Achieving Operational and Organizational Excellence

2024 APTA-FTA STUDY MISSION TO PARIS AND LONDON

American Public Transportation Association

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OVERVIEW:

Purpose and Major Findings of Mission

The American Public Transportation Association (APTA) and U.S. Federal Transit Administration (FTA) organized a joint study mission of more than 25 public transit agency and business executives to Paris and London, June 12-20, 2024.

Led by APTA Chair Michele Wong Krause, APTA President and CEO Paul P. Skoutelas, and FTA Acting Administrator Veronica Vanterpool, the group met with public transportation authorities and operators in both cities, including Ile-de-France Mobilités (IdFM), Régie Autonome des Transports Parisiens (RATP), and Transport for London (TfL).

Through round table discussions and site visits, participants shared ideas on streamlining project delivery, transitioning to zero emission fleets, changing ridership trends, and innovating and modernizing operations, maintenance, safety, security and customer service.

The major takeaways from the study mission were:

1. **Start with the Why and Set Ambitious Goals,** with Paris aiming to double its metro network by 2031, and London committing to make 80 percent of all city travel on public transportation or active transport modes by 2041;

2. **Continuously Invest in Service Improvements** to develop high-performing public transportation networks that are future-proofed to changes in ridership, funding, and governance;

3. **Make an Overarching Commitment to the Customer** by providing top-quality service, with reliability, frequency, and attractiveness at the heart of all decision-making;

4. **Make a Powerful Business Case for Transit** to be viewed as a significant contributor to the GDP and a vital economic driver without which businesses could not operate;

5. **Take a Big Picture Approach to Governance** and focus on moving people, not the modes themselves, and use creative funding and financing frameworks to support more integration and coordination on such issues as expansion, operations, workforce development, and sustainability;

6. **Leverage Transit Real Estate Assets** and the connection between land-use and public transportation to create more valuable results.

Image courtesy of Transport for London

PARIS

Transportation as a Key National Policy Lever

France has placed national responsibility for transportation issues firmly within the Ministry of Ecological Transition and Regional Cohesion, which delegates responsibility for transport to the Ministry of Transport. The Ministry of Ecological Transition and Regional Cohesion has broad responsibility to ensure a holistic, systemic, and long-term approach to ecological planning, a clean energy transition, and greater biodiversity.

Transportation is viewed as key to achieving significant improvements in carbon emissions, air quality, equity, the use of critical resources, and the adoption of clean energy. The government's approach incentivizes citizens to change their travel habits and behavior.

This requires significant investment in public transportation infrastructure and practices that will expand rail capacity, seamless ticketing, express bus service, and mixed use Transit-Oriented Development, along with new statutory disincentives for car use.

The goal for France is to achieve 2.2 percent growth in the use of public transportation by 2030 and to ban the use of fossil-fueled vehicles by 2035 while making the use of electric vehicles easier and more affordable.

Governing a Vast Mobility Network

Paris has one of the densest public transportation networks in the world, rivalling that of London. In the larger Paris metro region (Ile de France) with 12 million inhabitants, 22 percent of trips taken are by public transportation (9.1 million daily trips), 45 percent on foot, 33 percent by motorized vehicles, and 3 percent by bicycle.

Public transit ridership is still down 5-10 percent from 2019 levels; however, traffic patterns have been radically altered. Paris is experiencing peak days rather than peak hours, with weekend ridership increasing fastest. Subsequently, Paris has modified its approach to service delivery from a rush hour model to a focus on increased service throughout the day on Tuesdays, Thursdays, and Saturdays, the days with the heaviest ridership.

Transit map of Paris

Mobility policy is set at the regional level and administered by a public authority, Ile-de-France Mobilités (IdFM), which is responsible for all modes of transportation. It defines and sets service levels, pricing, and quality objectives for public transportation, awards contracts for operations, develops mobility plans, pilots new forms of mobility, studies and manages investment programs to modernize the network, and makes recommendations.

Almost half of its 12.9 Billion Euro [13.9 billion US$] budget is from the French mobility tax, a payroll tax levied on companies with more than 11 employees. The rest is from fare box revenue, public subsidies (2 billion US$ from the French state, the Ile-de-France region and several regional and communal governments), and other sources such as advertising. The percentage collected from fare box revenue has notably decreased over time, in particular since the COVID pandemic.

IdFM has established contracts for the operations of the mobility network that stipulate services (routes, frequency), expected quality of the service (customer service, cleanliness, punctuality), and required investments in the network. Historically this has been in a monopoly environment with RATP currently receiving 47 percent of total funding (21 billion Euro over four years through 2024) and SNCF receiving 32 percent (20 billion Euro over five years through 2025).

A progressive schedule has been established to open the entire mobility network to competitive tendering per European Union regulation starting with the bus networks in the outer suburbs in 2021, followed by the Paris metro area bus network in 2025, and then the light, regional, and heavy-rail networks through 2040. Consequently, in what is seen as an enormous opportunity to harmonize processes and modernize infrastructure, IdFM has entered a complex era of buying and integrating mobility assets, including bus and rail depots. This initiative also involves increasing the agency's in-house skills and resource capacity.

Modernizing and Expanding Transit Infrastructure

At present, the Ile-de-France Mobility Authority (IdFM) is studying or overseeing the execution of 60 major infrastructure projects ranging from the development of express bus lanes and the renovation of major interchange hubs to the creation or extension of streetcar, light, heavy, and regional rail lines. In May and June of 2024 alone, 24 new regional and metro rail stations were opened as part of rail extensions.

Delegation in front of the Grand Paris Express exhibit

To improve the quality of customer service, stations have been made more easily accessible, timely information for passengers has expanded, and station services, intermodality, and security have increased.

