UITP ADVANCING PUBLIC TRANSPORT

→ Position

Authorities: Strategic conditions & prerequisites

Ensuring high-quality, integrated transport

→ Oslo, Norway
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Developing, delivering, and overseeing, quality public transport (PT) systems in urban, peri-urban, and rural areas is a fundamental responsibility of PT and mobility authorities, together with industry. Ensuring that quality standards for both mass PT and shared services are met and continuously improved is paramount, particularly in a context shaped by various sectoral challenges. This publication explores the key strategic conditions needed to realise that goal, complementing the approach developed by this Committee in the publication Governing Quality and Performance, which focuses on service quality.

Key messages

High-quality, effective, and efficient collective mobility remains the best way to move masses of people – whether that be across urban, peri-urban, and rural areas.

Explore key conditions and prerequisites from the perspective of transport authorities to translate strategic transport policy objectives into successful, high-quality PT systems. Featuring 18 global case studies, this Position examines key success factors and shows that balancing the following three aspects are critical to reach a high quality, integrated, and multimodal transport system:

→ Geneva, Switzerland
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- → An end-user centric perspective that considers the entire user journey, ensuring frequent, clean, comfortable, punctual, and (physically and cognitively) accessible services, good information, and seamless transitions across different modes and services.
- → Alignment with strategic and policy objectives and the PT authority's (PTA's) legal requirements, through service continuity. This includes broader policy goals such as access and connectivity to employment, social equity, carbon reduction, and resilience.
- → Robust service performance and delivery conditions, encompassing PTAs' and operators' shared responsibilities, while also addressing market dynamics to ensure operational viability and long-term resilience. Investment is also needed to retrofit, upgrade, or develop new assets.

This Position formulates four actionable recommendations to help PTAs and other stakeholders deliver high-quality PT.

- → At a strategic level, strengthen governance and collaboration.
- → At a tactical level, define service quality from the user, territorial (urban, peri-urban, and rural) needs, and general interest perspectives.
- → At an operational level, implement a robust performance measurement system.
- → Foster incremental and inclusive innovation that meets public policy objectives.

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1. Introduction

Delivering high-quality, effective, and efficient collective mobility solutions remains the best way to enable large numbers of people to move around, across urban, peri-urban, and rural areas, throughout the day. PT frees up space for other vital city and territorial functions, helps connect urban and rural areas, and supports vibrant, resilient community development.

PT is not simply an efficient people-moving service. As a service of general interest and a public good, it is a structural tool for advancing societal well-being and shaping our territories' future. It enables urban and rural communities to thrive, supporting dynamic local economies and enhancing community vitality. A high-quality PT system helps address environmental and equity challenges by reducing emissions, improving accessibility and affordability, and creating cleaner, healthier, and more liveable environments through reduced noise and better air quality. It encourages healthy, active lifestyles and ensures high safety standards. The PT sector is also highly innovative – it was an e-mobility pioneer long before electric cars became mainstream, and fully autonomous metros have been in operation for over 35 years. The sector is now pursuing research and development in areas like hydrogen, artificial intelligence (AI), cross-border digital ticketing, and autonomous road vehicles.

This Position explores key conditions and prerequisites for translating strategic transport policy objectives into successful, high-quality PT systems.

Providing a strong alternative to private cars and adapting to evolving lifestyles and mobility patterns are essential in PT[1]. This Position introduces a three-tier framework defining key service quality dimensions, draws on global case studies to identify critical success factors for delivering, measuring, and improving high-quality sustainable mobility solutions, and concludes with actionable recommendations. It examines governance structures and mechanisms, institutional arrangements, and critical policy areas.

The aim is to help authorities and industry stakeholders identify critical factors for delivering services that meet users' expectations while advancing broader policy goals.

2. How transport authorities view quality

A shared vision of PT and mobility authorities' role in ensuring high-quality services is needed, regardless of the delivery model or transport modes.

2.1. Advancing accessibility through PT solutions

Within the large PT and mobility stakeholder ecosystem, authorities are responsible for ensuring the efficient movement of people while maximising accessibility and connectivity – i.e., the ease with which people can reach desired destinations and use PT. This enables individuals to seamlessly access essential services, destinations, and opportunities. A multimodal system is crucial for this, providing an integrated mobility offer where users can easily use multiple PT modes – mass public transport, shared mobility, and/or on-demand services – in a single journey.

To meet urban and rural mobility needs and make PT attractive, one should make the most of available public resources, without necessarily increasing overall expenditure. Nevertheless, high-quality service provision requires financial support in some cases such as fluctuating service usage due to changing mobility patterns. As it increases accessibility, PT, including modes like shared mobility, qualifies for related subsidies, which can help ease the financial burden.

Mass PT is the structural backbone of sustainable mobility systems (local, urban, suburban, and regional). Ensuring regular, stable, and high-capacity services is vital.

Shared and on-demand solutions, including demand-responsive services[2], are particularly relevant in low-density suburban and rural areas and where the regular PT service cost is very high. Shared mobility solutions reduce car dependency while simultaneously supporting high-capacity PT, encouraging PT use for a broader range of trips. Reduction in private car ownership helps free up road space for priority measures, strengthening the overall mobility system.

However, their effectiveness heavily depends on the existence of a strong, high-quality PT system with a reliable, well-functioning core and context-based solutions. Moreover, authorities must maintain robust governance to ensure these services complement, rather than compete with, PT, and contribute to broader policy goals, including equity, sustainability, and public space quality[3].

Ultimately, **not all services should be compensated.** Determining which mobility solutions deliver a service of general interest and qualify as PT requires analysis of local regulations, demand, and market players. Individualised, tailored services may be difficult to deliver efficiently and manage as part of a PT network. Therefore, a variety of solutions must be considered. However, even if authorities decide to leave tailored services to the private sector, multimodal transport provision must be guided by the relevant regulatory/policy frameworks to ensure alignment with broader transport objectives.

