Appendix 1

Optimal Public Transit Fare Structures in Small and Mid-Sized Cities:

A Public Finance Perspective

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[1] Introduction

Designing public transit fares in small and mid-sized Canadian cities presents unique challenges. Lower ridership density, modest farebox recovery, and heightened equity concerns all complicate fare setting (Litman, 2023; Rosen, Gayer, Tedds, & Tombe, 2023). Optimal fare structures must balance allocative efficiency—pricing rides near marginal cost—and vertical equity—ensuring affordability for lower-income riders (Rosen et al., 2023; Brown, 2018). Achieving the right efficiency-equity trade-off involves setting tax subsidies at a level that encourages appropriate resource allocation (Litman, 2023).

This paper analyzes transit fare policy through a public finance lens, treating public transit as a merit or club good—justifying partial subsidization for most users (Litman, 2023; Musgrave, 1956). Key frameworks include marginal cost pricing, Ramsey (second-best) pricing, and Lindahl pricing (Rosen et al., 2023; Ramsey, 1927). Examples from Canadian and U.S. cities illustrate how different fare structures perform on efficiency, cost recovery, and equity criteria (Brown, 2018; Canadian Urban Transit Association, 2023). The goal is to offer a practical framework for policymakers, acknowledging the inherent trade-offs in fare policy design. To that end, the paper concludes with potential policy proposals aimed at optimizing public transit fares.

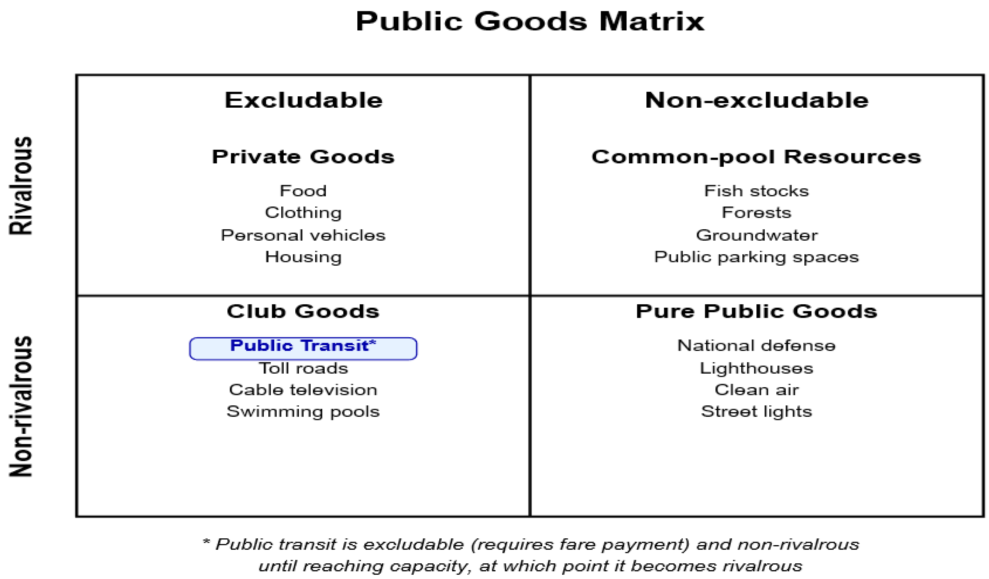
[2] Understanding Public Transit in the Context of Public Goods

Publicly provided goods span a spectrum or continuum from pure public goods at one end—non-rivalrous and non-excludable, like national defense—to pure private goods—rivalrous and excludable, like pizza (Rosen et al., 2023) at the other end. A good is non-rival when additional users impose no extra cost, and non-excludable when it is prohibitively costly or impossible to prevent usage (Rosen et al., 2023).

Public transit falls between these extremes. In uncongested settings, it is generally non-rivalrous (one more rider does not reduce service for others) but excludable (fares are charged), making it a club good (Litman, 2023; Levinson & King, 2013). This classification supports targeted public intervention and partial subsidization.

Figure 1 illustrates the public goods matrix, placing transit as a club good. Economists also label transit as a merit good—a service with positive externalities (e.g., less congestion, lower pollution, better access to jobs) (Musgrave, 1956). Because individuals may undervalue these benefits, market-driven transit use tends to be suboptimal (Rosen et al., 2023; Litman, 2023). Public finance theory therefore supports government intervention, often via subsidies or price controls, to encourage socially optimal transit use (Rosen et al., 2023; Litman, 2023). In practice, nearly all transit systems are subsidized, though actual subsidy rates often exceed the theoretical optima (Litman, 2023; Zipper, 2023).

