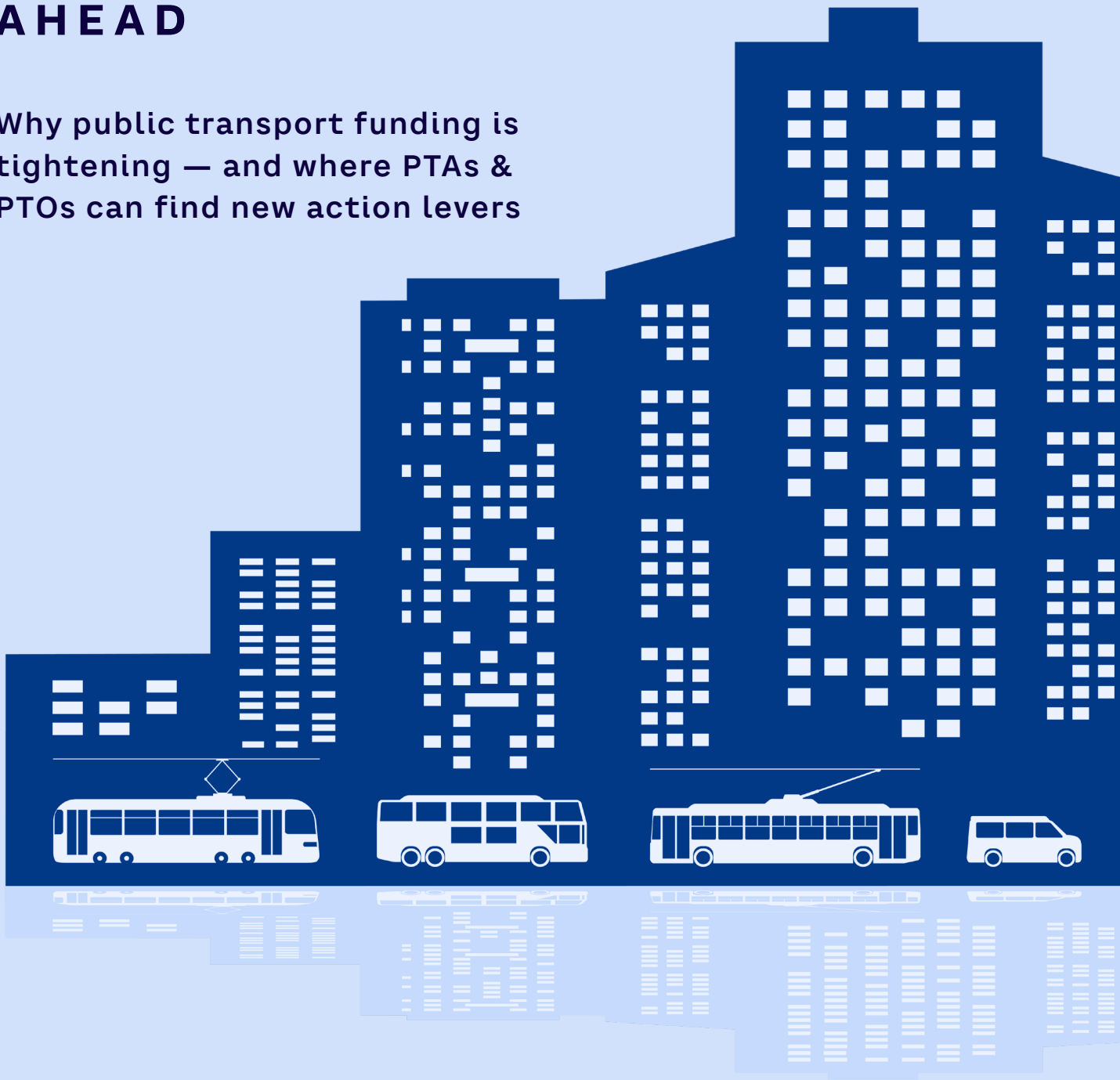


REPORT

2026

FUNDING STORM AHEAD

Why public transport funding is tightening — and where PTAs & PTOs can find new action levers



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FUTURE OF MOBILITY LAB

The Future of Mobility (FoM) Lab is Arthur D. Little's (ADL's) contribution to tackling the mobility challenge. With this lab, ADL aims to support mobility actors in shaping the extended mobility ecosystems of tomorrow and facilitating an open dialogue between mobility stakeholders. The FoM Lab gathers under the same roof as cross-industry and cross-functional professionals to support governments, authorities, mobility solution providers (public and private), and investors in shaping their roles in future mobility ecosystems. Supporting cities and investors in selecting, sourcing, improving, and engaging with micro, shared, and active mobility solutions providers and supporting the latter in improving their operations are among the key services offered to our clients

POLIS

Founded in 1989, POLIS is the leading network of European cities and regions working together to develop innovative technologies and policies for local transport. POLIS aim is to improve local transport through integrated strategies that address the economic, social, and environmental dimensions of transport. To this end, POLIS supports the exchange of experiences and the transfer of knowledge between European local and regional authorities. POLIS also facilitates the dialogue between local and regional authorities and other mobility stakeholders, such as industry, research centers and universities, and NGOs. POLIS fosters cooperation and partnerships across Europe with the aim of making research and innovation in transport accessible to cities and regions and to facilitate dialogue and exchange between local authorities, the transport research community, and the industry. POLIS also strives to provide decision makers with the necessary information and tools for making sustainable mobility a reality.

EXECUTIVE SUMMARY

HIGH EXPECTATIONS, SLOW PROGRESS

Public transport and shared mobility systems face an unprecedented funding challenge at a time when they are expected to deliver more than ever. On one hand, demand for sustainable and inclusive mobility is rising, and governments have set ambitious goals for modal shift, fleet decarbonization, and resilient infrastructure by 2050. On the other hand, traditional funding models are struggling to keep up.

Despite these headwinds, expectations for the mobility sector are higher than ever. Urban populations continue to grow (the United Nations projects an additional 2.5 billion urban residents by 2050, mostly in emerging economies) and with them the demand for transport infrastructure and services. Policymakers in urban areas are also **urging a rapid modal shift** away from private cars toward public, shared, and active modes to meet climate targets and reduce congestion. **Yet progress has been slow:** over the past 15 years, the combined global share of trips by public transport, walking, cycling, and new mobility services increased from roughly 20% to about 30% of urban trips. But they remain almost stable when it comes to kilometers traveled (passengers per kilometer, or pax-km), where private cars still account for ~70% of urban pax-km worldwide (even higher in many suburban and rural areas), according to the Arthur D. Little (ADL) "[The Future of Mobility 5.0](#)" report.