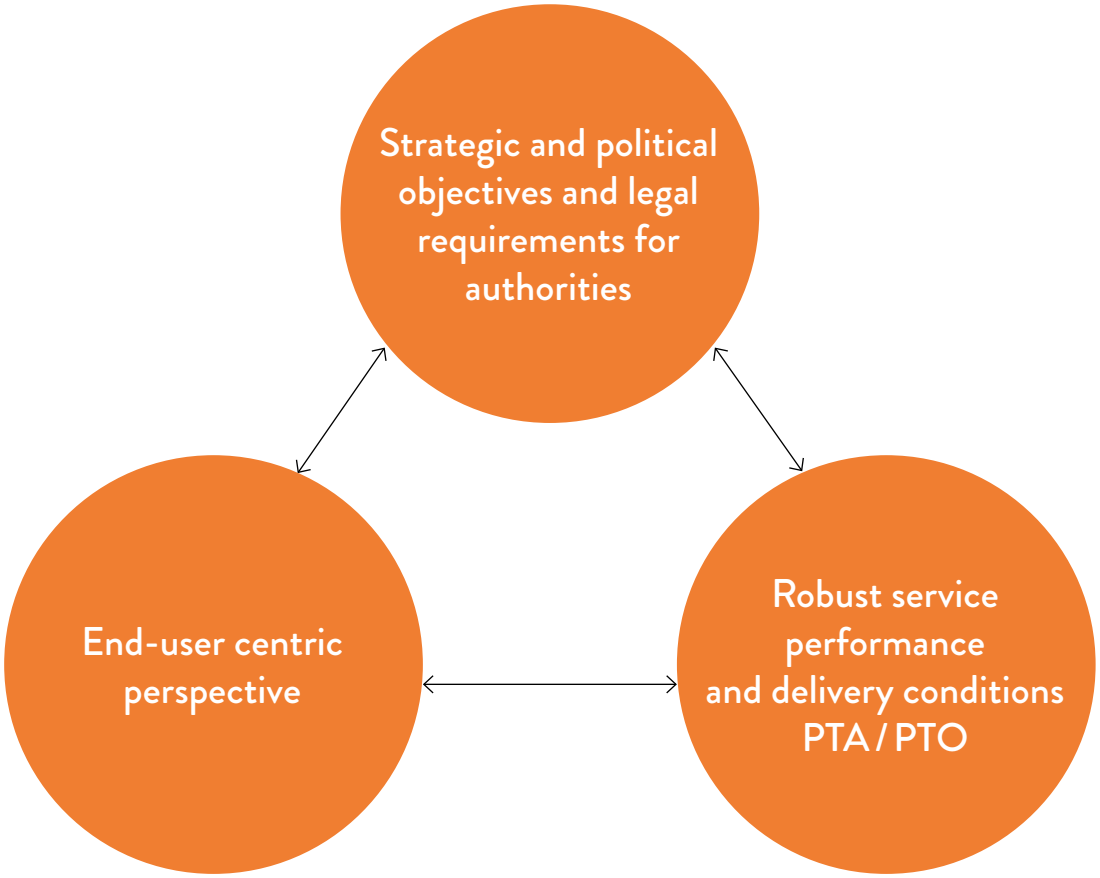
2.2. A three-tier approach to service quality

Defining service quality in PT[4] requires an integrated, multi-dimensional approach based on three interrelated pillars:

- An **end-user centric perspective** that considers the entire user journey, ensuring frequent, clean, comfortable, punctual, and (physically and cognitively) accessible services, good information, and seamless transitions across different modes and services.
- **Alignment with strategic and policy objectives** and the PT authority's (PTA's) **legal requirements,** through service continuity. This includes broader policy goals such as access and connectivity to employment, social equity, carbon reduction, and resilience.
- **Robust service performance and delivery conditions,** encompassing PTAs' and operators' shared responsibilities, while also addressing market dynamics to ensure operational viability and long-term resilience.

Fine-tuning and balancing these aspects is critical to maintaining and improving service quality. **Investment** is also needed to retrofit, upgrade, or develop new assets.

Figure 1: Service quality dimensions



Four core principles underpin service quality

- → A clear distinction between essential and aspirational quality levels with minimum thresholds to ensure there are no break-event points.
- → Consistency across modes within the integrated multimodal network.
- → Service continuity and adaptability to planned and unexpected changes. This approach must be location-based, as service expectations differ across geographies and communities, from suburban/rural vs. urban and across regions like Europe, North America, Latin America, Asia, and Africa.
- → Innovative solutions – both new technology adoption and continuous improvement in service design and delivery, focused on adding value and meeting evolving public needs.

3. High-quality service delivery: Success factors

Focusing on end users is critical to high-quality PT service delivery. Yet there are a diverse range of contexts, governance models, competences, and capacities among PTAs. These differences translate into different service delivery models (e.g., direct operation vs. contracted services), legal powers and responsibilities, and funding structures[5].

This section presents seven key success factors at the strategic, tactical, operational, and innovation levels for improving service quality, along with related global case studies.

- → **Strategically,** (1) strong political commitment is vital, supported by (2) adequate, stable, and well-targeted funding and (3) effective cross-cutting cooperation among authorities to ensure accountability, coherence, and operational efficiency.
- → At the **tactical level,** there must be (4) clear responsibility allocation, complemented by (5) a user-centred approach prioritising accessibility and seamless system integration.
- → **Operationally,** (6) a robust reporting framework with well-defined key performance indicators (KPIs) is essential to track progress and guide continuous improvement.
- → **Innovation** is equally important: authorities must continuously explore and adopt new solutions – technological, organisational, and/or service-oriented – to meet evolving needs. This includes (7) developing novel tailored approaches for rural and urban areas.

→ Berlin, Germany

3.1. Strategic: Political support and optimal use of public funds

Ensuring that PT evolves to effectively support equity, economic development, and climate goals requires strong political commitment. This should translate into sustainable, stable funding, sound public resource management, and the implementation of coherent, supportive policy frameworks.

Service quality cannot be improved through funding cuts: meaningful PT improvements require greater investment, and trade-offs must be presented transparently. Increased funding enables enhancements such as more frequent services, increased backup resources, and expanded infrastructure, including bus lanes and rapid transit lines.

→ Service quality cannot be improved through funding cuts.

Nevertheless, service quality can be improved at any spending level and even within a fixed budget. This requires implementing smart, targeted measures that are low-cost, low-tech, and common-sense.

Authorities should be balanced and impartial when advising decision-makers. Political, financial, and legal support are fundamental prerequisites for implementing measures to improve PT service quality. This includes political support for establishing a robust legal framework that empowers PTAs and creates favourable market conditions. In-house models should ensure that operators' and shareholders' interests align with the authorities' public service remit.

Case study 1: Ottawa, Canada – Service quality from a North American perspective

Ottawa, Canada's capital, with a population of around one million, lost 85% of PT riders during the 2019 coronavirus disease (COVID-19) pandemic. With a predominantly white-collar population still working from home, OC Transpo had to simultaneously address service delivery issues and workforce shortages.

The City of Ottawa's Transit Commission expanded bus operator recruitment and training, restructured maintenance workflows, and enhanced mechanic apprenticeship schemes. These measures significantly reduced trip cancellation and improved vehicle availability, increasing conventional service ridership to 72% of pre-pandemic levels and paratransit demand for customers with disabilities to an all-time high of over 3,000 daily trips.

