

**How is the global transport sector responding to the Coronavirus (COVID-19)?
July 2020**

Introduction

As a result of the COVID-19 virus outbreak, transport providers have had to make substantial changes to how they manage their organisations and serve their customers, within a rapidly evolving and uncertain environment. For many, their reaction is crucial for the sustainability of their businesses, the safety and security of employees and passengers and may have substantial implications for the societies and economies within which they operate.

Over 100 metro, rail, bus, light rail and airport operators participate in the international benchmarking groups run managed through the [Transport Strategy Centre \(TSC\)](#) at Imperial College London. Most transport organisations are having to take significant actions to cope with the outbreak affecting virtually every aspect of how they conduct their business.

The members of these groups have been sharing valuable information within the individual benchmarking groups about how they are responding to the outbreak and planning for the future. This has been synthesised by the TSC to provide a summary of the practices and approaches implemented, considerations for the future, and a summary of how these actions have been progressing since the early stages of the pandemic. These are included in this document in order to help organisations in the transport sector to optimise their response to the COVID-19 virus outbreak. The information has been anonymised to respect confidentiality according to the protocols of each group. This is a dynamic situation and therefore this document will be updated on a periodic basis.

The key findings have been categorised according to the following themes:

- Impact on demand, revenue and implications for funding
- Strategic management (decision-making, relationships with stakeholders, business continuity)
- Staffing (levels, protective equipment, information, change in roles, safety, homeworking and leave)
- Passenger and customer measures (e.g. passenger information, refunds etc)
- Operational changes (service levels, limiting contact between staff and passengers, etc)
- Technical actions (e.g. changes to ventilation, managing maintenance and asset management)
- Cleaning processes

Public transport demand

The transport sector has been severely affected by the COVID-19 pandemic. Over the last few months, passenger demand on most systems fell to small fraction of normal, pre-pandemic levels. However, the way transport demand has been affected for an individual organisation, or in a certain city, depends on many factors including the extent of lockdown measures implemented, the local spread of COVID-19, availability of other modes, service reductions or cuts, etc.

The TSC has been comparing demand data amongst modes and cities to establish patterns of demand response to the pandemic. The strength of response has been highly dependent on local factors, but the timing of declines indicates that there may have been public fear of the virus that led to pre-emptive demand declines. One of the trends that can be drawn include the speed of decline after the first case of COVID-19 was declared. Figures 1 and 2 show a series of metro demand trends highlighting those that had a very immediate, pronounced decline (Figure 1) and those that had a delayed decline (Figure 2). Several of these metros (particularly those that saw the most immediate and sharpest declines) have stabilised their demand at a low level, while others show signs of steady re-growth in demand.