Figure 1. Public Goods Matrix illustrating the classification of public transit as a club good.



Some scholars advocate viewing transit more explicitly as a club good—excludable but non-rivalrous up to capacity (Buchanan, 1965, Levinson & King, 2013.). Agencies can use membership models (e.g., passes) to cover fixed costs, enabling low marginal cost per additional rider, especially when vehicles are under capacity (Levinson & King, 2013). This justifies two-part tariffs (fixed fees plus low per-ride prices) to enhance efficiency and build loyalty (Levinson & King, 2013; Rosen et al., 2023).

Lindahl pricing, while impractical for transit, highlights the ideal: each rider pays in line with their benefit (Rosen et al., 2023; Lindahl, 1919). Since this is unmeasurable, real fare structures use discounts for perceived high-need groups (students, seniors) and general tax subsidies to approximate fairness and equity (Litman, 2023).

[3] Efficiency vs. Equity Trade-offs in Transit Pricing

Economically, the optimal transit fare equals the marginal social cost (MSC) of a trip: the marginal operating cost (often near zero off-peak) minus marginal external benefits (e.g., reduced congestion or pollution), plus any marginal external costs (e.g., crowding) (Fielbaum et al., 2020; Vergés, 2023). In many small and mid-sized cities, spare capacity means the cost of one more rider is almost nothing. Further, the “Mohring effect” means higher ridership can improve frequency and reduce wait times, creating additional positive externalities (Fielbaum et al., 2020; Mohring, 1972). Ideally, fares should be very low—or even zero—until the point where marginal social benefit (MSB) equals marginal social cost (MSC), justifying government subsidy to reach this social optimum (Vergés, 2023; Rosen et al., 2023).

However, agencies face budget constraints and cannot provide unlimited subsidies. When marginal cost pricing would create unsustainable deficits, “second-best” pricing is needed: fares are set above marginal cost to recover revenue, even though this reduces efficiency by deterring some beneficial trips (Vergés, 2023, Rosen et.al, 2023).

Ramsey pricing addresses this trade-off by marking up fares where demand is less price-sensitive (lower elasticity), and discounting where it is more elastic, thus minimizing total welfare loss for a given revenue target (Rosen et al., 2023; Ramsey, 1927; Vergés, 2023). For transit, this implies higher fares for peak-hour downtown commuters (who have few alternatives) and lower fares for price-sensitive groups, such as low-income or off-peak riders. While Ramsey pricing maximizes welfare under a break-even constraint, it can conflict with equity: the least price-sensitive are often higher-income, while lower-income riders may be priced out by fare increases (Brown, 2018).

Vertical equity—ensuring affordability for those with limited financial means—is a central goal in transit policy (Litman, 2023a; Rosen et al., 2023). Many systems provide fare discounts or subsidies for low-income riders, treating transit as both a basic service and a social policy tool (Litman, 2023a). This creates an explicit trade-off: providing deep discounts or free rides to low-income individuals can increase ridership beyond the efficient level, as the extra trips may not yield commensurate social benefits (Gagnepain et al., 2024; Rosen et al., 2023a). Public finance theory acknowledges that some efficiency loss is accepted for improved equity and access. The optimal approach is to target subsidies to those who need them, minimizing unnecessary inefficiency, and to fund them via progressive taxes or general revenues, not solely from the transit budget (Musgrave, 1956; Litman, 2023a).

Empirical evidence illustrates this tension. For example, studies of California transit systems show that flat fares create cross-subsidies: short trips (often by lower-income, urban riders) are overpriced relative to cost, subsidizing longer, peak-hour suburban trips (often by higher-income riders) (Brown, 2018). Off-peak riders also return a higher share of costs at the farebox than peak commuters, furthering both allocative inefficiency and vertical inequity (Brown, 2018). In effect, poorer urban riders often subsidize longer, higher-income commutes—an outcome that is both inefficient and inequitable (Brown, 2018).

Recent empirical work in Los Angeles reinforces the efficiency–equity tension in fare policy. Research on LA Metro’s flat fare system found that low-income riders paid about 29% more per mile than high-income riders, reflecting a disproportionate burden under flat pricing (Brown, 2018). While LA is a large city, the principle applies elsewhere as well.

The Brown (2018) study modeled alternatives and found that a distance-based fare combined with off-peak discounts would be most equitable: under this approach, low-income riders would pay about 7% less per mile than higher-income riders and face the lowest absolute fares. This better aligns with vertical equity, as distance and time-based pricing does not penalize short, off-peak trips disproportionately made by lower-income riders (Brown, 2018; CUTA, 2023). However, the authors caution that high minimum fares or mode surcharges can make even distance pricing regressive (Brown, 2018). Qualitative research (Canadian Urban Transit Association, 2023) echoes this point.