In addition, **the transport sector is not doing enough to reduce CO2 emissions**, as the 2015 Paris Agreement target (+1.5°C) was reached last year. The continuous growth of road transport, still largely led by internal combustion engine (ICE) vehicles, is the major driver of these emissions, and car occupancy rate remains low (~1.5 people per car in OECD [Organisation for Economic Co-operation and Development] countries). Furthermore, this has negative impacts on cities (e.g., congestion, urban sprawl, accidents).

Given the massive funding needs fueled by climate change and modal shift policies, what is the size of the gap for public transport by 2035 and 2045? How can we efficiently and pragmatically bridge the gap using both short-term solutions and long-term programs?

In this report, we define "public transport" as the combination of all transport in a given urban area: metro, bus, tram, and suburban or interurban transport (suburban and regional rail, suburban bus and coaches, demand-responsive transport) organized and funded by public authorities, also known as public transport authorities (PTAs).

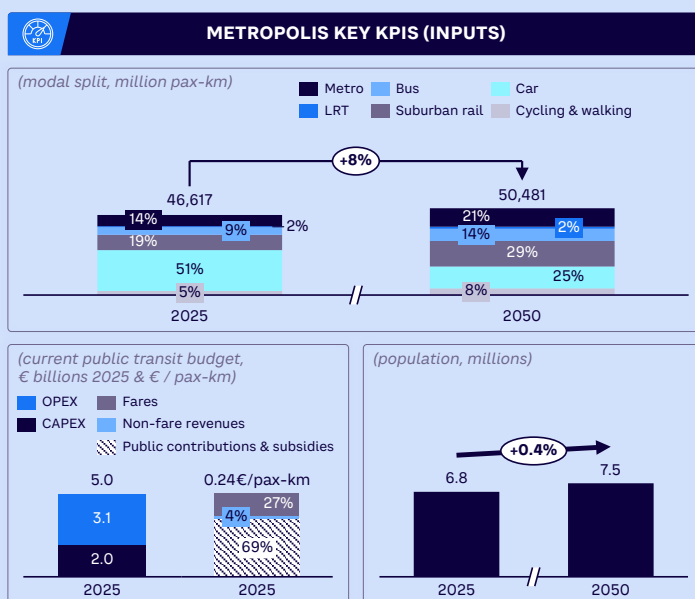
Methodology & terminology

Funding needs vary widely from one place to another. Nevertheless, there are some common challenges and constraints for policymakers, including climate change. ADL's Future of Mobility Lab modeled a CAPEX and OPEX plan for a conceptual standard urban area, which we named Metropolis (after the 1927 Fritz Lang movie). Metropolis is not a real city; it's a close average based on actual data from Paris, London, Amsterdam, Berlin, and New York. We relied on an extended literature review and previous reports and audits from scientific and public organizations in each of these urban areas to build a comprehensive model with a standard allocation base (in € per km, per vehicle, or per pax-km for each city) for more than 35 sub-items. The magnitude of addressable modal shift is based on the findings of ADL's "[The Future of Mobility 5.0](#)" report, published in collaboration with POLIS, a network of European cities and regions collaborating to develop innovative and sustainable urban transport solutions.

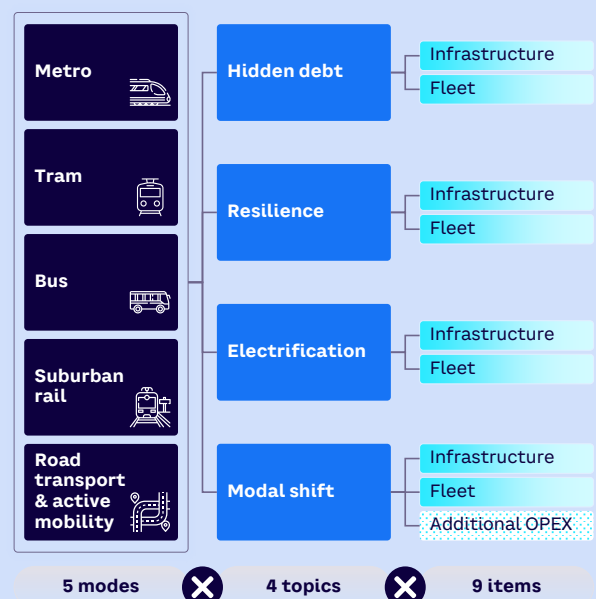
Glossary

- **Hidden debt** refers to underinvestment in infrastructure that leads to aging, deteriorating assets requiring large investments just to maintain existing assets.
- **Resilience and adaptation to climate change** refers to preventive and curative spending due to the direct consequences of global warming (e.g., flooding, submersion, heat waves, storms) and should be clearly distinguished from climate change mitigation actions aiming to reduce CO2 emissions (e.g., electrification).
- **Electrification** of vehicles and their charging infrastructure refers to buses/coaches and does not cover private vehicles (as they were paid for with private money from households).
- **Modal shift** refers to the transition from private cars to public transit and active mobility. We based our modal shift targets on the European consensus for large cities, as reported by POLIS Network and ADL in "[The Future of Mobility 5.0](#)."

Figure A. The Metropolis funding equation



Source: Arthur D. Little



KEY FINDINGS

Currently, PTAs and equivalent public bodies are responsible for evolving service offerings in their areas, setting pricing policies, and determining how to close the gap between current pricing and projected spending needs. Over the next 10 years — and even more so by 2050 — Europe will face rising demand alongside evolving environmental and resilience requirements. Without significantly higher spending, PTAs will not be able to close that funding gap.

We estimate the total spending for public transport in Europe (excluding Russia and Turkey) at **~€130 billion yearly, of which ~€96 billion is OPEX only**.¹ There are three main funding sources for mobility (see Chapter 2 for more details):

1. **Fare revenues** (paid by users) account for ~44% of OPEX on average (~27% of total spending, including CAPEX).
2. **Subsidies, tax schemes, public compensation, and earmarked taxes** (paid by taxpayers) help fill the funding gap.
3. **Direct non-fare revenues** (e.g., real estate, retail, advertising, consulting) usually account for less than 5% of the total budget.