OC Transpo's customer service centre and control centre collaborate to manage bus and paratransit operations. All paratransit bookings, whether via phone or online, feed into a central scheduling system every evening. Planners group travellers into public minibuses, and a private contractor representing four taxi firms handles single passenger trips.

The 'New Ways to Bus' network redesign aims to increase neighbourhood connectivity, maximise rail feeder services, and save 10 million Canadian Dollar (CAD) annually. This illustrates OC Transpo's political balancing act. Since downtown commuters were largely working from home, planners reallocated resources toward shift workers, students, healthcare staff and lower-income passengers. Transparent communication with municipal councillors was crucial to getting this reallocation approved.

Ottawa, Canada →
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Case study 2: Auckland, New Zealand – Evolving bus network and contracting model

Auckland, New Zealand's largest city, drastically transformed its PT system over the past decade. Challenged by complex topography, low urban density, and rapid population growth, it restructured its bus network and governance model to improve connectivity, frequency, and resilience.

Before 2013, Auckland's bus services were largely operator-controlled, with most routes terminating in the city centre. Between 2017 and 2019, Auckland Transport (AT) rolled out a redesigned network focused on frequent, connected services (every 15 minutes, 7am-7pm, daily), rather than one-seat journeys. Extensive community engagement facilitated this shift.

The first procurement round involved 52 separate units, reflecting a mix of legacy operational patterns. This model attracted new entrants, including international operators, due to low financial risk and guaranteed revenue. However, it also revealed gaps like weak local representation and wage pressures for drivers. A second procurement round, in 2023, consolidated contracts into 21 regional units and included stronger social and employment safeguards.

Auckland's bus system plays a vital role in transport resilience. During recent transport disruptions, including a major weather event in 2023, buses were the only mode able to evacuate passengers. The city has developed a multimodal operational response system, ensuring bus, rail, and road authority coordination during emergencies.

Case study 3: Geneva, Switzerland – Network development and service standards

Geneva has a robust PT legal framework, the Loi sur le réseau des transports publics (LRTP), which sets service standards to ensure accessibility, reliability, and efficiency. Under the law, the network must be fully integrated, connecting urban, regional, and cross-border areas.

Key service targets include commercial speeds of over 18 kilometres per hour (km/h) on major road-based lines and 30km/h on dedicated corridors, short walking distances to stops, frequent services with minimal waiting times, and continuous coverage between 6am and midnight. Network development is planned through multi-annual action programmes, prioritising high-capacity, high-quality modes like trams and regional rail. The law mandates the creation of continuous reserved corridors for trams and bus rapid transit (BRT). This approach combines ambitious service quality targets with long-term network expansion, offering a strong integrated, legally-anchored transport planning model.

Case study 4: Barcelona, Spain – Dual bus management model

Barcelona's metropolitan area, with 36 municipalities and over 3.3 million residents, has developed a diverse, multi-layered PT network. PTA Àrea Metropolitana de Barcelona (AMB) runs a dual bus management model, split between direct operation by the public company Transports Metropolitans de Barcelona (TMB) and indirect management through private operators.

TMB manages Barcelona's urban bus and metro networks with a high degree of operational autonomy but under AMB supervision, operating a fleet of around 1,100 vehicles. Its leadership includes metropolitan authority and city council members, ensuring both local and metropolitan representation.

→ Barcelona, Spain

Private operators manage many lines in the municipalities surrounding Barcelona, as well as connections between these municipalities and Barcelona. AMB tenders out services to private companies, through up to 10-year contracts. A total fleet of around 900 buses is operated by several private firms under AMB supervision. Operators are responsible for vehicle and facility procurement on behalf of AMB, which retains ownership, and daily service delivery. AMB defines service levels and controls network development, permitting limited adjustments like reinforcements on existing routes.

This hybrid governance structure enables public and private operator benchmarking, thus fostering healthy competition and ultimately enhancing efficiency and service quality. Barcelona's model shows how carefully balanced partial privatisation in high-density metropolises can improve services while maintaining long-term public asset control.

AMB's dual model illustrates a deliberate political and managerial balancing act. With direct management ensuring core urban service continuity and accountability and indirect management harnessing competition to extend coverage and flexibility, the model shows how to align public oversight with private initiative to deliver high-quality services.

3.2. Strategic: Promoting multistakeholder cooperation

High-quality service delivery depends on numerous actors. PTAs' scope for service delivery improvement is shaped by governments' strategic decisions and other stakeholders' actions. Several factors affecting service quality require various stakeholders' early involvement and coordination. When rolling out new services, infrastructure, or rolling stock, one must engage users, beneficiaries, and the public early on, involving them in project conception, design, and evaluation. Structured collaboration between PTAs and the following key actors is essential to ensure integrated, user-centred solutions:

- → Users
- → Operators
- → External partners
  - → Road, public space, and railway infrastructure managers and regulators
  - → Station managers
  - → Police
  - → Transport infrastructure project developers
  - → Key traffic generators like employers and leisure venues

It is also crucial to connect with potential funders and lobby policymakers to take into consideration broader factors influencing service quality.

→ San Francisco, USA
© UITP

→ San Francisco, USA
© UVL

Case study 5: San Francisco, USA – Advancing congestion-free bus lanes through cross-agency collaboration

Urban congestion in cities like San Francisco (SF) causes costly bus delays, leading to higher operating expenses, unreliable service, and pressure to cut services if additional revenue cannot be secured. The result is reduced access to jobs, lower economic activity, and disproportionate impacts on disadvantaged communities who rely most on transit. To mitigate this, SF adopted bus priority measures like transit-only lanes, transit signal priority, and quick-build improvements to rapidly test and refine measures. These projects followed the "3 Ps" framework, Partner, Pilot, Persist. In other words, alignment with other urban works, low-cost reversible pilot implementation, and performance-based iteration. SF's 14 Mission line saved time through such measures, helping riders gain greater job access within a 30-minute commute window and benefitting 46,000 daily riders.

Bus lanes are more affordable upfront than other PT infrastructure projects and can decrease average bus travel times by 10-20%, along with operating costs and carbon emissions, while increasing ridership due to faster, more reliable service and supporting local businesses along transit corridors. Bus priority measures represent a hidden treasure: they simultaneously increase ridership and reduce operating costs, while addressing inequality and environmental goals. The SF case demonstrates that modest, well-planned interventions can produce exponential benefits for cities and their residents.