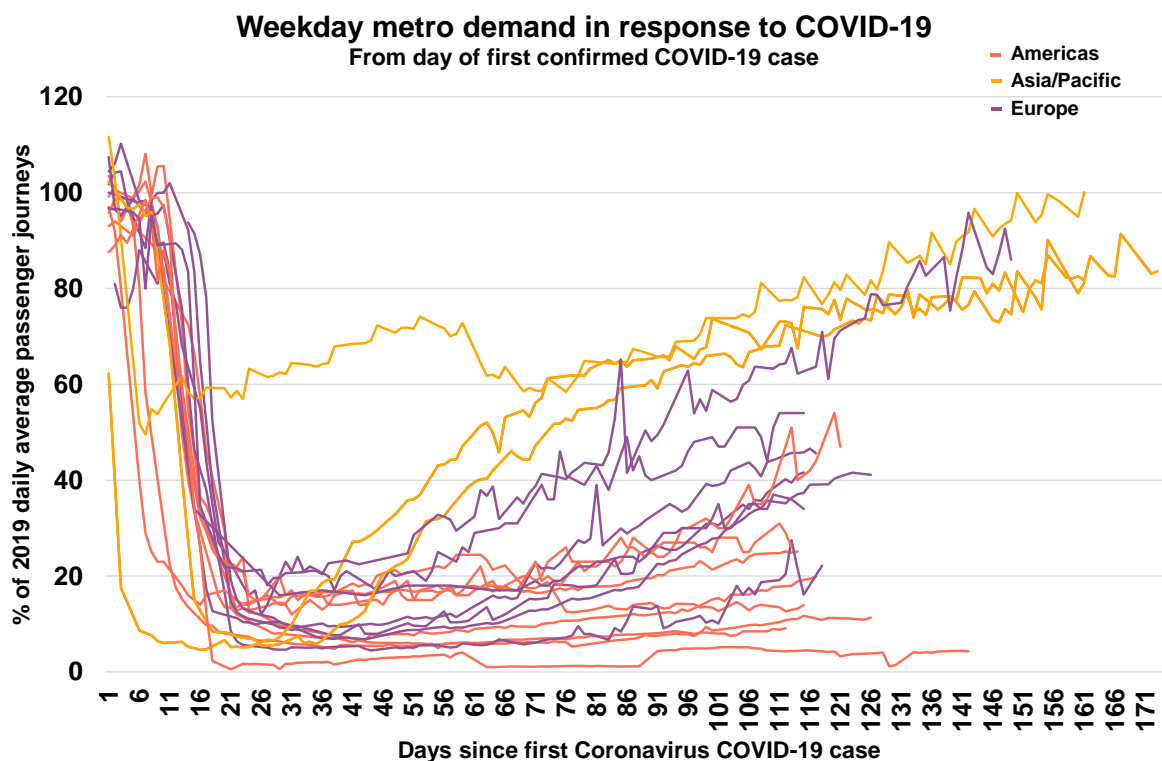


Figure 1: Weekday metro demand in response to COVID-19 (immediate decline) anonymised by region

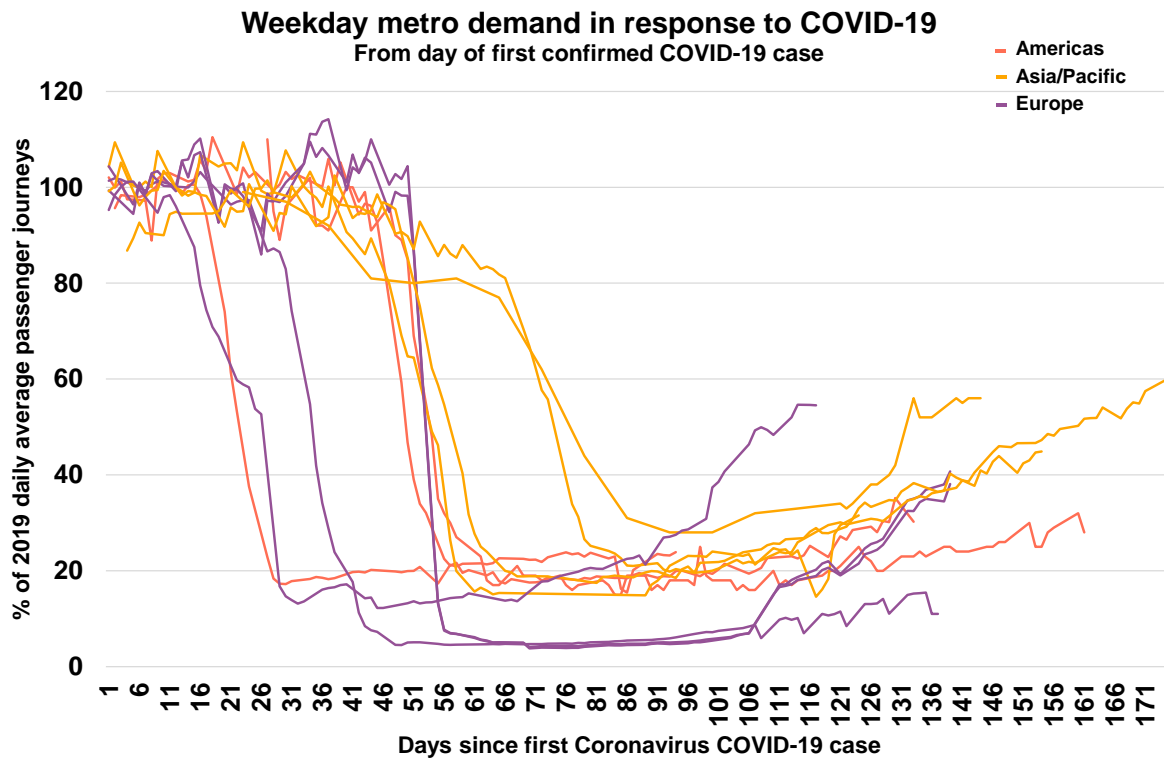


Figure 2: Weekday metro demand in response to COVID-19 (delayed decline), anonymised by region