Estimates of the funding shortfall underscore the magnitude of the challenge. We estimate that, on average, **yearly spending could grow by +13% in OPEX and +56% in CAPEX**. Additional spending over the period will increase the budget by +36% yearly in total (~€153 per capita per year):

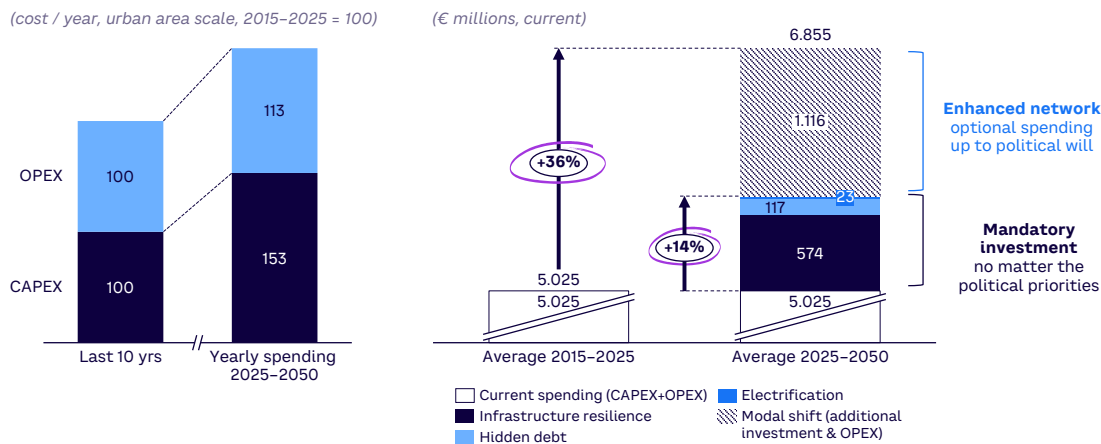
- Hidden debt
- Climate change resilience
- Fleet electrification
- Modal shift through network and service expansion

OVER THE NEXT 10 YEARS EUROPE WILL FACE RISING DEMAND ALONGSIDE EVOLVING ENVIRONMENTAL AND RESILIENCE REQUIREMENTS

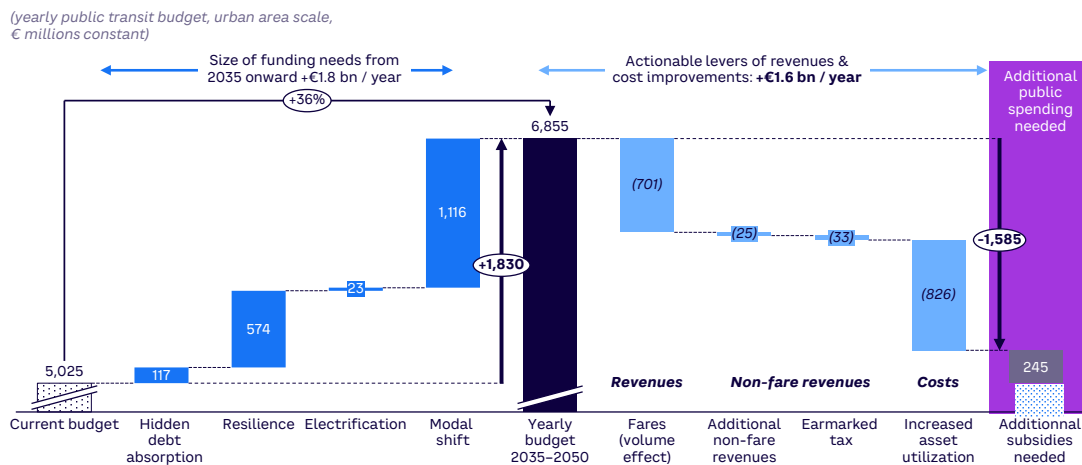
Our research resulted in five key findings:

1. In the Metropolis model, the four dimensions are not equal; electrification (which is currently the primary focus of many policymakers) will yield high levels of resilience at relatively low cost (see Chapter 1).
2. High-capacity modes such as metro and suburban rail will make up more than 80% of the needed funding in the next 10–20 years, mainly due to the large projects needed to adapt the existing infrastructure to climate change.
3. 60% of additional spending will go toward network/service expansion (which, ultimately, is a political decision), but the other 40% of investment needs are not optional. They should be funded to maintain the network at the same level of standards, or PTAs should accept a quantitative/qualitative reduction in service in the coming years.
4. All available levers — from increasing revenues to improving cost per passenger — should be leveraged at the same time, as none is enough to move the needle on its own (see Chapter 2).
5. Huge investments in infrastructure, technology, and upskilling will be needed (see Chapter 3).

¹ Based on European Metropolitan Transport Authorities (EMTA), UITP (International Association of Public Transport), Eurostat, and operators' annual reports.

Figure 1. Additional spending needed to fund transport in Metropolis

Source: Arthur D. Little

Figure 2. Additional yearly spending and levers to bridge the gap for Metropolis

Source: Arthur D. Little

Key assumptions**— Passenger revenues:**

- 10% fare increase (from 0.07€₂₀₂₅/pax-km in 2025 to ~0.077€₂₀₂₅/pax-km in 2050)
- Increased subscription rates (almost double the number of monthly subscribers)
- Additional fares at some stations (e.g., airports, stadiums)

— Non-fare revenues:

- Increased non-fare revenues (e.g., retail, telco) by 20%
- Up to 10% of new infrastructure projects covered by real estate revenues

- New tax on tourists/nonresidents (equal to 4.7 million nights in 2050 with an equivalent of €₂₀₂₅7/night tax)

— Asset utilization:

- Higher vehicle occupancy rate (from 12 passengers per vehicle to 17)
- Higher rotation of vehicles (number of km/year/vehicle +40%) thanks to expanded hours of operation, better planning, and increased commercial speed
- Higher infrastructure utilization (doubling yearly train-km per km of infrastructure by 2050)

This report is based on a dozen interviews with executive committees, CEOs, and national and local policymakers across Europe. We want to thank all of them for their kind contribution to this study. Institutions involved include several of the largest PTAs (among the top 5); regional leaders in charge of transport at the political level; CEOs, CFOs, and CSOs of large PTOs; and researchers and experts.



1. THE 2050 FUNDING IMPERATIVE

To understand how mobility funding must evolve, we must understand the scale of investment required across various dimensions (see Figure 3). PTAs will need to finance four critical transitions over the coming decades:

- 1. Hidden debt (6% of additional funding needs)** — investments on legacy assets needed to absorb ageing infrastructure.
- 2. Climate change adaptation and resilience (32% of funding needs)** — upgrading infrastructure to protect it against climate-related incidents and other shocks.
- 3. Fleet electrification/decarbonization (2% of additional funding needs)** — replacing or retrofitting vehicles and equipment to eliminate fossil fuels.²

- 4. Modal shift and network coverage expansion (60% of funding needs [both CAPEX and OPEX increase])** — scaling up public and shared mobility to significantly reduce car dependence, including service improvements in both cities and less dense areas. Modal shift is also needed to reduce congestion, which creates high costs for cities.³