3.3. Tactical: Clarifying responsibilities vertically

To ensure efficient use of public funds for high-quality service delivery, **a well-defined distribution of tactical and operational functions** between the PTA and PT operator (PTO) is needed. Tactical functions centre on medium-/long-term activities and decisions to achieve specific objectives supporting the organisation's overall strategy. Operational functions include day-to-day processes and activities that keep an organisation/system running, with a focus on ongoing execution of core tasks that deliver products, services, or outcomes.

→ Cape Town, South Africa
© Diriye Amey

One key governance issue revolves around the PT **market structure.** Running services in-house vs. contracting them out can strongly influence results. Another major question is that of asset ownership. When services or assets are tendered, authorities must understand the supplier landscape to manage competition effectively. A healthy operator mix helps prevent monopolies and encourage the participation of smaller providers.

PTA and PTO responsibility sharing is another concern. On one end of the spectrum, the operator is responsible for delivering a full, integrated service. On the other end, the authority defines mandatory specifications the operator must follow. Finding the right balance between operator freedom and authority oversight is essential.

A third question centres on defining roles and relationships across different functions. The authority-focused approach relies on incentives like bonuses and innovation rewards, combined with clear risk-sharing rules. The operator-leaning approach emphasises collaboration, flexibility, and shared responsibility, allowing both sides to adapt and problem-solve together.

For incentives to work, clear penalties and compensation rules are needed. Contracts with excessive risk buffers or profit margins can weaken quality management, such as when competition is limited or an in-house operator cannot realistically be penalised. Maintaining a diverse operator pool is essential to ensure fair pricing and effective performance management.

Case study 6: Skånetrafiken, Sweden – Service quality from a European perspective

Skånetrafiken, the PTA for Sweden's Skåne region, manages an integrated network of around 200 regional trains, 1,100 urban buses, and 450 specialised vehicles for transport services across 33 municipalities and into Denmark, with 500,000 daily trips. Skånetrafiken balances strategic vision with robust contract management, evaluating contracts based on the proposed solution's robustness, the customer engagement strategy, and the proposal's overall resilience. A minimum 84% satisfaction clause helps ensure high performance.

Operationally, operators manage vehicles, personnel, and local marketing, while Skånetrafiken handles ticketing, regional marketing, and customer information. Operators must assume some demand risk, to incentivise them to grow ridership. Five times a year, they can propose minor route/frequency changes according to demand.

Since the pandemic, Skånetrafiken has seen continuous improvements in punctuality and customer satisfaction, driven by upgraded app-based ticketing, real-time dashboards, and a combination of risk analysis, SWOT analyses, and strategic reviews throughout each contract's lifecycle.

Case study 7: Cape Town, South Africa – Service quality from an African perspective

The minibus taxi (MBT) industry is the primary PT mode for most South African commuters. Key sectoral issues including poor service quality, illegal operations, and violent conflict, exacerbated by outdated regulations, weak enforcement capacity, and the absence of operating subsidies. Over the past two decades, the government has tried to replace this mode with BRT and integrated PT networks, but there is growing recognition that PT needs to include, not displace, MBTs. To achieve this, there is a need for long-term incremental MBT industry reform, starting with existing business models and gradually transitioning to more formal, accountable structures. A balanced approach combining updated regulation, targeted incentives, and better enforcement mechanisms is needed, complemented by bottom-up interventions focused on operators and drivers. For instance, enhanced service standards and targeted compliance support.

While pilot initiatives, like the 7th Avenue Targeted Operating Contract project, have shown promise, upscaling remains difficult. Many associations do not meet the preconditions for formalisation, and where they do, additional financial and institutional support may be necessary. Nevertheless, the city and province have successfully implemented targeted interventions with strong scale-up potential. Industry leadership involvement in vision and long-term roadmap co-creation, strengthened governance, clearer institutional roles, and collaboration across all levels of government and industry are key to meaningful, lasting reform.

Case study 8: London, UK – The Elizabeth Line

The Elizabeth Line and Docklands Light Railway (DLR) illustrate how Transport for London (TfL) manages diverse rail operations while maintaining high service quality. The Elizabeth Line is operated under a concession by GTS Rail Operations. The DLR is operated and maintained under contract by Keolis Amey Docklands. Each mode operates under a distinct performance framework tailored to its delivery model but aligned with TfL's strategic objectives: safety, customer satisfaction, environmental impact, colleague well-being, and financial sustainability.

→ London, UK
© Eleanor Bentall/TfL

TfL uses a mix of input, output, and outcome-based metrics (such as staffing levels, customer asset cleanliness and condition, and customer satisfaction) to monitor and improve service quality. One metric, weighted journey time, reflects the perceived customer journey experience by incorporating factors such as crowding and delays, enabling comparison across different services, including contracted modes like DLR and directly operated ones like the London Underground.

TfL emphasises collaboration over competition in its contracting. There are clear performance targets but limited penalties, with contracts encouraging mutual success through shared objectives, regular reviews, and long-term relationships. Safety, for instance, is managed through a shared culture of awareness and understanding, as well as regulatory frameworks, rather than financial incentives.

TfL retains control over fare-setting and assumes the revenue risk for both the Elizabeth Line and DLR, enabling fare integration, affordability, and alignment with broader policy goals like equity, accessibility, and modal shift.

3.4. Tactical: User-centric approach: Mobility needs, accessibility, and integration

Understanding and integrating users' needs and feedback is crucial to high-quality PT system design. When perceived service quality meets or exceeds expectations, user satisfaction rises[6]. However, service improvements must be carefully managed; increasing demand without adequate support can undermine improvements.

→ Helsinki, Finland
© Tapio Haaja

Case study 9: Helsinki, Finland – HSL's approach to user-centricity

Helsinki's PTA, HSL, uses user feedback to inform service improvements. A digital platform collects real-time passenger data, facilitating specific bus line tracking and targeted demographic group-based studies. Short-term qualitative feedback is gathered alongside long-term travel pattern analyses, enabling an evidence-based service planning approach. By integrating these insights, HSL can assess system changes' impact and adapt services to passenger needs, demonstrating structured feedback mechanisms' value in shaping both strategic decisions and everyday operations.

PT should be open to all! It is critical to ensure as many demographic groups as possible, especially vulnerable end-users, can use these services. Moving towards universal, accessible transport networks and connection with their environments is vital.

Case study 10: Lisbon, Portugal – Using integration and accessibility to drive modal shift

As part of the UPPER project, Lisbon's PTA, TML, is actively reshaping mobility by integrating fares, planning, and infrastructure, while simultaneously prioritising accessibility. Its unified Navegante fare card and Sustainable Urban Mobility Plan aim to increase PT use – currently only 20% – and reduce private car dependency.

To ensure the entire user journey is accessible, TML launched the Accessibility Plan for People with Disabilities. Through comprehensive surveys and consultations with cities, operators, infrastructure managers, and disability associations, TML identified significant barriers, especially in public spaces surrounding stations, of information provision and safety.