As part of its network modernization policy, the authority is accelerating the renewal of rail rolling stock, reorganizing the bus network, and planning a complete clean energy transition for the densest urban areas in the Paris region by 2025 and the entire Ile-de-France region by 2030. The current energy mix for buses is 30 percent battery electric and 70 percent biogas.

In the Paris region:

- more than 1,000 electric buses and 1,300 biogas buses are operated by RATP group;
- the bus fleet is composed of 70 percent electric or biogas buses; and
- the current energy mix for buses is 22 percent battery electric, 22 percent hybrid battery, 28 percent biogas, and 28 percent gas-oil.

The largest infrastructure project by far is the Grand Paris Express, a 125-mile expansion of the existing spoke and hub rail system for the Ile-de-France region to allow for more circumferential routes in the suburbs and exurbs. It will double the length of the Paris metro network, reduce travel times across the region, provide better access to key Paris attractions and connections from and between the outer suburbs, and

connect the three international airports. It is a transformative innovation for mobility in Paris as users will no longer have to go through the city center to change metro lines. It also will alleviate overcrowding on the current regional rail network that is at capacity, help address population growth and contribute to the greening of the region.

The Grand Paris Express is currently the largest infrastructure project in Europe and the third largest in the world. The total investment is 36 billion Euro (38.8 billion US$) with approximately a third borne by the French State. The rest is obtained through loans and bonds and a specific transport/commuter tax for companies operating in the greater Paris metro area.

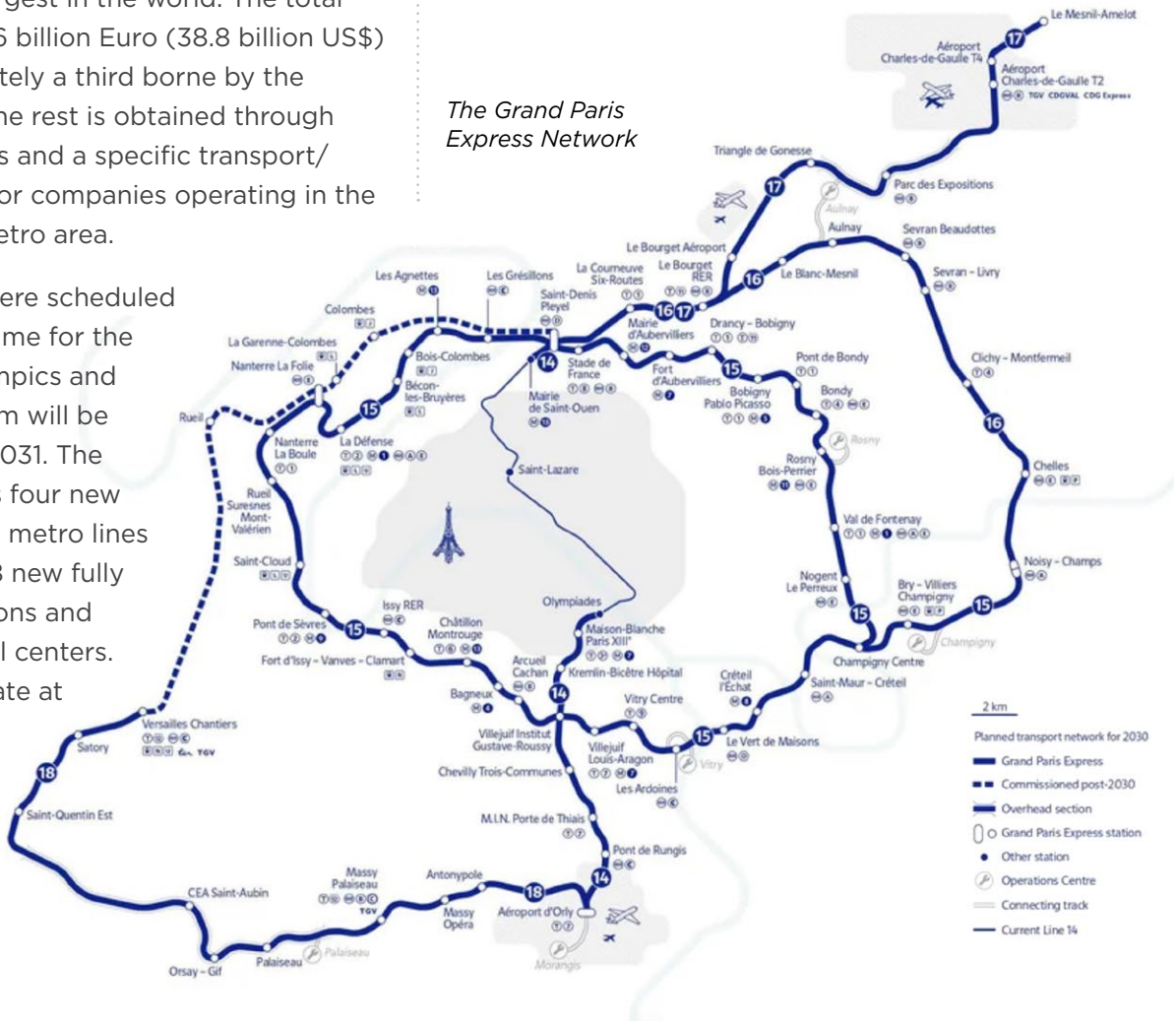
The first lines were scheduled to be ready in time for the 2024 Paris Olympics and the entire system will be completed by 2031. The system includes four new fully automated metro lines (GOA4) with 68 new fully accessible stations and two new control centers. Trains will operate at a higher speed (75 miles per hour) than the existing network with 2–3-minute headways and have an estimated system-wide capacity for 3 million daily riders.