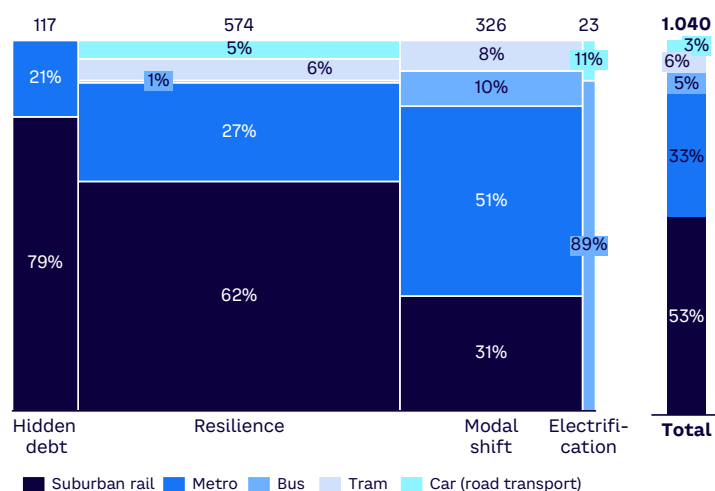
ABSORBING HIDDEN DEBT

Decades of deferred maintenance have created a sizable state of good repair (SGR) backlog in mature networks, especially in rail.⁴ This hidden debt spans life-expired track, power and signaling, outdated station systems, and assets no longer compliant with current safety and accessibility standards. Left unaddressed, it reduces reliability, causes speed restrictions, and inflates corrective maintenance costs — undermining climate resilience and modal shift plans.

The first step is to focus on fixing the basics, including track and civil works (bridges, tunnels), power telecoms and signaling, stations and depots, and core road assets. These projects should bundle works by corridor, use condition-based planning and night/blocked-line access, and standardize designs to ease market-capacity constraints. Programs like the New York City Subway SGR and London Underground renewals have shown that improved reliability results from projects that are ring-fenced and sequenced. Ring-fencing a multiyear SGR budget with transparent backlog metrics and KPIs is critical to success.

Figure 3. Predicted yearly additional investments by levers

(€ millions, CAPEX only, urban area scale, 2025–2050)



Source: Arthur D. Little

² This report focuses on public transport fleets and supporting infrastructure.

³ The benefit from congestion reduction, including financial benefits for cities, is not directly discussed in this report.

⁴ As stated in many audit reports at the national level and in most operators' memos since 2021.

Indicative funding requirement

In our Metropolis model, absorbing hidden debt accounts for approximately 6% of total funding needs through 2050, including OPEX, and 11% of additional CAPEX. Most of this investment must be front-loaded between 2025–2035 to avoid cost compounding and unlock performance benefits. Road networks and rolling stock are generally in good condition. In contrast, metro and rail systems have been underinvested across most countries for many years. Regulatory bodies have documented this extensively through internal and external audits. We estimate the resulting hidden debt at an average of approximately €2 million/km for existing metro networks and €4 million/km for existing railway infrastructure.

PTAs WILL NEED TO FINANCE FOUR CRITICAL TRANSITIONS OVER THE COMING DECADES

INVESTING IN RESILIENT, CLIMATE-PROOF INFRASTRUCTURE

Context: Growing climate risks to mobility systems

Transport infrastructure worldwide is already feeling the impacts of climate change. Extreme weather events that were once rare are becoming more frequent and severe — from flash floods inundating metro lines and highways to heat waves causing rails to expand and overhead cables to sag. Examples include Paris's 2016 flooding issues and the flash flooding of New York City subways in 2025. Many urban transit systems, especially older ones, were not designed with these extremes in mind. Rail and metro networks often lack adequate drainage or pump capacity for heavy downpours, and road pavement can degrade faster in high temperatures.

Beyond physical damage, impact on operations includes more frequent service disruptions, slower speeds, and higher deterioration levels on vehicles and infrastructure, all of which translate to higher OPEX. In some cases, large disruptions impact fare revenues (fewer occasional rides), although this is far less important than the costs. Indeed, in Metropolis, an entire week of total interruption would impact less than 0.3% of the public transit budget (see below for a discussion of fare levers).

What needs to happen

Increasing resilience will involve a mix of infrastructure upgrades, new technologies, and operational strategies:

- **Retrofit infrastructure assets** — for instance, raising or sealing entrances to underground stations to prevent flooding, reinforcing bridges, improving track bedding, and installing expansion joints or heat-resistant materials on rails. In coastal cities, protecting ports, roads, and rail lines against sea level rise and storm surges is a major undertaking. For example, in London, up to £m2 per station will be invested in entrance elevation and pump upgrades on several lines to minimize flooding from heavy rain.
- **Upgrade equipment and systems** — deploying stronger air conditioning and cooling systems in vehicles and stations to cope with heat waves, especially in central and Western Europe, which are not as prepared as southern Europe and Asia. In Paris, only 40% of buses were equipped with AC systems in 2024, with similar low levels for older trains. Progressive renewal (including through electrification) will significantly reduce the need for vehicle adaptations, although retrofitting will remain necessary for older rolling stocks and systems.
- **Adjust maintenance regimes** — inspecting assets more frequently, doing preemptive repairs before seasons with extreme temperatures, and developing contingency plans (e.g., reserve buses for evacuation or backup power generators for stations). These adaptations involve both up-front capital and ongoing expenditures.

- **Prepare for crises** — redundancy plans are expensive but cost far less than being unprepared. For instance, operators should investigate redundancy/backup plans for cybersecurity threats (e.g., Paris's RATP has backup plans that enable automated metro trains to be driven manually in a massive IT outage).

Indicative funding requirement

We estimate that Metropolis will require **~€15 billion in additional resilience funding by 2050 (~€574 million per year) with most going to rail and metro networks**. Most of the money will go toward increasing resilience. However, this should be considered a minimum, as final costs will depend on future global temperatures (+2°C or +3°C will have major implications), and the post-2040 period remains uncertain. Adaptation of old metro and rail networks will likely subsume most spending (>80%), followed by road repair and maintenance. Rolling stock retrofitting (e.g., AC installation) will make up a small part of the budget, as the fleet renews progressively.

TRANSITIONING TO GREEN FLEETS

This means a wholesale shift to zero-emission vehicles and equipment over the next two decades. Buses, coaches, municipal vehicle fleets, and even regional trains currently running on diesel must transition to electric or other zero-carbon energy.

In this report, we do not include private cars in our calculations, as that fleet renews using private money. In parallel, supporting infrastructure such as bus depots, charging stations, and electric grid connections must be built or upgraded at scale. Many governments have set targets; some European countries mandate that all new urban buses be zero-emission by 2025 or 2030, and the EU is considering requiring all cities to have 100% zero-emission bus fleets by 2035 (see Figure 4). Several large cities (Paris, London, and Shenzhen) have committed to only purchasing electric or hydrogen buses going forward.