The study also highlights a subtler equity issue: monthly passes and volume discounts can be regressive. Higher-income riders are more likely to afford unlimited-ride passes, gaining access to discounted rides, while many low-income riders, unable to pay upfront, are forced to pay per ride—unless assisted by subsidies (Brown, 2018). As a result, the poor may pay more over time than wealthier frequent riders, creating a cross-subsidy favoring the better-off (Brown, 2018; Litman, 2023). This insight has led some agencies to adopt fare capping—ensuring that no rider pays more in a month than the cost of a pass—to improve equity (Litman, 2023).

In summary, the efficiency-equity tension in transit fare policy is fundamental (Rosen et al., 2023; Litman, 2023). Economic efficiency suggests low fares, especially off-peak, but requires substantial subsidy (Mohring, 1972). Equity goals push agencies to reduce fares further for those least able to pay—sometimes beyond the welfare-maximizing level (Gagnepain et al., 2024). The optimal compromise is a second-best solution: subsidies (via taxes or cross-subsidies) fill the gap between efficient prices and financial constraints, targeted to those most in need while minimizing distortions for others (Rosen et al., 2023; Vergés, 2023). In practice, agencies mix fare structures to manage these trade-offs, as section 4 examines.

3.1 Elasticity and Economic Welfare Implications

One important consideration about fare structures is how consumers respond to price changes, or the elasticity of demand. Empirical evidence finds that the price elasticity of transit demand in small and mid-sized cities typically ranges from -0.2 to -0.6 (Paulley et al., 2006; Taylor & Fink, 2003; Litman, 2025). That is, a 10% fare increase reduces ridership by 2–6%, all things equal. This means that transit ridership with respect to transit fares in elastic.

This generates some economic welfare implications[1] that analysts and decision makers need to be aware of. Namely:

- **Potential Efficiency Loss:** Higher fares deter trips whose social benefit exceeds marginal cost, generating deadweight loss (Small & Verhoef, 2007).
- **Revenue/Cost Recovery:** Modest fare increases can boost revenue, but large increases risk disproportionate ridership losses—especially among lower-income, price-sensitive groups (Paulley et al., 2006).
- **Zero or Sharply Reduced Fares:** Fully subsidized fares for some groups (e.g., children/youth) have strong equity effects but may induce trips with low marginal

[1] Note the term welfare here refers to the total benefits people receive from consuming goods and services, minus the costs. When economists talk about "maximizing welfare," they mean finding ways to make society as well-off as possible overall.

social benefit—particularly if crowding or nonzero marginal costs are present (Litman, 2023). Optimal subsidy policy requires careful targeting and monitoring of behavioral responses to fare changes.

[4] Analysis of Fare Structure Models

Small and mid-sized cities employ a range of fare structures, each with different implications for efficiency, cost recovery, and equity. The four main approaches are: flat fares, distance-based pricing, time-of-day (peak/off-peak) pricing, and means-tested discounted fares (Canadian Urban Transit Association [CUTA], 2023; Litman, 2023).

According to CUTA (2023), most agencies use a combination of these models, such as a flat base fare combined with targeted discounts or passes. The association identifies twelve fare products, but most are variations on these four core types. CUTA evaluates fare options using six criteria, placing "affordability and equity" first—highlighting its primary importance among agencies. The report does not endorse a single "best" option, instead presenting a menu for agencies to consider (CUTA, 2023).

4.1 Flat Rate Fares

A flat rate fare charges the same price per ride regardless of trip length, zones, or time of day—a historically common and simple approach in North America (Brown, 2018; Litman, 2023). For example, smaller cities like Saskatoon and Kingston charge a uniform cash fare (e.g., $3.00) for any local trip, with minimal category discounts (City of Saskatoon, 2025; City of Kingston, 2025).

Efficiency:
Flat fares are easy to understand and administer, but they do not reflect marginal costs. Since operating costs vary by distance and peak period, flat fares overcharge short, off-peak trips and undercharge long, peak trips, resulting in cross-subsidization (Brown, 2018). This leads to under-consumption of short trips and over-consumption of long trips, with empirical studies showing riders making short journeys pay a higher per-mile rate than those traveling farther (Brown, 2018). If most trips are similar in length and uncongested, flat fares may be an acceptable proxy for marginal cost pricing, but generally they are allocatively inefficient (Rosen et al., 2023; Litman, 2023).