Delivering the Grand Paris Express

Building the Grand Paris Express started in 2010 with the creation of the "Société du Grand Paris", now named the "Société des Grand Projets" (SGP — the Company for Major Projects), a separate 100 percent state-owned public entity to design, build, and finance the project.

SGP owns the infrastructure and is essentially shielded from political and policy changes to ensure the Grand Paris Express is completed on time and within budget. SGP benefits from specific taxes and has the authority to issue bonds and borrow money on the open market.

The Grand Paris Express Network



The project is managed under a multiparty agreement that separates the development and ownership of the infrastructure from the maintenance and operations. Once procured by SGP, the ownership of rolling stock will be transferred to IdFM, who will also set the performance conditions and award contracts for operations. RATP Infrastructures will function as the infrastructure manager and maintainer, and Keolis and RATP Dev have been awarded operations contracts for specific lines and will ensure the maintenance of rolling stock and the stations. Systra has been awarded contracts for design and construction management for parts of the network and as the integrated project delivery partner for several new lines.

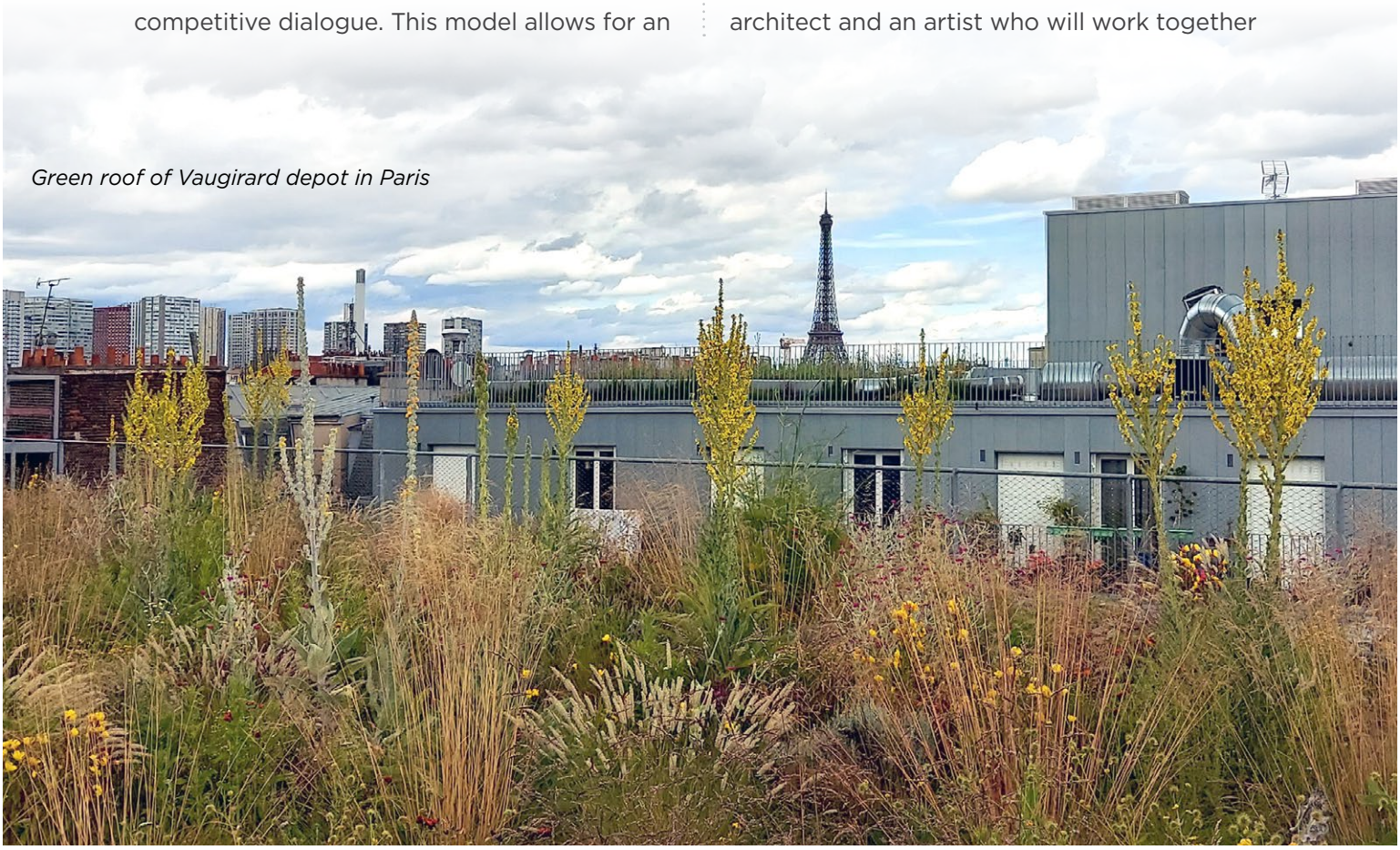
Newer for France is the Design and Build form of project delivery for the Grand Paris Express. The RFPs identify functional rather than technical requirements. The final solution with a fixed price is identified through the bid process after 2.5 years of competitive dialogue. This model allows for an optimization of technical, timing, contractual, and financial aspects which are agreed upon by all parties. A larger portion of the risk is transferred to the contractor ensuring designs maximize safety and minimize cost.

Designing with Sustainability and the Customer in Mind

LEED type sustainability principles are being applied throughout the construction with some key features:

- The waste generated from tunneling is used to fill quarries and make cement and bricks;
- Station walls are made of graffiti resistant materials;
- Station and tunnel lighting is ergonomic, following the colors of natural sunlight across the day.

