in their accounts. For rail transit, the capital and maintenance cost of tracks are included.

The cost factor is easy to quantify since data are readily available, in most instances - from either a sample or dataset from transit operators. Variable costs of buses and jeepneys differ based on speed, which in turn is affected by road congestion. However, for practical reasons, average speed in several or all corridors would suffice. Figure 3 illustrates the comparative

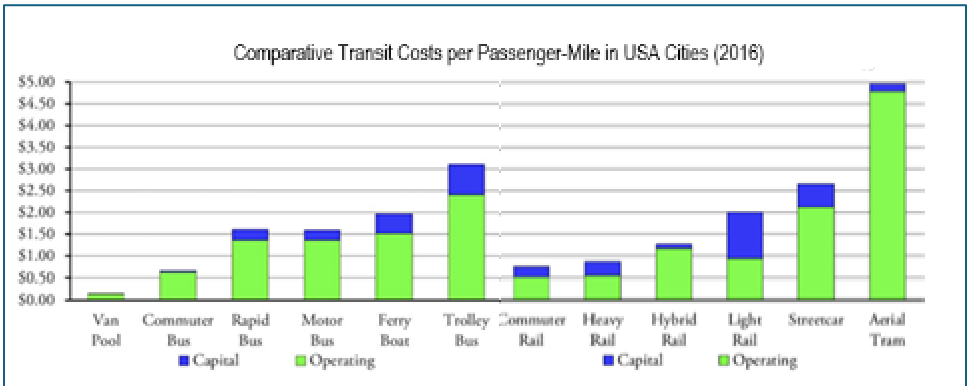

Figure 3 – Comparative Transit Cost per Passenger Mile

values for capital and operating cost by mode, derived in USA cities (O'Toole, 2020). The data for GS cities would exhibit similar variations. In both context, fares that recover cost differ according to modes.

For rail transit, the farebox ratio is readily available data. Figure 4 depicts the comparative ratio for selected cities – GN and GS. It should be noted that the ratios for cities in Europe and North America are below one (i.e., heavily subsidized) while those in Asia are above 1.0 (zero or little subsidy). Despite the high subsidies to bring down fares in GN cities, their market share of public transport is less than those in GS cities.

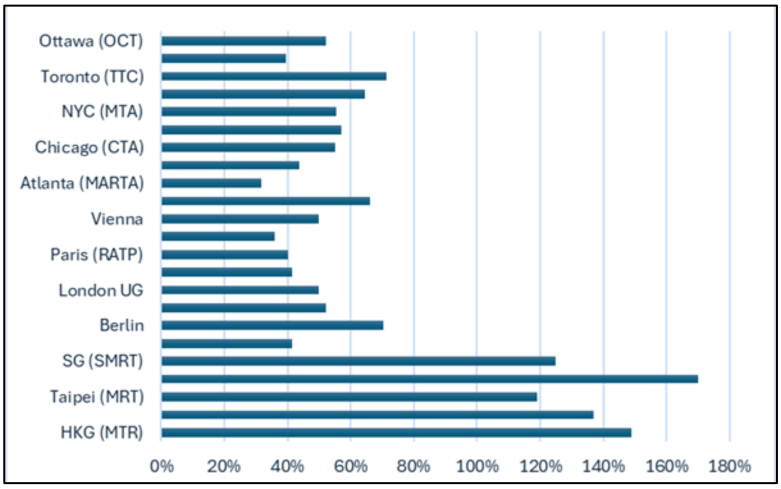

Figure 4 - Farebox Ratios for Rail Transit in Selected Cities

Where available, the production cost of the most efficient operator should be used as the benchmark lower bound for fares – for rail, bus, and other modes. The 3 rail lines in Metro Manila, for example, started with farebox ratio above 1.0 when they commenced commercial operations; but by 2024 exhibited wide differences (with Line 1 above water, and Lines 2 and 3 below 0.70).

4.2 Intrinsic Value of Trip

This factor revolves around the value proposition of a trip in a particular mode. It is the aggregate benefits to a commuter taking that trip, the flipside of social costs (which is the sum of private costs and external costs). Some researchers would label this as a social surplus.