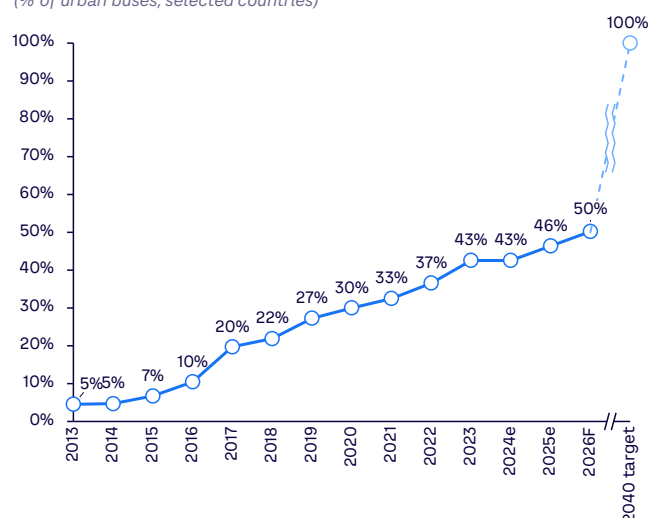
Progress to date & what's needed

Electric buses are rapidly gaining market share, but adoption is unequal. In the EU, battery electric buses reached 36% of new city bus sales in 2023 (overtaking diesel as the most sold type) and are on track to exceed 50% in the next couple of years. Some countries are further ahead: the UK and the Netherlands have aggressive e-bus rollout programs (aiming for a 100% e-fleet in Amsterdam and London), and China already has more than 500,000 e-buses in operation (Shenzhen has electrified 100% of its bus fleet). There is also movement in rail, as some European suburban rail lines remain diesel-operated. Some countries are experimenting with battery-operated locomotives, hydrogen, or bi-mode trains in an effort not to use diesel in places where tracks are electrified.

The mobility energy transition requires parallel investment in infrastructure and energy systems. Every electric bus or train requires a reliable source of clean electricity. This means reinforcing the grid (many transit depots need new high-voltage connections), deploying thousands of charging stations (depot chargers and possibly en route fast chargers for buses), and ensuring a reliable renewable energy supply. In some cases, new depots or storage facilities will be needed to house e-bus fleets. Training and new systems will be required for operations and e-fleet maintenance.

Figure 4. Share of electric/H2/hybrid urban buses in Europe

(% of urban buses, selected countries)



Source: Arthur D. Little, EMTA, public reports

Greening the fleet: CAPEX vs. OPEX

- Electric buses and trains cost more up front than diesel, but promise lower energy and maintenance costs.** A standard 12-meter electric bus can cost anywhere from 1.2–1.8 times the price of a diesel bus, depending on the model and battery, but uses less expensive energy and has fewer moving parts to maintain. Over a 10–15-year lifespan, the TCO of e-buses may be the same or lower than diesel (assuming long battery life, affordable electricity, and sufficient utilization). The battery makes up 30%–40% of the total cost of acquiring a battery electric vehicle (BEV) bus and usually needs to be replaced once during the bus's lifetime.
- The up-front burden is heavy for transit agencies;** they must purchase the vehicles and invest in either charging infrastructure or hydrogen-fueling infrastructure. Adapting a bus depot costs around €40 million, with exact pricing depending on the city and physical constraints (underground versus aboveground depot).
- Agencies face uncertainties** like residual value risk (e.g., what will a 2020 electric bus be worth in 15 years) and technology risk (e.g., if battery technology improves, early adopters might see older e-buses become obsolete faster than anticipated).

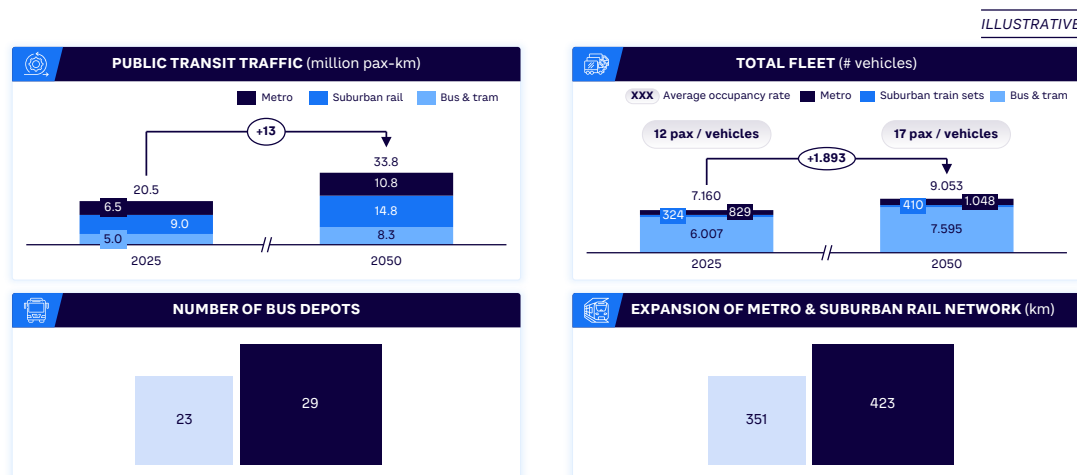
- Electrification can shift costs from OPEX to CAPEX.** Traditionally, a private operator might cover fuel and maintenance (OPEX) while a PTA provides vehicles (CAPEX). With electric fleets, the equation changes: the authority might have to invest more in vehicles and charging, while the operator benefits from lower operating costs. This necessitates new contracting arrangements to share cost savings or new funding to cover the capital. Some innovative financing models are emerging, including battery or bus leasing, energy-as-a-service contracts, and green bonds to raise capital for fleet projects.

ACCELERATING MODAL SHIFT

Building resilient infrastructure and switching to clean vehicles are critical first steps, but sustainable mobility hinges on moving a much larger share of people by public and shared transport. This means significant investments in capacity and quality: more routes, higher frequencies, better intermodal integration, and better coverage of underserved areas (see Figure 5). Focus should be on two areas:

- Urban and suburban areas** — cities and their immediate peripheries, where there is baseline public transport that may need expansion
- Smaller cities, towns, and peri-urban/rural areas** (not covered in this report) — where cars dominate and innovative approaches are needed

Figure 5. Impact of increase of public transit modal share in Metropolis



Source: Arthur D. Little

THE MODAL SHARE OF PUBLIC TRANSIT IS DIRECTLY LINKED TO THE LEVEL OF SERVICE

Urban & suburban public transport: Scaling up networks

In large urban areas, one might assume public transport is already ubiquitous, but many cities need to significantly expand and upgrade their networks to meet future demand. The modal split of cars is still ~60%–70% of pax-km, including in larger urban areas in 2023.⁵ The ADL/POLIS mobility study found that implementing a suite of measures could potentially double the share of sustainable mobility from ~30% to ~60% pax-km in the next decade, but this would involve, among other things, a major uplift in mass transit provision. The modal share of public transit is directly linked to the level of service (see Figure 6).