Each station has been assigned both an architect and an artist who will work together



Green roof of Vaugirard depot in Paris

to create a unique indoor and outdoor station identity reflecting the local neighborhoods. The new stations are seen as a catalyst for redeveloping ex-urban and suburban centers allowing greater density where it did not previously exist. Stations will be integrated with bus and streetcar networks as well as pedestrian access and bicycle parking facilities.

A hands-on exhibition of the project, called "La Fabrique du Metro" – the Metro Factory, has been created to provide the general public with an opportunity to visualize the project's development, and experience the seating and accessibility features of the stations and rolling stock.

Modernizing the Paris Metro

RATP, the primary operator in the Paris metropolitan area, is leading an extensive modernization of the heavy-rail network and rolling stock directed and financed by IdFM. The goal is to modernize the entire network by 2035, and to renovate 85 percent of all rolling stock. This includes introducing Communications-Based Train Control (CBTC) technology to increase automation, efficacy, and safety, improve accessibility and capacity of stations and trains, deliver more real-time information to customers, upgrade passenger facilities, and increase energy efficiency and sustainability practices.

A key accomplishment has been the conversion of two subway lines to fully automatic operations (Level 4). The first transition of Line 1 took 10 years to complete, working entirely overnight so that service would not be interrupted. Lessons learned were applied to the conversion of Line 4, which took seven years and was completed in January of 2024. The automated lines benefit from 85-second headways. The conversion allowed RATP to forego the purchase of new rolling stock which would have been required to increase capacity on these heavily frequented lines. Rolling stock is also being shifted between lines to delay purchasing new rolling stock and ultimately, save taxpayer money.

The heavy-rail fleet has a broad range of vehicles with an average age of 29 years. When purchasing new rolling stock, a key priority is ensuring the capability to convert to fully automated service. Good data and analysis of maintenance needs is being used to ensure rolling stock is not over-maintained. For older trains, placing a sensor on the track has proven to be more effective than upgrading all trains.

"La Fabrique du Metro" – the Metro Factory exhibit

Modernizing the Bus Fleet

The Paris region is undergoing a major modernization of its bus fleet and depots to transition to clean energy as directed by IdFM. IdFM owns 120 bus depots across the region, of which 65 have already been converted and 18 are undergoing conversion.

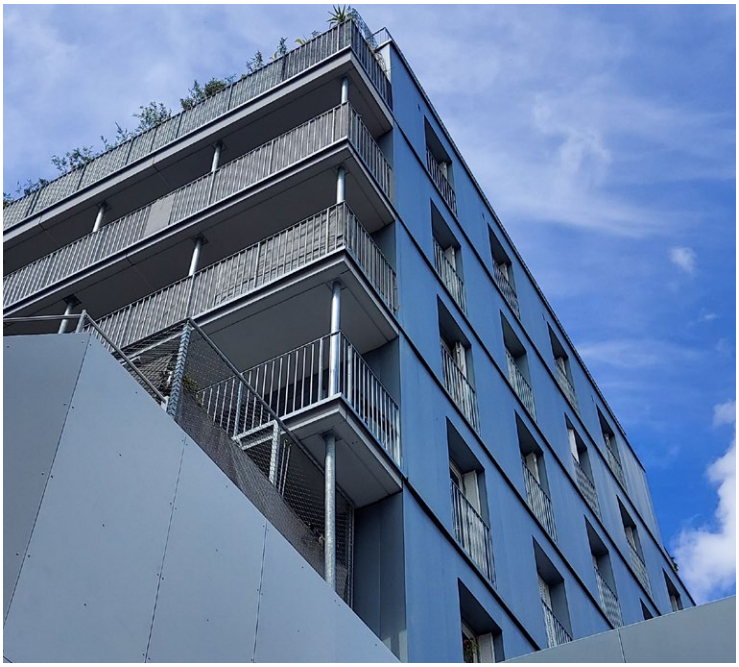
The RATP network will have 1,000 electric buses in operation by the end of 2024 (alongside 1,400 biogas and 1,100 hybrid buses). To date, 19 of the bus depots RATP operates have been converted, 5 are in the process of conversion and 1 new depot is being built.

A unique pilot program is underway to utilize bus storage areas during the day (when buses are on the road) for urban logistics: operating a bike cargo business to distribute packages as Parisian streets hinder delivery trucks. Cargo e-bikes are also being used for mobile maintenance in the densest urban areas.

Ensuring Housing and a Future Transit Workforce

Ridership has returned to the rail and bus networks despite a significant increase in remote work and overcoming a shortfall in bus operators. Thanks to a recruitment plan and a major campaign in Paris to attract more people to work in transit, this shortage has been overcome with 3,000 drivers hired in 2023 and 1,600 drivers hired in 2024. The hiring process is also being digitalized and streamlined, and there is a focus on providing more affordable housing for the transit workforce.

Among the world's major metropolitan areas, Paris has some of the most expensive housing costs. To help address this, RATP has initiated programs to build new housing units over battery-electric bus depots and adjacent to rail stations and depots. A portion of this new



New housing adjacent to Vaugrirard depot Paris

housing is reserved for RATP employees and students, with subsidized housing priced on a sliding scale based on need. These projects are in part financed by the state, the Regional Ile de France Council, and the City of Paris. The concept of "urban co-construction" is managed by RATP through its subsidiaries RATP Real Estate and RATP Habitat.

Redevelopment of and around the Vaugirard rail maintenance workshop for Metro line 12 is a first of this nature and requires the creation of a new legal framework to allow for mixed use development. The project, to be completed by 2029, will result in a new Paris neighborhood that blends industrial activities, housing, and public facilities. In total, approximately 285 housing units (54 percent of which will be affordable housing with priority given to jobs of public interest) will be built along with daycare and food-related businesses.