A 10-km trip by rail, or bus, or taxi is not of the same value: fare wise, cost-wise, or benefit-wise. The most obvious differentiator is travel time, which differs according to mode and trip classes (VTPI, 2009).

In traffic assignment model, the flow of passengers from one origin to a destination is distributed according to a generalized utility function. The utility value is a function of travel time, travel cost, and waiting time; with transfer cost added in more sophisticated demand forecasting models. The premise is that a commuter would choose the mode and route that gives him the maximum value or utility. A study of rail users in Metro Manila (Dimla, et.al, 2024) found that safety, time, cost, and reliability of modes greatly influence their travel choice.

Thus, if all the intangibles can be quantified, they could provide an upper bound to the price of a trip on that mode. Unregulated, a profit maximizing operator – without a competitor - would raise fares until his gross revenue peaks or capacity is breached, whichever comes first.

4.3 Affordability, Equity and Subsidy

The poor are the favorite scarecrows against fare adjustments. While it has some merit, it ignores the fact that not all public transport users are poor. In fact, majority of PT users can afford to pay. Otherwise, the thousands of small-scale transport providers would not have prospered.

Several surveys showed that the non-poor segments constituted a larger proportion (90%) of riders on Manila's LRTs. In contrast, the poor comprises the greater portion of paratransit riders, on tricycles that charge Php25-Php40 for a trip less than 2 km. This mode often serves as the last-mile or first-mile, where the only substitute is walking. The irony is that a Php1 or Php2 adjustment for jeepneys (currently, at Php13 for a trip distance of 4km) is opposed, but there is nearly no objection to the 3x higher fare for tricycles. Aside from the poorer segments, which are already granted monthly cash grants under the government's Conditional Cash Transfer program, students and senior citizens are two special groups given fare discounts of twenty percent on domestic transport.

The other side of affordability is the government. Nearly all GS countries suffer from fiscal deficit. Urban rail transit is subsidized, while other modes are not. In the Philippines, a token subsidy of Php2 per liter of diesel for the road-based PT is occasionally extended, but rarely reaches rural areas (where petrol stations are few) nor sufficient to cover several months of urban operations.

The government bears the cost of a subsidy. If the regulator forces the fare to go below cost, the transport operator ends up paying for the subsidy. And with negative cost recovery, capital investment and maintenance degrade to the detriment of present and future commuters. Supply and service quality suffers, demand shifts to alternatives. On the other hand, if paid directly by the government to transport operators, the subsidy becomes a convenient cover for service inefficiencies. A targeted subsidy – one that is limited to a commuting segment – removes the dark side of transport subsidy.

4.4 Implementing the Preferred Fares

Implementing a fare regime is often seen as an issue of flat vs distance based. Often overlooked is the more important lens of political acceptability, as well as the enabling role of digital payments.

4.4.1 Distance vs Flat Fare

PT fares have largely tilted towards distance based, especially with the emergence of digital payment systems. Arguably, flat fare is unfair to short-trip makers and to transit operators, aside from a nod to sprawl development.

Table 1 – The Issues About Flat Fare

Pros	Cons
Simplicity: Flat fare systems are easy to understand and use	Inequity: Flat fares can be seen as unfair to those who travel shorter distances, as they pay the same as those who travel longer distances.
Speed: Since all passengers pay the same fare, boarding can be faster.	Revenue: Flat fare systems may not generate as much revenue as distance-based systems
Accessibility: A flat fare can encourage more people to use public transportation, particularly for shorter trips, which can reduce traffic congestion and pollution	Subsidies: To maintain affordability, flat fare systems often require more subsidies from local governments or agencies, which can strain public budgets.

Predictability: Passengers always know the cost of their trip in advance,	Limited Incentives: Flat fares do not encourage efficient use of the system, such as spreading out travel times or choosing shorter routes

Table 2 - The Issues About Distance-based Fare System

Pros	Cons
Fairness: Charges passengers based on the distance traveled, making it fairer for those traveling shorter distances.	Complexity: Can be more difficult for passengers to understand and calculate the cost of their trips.
Revenue Generation: Can potentially generate more revenue, which can be used to improve and expand services.	Time-Consuming: Boarding may take longer as fares need to be calculated and verified.
Incentives for Efficiency: Encourages efficient use of the system, such as choosing shorter routes or traveling during off-peak hours.	Variable Costs: Passengers may face unpredictable travel costs, making budgeting and planning more challenging.