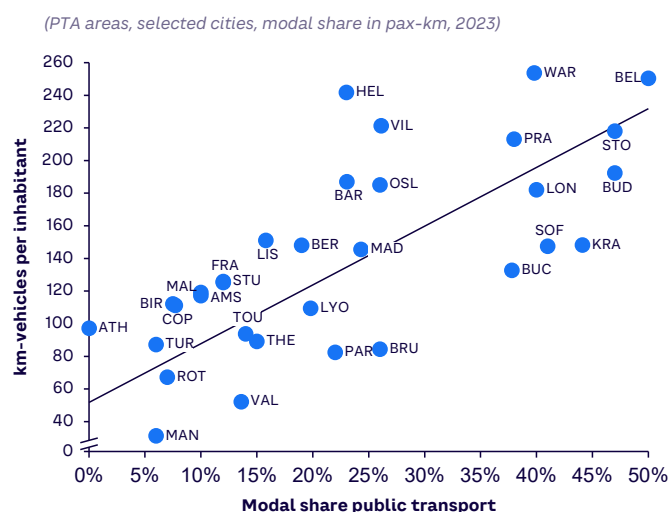
Core network development remains limited and uneven, particularly in Asia, reflecting differences in urban population density and city size.

There is also room for large network-improvement projects, especially in metro and suburban trains. Paris, London, and Geneva are leading the way, having added significant infrastructure (RER and tram network in Geneva, Grand Paris Express in Paris, Elizabeth Line in London).

Cities should also increase frequency on existing lines (which may require more vehicles and staff), improve connectivity (e.g., better integration between modes, more mobility hubs, more park-and-ride facilities at city borders), and enhance service quality (e.g., newer rolling stock, real-time arrival/departure information, reliability improvements). These will require capital investment (modern control systems, depot upgrades) and additional operational capabilities.

As outlined in “[The Future of Mobility 5.0](#),” the cost per passenger transported in large European cities has remained stable in recent years despite rising traffic. This indicates that expenditures have increased in line with passenger growth, limiting economies of scale (see Chapter 2). In the Paris region, for example, total expenditure per pax-km remained almost stable, increasing from €0.30/pax-km in 2004 to €0.32/pax-km in 2019 (in constant euros, including amortization).

Figure 6. Public transit service level and modal share



Source: Arthur D. Little, EMTA

⁵ As stated in many audit reports at national level and in most operators' memos since 2021.



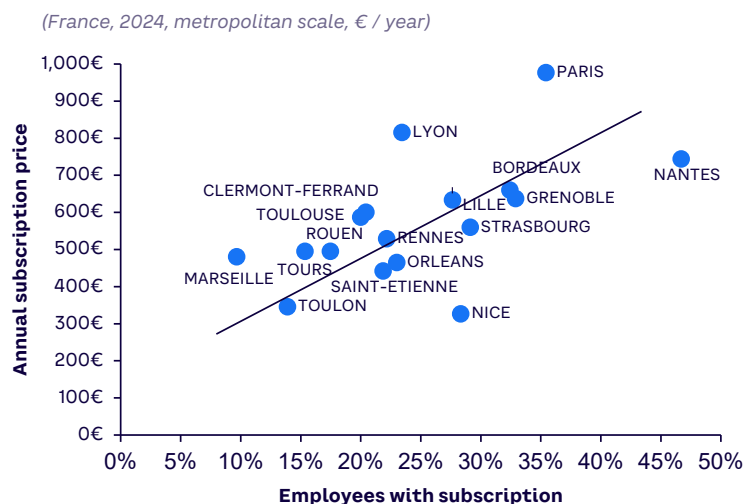
2. STRATEGIC LEVERS TO ADDRESS MOBILITY FUNDING GAP

MANY PUBLIC TRANSPORT SYSTEMS HAVE KEPT FARES LOW FOR SOCIAL AND POLITICAL REASONS

Faced with the financial needs outlined above, mobility leaders must deploy a range of strategic levers to improve the financial sustainability of transport systems. In this section, we explore:

- **Increasing top-line revenues** — generating more income from users or taxpayers
- **Exploring non-fare revenues** — unlocking complementary funding sources beyond fares
- **Improving efficiency and cost-effectiveness at the system level** — getting more output from each euro spent to stretch current funds

Figure 7. Monthly full-price subscription and share of subscription among employees



Source: Arthur D. Little, CST, SNCF, OMNIL, SDES, INSEE

INCREASING TOP-LINE REVENUES

There are two main sources of revenue for public transit: users and taxpayers.

Fares

- **Revisiting fare structures and levels.** Many public transport systems have kept fares low (often below inflation) for social and political reasons. In some cases, transport is free. Although affordability is crucial, extremely low fares can undermine financial viability. In France in 2024, the cost per passenger was ~€0.23/km by car versus ~€0.08/km with a monthly public transport subscription. This suggests there may be scope for higher fares, provided service quality improves enough for public transport to become a viable alternative to private cars.
- **There is a common misconception among PTAs that lowering fares will significantly impact ridership.** This is not supported by data. In France, the cities with the highest monthly subscription fees also have the highest public transport penetration rates (see Figure 7). Similarly, cities such as London and Paris have increased fares without reducing ridership; for example, Paris increased the price of its monthly Navigo pass by ~12% in 2023. Overall, the evidence suggests that service quality, rather than fare levels, is the primary driver of public transport use.
- **The question of social justice remains highly relevant.** Discounted fares to promote social equity continue to play a central role in fare policy and could be better coordinated across cities and authorities. In some cases, these schemes could be expanded to reach a broader population, ensuring that young people and unemployed people can access public transport without financial barriers.⁶

⁶ The social justice aspects of fare setting are beyond the scope of this report.

MOBILITY LEADERS MUST DEPLOY A RANGE OF STRATEGIC LEVERS TO IMPROVE THE FINANCIAL SUSTAINABILITY OF TRANSPORT SYSTEMS

Considering the above, several viable options for PTAs emerge:

- **Increase short-term ticket prices while keeping subscription prices stable.** This encourages habitual use (and captures more revenue from visitors).
- **Increase revenue from visitors.** Tourists pay a premium day ticket or tourist tax that helps fund city transit, acknowledging that residents already support the system via local taxes year-round (e.g., a nightly tax in Switzerland allows tourists to access local transportation for free during their stay).
- **Increase the penetration rate of subscriptions among commuters and local populations.** Our studies show that subscription penetration rates are heterogeneous among cities and logically decrease as inhabitants move away from city centers. Expanding transport networks and integrating suburban and outskirt transport solutions into subscription schemes could help attract new subscribers, especially a bundled subscription with both urban and interurban modes.
- **Introduce higher fares for some rides,** including situations where people are more willing to pay or routes mainly used by visitors (e.g., airport connections, amusement parks, funiculars, stadiums).
- **Explore the potential for a non-flat fare system,** especially on suburban rail lines where distances are large (e.g., a zonal system, reduced fares for short trips, enhanced fares for longer trips).
- **Consider increasing monthly subscriptions, especially in countries with mandatory repayment by employers.** For example, in France, employers must refund 50% of monthly subscriptions to employees.