The Vaugirard site was designed to reduce disturbances emanating from the worksite, to optimize energy performance in buildings, and to add greenery to spaces with green roofs, "suspended gardens" above the workshops, balconies and terraces.

LONDON

A Holistic View on Mobility

London, a city of 8.9 million people, has an average daily transit ridership of 11 million passengers. The mayor of London is responsible for transportation and oversees Transport for London (TfL), the largest integrated transportation authority in the world. Under the direction of a Board appointed by the mayor, TfL manages the road network, operates the majority of the underground rail (the Tube), contracts out operations of parts of the rail network and the entire bus system, and oversees taxi, rideshare, and bike share services. It is the second largest infrastructure provider in the country.

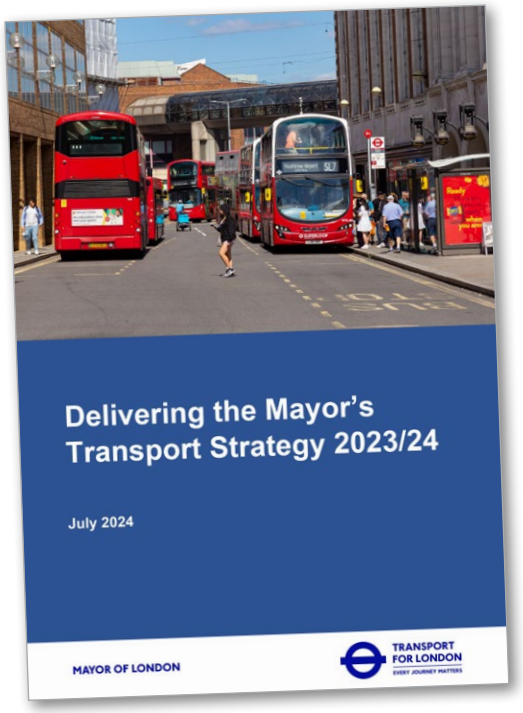


Image courtesy of Transport for London

The current Mayor, Sadiq Khan, has set an ambitious target to significantly reduce car use and increase travel by transit, cycling and walking to 80 percent of all trips by 2041. To meet this goal, TfL needs to grow the customer demand from 1.6 billion annual trips today to 4.3 billion annual trips by 2041. London has already seen a significant shift away from private car use over the last 20 years due to car access and parking restrictions, land-use, and upgrades in transit. Today, 97 percent of London residents live within a quarter of a mile from public transportation.

> "We are creating a city where the fabric works for sustainable mobility."
>
> — **Lilli Matson**, Chief Safety, Health, and Environment Officer

Changing the OPEX and CAPEX Funding Model

In recent years, TfL has not received operating subsidies from the government, save for the emergency funding received during the pandemic. However, there is significant funding from local tax sources which amounts to about 25 percent of TfL's budget and

Delegation visit with TfL Commissioner Andy Lord

includes advertising and real-estate dollars. In addition, TfL has an operating surplus for the first time in 135 years with close to a 4 billion US$ turnaround over the last 3 years. The surplus is reinvested to help cover the cost of operations.

Historically, the budget has been heavily dependent on fares. Though ridership on the rail system is at 89 percent of pre-pandemic levels, TfL's overall fare box recovery rate has dropped to 62 percent from 75 percent pre-pandemic. Fare evasion is an additional challenge, estimated to be 3.5 percent of ridership and amounting to a loss of approximately 165 million US$.

The goal is to reduce fare evasion levels to 1 percent by 2028 and lessen dependence on fare box revenue through increased commercial activity, notably in real estate and advertising. Digital ads on the Elizabeth Line have already proven to be lucrative, for example.

TfL has a very ambitious strategy to increase ridership and be financially sustainable. As it seeks to secure long-term capital funding, one avenue it is pursuing is an increase in third party funding to upgrade and expand the transit network. A stretch goal is to attain 1 billion British Pounds (1.26 billion US$) per year in operating surplus to self-fund capital programs.

Staying True to the TfL Motto: Every Journey Matters

TfL purposefully changed its culture from a supply focus to a customer focus. TfL's slogan of "Every journey matters" conveys the organization's commitment to ensure all can travel safely and efficiently throughout London and that customers are at the heart of everything it does. The goal is to give customers more reasons to choose sustainable modes of travel. The priority is journey time, efficiency, and ease and comfort of travel, not on-time performance of the individual route.

Providing consistently good service, eliminating travel problems for customers, and improving multi-modal connectivity is key, especially for the outer suburbs. The latter is a priority as fewer and fewer people are travelling into Central London and there is an increase in suburb-to-suburb travel. In that context, TfL plans to create more than 15 miles of new bus lanes by 2025 and achieve a 6 percent increase in bus speeds by 2030. Additionally, since 2016, London's air quality has improved as a result of the Ultra Low Emission zone (congestion-charging) expansion to outer London. The ultimate

objective is to move to Healthy Streets where people are prioritized over cars, streets have shade, and are safe, clean, and quiet.

Listening to the customer, building trust, and showing care is paramount for TfL. As outlined in a strategic plan "Equity in Motion" published in February 2024, this means consistent and proactive customer communication, physical as well as digital accessibility and comfort, addressing inequalities in service and zero tolerance for all hate crimes.

> "[We aim] to make the network more available, accessible and affordable."
>
> — **Andy Lord**, TfL Commissioner

TfL collects an enormous amount of data to understand the customers' challenges and track progress in delivering more equitable service. It starts with an understanding of the highly diverse population of London from social identity to language, economic status, ability, and age. Improvements are prioritized for those who experience the greatest physical or economic barriers to access.