4.4.2 The politics of transit fares

Fares in GS cities are invariably vulnerable to political intervention. Elected officials like to pander to what is popular. This fact alone creates an invisible upper ceiling on upward adjustments in transit fares. Agencies that regulate fares take the path of least resistance. Selling the new fare regime entails timing, as well as the conduct of information campaigns anchored on data and transparency to which regulators are not good at.

4.4.3 Fare Integration across modes

An integrated public transport system is incomplete without fare integration. Its biggest impact is on ridership system wide. As articulated in a paper (Sharaby and Shiftan,2012), switching from a complex per-boarding fare system to an integrated fare with free transfers leads to a significant increase in ridership. “Single ticket sales rose by up to 25% in the first year, passenger trips increased by 7.7%, and boardings by 18.6%”. The average number of boardings per trip also increased, indicating that people were making more use of multimodal connections and free transfers. The fare reduction and integration encouraged shifts from private cars and taxis to public transit, created new trips, and expanded travel options for users.

Digital payment system makes fare integration do-able, as well as the application of targeted subsidy. The subsidized segment can be issued payment cards with discounted features. For example, senior citizens in Metro Manila enjoy fare discounts. The *Octopus* card in Hongkong, the *Oyster* card in London, *Jak Ling*ko in Jakarta, and *SimplyGo* in Singapore are good examples of cashless payments.

5. PUTTING THE FOUR-WAY TESTS INTO THE WRINGER

5.1 Why Metro Manila?

Table 3 are the features that make Metro Manila a typical city in the global South.

Table 3 - Key Characteristics of Metro Manila's Public Transit

Item	Scale	Remarks
Population & Area	~15 million, of which 3⁺M are informal settlers	Spread over 611 km^2 area, with 17 local gov't units. A sizeable portion of workers in the Informal Sector.
Railway Lines	60 kms track length; 55 stations	3 LRT. Line 1 under PPP; Line 2 under LRTA; Line 3 under DOTr
Buses	4,600 units under 156 bus companies	31 re-organized bus routes. 16-hour operation, a few on 24-hours.
Jeepneys	~73,000 units in 685 routes	Mostly 1 unit=1 operator; capacity=15-20 pax. To be replaced with minibus w/capacity of 22pax. Drivers are mostly on 'boundary' system
GTE/UV Express	No data, estimated 100^+ routes	Vans with 10pax, point-to-point service, loose service schedule
Motorized Tricycles	~200 thousand	Franchised by local government units. Also set fares for tricycles in their jurisdictions.
Fare Regulator	2 national agencies & local governments	A rail regulatory unit under DOTr sets rate LRT; Bus and Jeepney fares are set by LTFRB. No fare integration across modes.
Digital Payment	Beep card on 3-Rail lines, and some buses	P2P or Express Buses uses TripKo or Beep; Other buses and Jeepneys on cash method

Another reason for using Metro Manila as an example is convenience: data, as well as several studies on rail and non-rail public transport, are available for this paper.

Table 4 - Fare Structure as of 30Jan2025

LRT-1	Boarding fare = Php13.25 plus Distance fare = Php1.21/km by end 2024. Average fare/pax = Php25.30 Fare was stagnant from 2011 to 2014. Adjusted in Aug 2023 and May 2025.
LRT-2 & LRT-3	Same as above for 2024. Average fare/pax = Php23.90 for Line 2. Data for Line 3 not yet available. Fare Rate for 1st sem2025 the same as in 2023.
Bus (40-60 pax)	Regular (non-aircon) bus. Boarding fare = Php12.0 plus Php2.25/km after 4km. Aircon Buses fares: Boarding fare = Php15.00 plus Php2.65/km after 4km. Fare unadjusted since Oct 2024, despite stated fare policy
Old Jeepneys (15-20 pax)	Boarding fare = Php13.0 plus Php1.80/km after 4km Fare unchanged since Aug 2023.
New Jeepneys (20-30 pax)	Boarding fare = Php15.0 plus Php2.20/km after 4km Fare unchanged since Aug 2023.
PU Vans	Flat fare, ranging from Php15 to Php60 depending on route distance
Tricycles	Guiding tariff of Php16 plus Php5/500 m after 1.0 km. But usually negotiated and split among passengers. Average =Php25/pax