An evaluation of 256 transport stops analysed the availability of taxis (50% of stops), bike parking (79 stops), and parking spaces, including supply-demand mismatches. This evidence-based approach feeds into an intervention typology guide, aiming to systematically improve regional accessibility.

While TML does not own or control transport hubs, it plays a pivotal facilitator role, assisting municipalities in prioritising and planning improvements. Together with the European Investment Bank, TML is developing an investment planning framework to identify financial needs for infrastructure upgrades like metro extensions and BRT systems.

A key service quality-related challenge is ensuring a **smooth and seamless mobility experience,** particularly transitions between modes in both infrastructure and intangible aspects.

→ Lisbon, Portugal
© Pedro Sadio/ UPPER

→ Shanghai, China
© ssguy

3.5. Operational: Service quality measurement tools

Measuring service quality is essential. It enables continuous improvement by ensuring political and democratic accountability and service alignment with user needs and broader strategic objectives. Evaluation also enables better decision-making and builds stakeholder trust by showing system performance and value.

A comprehensive approach includes different metrics: 1) **'objective',** like punctuality or vehicle availability; 2) **'emotional/experiential',** like comfort or aesthetics; and 3) specific **cultural** ones capturing users' experience, highly dependent on the individual user given demographics and cultural traits/expectations[7]. Prioritising the entire customer experience means creating a shared sense of value, connection, and curiosity; PT as a collective journey. It is essential to anticipate future challenges and identify emerging requirements through forward-looking planning.

KPIs also enable comparison across different networks, service delivery models, contract management practices, and geographical regions. Benchmarking these indicators, by developing a specific standard framework, can facilitate evidence-based decision-making.

Responsibility for KPI and service quality measurement varies: in tendered contracts, the PTA typically oversees performance monitoring, whereas for in-house services provided by public operators, the operators often measure their own performance – an approach lacking accountability. PTAs should be proactive and evaluate all service models consistently.

Case study 11: Paris, France – Île-de-France mobilités's approach to quality KPIs

IDFM, the Paris metropolitan PTA, has established a comprehensive and structured approach to monitoring and improving service quality across its multimodal network. This framework is embedded within operator contracts (monopolistic tender and tendered contracts) and reinforced through performance-based incentives.

Service quality is evaluated on three interrelated dimensions: 1. service punctuality and regularity; 2. passenger experience, operational aspects such as cleanliness, accessibility, and customer support; and 3. passenger perception based on structured user surveys.

Each transport mode (train, metro, tram, bus) is assessed through specific components, evaluated by sets of KPIs. Each component's weight in financial incentives varies by mode and operator:

Mode/operator	Punctuality & regularity	Passenger experience	Passenger perception
SNCF (train/RER)	50%	25%	25%
RATP (RER A & B)	50%	25%	25%
RATP (metro)	40%	35%	25%
RATP (tramway)	40%	35%	25%
RATP (bus)	40%	35%	25%

The number of KPIs varies by transport mode. For example, the RATP bus network includes 44 KPIS: passenger information (19 KPIs), passenger contact (8), cleanliness (5), accessibility (7), and sales and validations (5). Both operators and IDFM monitor all components, ensuring accountability and transparency.

A key innovation in the IDFM model is the emphasis on perceived service quality, measured through an extensive annual survey of around 210,000 interviews, including 78,000 at SNCF-operated stations, 66,000 at RATP stations and tram stops, and 65,000 at suburban bus stops. The results directly influence operator compensation, linking financial rewards to passenger experience.

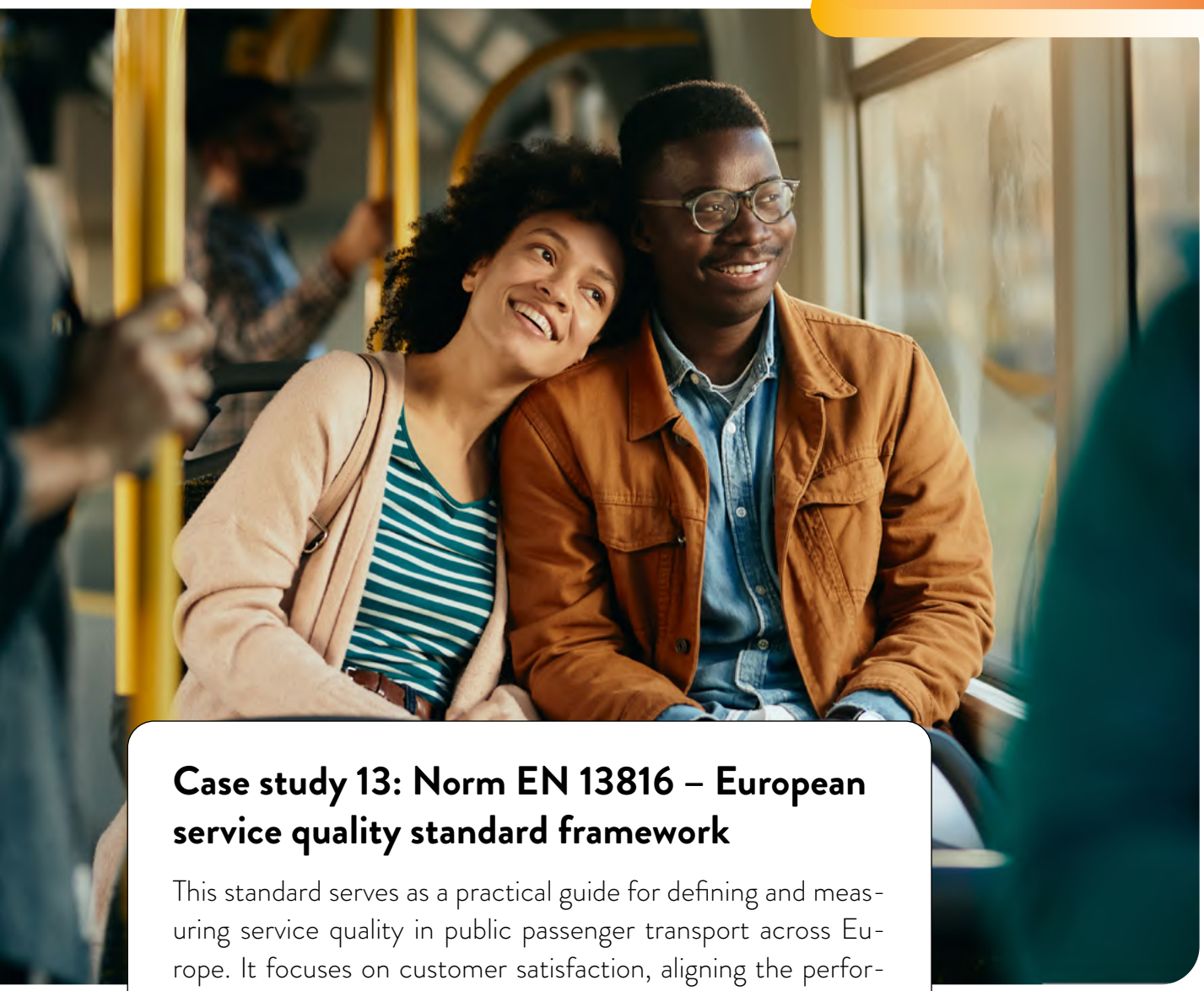
Case study 12: Chicago, USA – Data, transparency, and recovery