Accessibility issues affect 13 percent of customers. For example, providing "step-free" journeys remains a major funding and engineering challenge for TfL given the age and design of the stations in the oldest subway system in the world. Only about 30 percent of stations are currently accessible to customers who rely on wheelchairs or motorized personal mobility devices. Mayor Khan hopes to increase this to 50 percent by 2032. Hence, TfL aims to become more

Image courtesy of Transport for London

The new entrance at Paddington Tube station provides step-free access to the Bakerloo line.

efficient and agile in rehabilitating stations with a priority focus on those that will have the biggest impact. Twenty-four "step-free" stations have already been created since 2016, with 13 more modernized with improved signage and plans to make Google Street View available. TfL is also looking to personalize digital interaction with the system through the TfL GO app.

Investing in Workforce Well-being

TfL has 27,000 direct employees and 160,000 total transit employees, including contractors.

The COVID pandemic led to a much greater focus on workforce well-being. Today, TfL's goal is to be a great and safe place to work with sufficient resources, an outstanding and inclusive environment, and an approachable and diverse leadership team that reflects London's demographic makeup. To foster a culture of innovation, all employees are empowered to freely express their ideas and think outside of the box.

The biggest challenge remains the shortage of engineers and managers, primarily maintenance staff. To improve retention, TfL has prioritized employee training, individual career plans, and flexible working hours. Recruitment efforts are focused on attracting candidates with customer service experience in retail businesses and growing the pool of leadership talent in middle management.

Operating a 160-Year-Old Rail Network

TfL has direct responsibility for operating and maintaining the London Underground, including the oldest subway lines in the world, some of which began running in 1863. In contrast, the newest service, the Elizabeth

line, is contracted out as part of a long-term franchise.

Since opening less than three years ago, it has spurred enormous real estate development adjacent to stations, created 100,000 new non-transit jobs, and achieved the highest customer satisfaction of any rail line in the country. Thirty percent of the Elizabeth line's customers are new to public transportation.

Currently, there are 24 trains operating per hour with 91.5 percent on-time performance. The stations have been future-proofed to allow for increased capacity and ten more train sets are on order. By comparison, the Victoria line, the highest frequency line, operates on 100 second headways with 36 trains per hour.

Elizabeth line equipment must navigate three signal systems, including ECTS (European Train Control System) and CBTC (Communications Based Train Control). Challenges have included creating operational coherence among new infrastructure, new equipment, and a new team that had never

worked together, and coordinating with two above-ground ends operating over Network Rail. The message reinforced by top leadership is "One railway, one reputation."

With a recent decline in the entire rail system's overall condition, the focus is on asset management, requiring government support totaling 500 million Pounds (631 million US$) per year. Currently, 40 percent of the Tube is being upgraded to CBTC, a 5.4 billion Pound (6.8 billion US$) program over 15-20 years, allowing 3.5 hours per night for maintenance.

New trains are serving the Docklands Light Railway (DLR), increasing capacity by 15-20 percent, and decreasing operating costs. New trains on the Piccadilly line are also improving the customer experience.

Learning from Crossrail Construction

The construction of Crossrail, which opened as the Elizabeth line, required building 13 miles of tunnels and 10 new stations. Serious planning started in 2004 with construction beginning in 2010. Tunneling was completed in 2016, but due to issues with systems integration, the opening was delayed until May 2022 and cost 20 percent more than anticipated.

Project elements were separated when the project was launched with distinct contracts for tunneling and different systems and facilities. This allowed for a quick start, but the failure to adequately combine and coordinate the various elements created a major, time-consuming integration process at the end.

Key lessons were learned:

- The project schedule and approach must take account of new infrastructure, new rules, and new employees.
- It is essential to have a consistent, coherent vision and set of requirements from the start.
- The goal must be to provide the most reliable service possible; that is the metric most impacting ridership and customer satisfaction.
- Implement and benchmark best practices.

DLR and Elizabeth line trains passing at Custom House station
Image courtesy of Transport for London

- Pay for the best team, e.g., most experienced, knowledgeable, and skilled with a successful record.
- All project members require total buy-in, with employees from different agencies coming together to 'own' the project. Consider embedding the Chief Operating Officer in the design and construction team.
- This is a systems integration project, not simply a civil engineering project.
- Take time to get the project right, the first time.

Image courtesy of Transport for London

Ensuring High Quality Bus Service

TfL contracts out all bus services: six companies run 621 routes with 9,000 buses (the largest bus fleet in Europe) under seven-year contracts. Vehicles are purchased and owned by the operating companies on a 14-year basis with technical specifications provided by TfL. Contracts stipulate a maximum wait time for riders for bus service. This requires operating companies to have a 10 percent spare ratio. TfL markets the services, but bus contractors collect on-board advertising revenues.

Today, more than 1,600 buses are zero-emissions vehicles with a goal of achieving a fully zero-emissions fleet by 2030. (This is an ambitious goal given current power availability and manufacturing capacity.)

To reduce expenses, bus operators are matching the choice of battery size and kilowatt hours to the use of the bus. Operators have discovered that maintenance costs for electric vehicles are about half of traditional diesel buses.

TfL inherited widely distributed bus maintenance facilities from prior private operators. Unlike the typical approach in the US of consolidating bus maintenance in large facilities housing hundreds of buses, TfL facilities are smaller and close in proximity to the routes served by the buses maintained in those facilities. This has benefited the transition to electric bus operations. Smaller facilities require less electric charging infrastructure, making it easier to add electric load. In addition, the close proximity of bus routes to the facility supports the use of smaller batteries — bus batteries for many

Batteries used in London buses are half the size (and cost) of those used in the U.S., where agencies often operate longer routes.