Bus operators have filed applications - as far back as 2023 - for rate adjustments to the Land Transportation Franchising and Regulatory Board (LTFRB). These remained unacted, as of mid-2025. The petition is for a ₱4 to ₱7 base fare increase for city and provincial buses, along with a ₱0.45 to ₱1.20 per-kilometer rate adjustment, depending on the type of bus.

The modal share of paratransit is sizeable in GS cities. In Metro Manila, jeepneys accounted for 28% of about 19.5m trips/day, with buses at 10% share, and 6% by rail (JICA, 2019). Although banned from major roads, motorized tricycles got 23% share. Modal split has likely changed toward more private trips since 2017.

A study (UITP, 2024) on mobility in the global South found that in 18 large African cities, paratransit represents 60% to 100% of collective transport.” This mode is nearly absent in GN cities.

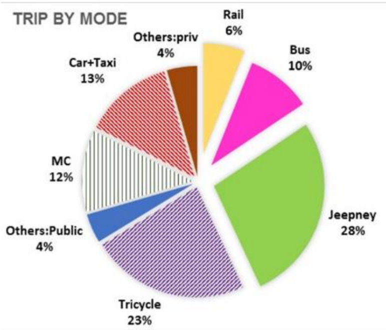

Figure 5 - Modal Split in MManila

5.2 Determining PT Fares for Metro Manila

For the first factor, Table 5 shows the estimated operating cost for LRT, bus, jeepney, minibus, and motorized tricycles in Metro Manila.

Table 5 - Operating Cost vs Fare Revenues*

PT Mode	Mnmgt	Ave. Fare/Pax	Oper.Cost/ Pax	Remarks
LRT-1	Private	25.30	22.60	*Calculated average fare for 2025= Php29.38, at farebox ratio =1.30*
LRT-2	Gov’t	23.90	34.60	*Operating cost is higher than Line 1.*
LRT-3	Gov’t	18.46	61.60	*Data for Year 2023.*
Bus	Private	20.87	21.38	*In need of fare re-set. Government inaction has deterred fleet renewal and addition.*
New Jeepney	Private	15.00	12.71	*New jeepney appears to be above water, without debt servicing*
Jeepney	Private	13.00	19.37	*Traditional jeepneys are dwindling, struggling by resorting to overloading & shaving income of drivers and owners*
Trikes	Private	25.00	21.32	*Charges Php45 for solo pax, or carry extra pax >2*

**Data calculated by author, from various sources. Php to USD at 56:1.00*

As to the second factor, travel time is used as the estimator of value. The comparative average travel times (TT) for 3 years by different modes for Metro Manila, is depicted in Figure 4. A rail trip, on the other hand, averaged 17 minutes for a 8.5-km journey of a typical commuter. Using the average minimum wage, the value of time yields the add-on cost penalty for longer trip time that is not reflected in the fares. The mode with the least travel time yields the highest economic value.

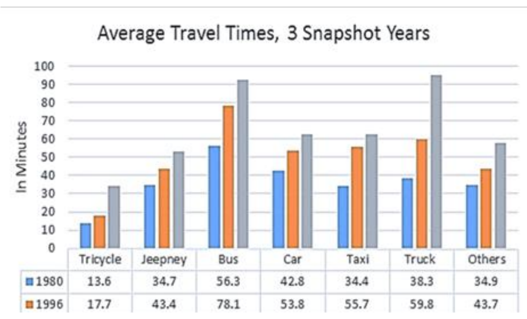

Figure 6 – Travel Time, by Mode

For the most part, valuations based on TT are not monetized or captured at the farebox. Assuming these are shared on a 50:50 split with commuters, then a railway trip would end up as the most valuable against other modes. The longer the trip lengths, the higher the benefits of taking the railway.