Cost Recovery:
Flat fares can be set to target a desired farebox recovery ratio, but cross-subsidies mean costs are not evenly recovered across services (Litman, 2023). Many agencies keep flat fares low to encourage ridership, relying on volume for cost recovery, but in smaller cities with limited ridership, this generates modest revenue (CUTA, 2023). Simplicity reduces administrative costs and slightly improves net recovery compared to more complex systems (Litman, 2023).

Equity:
Flat fares raise both horizontal equity (users imposing different costs pay the same) and vertical equity concerns. They are typically regressive: lower-income riders, who tend to

make short, local trips, pay more per unit of service, while suburban, peak-hour riders benefit from underpricing (Brown, 2018; Litman, 2023). Research shows lower-income and minority riders pay a higher share of their costs under flat fares (Brown, 2018).

On the positive side, flat fares are transparent and uniform, which some see as fair (Litman, 2023). When heavily subsidized, the absolute burden may be small, but fare increases fall most heavily on the poor (Brown, 2018). Frequent riders who cannot afford monthly passes may also face a higher overall burden. Monthly passes, while helpful, still leave the poorest at a disadvantage if they can't afford the upfront cost (Brown, 2018).

Summary:
Flat fares offer simplicity and predictability, making them politically popular in small and mid-sized cities. However, they sacrifice allocative efficiency and can be regressive, relying on subsidies to address inherent cross-subsidies and equity challenges (Litman, 2023). Examples include Winnipeg and Saskatoon, which pair flat fares with basic age-based discounts and broad public subsidies.

4.2 Distance-Based (or Zone-Based) Pricing

Distance-based pricing increases fares with trip length, commonly used in European and Asian transit and some North American commuter rail or express services (Litman, 2023; Brown, 2018). In small to mid-sized Canadian cities, pure distance-based systems are rare, but zone-based or graduated fares are sometimes used for suburban or regional trips—for example, GO Transit in Ontario, or historical zone fares in Metro Vancouver (CUTA, 2023; Litman, 2023).

Efficiency:
Distance-based fares are efficient because they better align price with resource usage: longer trips consume more fuel, time, and maintenance, so higher fares send accurate cost signals (Litman, 2023). This model discourages unnecessary long journeys and encourages efficient land use (Brown, 2018). Research shows distance-based fares reduce the cross-subsidy burden on short trips, and when finely tuned (e.g., by kilometer), can closely approximate marginal cost pricing (Brown, 2018; Litman, 2023). However, such fares may overlook time-based cost variations (peak/off-peak), and in smaller cities with fixed routes, the marginal cost of one extra kilometer can be very low. In those cases, distance pricing mainly redistributes costs rather than reducing true inefficiency (Litman, 2023).

Empirical evidence from Toronto, Los Angeles, and Utah suggests distance-based fares make pricing more proportional to service and can improve welfare, especially when designed with local travel patterns in mind (Brown, 2018; Litman, 2023). In Utah, for example, shifting to distance-based fares was found to be both more progressive and more efficient (Taylor & Fink, 2003).

Cost Recovery:
Distance-based systems can raise more revenue from long trips, which are subsidized

under flat fare models. This improves cost recovery, particularly where there are many long-distance commuters (Litman, 2023). Fare caps are often included to avoid excessively high charges for very long trips, which may slightly limit revenue. Complexity and implementation costs are higher, though modern fare technology (e.g., smart cards, apps) helps mitigate this (Litman, 2023). In lower-density cities, distance-based fares can better cover the costs of serving distant areas, though they may also discourage ridership from the periphery (Litman, 2023).

Equity:
The vertical equity impact depends on local demographics. Where low-income riders take shorter, central trips, distance-based fares are progressive, reducing costs for the poor and shifting more of the burden to affluent, long-distance commuters (Brown, 2018; Litman, 2023). In other settings—where affordable housing is on the outskirts—distance fares can be regressive, disproportionately impacting low-income riders with long commutes (Litman, 2023).

Design features like fare caps, per-mile discounts for certain groups, or integration with income-based discounts can improve equity (Litman, 2023). However, distance-based systems are less transparent, and occasional or vulnerable users may find them confusing, even with modern apps and cards (CUTA, 2023; Litman, 2023).

Summary:
Distance-based pricing generally enhances efficiency and can improve fairness, but its impact on vertical equity is highly context-dependent (Litman, 2023; Brown, 2018). Many small/mid-sized cities avoid pure distance pricing due to complexity and limited geographic scope, but zone-based pilots (e.g., single city fare, higher fare for suburban trips) may offer a practical compromise (CUTA, 2023).