Serving as the Green Heartbeat of the City

Sustainability is fundamental to TfL's business strategy. It is a major part of the Employee Value Proposition with the sustainability message attracting younger generations to work for TfL. The objective is to build a workforce that views sustainability as integral to TfL's success.

Employee engagement and communication are key to attaining TfL's sustainability goals. The emphasis is understanding the goals rather than what tasks need to be performed. TfL's approach is to communicate the positive benefits of "greening" and to celebrate progress rather than emphasizing negative messages.

> "We have delivered some very transformational top-down [initiatives] but [we also need to] upskill and train [our employees], give them tools, make them accountable and get them engaged at all levels."
>
> — **Sam Longman**, Head of Sustainability and Corporate Environment, TfL

Although TfL does not receive any government support for its decarbonizing efforts, the organization has sought government grants and developed a sustainability training course

Green Infrastructure for Northern line extension
Image courtesy of Transport for London

that more than 5,000 employees (including the entire Executive Team) have completed. TfL also established a net-zero matrix team with engineers, finance professionals, and project managers for the design and management of facilities, thus ensuring the carbon cost is considered across lifecycles.

With a goal of "Net Zero" by 2030, TfL's corporate environmental plan tracks progress against key performance indicators (KPIs). Efforts are focused on decarbonization of the bus network, buildings and facilities. TfL is the largest buyer of electricity in London (375 million Pounds annually), which will only increase as the bus fleet transitions to zero emissions. Hence, a move toward purchasing from zero-emission sources will be critical, shifting away from relying only on the national grid to contracting directly for local renewable resources such as solar — and even using waste heat from the deep Tube network. TfL plans to transition to a fully renewable energy supply by 2030.

Climate change is already disrupting TfL's operations and damaging the London transportation network with increases in flash flooding and extreme heat. As a large landowner in one of the least water permeable cities in the world, TfL can have a major impact on greening the city and mitigating the most

damaging aspects of climate change. Through a green infrastructure and biodiversity plan, TfL is taking a risk management approach to climate adaptation and building models for better decision-making, redefining how infrastructure is used and managed.

Adopting a Zero Risk Approach

TfL has adopted a risk-management approach, balancing safety, security, and reliability of operations. The safety management system is guided by learning across all modes.

Notably, the rail safety culture is being brought to its bus system and road management. A data-driven team is examining everything from bus design to operational safety with the ultimate goal of zero injuries or fatalities on all trips by 2041. Bus fatalities have already been reduced by 40 percent over the last 10 years. TfL also aims to have the bus be a safe haven for passengers and has implemented an active bystander campaign.

From a security perspective, the Swiss-cheese model of layered protection has been implemented. Lessons from the 2017 terrorist attack on the Tube include instituting remote turn-style release and remote announcements from the control center. TfL is piloting a smart stations concept using CCTV at all stations coupled with AI to identify trends and hazards (e.g., litter, people falling, unaccompanied packages) and potential suicides. Personnel at stations are equipped with iPads to view dashboards on customer movements and incidents. There is both an overt and covert police presence in stations and on trains. For privacy reasons, TfL is not using biometrics in the fare payment system.

TASS (Track Access Safety System) is being tested to upgrade safety for MoW (Maintenance of Way) work at night, providing all relevant information on outages, train schedules, location of work, access/egress, crews, etc. The goal is to reduce safety incidents from the current 26 per year to one or fewer. WiFi is available in all tunnels, but workers are trained on non-digital safety procedures in case of a WiFi outage.

Developing a Digital First Strategy

TfL has more than 20 years of "smart ticketing" experience with its Oyster card. Contactless payments were introduced in 2012 as a world first and now constitute 60 percent of fare revenue collected. Mobile ticketing was introduced in 2015 and continues to evolve. However, the Oyster card itself remains a highly effective way to meet a broader range of customer needs and endures as a critical part of the fare payment system. The organization issues nearly 10,000 Oyster cards a day, and only the Oyster card provides daily and weekend fare caps. In addition, 20 percent of payments are still by cash, which TfL will continue to support.

Nonetheless, digitalization of the ticketing system has driven down the cost of fare collection from 15 percent to 6.5 percent

Image courtesy of Transport for London

of revenue generated. In addition, there has been a long-term trend away from season tickets to pay-as-you-go, which was accelerated by the pandemic.

Strategic steps are being taken to move the ticketing system away from legacy technologies by 2030, including introducing a digital Oyster card, transitioning the card to an account-based platform, and making pay-as-you-go the primary ticketing means.

With digital ticketing, TfL sees numerous benefits:

- Lower fare collection costs
- Simplified infrastructure
- Improved use of staff time
- Reduced fraud
- Increased system reliability
- Improved customer satisfaction

A real-time travel app, TfL Go, was launched in 2020 and is used primarily for route status (next bus) and step-free access. Designed to be inclusive and expandable, the app will have the capacity to add notifications, which can be limited to specific lines and routes, and to see the level of crowding at stations. Next, all modes will be integrated in the app with the goal of influencing customers to choose sustainable modes. Ultimately, the app will include payment capability so customers can top-up Oyster cards, buy Travelcards, and view their travel history. In the long term, TfL is seeking the ability to link public transportation payment and road usage charging.

Being a Prime Real Estate Developer

London will require 65,000 new housing units per year through 2041 to accommodate growing needs, but at present is only building 25,000-30,000 units. The aim is to use transportation as a lever for smart growth. For example, 45,000 new homes were built due to the opening of the Elizabeth line and HS2 at Old Oak Commons, making it the largest regeneration zone in Europe.

With TfL as the second largest landowner in London, owning 1.5 percent of London's land mass, it has been granted the authority to purchase property if there is a transportation nexus. "Places for London" was created as an in-house property developer two years ago to consolidate property assets and build housing and retail shops on unused land. It is seen as a means of reshaping London, ensuring the city grows in a way that guarantees a high quality of life for all.