A survey conducted in 2018 for road-based public transport riders in Metro Manila revealed a willingness-to-pay Php10 more for travel time savings of 10 minutes. At that time, the minimum fare for bus/jeepney was Php10. Another survey (LRMC, 2024) among rail riders revealed that 88% were willing to pay an additional Php10 for time savings of 10 minutes, and 54% for an additional Php20 for time savings of 20 minutes. The alternative option to rail is jeepney, which would take an extra 33 minutes; equivalent to an indirect charge of Php44. What this implies is that a commuter taking rail would still benefit even if the rail fare went up by Php20 (which would result in 2x the prevailing average rail fare).

The results of valuation are reflected in Table 6. Bus trips take the longest because of traffic congestion, where a bigger vehicle is less nimble than a smaller vehicle on the road.

Table 6 - Intrinsic Benefits

	½ of Eco Value	Ave. Time
LRT	45	25.0
Bus	0 (use as base)	92.2
Minibus	18.0	60.0
Jeepney	22.0	53.2

By differentiating fares according to mode, transit prices could serve the additional purpose of nudging commuters toward the most efficient mode on a route or market segment where they enjoy the most comparative advantage. There exists a hierarchy among modes, although the boundaries overlap. Railways are built on transport corridors of highest demand, and micro transit for the short-distance feeder roles. Competition and collaboration co-exist. The variety of modes explains why various studies (Coulombel and Monchambert, 2022) came out with conflicting conclusions about economies-of-scale for urban transport.

The 3rd factor is affordability and equity. If a minimum wage earner (=Php645) spends about 13 % of his daily income to transport, then the affordable cost of fare is Php83 per day, or Php42/trip. Fares for the government-run LRTs are subsidized by the government. Line 3 had the highest subsidy, at approximately Php43/pax. In contrast, all road-based public transport modes are not granted subsidies, except for limited fuel cost discounts. When covered by national funds, the cost of the subsidy is shared even by taxpayers outside the city and therefore inequitable. While Philippines regulators pay lip service to affordability, there is no record they ever quantified the needs of the poor or dis-aggregated the commuting markets according to income.

This leads us to the 4th factor: the structure of fare. Distance-based fares would be ideal for rail and bus, as they cater to longer trip lengths. A low boarding fare in tandem with a higher distance rate is recommended. For seamless transfers, the transfer from one mode to another should be zero, or near zero. Absent a common digital fare ticketing system, a low boarding fare would be a second-best option to reduce penalties for inter-modal transfers. Such a multi-modal payment system already exists in a GS city: *Jak Lingko* (Wikipedia,2025) in Jakarta. The integration covered BRT, Commuter rail, Light Metro, MRT, LRT, Airport rail link and local *angkot* (Mikrotrans). On the other hand, Metro Manila's Beep System is still as basic as it was since its introduction in 2015.

A flat fare would be suitable for micro transit – as it avoids the complication of fare calculations for the most fragmented and dispersed mode; more so, because the average passenger trip length is less than 4.0km. The flat fare for jeepneys and new jeepneys also disincentivize overlaps with higher capacity modes. In practical terms, jeepneys are most averse to non-cash transactions aside from being notorious in ignoring loading/unloading signs.

A proposed pricing structure for different PT modes in Metro Manila is illustrated in Figure 7. For trip distance longer than 5.5km, LRT will cost more than the other modes. The bus would