4.3 Time-of-Day and Congestion Pricing

Time-of-day pricing sets fares higher during peak periods and lower in off-peak or low-demand times—classic "peak-load pricing" widely endorsed in public economics for efficient resource allocation (Rosen et al., 2023; Taylor & Fink, 2003). Major systems like the Washington D.C. Metro and London Underground use peak/off-peak fares; while less common in small and mid-sized cities, the model is feasible wherever there are significant demand spikes (Brown, 2018; Taylor & Fink, 2003).

Efficiency:
Time-of-day pricing addresses marginal cost differences by charging higher fares when additional service is most costly—during peaks, agencies must deploy more vehicles and staff, and each extra rider can contribute to crowding and increased costs (Glaeser & Kahn, 2008; Rosen et al., 2023). By contrast, off-peak service often runs with empty seats, so the marginal cost of additional riders is negligible or even negative (Mohring, 1972). Higher peak fares can moderate demand and encourage some riders to shift to less crowded periods, smoothing demand and raising system efficiency (Taylor & Fink, 2003; Glaeser & Kahn, 2008). Economic theory finds that such pricing moves the market closer to allocative efficiency, as shown in systems like the Washington Metro,

which historically adjusted fares to reflect service crowding and entice midday travel (Taylor & Fink, 2003).

In small and mid-sized cities, peak demand spikes (work and school commutes) are common, though crowding may be less acute. Charging a modest peak supplement (e.g., 25% higher fare) could help cover added costs and better signal the true cost of peak service. Similarly, off-peak discounts can increase utilization at little extra cost, especially for groups like seniors. However, agencies should assess whether higher peak fares would push choice riders to drive—particularly if road congestion is low and parking is abundant (Litman, 2023).

Cost Recovery:
Peak-period pricing can improve revenue if demand is inelastic; higher fares at these times can increase income with minimal ridership loss (Taylor & Fink, 2003; Glaeser & Kahn, 2008). Off-peak discounts might slightly reduce revenue per ride, but can be offset by increased ridership during low-demand times (Taylor & Fink, 2003). Overall, variable pricing shifts the revenue burden toward peak users. In small systems, however, higher peak fares could backfire if riders switch to private cars, undermining both revenue and traffic goals (Litman, 2023).

Equity:
Equity impacts are mixed. Many low-income workers and essential service staff travel at peak times and could be disproportionately affected by peak surcharges (Brown, 2018). However, research shows that low-income riders often travel in off-peak hours (e.g., for retail or social services), so off-peak discounts would disproportionately benefit them (CUTA, 2023). A balanced design might keep the base fare at peak and reduce off-peak fares, ensuring that low-income or flexible riders see the greatest benefit. Additional measures—like exempting low-income passes from surcharges or expanding employer-sponsored transit benefits—can help offset any regressive impacts (Gagnepain et al., 2024).

Summary:
Time-of-day pricing increases efficiency by matching prices to marginal costs and can improve cost recovery (Taylor & Fink, 2003). With careful design—such as combining off-peak discounts, targeted mitigations, and modern fare technology—equity can be preserved or enhanced (Brown, 2018). While such models may face political resistance in smaller communities, electronic fare systems are making them more viable, and peak pricing remains a valuable tool where demand management is critical (Glaeser & Kahn, 2008).

4.4 Means-Tested, Concessionary, or Discounted Fares

Means-tested fares offer reduced pricing to riders who meet income or need-based criteria, creating a two-tier system: standard fares for the public, and lower fares for eligible groups. Typical programs include low-income passes, senior or student discounts, and free (or fully subsidized) fares for children. Examples include Calgary's sliding-scale "Low Income Monthly Pass" (as low as $5.90/month in 2025) (City of

Calgary, 2024), Saskatoon's "Low Income Bus Pass Programs" ($66.40/month for low-income adults vs. $83 regular) (Saskatoon Transit, 2025, and Halifax's 50% discount for low-income residents (Halifax Transit, 2025).

Efficiency:
Means-tested discounts deviate from marginal cost pricing for targeted groups, deliberately increasing ridership among those least able to pay (Gagnepain et al., 2024; Litman, 2023). Some additional trips may yield low private or social value, introducing inefficiency; however, many low-income riders generate positive externalities (e.g., avoiding car dependence, improving access to jobs and healthcare), so social benefits may be understated in traditional cost-benefit analysis (Litman, 2023; Gagnepain et al., 2024). Since marginal costs are low off-peak, the efficiency loss from extra low-income trips is often minimal.