After the pandemic, the Regional Transportation Authority (RTA), which oversees planning and finance for the Chicago Transit Authority (CTA), Metra (commuter rail), and Pace (suburban bus), faced a rapidly evolving landscape shaped by staffing shortages, legal mandates, and public demand for transparency. Operational gaps narrowed as staff increased, but there was only partial service recovery. Data collected on headway adherence, passenger wait times, and service frequency indicated persistent challenges like unreliable headways and bus bunching, which negatively impacted rider experience. The changing transport landscape triggered drastic changes in the PT system's performance management, public engagement, and interagency governance.

→ Chicago, USA
© Matthew Jackson

In Illinois, operators are now legally required to submit monthly KPIs covering staffing, service, and safety. RTA ensures compliance and can withhold funding if data is insufficient or not made publicly available. This legal framework drove a transformation in public data sharing. There are user-friendly dashboards with metrics like service miles, staffing levels, operational gaps, and recovery progress. During the pandemic, fragmented dashboards with different datasets led to confusion and poor user engagement. Transit-savvy users extracted data and produced independent analyses, sometimes resulting in public misperception. Now, there is a single 'rider hub', which provides detailed but more understandable insights to the public.

Questions remain about the KPIs' usefulness for decision-making. Legislative mandates drafted without operator consultation have driven granular indicator measurement, such as passenger wait times at individual stops, and it remains unclear whether this level of detail informs policy or improves rider outcomes.



→ © Dragen Zigic

Case study 13: Norm EN 13816 – European service quality standard framework

This standard serves as a practical guide for defining and measuring service quality in public passenger transport across Europe. It focuses on customer satisfaction, aligning the performance expected by customers with the services provided. Key customer service quality areas include:

→ **Availability:** service frequency and route reliability

→ **Accessibility:** ease of getting on and off vehicles for all users

→ **Information:** quality and ease of accessing service-related information

→ **Time:** journey time, waiting time, and schedule adherence

→ **Comfort:** physical comfort in vehicles and at stations

→ **Security:** passenger safety during their journeys

→ **Environmental impact:** the service's environmental footprint

→ **Customer care:** Service provider responsiveness and support

29
metro lines

879km
length

500+
stations

Case study 14: Beijing, China – Network integration strategy

Beijing's rapid transit network is one of the largest worldwide. Complementing this is an expansive bus system, with over 1,000 routes and a fleet exceeding 27,000 vehicles. While millions of daily commuters use these services, PT's modal share is decreasing (now only 25.5%), due to shifting travel habits, increased private vehicle ownership, and the emergence of alternative mobility options like ride-hailing and shared micromobility.

To address this, Beijing has prioritised railway and bus network integration, with particular emphasis on intermodal stations, as some key transfer hubs handle over 500,000 passengers per day. Passenger surveys highlight long walking distances and excessive waiting times as major pain points during transfers. Key measures to improve transfers include reducing walking distances between subway exits and bus stops through better urban design and infrastructure adjustments and expanding and enhancing feeder bus services, ensuring high-frequency and reliable connections that support last-mile travel needs. There has been a 2% increase in bus stops located within 50m of subway stations and an average 25 second decrease in transfer waiting time, easing the passenger burden and improving network attractiveness.

→2% increase in bus stops located within 50m of subway stations and an average 25 second decrease in transfer waiting time.

Beijing, China →

Case study 15: Madrid, Spain – Building seamless mobility through interchanges

Madrid's PTA, Consorcio Regional de Transportes de Madrid (CRTM), is responsible for infrastructural and service planning of all modes, fare policy, contract management, customer service, and investment alignment with regional mobility objectives. Madrid has invested heavily in physical integration through large multimodal interchange development. These interchanges connect suburban buses and railways with urban metro and bus networks, reduce congestion by facilitating efficient transfers, free up surface space through underground designs, improve passenger flow with escalators, lifts, and pedestrian pathways, provide real-time information systems for navigation, and enhance user comfort through naturally-lit waiting areas, clear signage, and commercial amenities. All interchanges can accommodate passengers with reduced mobility, ensuring universal accessibility.

→ Madrid, Spain
© Ivan Marc

The interchanges were developed through long-term PPP concession contracts (35–40 years). Under this model, private partners handle construction, operations, and maintenance.. CRTM retains control over service standards, accessibility, and pricing policies. Operators can therefore focus on delivering high-quality services, while CRTM, as PTA, steers the overall strategy and guarantees network-wide fare and service cohesion.

CITRAM (Transport Management Centre) is Madrid's 24/7 operations hub overseeing the entire transport system. It coordinates real-time services (supply, ridership, disruptions, and incidents, etc;) among 40 different public and private operators. In the case of interchanges - used by more than 1 million people/day - CRTM also monitors infrastructure and safety.

3.6. Innovation: Building resilient and green networks

PT and mobility authorities are responsible for providing transport access for all across diverse areas, from dense urban centres to sparsely populated rural areas. Innovative mobility solutions that address the specific needs of both urban and rural communities, while simultaneously striking a balance between tailored service delivery and value for money, are therefore needed. However, de-risking innovation is essential when designing services, infrastructure, or rolling stock, and incremental innovation can help mitigate the risk. The innovation governance framework should acknowledge the diverse innovation drivers and outcomes and ensure equitable stakeholder risk-sharing and benefit distribution. Otherwise, there is a risk of underutilising innovation or misaligning incentives, particularly when public-private collaboration is key.

Measures should focus on ensuring a safe digital environment for the entire mobility system, from PTAs to PTOs and industry, to encourage innovation and risk-taking[8].

Adapting transport networks to volatile, uncertain, and complex environments and geopolitical contexts is critical. This enhances both system resilience and wider territorial resilience.