Taxes & earmarking

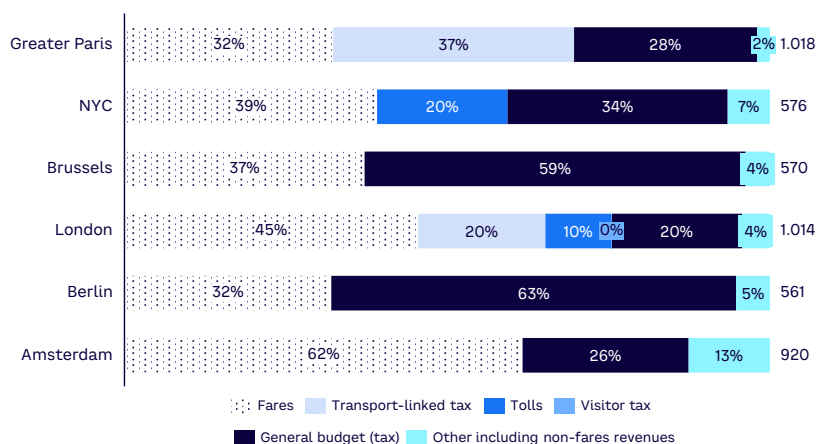
Taxes (and fares) serve a combination of three objectives: maximizing revenue, promoting social justice and equity, and maximizing potential traffic (in public transit). Politicians ultimately decide how public money is allocated to transportation, but the respective roles of central and local government in levying taxes vary across countries. While securing additional subsidy funding is often more a political decision than a technical challenge, combining funding from different public sources could be an effective way to distribute the financial burden across multiple stakeholders.

Consider these four types of public sources by PTAs:

1. **General budget.** The simplest way to fund transportation is through subsidies, and they account for 20%–63% of total budgets in large metropolises. Ultimately, this is the deepest “pocket” for transportation, since it’s capped only by political will and the size of a country’s economy.
2. **Transport-linked tax.** This tax is specifically designed to fund the transport system. In France, the *Versement Mobilité* is a 2%–3.2% tax on salaries paid by employers directly to PTAs in areas with public transit. But there are other options, such as London’s business rates and taxes on real estate transactions.
3. **Tolls and behavioral taxes.** These are based on non-sustainable mobility and primarily tax car users through road tolls (e.g., London, New York City, and Stockholm), on-street parking charges, and vehicle taxes (e.g., Catalonia). In New York City, toll revenues account for approximately 20% of the total transportation budget.
4. **Visitor tax.** This will never be a huge revenue source, but the Swiss model (a visitor tax that allows temporary free access to public transit) is worth considering for cities that attract large numbers of tourists.

Figure 8. Source of public transit funding — all modes (metro, tramways, buses, suburban rail)

(selected cities, 2023 est., € / inhabitant)



Source: Arthur D. Little

EXPLORING NON-FARE REVENUES

Non-fare revenues in mobility account for only a small portion of total budgets (see Figure 8), so they should not be a primary focus for authorities. However, some opportunities exist, including activities that generate strong ROI for public transport operators (PTOs):

- **Advertising is a low-hanging fruit** when it comes to revenue and can be explored with little to no risk.
- **Transit retail has potential, but it requires space, expertise, and daily management.** Frequent investments (in shop renovation, extension, or creation) may compete with other investment priorities.
- **Real estate is an interesting long-term revenue source, but few PTOs or project owners have sufficient assets to monetize it** (beyond a few examples such as Hong Kong's MTR). However, this may be an interesting source for future infrastructure projects and has been implemented in Paris (Grand Paris Express) and Riyadh (Riyadh Metro), where real estate revenues are expected to cover 10% of investment needs.
- **Green financing can be a useful way to diversify revenue sources for public transport.** These "greeniums" (i.e., the yield spread between green and conventional bonds) have occurred a few times, but they are new products driven by transient demand-supply imbalances. They are not guaranteed, and their margins may narrow (or even disappear) as the market shifts.

Accordingly, authorities should not treat greenium as a core funding lever, and issuers with weaker credit or unconvincing use-of-proceeds should not expect less expensive funding than plain "vanilla" debt. The case for issuing green bonds remains strong, however — they tap specialized investor appetite, broaden the investor base, and create safe assets (as France's Green OAT illustrates) while generating an external commitment device that anchors green-action delivery. This governance discipline can accelerate credible transit programs and guard against calls to subsidize or administratively cap yields, which could signal product weakness. We recommend treating any greenium as an opportunistic upside — the durable value of green bonds lies in accountability and market access to finance public transport investment.

- **By itself, public-private partnership (PPP)/concession is not an external revenue source.** PPPs help with cash-flow optimization, but usually at a higher yield than sovereign entities. Initial private investments must be paid back by public money with the investor's markup, as there is no standalone business case for mobility infrastructure without subsidies. However, past experience shows that in some cases, well-designed PPPs can be useful to (1) bring expertise in complex infrastructure projects when public bodies lack it and (2) accelerate infrastructure rollout with cost control. This could bring additional value to a system unbalanced because of concessionaire's margins and help with yield spread.

IMPROVING EFFICIENCY & COST-EFFECTIVENESS

Maximizing spend is as important as raising money. Many public transport systems can reduce costs or slow cost growth without sacrificing service quality by improving efficiency and changing how services are delivered. When requesting public funding, PTAs can strengthen their case by demonstrating that they are containing costs and operating efficiently. Any efficiency gains should be reinvested in the public transport system rather than used to offset subsidies or fund fare reductions.