Unlike across-the-board fare reductions, means-tested discounts target subsidies where they are most likely to improve welfare, helping those who would otherwise be priced out of transit (Brown, 2018; Gagnepain et al., 2024). In this sense, means-tested fares are a second-best but more efficient redistribution tool than general subsidies (Musgrave, 1956; Rosen et al., 2023).

Cost Recovery:
Discounting fares for specific groups reduces farebox revenue unless offset by government funding or cross-subsidies (Calgary Transit, 2025; Halifax Transit, 2023). Many cities fund these programs through social service budgets or provincial grants (Saskatoon Transit, 2023). If not, transit agencies may need to raise other fares, cut costs, or accept a lower cost recovery ratio. Administrative costs are higher, as income verification and special pass issuance require resources (CUTA, 2023). Not all eligible riders enroll, which may save agencies money but this means the intended equity benefit is not fully realized.

Still, such programs can boost ridership among low-income groups and generate broader social benefits—improved employment, reduced need for other services, and increased system usage—which may justify the subsidy even if cost recovery drops (Gagnepain et al., 2024; Rosen et al., 2023).

Equity:
Vertical equity is the core rationale for means-tested fares (Brown, 2018; Litman, 2023). These programs reduce the burden on those least able to pay and can dramatically improve mobility and social inclusion (Gagnepain et al., 2024). Such policies help transit serve as a social leveler and align with the ability-to-pay principle when funded through general revenues (Rosen et al., 2023).

Potential downsides include stigma from special passes (which can be addressed by universal smartcard systems) and political resistance from full-fare payers (Litman, 2023). Administrative hurdles can also limit participation, particularly for smaller agencies (CUTA, 2023). However, as awareness of inequality grows, public acceptance of such programs is increasing (Brown, 2018).

4.4.1. Special Case: Subsidized Youth and Child Fares

A growing number of cities—including Saskatoon—now provide fully subsidized transit fares for children and youth. While this policy is popular and improves vertical equity for families, its economic efficiency rationale is weaker. The externalities of children's transit use are typically smaller than for working-age adults (e.g., job access, congestion reduction). Universal youth subsidies can crowd out resources for more targeted, cost-effective programs, such as low-income passes or off-peak discounts (Litman, 2023; Rosen et al., 2023). In practice, most systems use a hybrid model—flat fares plus concessions (Canada) or distance pricing plus low-income discounts (some U.S. metros).

Summary:
Means-tested discounts maximize equity at some cost to efficiency and revenue, treating transit as a quasi-social service for disadvantaged groups (Litman, 2023; Gagnepain et al., 2024). Public finance theory supports these policies if the welfare gains from improved access and income support outweigh efficiency losses (Musgrave, 1956; Rosen et al., 2023). Case studies, such as Calgary's sliding-scale pass, show positive impacts on low-income ridership, job access, and health outcomes (Calgary Transit, 2025; Gagnepain et al., 2024).

4.5 Summary of Fare Structures

Each fare structure offers distinct advantages and drawbacks, and most cities adopt a hybrid approach tailored to local goals. For example, a city may maintain a flat base fare for simplicity, introduce a low-income pass for equity, and add surcharges for express routes as a proxy for distance pricing. Others might pilot off-peak, fully subsidized (fare-free) service for select groups, blending time-based and concessionary strategies. There is no universal "optimal" model; the best solution depends on local priorities—whether maximizing ridership, improving equity, or ensuring financial sustainability—and on local context, including geography, demographics, and available funding (CUTA, 2023; Rosen et al., 2023).

Table 1 (see next page) summarizes the main fare structures and compares them across four key criteria:

- **Allocative Efficiency:** How well fares match marginal social cost.
- **Vertical Equity:** Benefits for lower-income riders.
- **Simplicity & Usability:** Ease of understanding and administration.
- **Cost Recovery:** Fare revenue and implementation costs.

The criteria is useful to illustrate the inherent trade-offs that exist under each fare structure.

Table 1. Comparative Summary of Public Transit Fare Structures

Fare Structure	***Allocative Efficiency***	***Vertical Equity***	***Simplicity & Usability***	***Cost Recovery***
Flat Fare	Low	Low–Medium	High	Medium
Distance/Zone-Based Fare	High (if precise)	Variable*	Medium	High
Time-of-Day Pricing	Medium–High	Medium	Medium	Medium–High
Means-Tested Discounts	Low–Medium	High	Medium	Low–Medium
Fare-Free (fully subsidized)	Low	High	High	Low

**Variable: Depends on local demographics/geography.*

[5] Public Economics Frameworks and Policy Trade-offs

Economic frameworks help clarify these trade-offs. First, marginal cost pricing is the theoretical ideal for efficiency but requires substantial subsidization, especially in smaller systems with increasing returns to scale. Empirical studies indicate that marginal operating costs in small urban transit are far below average costs, necessitating significant subsidies—estimated at $0.50 to $1.80 per vehicle-mile (Small & Verhoef, 2007; UGPTI, 2023).