Case study 16: Schleswig-Holstein, Germany – Transforming rural mobility through integrated services and AI

In the Schlei region, with 120,000 residents, Schleswig-Holstein PTA NAH.SH has launched demand-responsive shuttles in rural NA.SH areas under the federally-funded "Smile 24" project. NAH.SH is collaborating with county transport planners, municipal councils, and Deutsche Bahn subsidiary Yoki, which provides independent mobility analyses. The objective is to offer truly inclusive, door-to-door mobility in a region larger than the Hamburg metropolitan area, breaking the rural isolation that has constrained access to jobs, education, and leisure.

Services operate 24/7, with a fleet of 24 vehicles (30% wheelchair accessible) at peak times, bookable by app or telephone. Fares are integrated into the existing PT tariff, so a pooled ride costs the same as a bus ride. As of November 2024, 195,000 booking attempts yielded 18,000 pooled rides carrying 22,000 passengers, data that AI uses to forecast commuter peaks and cut empty runs. AI finetunes pooling parameters, replacing manual guesswork, and its predictive scheduling has decreased unproductive mileage by shifting vehicles to high-demand corridors. The ultimate aim is to achieve full automation, where the system self-adjusts in real-time, to maximise efficiency.

Smile 24 shows how the right combination of funding, technology, and collaboration can bring city-level mobility to rural areas through shared demand-responsive transport and AI-driven optimisation.

Case-study 17: Singapore – Building bus network resilience

Singapore, a compact island city-state of 740km^2, faces unique challenges in PT provision, from extreme tropical heat to high urban density. Five million people use its integrated rail and bus system daily. The city's 240km rail network, supplemented by light rail, serves as the PT backbone. Structured feeder bus services connect passengers to rail hubs. In areas less connected by rail, express bus services link major residential estates directly to the central business district, especially during peak hours.

Over the past decade, Singapore's bus sector has undergone a series of reforms to improve resilience and service quality. Under the new Bus Contracting Model, which replaced an ownership-based system, the Land Transport Authority (LTA) procures services through competitive tendering, dividing the network into 14 packages operated by four main providers. To meet the needs of newer housing estates on the city's fringes, Singapore introduced the Bus Connectivity Enhancement Programme, focused on more direct routes connecting residents to MRT stations without traditional feeder transfers.

In parallel, LTA has made significant progress in bus electrification, having procured over 1,000 electric buses (e-buses) since 2020 and aiming for 50% fleet electrification by 2030 and 100% by 2040. Dedicated e-bus depots and hybrid charging facilities are being rolled out accordingly.

When transitioning to a greener bus fleet, review the entire value chain to consider all possible implications and ensure service continuity and quality. Zero-emission buses require sufficient buffers and flexibility to adapt to future service needs. A cautious, step-by-step approach with tests and pilot projects is recommended. Overall value comes from finding the right energy transition strategy that supports equity, economic development, and resilience.

2030
50% electrification

2040
100% electrification

→ Singapore, Singapore
© PTC

Budapest, Hungary →
© Albert Lugosi

Case study 18: Budapest, Hungary – Service quality, bus fleet electrification, and trolleybus development

Budapest's PTA, BKK, has a range of responsibilities, from strategic planning and service ordering to contracting, fare management, and traffic control. While day-to-day operations are conducted by service providers, BKK defines quality standards, performance levels, and investment strategies. BKK's bus service contracts clearly define service areas and duration. Operators must adhere to strict vehicle design, passenger capacity, and performance specifications (e.g., 69,000km per bus annually, ±15%). A 50-item penalty system ensures compliance with service quality standards, focusing on punctuality, vehicle condition, and customer experience.

The Budapest Mobility Plan integrated environmentally friendly vehicles into the city's long-term vision, including the deployment of 90 new e-buses, alongside trolleybus network expansion, as part of a gradual, sustainable electrification strategy. BKK is taking a phased electrification approach, prioritising network efficiency and service quality. The city's electrification strategy acknowledges financial constraints and the need for long-term funding commitments.

Under e-bus contracts, operators must install and manage charging infrastructure. Charging follows a system-based approach, not traditional fuelling, requiring operational shifts. Nighttime depot charging is prioritised for simplicity and cost control. Due to the longer battery lifetime, assumed to be six years, e-bus contracts are set at 12 years, instead of the standard ten. Operators are responsible for electrification assets during the contract period.

A critical concern is maintaining service quality during the electrification transition: routes are provided to operators in initial contract phases to stabilise operations. Penalties for temporary diesel bus usage are initially reduced to allow flexibility. E-bus contracts demand fixed corridor routes and less frequent timetable adjustments compared to diesel services, ensuring network reliability.

Despite procurement delays (e.g., bus manufacturing bottlenecks), Budapest has secured 70 BYD e-buses (50 standard, 20 articulated) through a contract with ArrivaBus, with 20 more under procurement. Service is scheduled to commence in 2026.

Case-study 19: Yucatan, Mexico – The region's first electric BRT system

In Yucatan, a metropolitan area with 1.1 million people and 500,000 daily trips, the region's first electric BRT system was launched in December 2020. It now includes five lines, two of which connect to a new regional train. With affordable fares under $1 USD, the system provides accessible, equitable mobility to diverse users, including the elderly and people with disabilities.

→ Yucatan, Mexico
© Brian Jiz

Initial challenges included low demand, poor route alignment, and spatial constraints, as BRT lanes and stations require significant space. However, the use of repurposed train tracks allowed for cost-effective development and urban renewal in previously neglected areas.

Service improvements, including earlier operating hours, flexible routing, and a transfer centre, boosted ridership to 10,000 daily trips and 770 transfers. A hybrid model of exclusive and mixed lanes, combined with conventional buses for last-mile connectivity, helped improve flexibility and access. Ongoing issues with battery performance and peak-hour overcrowding are being addressed through operational research, regular passenger surveys, and continuous route adjustments. The project demonstrates how a well-defined strategy and the right choice of technology can make electric BRT a powerful tool for sustainable urban mobility.

4. Conclusion

Continuously improving PT system quality is key to delivering user-centric, efficient, sustainable, equitable, and cost-effective mobility solutions and combatting changing mobility patterns and increased private car ownership. Through seven key dimensions and 19 international case studies, this publication has presented the prerequisites and enabling conditions of governance frameworks, institutional arrangements, and coordination mechanisms that underpin effective delivery, with a focus on critical policy areas shaping system performance and user experience.

The following four actionable recommendations, based on this study, aim to help PTAs and other stakeholders deliver high-quality PT.

Recommendations

Recommendation 1

At a strategic level, strengthen governance and collaboration. These aspects are essential for delivering high-quality, user-centric, and community-beneficial PT services.