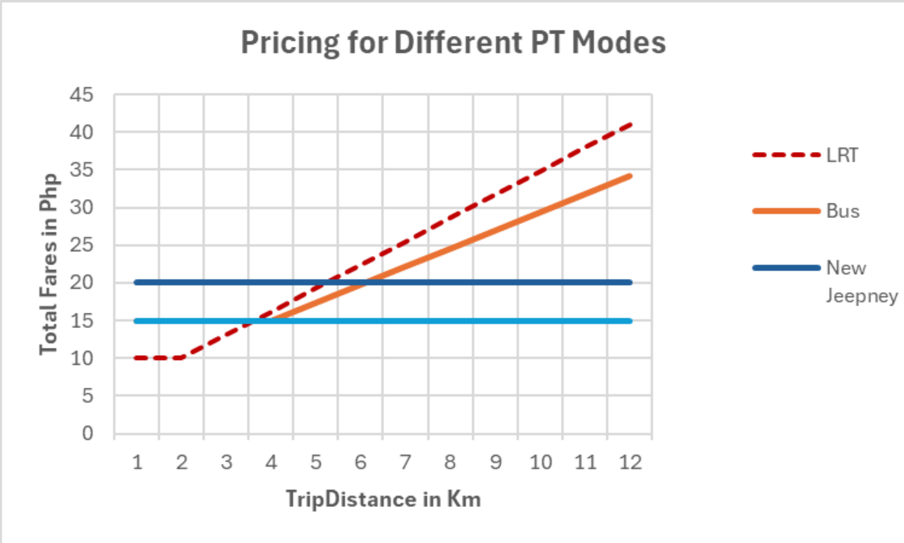

Figure 7 – A Notional Pricing Structure for Various Modes

be slightly cheaper than rail after 4 kms, as it is often in competition with rail for long trip distances.

In relation to the boarding plus distance fare structure, 44 cases under six fare scenarios were simulated based on discrete choice modeling for Davao City (Ninomiya, S., et.al, 2017), a secondary urban center in the Philippines with no railway line. The modal share of public transport was almost 70%; mostly by jeepney class to be replaced with regular and large buses. It favored a higher boarding charge when the overall fare level is on the high range, and conversely a low distance rate when fares are in the low range. It suggested that removal of the transfer charge – with a single bus operator – enhances its profit as well as social surplus. However, it did not indicate the operating cost that should be recovered.

5.3 Poster Boy of Schizophrenic Regulation

Not only does Metro Manila tick the boxes of GS city, its management of the fare-setting issue is equally amorphous. One can't make heads out of tails. There were no four factors to consider.

For example. Sometime in January 2025, the rail regulatory unit of the Department of Transportation conducted a public hearing in response to a petition from the private operator of LRT 1 to adjust its fares in accordance with the terms of its PPP Concession Agreement. That agreement stipulated a biennial adjustment of fares at the fixed rate of 5% per annum, equivalent to 27% from 2016 to 2024. The belated fare adjustment was approved but based on changes in the Consumer Price Index, rather than what is in the contract. The CPI went up by 22% from 2016, which it applied to both the boarding and distance rates. In the process, it also ignored the fundamental reason for the boarding fare, as well as presuming that the old structure was correct *priori*. Strangely, the fares for LRT-2 and LRT-3 were held static; the 2 lines are under government management, and as noted earlier, were worse off in terms of farebox ratio. These two lines also exhibited congestion and capacity shortages, i.e., overcrowding. The absurdity was multiplied when the government ordered – on 20June 2025 - the increase in discounts to students (PWD and senior citizens) from 20% to 50% (PIA, 2025) on the 3 rail lines!

Adding to the contradiction, no corresponding fare movement or review has transpired for buses and jeepneys modes – despite clamor from operators and their precarious viability. This matter lies with an affiliated but separate agency that committed to a fare formula (LTFRB, 2019) based solely on changes in fuel prices. Whilst the formula itself is deficient, it would at least provide temporary relief and waive lengthy and pro-forma public hearings. It chose to violate its own rules. By 20-June2025, the regulator announced that it was considering a fare increase of one peso (from base of Php13), which is still below the break-even level shown in Table 5.

This was not the first time that PT operators were forced to accept a low fare and to subsidize commuters from their own pockets. For jeepney drivers who eke out their daily income from the excess of farebox over lease and fuel cost (colloquially named boundary system), this forced subsidy comes from their share. History has shown that such stagnant fares led to a decline in quantity and quality of service. The dwindling supply was already apparent, after the 2-year Covid lockdown. Parenthetically, a government official admitted that 1/3 of those who participated in the Public Transport Modernization Program (involving the shift from old to new jeepneys, among others) of the government have defaulted on their loans (Garner, 2025).

Another paradox is the popularity of tricycles. It is the most expensive mode per km (Php15/km) and yet is preferred by those on the lower income brackets over walking or bicycling.

Concerns for the poor have always been the favorite alibi for holding the fares down. And yet, in determining or adjusting the fare tariff, there is no semblance of measurements: how many, which route, and on what mode. Nor results of surveys on willingness to pay ever enter the calculus.