Second, Ramsey pricing provides guidance for minimizing ridership loss when raising fares. The principle suggests higher fares for less price-sensitive trips (premium or peak) and lower fares for price-sensitive groups, like low-income or off-peak riders (Rosen et al., 2023; Witpress, 2022).

Third, Lindahl pricing implies funding transit subsidies through progressive taxation—so users contribute according to ability to pay, not solely at the farebox. For instance, some Canadian cities use property taxes to support transit, enhancing vertical equity (Rosen et al., 2023; Musgrave, 1956).

When designing or reforming fare policy, decision-makers in small and mid-sized cities typically balance four main goals:

1. **Increase Ridership** (favoring lower fares, simple structures, and free transfers or zones),

2. **Improve Equity** (favoring targeted discounts, fare capping, or low-income programs),
3. **Ensure Financial Sustainability** (favoring some cost-based pricing or creative revenue schemes),
4. **Simplicity & Usability** (favoring flat fares or easy-to-understand systems).

Recent trends show a tilt toward simplicity and equity, with minor efficiency losses considered less important than keeping transit attractive and inclusive (Litman, 2023; CUTA, 2023). Some experts advocate for fully subsidized (fare-free) transit in small cities, arguing that with low cost recovery and minimal congestion, fare collection may be both economically inefficient and socially exclusionary (Walker, 2020; Urbanophile, 2019). Cases like Dunkirk, France, and Kansas City, USA, which have adopted fare-free models, illustrate this approach (Utter, 2021; Urbanophile, 2019).

5.1. Case Studies – Understanding Efficiency–Equity Trade-offs in Practice

To illustrate how cities navigate the trade-offs between efficiency, equity, and administrative simplicity, we briefly review select fare policy models from small and mid-sized cities. More detailed data analysis is available in the companion document, which provides an empirical analysis of the actual transit data.

5.1.1 Saskatoon, Saskatchewan

Saskatoon employs a flat fare structure ($3.00 adult fare in 2024), with category-based discounts for seniors, students, and children (City of Saskatoon, 2024). While simple to administer, this approach produces cross-subsidization—short, local trips are relatively expensive per kilometer, while longer, peak-hour trips are underpriced. Saskatoon's affordable transit pass pilot for low-income residents provides significant discounts, improving vertical equity. This hybrid model reflects a deliberate trade-off: maintaining system simplicity while promoting inclusivity and social welfare through targeted means-tested subsidies.

5.1.2 Calgary, Alberta

Calgary's sliding-scale Low-Income Monthly Pass is a leading Canadian example of deep means-tested subsidy (City of Calgary, 2024). Eligible residents can pay as little as $5.90/month—over 90% below the regular price—substantially enhancing mobility for low-income groups. This program requires significant public funding and accepts some efficiency loss (flat fares and cross-subsidization) in return for pronounced equity gains, reflecting a public finance perspective on redistribution and inclusion (Rosen et al., 2023).

5.1.3 Dunkirk, France (International Example)

Dunkirk[2] has implemented a fare-free public transit model, funding service entirely through municipal taxes (Utter, 2021). This initiative has attracted international attention, with recent coverage highlighting substantial increases in ridership, enhanced equity, and strong public support (Yeung, 2021; Utter, 2021). However, studies indicate that some new transit trips have replaced walking or cycling rather than driving, representing a potential negative externality (Utter, 2021). Dunkirk's experience illustrates both the potential and the trade-offs of fare-free transit: while ridership and inclusion improve, the model relies heavily on stable non-fare revenue, and its broader benefits depend on careful monitoring of modal shifts and fiscal sustainability.

5.1.4 Kansas City, Missouri

Kansas City, historically a North American leader in fare-free transit, recently announced a return to fare collection and service frequency reductions in response to post-pandemic budget pressures (KCUR, 2025). Fare-free service initially boosted ridership and improved equity for low-income users, but the transit agency faced persistent funding shortfalls after the expiration of federal COVID-19 relief funds. The new plan restores fares to stabilize finances but also reduces service frequency—highlighting the inherent tension between fare policy, funding sustainability, and service quality (KCUR, 2025).