We estimate that PTOs and PTAs could reach between 20%–40% in cost efficiency (in €/pax-km traveled) with a strategic redesign plan that includes:

- **Network redesign and service optimization.** Over time, transit networks can become inefficient. Routes that were necessary years ago might overlap today, or there may be too much capacity in one area and too little in another. By periodically redesigning the network (something cities like Houston and Barcelona have done in recent years), agencies can improve service while using resources more efficiently. This might involve consolidating low-performing routes and boosting frequency on core routes (doing “less of the empty buses, more of the full ones”), implementing measures like bus rapid transit that carry more people with fewer drivers, or adjusting service hours to match demand (e.g., not running large vehicles late at night when a smaller vehicle would do).
- **Improved asset rotation.** One concrete efficiency metric is commercial speed: if buses or trams can travel faster (via dedicated lanes and/or signal priority), each vehicle and driver can cover more route-kilometers in the same period of time, increasing productivity and reducing cost per km. Higher average speed means the fleet can be smaller for the same frequency, so infrastructure investments that speed up transit are cost-saving measures. Additionally, better scheduling and run-cutting (using software) can minimize unproductive time, and optimizing crew shifts can reduce overtime costs.
- **Productivity enhancements.** Labor is a huge component of transit OPEX (~70% of costs for bus operations). Any productivity gain — whether through training, better maintenance practices that reduce breakdowns, or workforce management — can yield savings. This includes reducing absenteeism and overtime through improved work quality.
- **Economies of scale or partnerships.** Small transit agencies can pool procurement (for buses, fuel, insurance) to get bulk discounts, as we see in France with CATP-AGIR Transport (especially useful for grouping bus purchases). In the age of digital tools, there’s a potential to share platforms (for ticketing, mobility-as-a-service apps, passenger information) rather than each city developing its own.
- **Reduced friction and interface costs.** Public transit systems have become more complex, with more players and internal and external stakeholders involved. This requires coordination and could lead to additional friction between PTAs and PTOs that results in time-consuming tasks (e.g., reporting, contract management, and internal coordination/alignment). More agile, integrated transit systems could significantly decrease management, support, and shared-services costs.
- **Competitive bidding.** Competitive tendering and performance-based contracts are more frequent of late, but they are not simple. In situations where private concessions face little to no real competition, new tendering strategies can help PTAs save money. In the UK, cities outside London saw reduced bus costs after shifting to competitive tendering schemes, and Seoul’s reformed bus system used competitive bidding to cut costs by ~20% in some corridors. However, in places where the cost per passenger is still low, and a public operator offers an integrated service, PTAs should consider their options before beginning a time-consuming, expensive transformation.

CONCLUSION — STRATEGIES & RECOMMENDATIONS FOR SUSTAINABLE MOBILITY FUNDING

Overcoming mobility funding challenges is a multifaceted endeavor. It is not just a matter of finding more money; PTOs must change mindsets, policies, and partnerships. Our recommendations focus on policy paradigm shifts (i.e., questioning long-held assumptions to unlock bold actions), strengthening collaboration and governance between transport authorities and operators (and across government levels), and embedding sustainability metrics (e.g., carbon emissions) into funding decisions to attract new sources and ensure long-term viability.

RETHINKING PARADIGMS & EMBRACING BOLD CHOICES

One of the biggest barriers to solving the funding problem is conventional thinking or treating paradigms as permanent. To enable change, leaders must be willing to challenge the status quo in several areas:

- **Pricing.** There is often a public expectation that public transport should be cheap or even free, while driving and parking are often subsidized or underpriced. This needs reexamination. A new social contract might mean acknowledging that high-quality mobility has a cost — but that cost is worth paying for collectively. Using price signals, such as appropriate fares and road tolls, offers a triple benefit: financing the system, managing demand, and encouraging users to better understand the cost of mobility.

TO ENABLE CHANGE, LEADERS MUST BE WILLING TO CHALLENGE THE STATUS QUO

- **Coverage.** Not every neighborhood needs a direct route to downtown. Given the constrained funding future, agencies must optimize networks for efficiency and impact — which could include changing underperforming services and reallocating resources (e.g., a shift to demand-responsive transport [DRT] as highlighted in the ADL Viewpoint “[DRT: A Key Lever to Bridge Mobility Gaps](#)” or autonomous shuttle)
- **Integration.** Transport, urban planning, energy, and finance often operate in silos. The future calls for integrated thinking, meaning that land use, mobility funding, climate policy, and transport investment should all be connected. Viewing mobility as an integrated ecosystem can unlock significant efficiencies. Improvements in one part of the system (e.g., cycling infrastructure) can reduce costs in another (e.g., road expansion). Even institutional silos created by legislation or competitive regulatory frameworks should be open to reexamination, as breaking down these barriers can create significant value across the system.

BUILDING STRONG PTA-PTO PARTNERSHIPS

Effective funding solutions require seamless collaboration between entities that plan and fund services (PTAs) and those that deliver the services (PTOs, either municipal or private). In many cases, these entities have a contractual relationship, but fostering a deeper partnership can unlock efficiencies and innovation:

- **Align objectives and incentives.** Contracts and governance structures should ensure that both PTAs and PTOs have skin in the game to improve financial outcomes.
- **Work jointly on business cases for new funding.** For example, if a congestion charge is proposed, the PTA and PTO should together plan how transit will absorb new riders and how funds will be used to scale up service.
- **Enhance data and transparency.** Collaboration is enhanced by sharing data openly (e.g., on costs, ridership patterns). A PTA should know the true cost drivers for the PTO, and the PTO should understand the PTA's budget constraints. By analyzing data together, they can identify problem areas (e.g., routes with exceptionally high subsidies per passenger) and develop more efficient solutions, such as replacing underused fixed-route bus services with demand-responsive transit where appropriate.

We recommend pursuing integrated governance at the metro/regional level, so funding levers like road pricing or employer contributions can be applied region-wide and the benefits shared. Some regions have created metropolitan transport authorities with taxing power (e.g., Transport for London, Verkehrsverbund organizations in Germany); these models pool resources to avoid harmful fragmentation.

INTEGRATING CARBON & EXTERNALITY BENEFITS INTO FUNDING DECISIONS

It's important to explicitly incorporate environmental and social benefits into the way projects are evaluated and financed. Traditional cost-benefit analyses tend to undervalue public transport's positive externalities (clean air, reduced emissions, equitable access). By quantifying these, PTAs can unlock new funding:

- **Use carbon metrics in appraisals.** Include "cost per ton of CO₂ avoided" as a metric when proposing a new transit line. If it's lower than alternatives (e.g., better than subsidies for EVs), make that case to climate-focused funding sources. Some climate funds or green recovery programs prioritize projects with clear emissions outcomes. Every major mobility project should include a climate-impact assessment that can then be used to tap climate-related finance.
- **Quantify co-benefits.** Public transport reduces congestion (through travel time savings), lowers accident rates, and improves public health by encouraging active travel. These societal benefits often far outweigh the financial costs. For example, a study may find that every €1 invested in public transport can generate up to €4 in wider economic and social benefits.
- **Estimate the cost of inaction.** Climate change is a reality, not a matter of political opinion. Failing to act today will result in significant social, environmental, and economic impacts in the future. The economic cost of climate change by 2050 is projected to be substantial and will be even greater if the Paris Agreement targets are not achieved.



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