Obviously, the fare setting mechanism for Metro Manila's public transport system is broken. What it offers to other GS cities is lessons on what not (and how not) to do.

6.0 EPILOGUE

6.1 Policy Recommendations

As a general principle, all GS cities should maximize users' contributions to sustainable public transport. That means fare levels that cover operating costs, which prevail where private service providers are dominant. It is only when the railway is put into service, or when the government decides to operate directly bus services, that fares below operating cost become the norm.

The setting of fares for each mode, separately from other modes, should give way to joint consideration of all PT modes. One cannot talk of transport integration without fare integration. This should be preceded by a total review of the fare structure – boarding and distance rates – rather than the simplistic application of percentage increases. A wrong starting base only amplifies the error of percentage increases at later years. Moreover, the fare for each mode should be set relative to other transport modes, if only to distinguish their unique roles in the network.

The boarding fare for all rail lines should be reduced gradually - initially to Php10 and to zero (for inter-rail transfers within 30 minutes) as improvements in the digital payment system are made. When expanded to all PT modes, it will reduce intermodal transfer penalties whilst encouraging more PT patronage.

Coordinated – if not integrated - pricing occurs when there is a single metro transit authority for urban areas. This will obviate conflicting decisions when disparate national and local government regulatory bodies exist. The burden for targeted subsidies, if required, can then be borne by the beneficiary cities rather than shared by non-residents. A second-best solution is for regulators to adhere to a common principle – such as the 4-factors laid out in this paper. Periodic review and evaluation, say annually, should be conducted without waiting for a petition from operators and with the data and findings shared to the public.

Privatization of existing railway lines, as well as resorting to Public-Private Partnership for their expansion and improvements, lead to improvement in service delivery aside from insulating the transit providers from political grandstanding. Conversely, the lure of nationalization – where government replaces private sector on road-based PT modes – should be resisted as the government is proven to be a bad manager. Worse, it opens Pandora's box to unconstrained fiscal subsidies. Ironically, the service-contracting prescription for privatization in GN cities turns into a form of nationalization when applied to GS cities dominated by thousands of privately-owned transport providers. The latter is abhorrent to GN cities, but popular – not to mention, a saving grace to poor transit governance - in GS cities.

6.2 Recommendations for Further Research

With progress in digital technology and with full awareness of the persistence of institutional deficiencies, the possible assignment of such fare-setting functions to AI should be explored. Not generative but Agentic AI, spewing out a suggested Fare Table by mode. This could include a feature for dynamic pricing to influence re-distribution of traffic flows in congested networks.

A low-hanging fruit is the introduction of a mobile application that provide commuters journey options involving several modes to complete a journey. On this score, GS cities can take a cue from Jakarta's *Jak Lingko* – which began in 2017 as a public transport integration program designed to integrate payment and physical connection between transport modes (Metro, LRT, Commuter Rail, Airport rail link, BRT, and *angkot*) in the city.

A study that may tempt academics is about an optimal combination of fares that would result in higher market share for public transport or maximize profitability. While interesting by itself, the level of sophistication and complexity may overwhelm the little benefit that could be achieved, considering the absence of a single agency and funding source for subsidy in GS cities. Besides, the PT network itself is far from optimal. It has not deterred several researchers to explore the issue of fare optimality. One paper (Kaddoura, et.al. 2019) has even resorted to agent-based simulation model. In almost all cases, a single PT mode was assumed as well as the availability of up-to-date data. These two conditions, however, are deficient for most GS cities.

6. 3 Summary

The pricing of urban public transit, especially in developing countries, is more than just about fares. For this reason, governments could not resist intervening in the market despite obvious shortcomings. In doing so, it risks triggering a greater catastrophe: a decline in service quality if not a shortage of PT supply.

As a policy paper (World Bank, 2002) on urban transport stated ". . . in the interests of both urban transport integration and sustainability, developing countries should move toward prices reflecting full social costs for all modes; to a targeted approach to subsidization reflecting strategic objectives; and to an integration of urban transport funding."

This paper offers a simplified playbook on fare setting through the lens of four factors: cost recovery, intrinsic value of trip, affordability with equity, and implementability.

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