This experience underscores a key lesson: fare-free transit can deliver equity and ridership gains, but without dedicated, sustainable funding, it may necessitate service reductions that ultimately undermine those goals. Aligning fare policy with reliable long-term funding is essential for maintaining both access and quality.

Many North American cities blend flat fares with targeted discounts or fare capping to promote equity. U.S. cities are experimenting with income-based passes ("Fair Fares") and, where feasible, limited distance-based pricing. The prevailing trend among small and mid-sized cities is toward hybrid models that emphasize administrative simplicity while incorporating targeted equity programs.

Each example highlights how fare structures reflect local values—some cities emphasize inclusion and social mobility (means-tested or fare-free programs), while others prioritize cost recovery and efficiency. Advances in fare technology now allow more nuanced, data-driven, and hybrid pricing even in smaller systems (Litman, 2023; CUTA, 2023).

[2] Dunkirk is a small French city, with an estimated population of just under 88,000, but the metropolitan area is about 200,000 persons.

[6] Conclusion and Policy Proposals

Optimal transit fare structures in small and mid-sized cities require a careful balance of efficiency, equity, and financial sustainability. Public finance and public economics frameworks support treating transit as a merit good—justifying both subsidies and differentiated pricing to reflect external benefits and promote broad access (Rosen et al., 2023; Litman, 2023). As a quasi-club good, transit can benefit from membership-style pricing (monthly passes, fare capping) to boost utilization.

While marginal cost pricing with full subsidy is first-best in theory, fiscal realities mean fares are set above marginal cost—a classic "second-best" scenario. Ramsey-style pricing suggests fares should be higher where demand is inelastic (peak, long-distance trips) and lower where it is elastic (off-peak, short trips, low-income riders). Practical fare structures that vary by distance, time, or rider type can operationalize these principles, while equity considerations inform the extent and targeting of subsidies.

The equity–efficiency trade-off is shaped by policy choices and community values. Some cities adopt low or fare-free programs for those in need, accepting higher public subsidies. Distance-based or peak pricing, which can theoretically improve cost recovery and efficiency, remain uncommon among smaller cities, where simplicity and equity concerns take precedence. Where subsidies exceed the marginal social benefit of extra rides, this is a deliberate redistribution—recognized in public finance theory as justified for merit goods.

For most small and mid-sized Canadian cities, the biggest gains come from simplifying and lowering fares to boost ridership, while targeting subsidies to those most dependent on transit. With largely fixed system costs, filling empty seats delivers substantial social value at little incremental cost. New fare technology enables experiments with more nuanced models—distance-based, time-based, or targeted discounts—even in smaller systems.

The optimal fare structure for small and mid-sized cities is likely a hybrid: simple and user-friendly, but integrating cost-reflective and equity-enhancing features. Public economics offers the analytic toolkit: marginal cost pricing, Lindahl and Ramsey principles, and the recognition of transit offering public and private benefits. The most optimal mix will vary by city, but the clear trend is toward "smarter" fare policies: lower but sustainable fares, targeted subsidies for those in need, and judicious use of differential pricing to address real cost pressures. By following these principles, cities like Saskatoon can maximize transit's social, economic, and environmental benefits while keeping their systems fiscally viable and fair for all users.

Given the analysis in this paper, some policy ideas worth exploring and evaluation are:

- **Pilot or Expand Fare Capping:** Ensure no rider pays more than the cost of a monthly pass, reducing the regressive effect of upfront pass costs for low-income and irregular riders (Walker, 2020).

- **Prioritize Targeted Subsidies Over Universal Subsidies:** Focus on means-tested or needs-based fare programs (e.g., income-based, disability-based) to maximize welfare impact per subsidy dollar (Litman, 2023).

- **Leverage Technology for Smarter Pricing:** Use smart cards and apps to pilot off-peak, distance, or capped fares—enabling data collection and customized offers for rider segments (CUTA, 2023).

- **Conduct Regular Elasticity and Equity Analyses:** Monitor how fare changes affect ridership (using local elasticity estimates) and assess distributional impacts via regular equity audits (Taylor & Fink, 2003). Adjust fares accordingly and regularly.

- **Explore Fare-Free Pilots Where Marginal Cost is Low:** Consider fare-free periods (off-peak or youth) only if supported by evidence of high social benefit and low incremental cost (Utter, 2021).

The public finance principles and fare structures evaluated in this paper now provide a robust framework for the subsequent analysis. In Appendix 2, these principles will be used to empirically assess Saskatoon's performance against 22 other transit systems. In Section 3, they will be applied to a detailed analysis of Saskatoon's local ridership and revenue data to build a data-driven case to provide more robust evidence for potential fare reform.

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