This involves:

- Defining clear roles and responsibilities for PTAs and PTOs. Establish performance-based incentive frameworks that foster high performance and innovation. Strategically define asset ownership between authorities and operators.
- Allocating significant stable resources while strategically using public budgets, balancing short-term service delivery needs with long-term investment and development goals. In an in-house model, ensure alignment of PTO shareholders' interests and the PTA's public service remit.
- Local and municipal government implementation of supportive policies and infrastructure such as bus, trams, and shared service priority lanes, parking management, and train slots for local services.

Recommendation 2

At a tactical level, define service quality from the user, territorial (urban, peri-urban, and rural) needs, and general interest perspectives. Service quality initiatives should focus on understanding and improving existing and potential end-users' experience of the mobility system. This means making the entire door-to-door journey seamless, delivering service continuity (regularity, punctuality, etc.), and integrating a wide range of transport options. PT should be promoted as a key contributor to broader territorial development, equity, economic competitiveness, and environmental sustainability.

This involves:

- Adopting tailored approaches to analyse the diverse expectations of users across different times (days, year, seasons) and geographies (urban, peri-urban, rural).
- Prioritising essential ('must-have', baseline) and desirable service quality attributes and preventing user attrition. An ambitious service quality vision based on a dynamic roadmap should support this.
- Framing PT as a core enabler in achieving city-wide strategic and operational objectives.

Recommendation 3

At an operational level, implement a robust performance measurement system. A strong performance measurement and reporting framework helps facilitate alignment with long-term goals and service improvement.

This involves:

- → Involving users and representative groups in indicator definition, progress monitoring, and reporting to ensure transparency and accountability.
- → Ensuring KPI alignment with broader strategic goals.
- → Exploring AI's role in monitoring, analysis, and adaptive service planning to support this framework.
- → Standardising KPIs (which would require the development of a standardised framework) to do cross-modal and cross-network benchmarking at the city and global level, generating evidence to support informed decision-making.

Recommendation 4

Foster incremental and inclusive innovation that meets public policy objectives. Innovation should enhance accessibility, strengthen system integration, and serve the community. It should be proactive, align with user needs, and contribute to long-term system resilience.

This involves:

- → Anticipating emerging trends and preparing for their integration into the system.
- → Broadening 'innovation' to include new service models, organisational structures, and operational practices. Innovation is also about low-cost, creative approaches and **requires a safe, reliable digital environment.**
- → Rethinking resource use and service design to deliver greater value and impact.

Based on this framework, the Authorities Committee will advance its work, with a focus on integrating shared and on-demand mobility solutions.

→ Geneva, Switzerland
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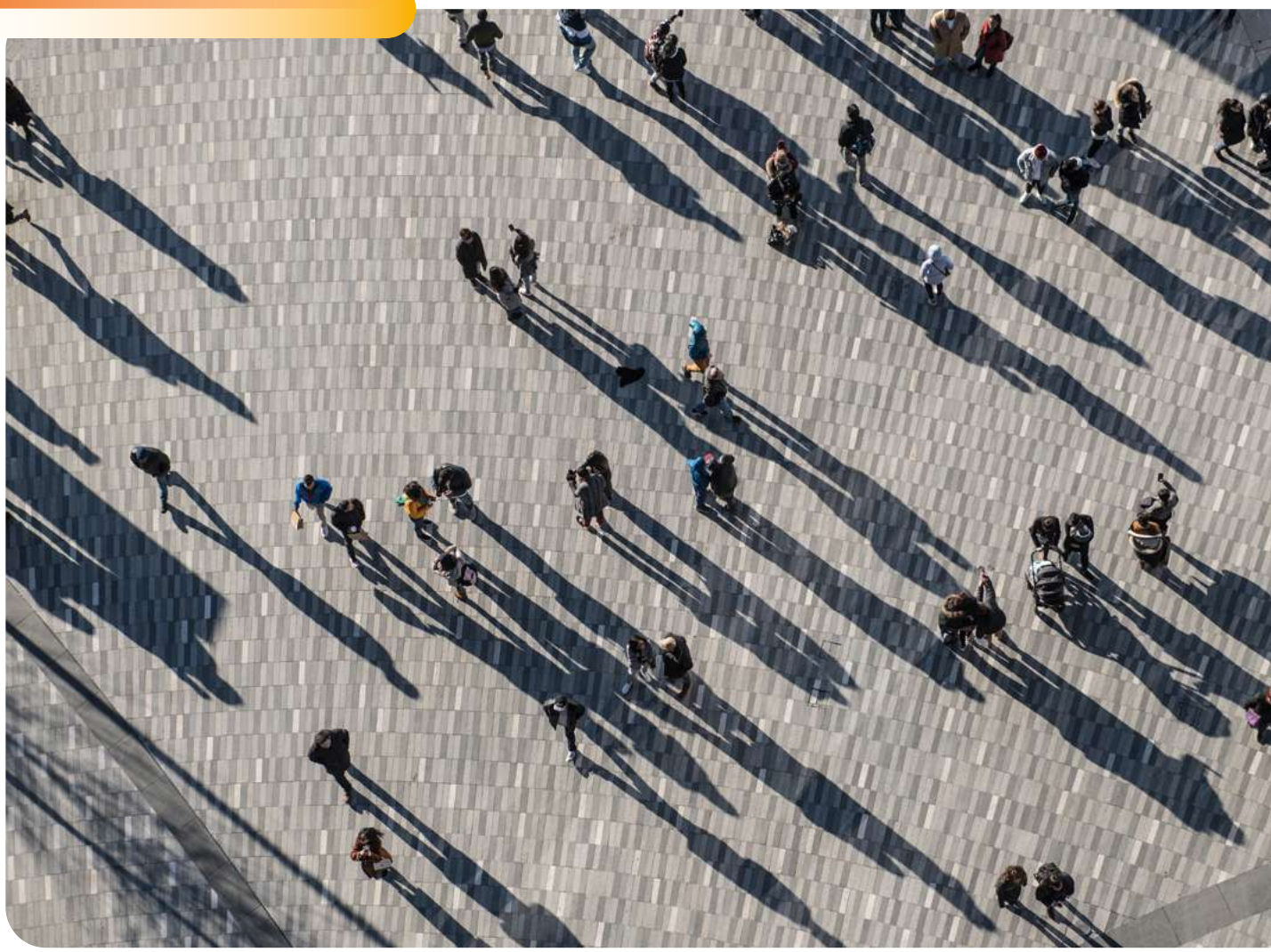

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Legal deposit: D/2026/0105/06 - Rue Sainte-Marie 6, B-1080 Brussels, Belgium | Tel +32 (0)2 673 61 00 | info@uitp.org | **www.uitp.org**