Image courtesy of Transport for London

The focus is on:

- Unlocking the potential for new jobs and new homes in underdeveloped parts of the city;
- Creating high-density mixed-use places with access to pedestrian, cycling, and transit infrastructure;
- Constructing low-carbon buildings with inclusive and accessible designs; and;

- Developing “Car-Lite” rather than “Car-Free” communities since most new homes will not provide parking but rather promote the use of electric vehicles.

The goal is to make 20,000 new housing units available on TfL property by 2031, with 50 percent designated as affordable housing. Currently, 1,000 houses have been built and 3,250 are under construction.

While “Places for London” is financially independent and has a separate governance structure, it pays dividends to TfL that are reinvested into transportation projects. TfL owns the assets and receives profits. Currently, annual dividends amount to 115 million US$. By 2033, the goal is to have invested over 317 million US$ in local transportation options. To maximize assets, TfL has partnered with Network Rail to combine land interests and undertake comprehensive land development.

“Transport is a social enabler.”

— **Andy Lord**, TfL Commissioner

The organization is also teaming up with multiple developers to share risks, costs, and revenues but remains focused on ensuring TfL branding.

In addition, “Places for London” manages all the retail on TfL property. Currently, TfL is home to 1,500 small- and medium-sized businesses in and around TfL stations. In addition, construction sites are being used as a workforce development opportunity with investments in career centers supporting skilled trades. This has helped more than 2,775 people enter the job market so far with the goal of engaging over 6,750 young people in the next few years.

Kidbrooke Centre Project
Image courtesy of Transport for London

KEY FINDINGS

Start with the Why and Set Ambitious Goals

Investments in public transportation are firmly linked to national and local strategies to combat climate change, and improve quality of life, the health, and well-being of people. The London Mayor's **Transport Strategy** is a testament to that, as are the transportation goals of the French Ministry of Ecological Transition and Regional Cohesion.

Sustainability is interwoven in planning and everyday operations. In Paris, for example, a third-party commission collaborates with the community and the transit agency to consider the environmental impact of transit projects. TfL has made sustainability a key lens through which all decisions are made.

Make a Powerful Business Case for Transit

In France, public transport is viewed as a vital economic driver without which businesses could not operate. Companies with 11 or more employees pay 50 percent of their employees' public transportation costs, as well as a levy to the regional transit provider.

TfL Commissioner Andy Lord emphasized that "with such a large portion of the population relying on TfL, the system is a significant contributor to the GDP of the UK."

Continuously Invest in Service Improvements

Before London's congestion charging concept could be adopted in 2003, public transit had to be improved to a level of service that made driving in Central London unnecessary. The benefits of those transit investments are visible today, not only in improved service, but in better air quality, reduced traffic congestion, and more bike lanes.

> "Paris and London are investing in the mobility services that matter most to their customers."
>
> — **APTA delegation**

And that investment has continued. TfL is committed to a full transition of its 9,000-vehicle bus fleet to zero emissions by 2034. To maintain a state of good repair, TfL is also investing heavily in areas that the public does not see: e.g., rail track infrastructure, signal systems, switches. Today, London's 160-year-old heavy rail system is already running an average of three-minute headways, which is an amazing achievement.

Paris is currently doubling its metro network to alleviate overcrowding on the current system, accommodate population growth, and contribute to the greening of the region. It is also modernizing the existing network by

> "Innovation starts with how we fund and finance our mobility networks."
>
> — **APTA delegation**

Image courtesy of Transport for London

accelerating the renewal of rail rolling stock, reorganizing the bus system, and aiming for a complete clean energy transition.

Make an Overarching Commitment to the Customer

There is an exceptional commitment to customer service by transit leaders in both Paris and London. High-quality customer service — reliability, frequency, and attractiveness — are at the heart of all future planning. Both cities are committed to developing high performing public transportation networks that are future-proofed against changes in ridership, funding, and governance.

In London and Paris, using transit is an efficient and dignified experience. Integrated mobility, bus and bike lanes, and protected spaces for pedestrians, bicyclists, and vulnerable people are designed for all users. Appreciation for various forms of mobility is intentional rather than an afterthought. New infrastructure is built with a level of design that makes it attractive for customers.

> "It is about how transit authorities and operators are showing up in the community."
>
> — **APTA delegation**

> What the Paris and London transportation authorities control, they do exceptionally well. In the United States, we spend too much time on what we can't control."
>
> — **APTA delegation**

Take a Big Picture Approach to Governance

Regional authorities in both cities focus on moving people, not the modes themselves, and they have sufficient control to make a difference. This allows for an impactful strategy and a significant return on investments. Creative funding and financing frameworks are in place to support expansion, operations, workforce development, and sustainability — and these issues are not mutually exclusive.

As Paul P. Skoutelas, APTA President and CEO, remarked: "In the U.S. we are too siloed in terms of governing mobility; we need governance models that support a more integrated and coordinated approach."

"Paris and London are models of what a concerted approach can do [enhancing mobility options] for users," stated Veronica Vanterpool, Deputy Administrator, U.S. Federal Transit Administration.

Image courtesy of Transport for London

Leverage Transit Real Estate Assets

Banking on the connection between land-use and public transportation is creating more valuable results. In Paris, a rail depot is the center of a transit-oriented mixed-use development and new housing. In London, TfL is working with a variety of public and private actors focused on real-estate development to generate revenue that is being reinvested in transit improvements.

> "We need to learn from our international peers how to connect real estate and the movement of people."
>
> — **APTA delegation**

2024 STUDY MISSION DELEGATION*

APTA / FTA Executive Study Mission to Paris and London

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