Comparing levels of travel demand highlights that, in general, **demand response appears to have no direct correlation with the severity of the pandemic in a city.** The majority of transport operators experienced a high reduction in demand (<25% of usual demand), regardless of the rate of cases in the city. Therefore, the demand response is likely to be more related to specific lockdown restrictions, and fear of the virus, which public transport operators have relatively little control over. Overall demand reductions have varied across modes, but have been substantial:

- **Demand for rail modes (metros and railways) appears to have stabilised at a lower rate** (approximately 10% of normal demand) **compared to buses** (approximately 20% of normal demand)
- **Rail modes (metros and railways) are more likely have shown a rapid decline in demand compared to buses,** potentially because of the availability of other modes around the system, a more significant decline in commuting trips, avoidance of discretionary travel, and concerns and perceptions of crowding both on trains and in stations.

Future planning, recovery and reform, and lessons learned

Lockdown measures have already been lessened in many places with governments attempting to enable economic activity to resume. However, while restrictions on citizen movement and business activities have been lifted in many cases, social distancing and other measures to prevent the spread of the pandemic normally remain, even if in a lesser form. Organisations thus face two distinct challenges in relation to future planning:

- **How best to continue to operate for an extended period with some restrictions on travel and/or social distancing measures in place** and while many passengers may return, demand is likely to remain considerably below pre-pandemic levels.
- **How to plan for an uncertain future in the longer term** where there may be some long lasting impacts and where travel pattern may not necessarily return to the pre-pandemic situation.

Initial practices suggest that **many of the enhanced measures adopted to manage the impact of the pandemic at public transport operators will continue in the medium-term**, including revised strategic management structures, staffing arrangements, and cleaning practices. This reflects that organisations need to be flexible towards the risk of a second wave/peak in infections.

Organisations are also looking to **scenario planning** to help formulate plans for recovery, reflecting the current uncertainty about the future. These include options and assumptions for demand and revenue growth, contingent on a number of wider contextual factors (infection rates, status of public services such as schools, seasonal variations, etc). These scenarios are crucial in discussions with government to ensure that it is aware of the specific implications for the transport sector from any government-led decisions.

Actions taken by public transport operators during the pandemic

The follow table summarises the actions that public transport operators have taken during the initial peak of the pandemic (when demand was decreasing rapidly in most cities), when demand stabilised, and as demand recovers. It is worth noting that several cities, particularly in Europe and the Americas, still appear to be experiencing a stable level of demand rather than significant demand growth.

Stage of Pandemic		
Decline	Stabilisation	Recovery
<i>When demand declined significantly as the main impacts of the pandemic affected organisations, in conjunction with the implementation of a multitude of immediate management and mitigation measures</i>	<i>When demand has settled at a steady level and management and mitigation measures tend to be properly established and functioning. Measures may be developed to increase their scope or effectiveness</i>	<i>When demand grows (steadily or significantly) and when demand is expected to settle at higher levels for a longer period of time – this stage takes into account how organisations are adapting in the short, medium and long-term</i>

	Actions during <u>Decline</u>	Actions during <u>Stabilisation</u>	Actions during <u>Recovery</u>
Strategic Management			
Decision-making	<ul style="list-style-type: none"> • Formation or stepping-up of special committees for pandemic co-ordination at leadership/executive level with oversight or direction from safety functions (such as Chief Safety Officers) • Implementing key measures from contingency plans/business continuity plans • Enacting Pandemic Plans to guide organisational response 	<ul style="list-style-type: none"> • Ongoing functioning of committees • Adherence to command and control structures • Updating and revising contingency plans/Pandemic Plans • Participating in regular briefings and cross-committee communications • Managing availability of management to ensure continuity of decision-making • Setup of daily ridership dashboards to monitor demand 	<ul style="list-style-type: none"> • Monitoring and assessing the impact of the pandemic on the business • Estimating the future financial impact and options to address this • Scenario planning to help formulate plans for recovery • Studying impact of past “shock” events • Conducting future demand forecasting • Planning and developing strategies and actions to stimulate demand and revenue growth (once safe to do so) • Identification of opportunities for cost optimisation under lower demand scenarios
Relationship with stakeholders	<ul style="list-style-type: none"> • Formation or stepping up of multi-organisational working groups to communicate and co-ordinate with stakeholders (e.g. city, authority, government, ministries, emergency services, etc) 	<ul style="list-style-type: none"> • Participating in regular briefings and cross-committee communications • Managing ongoing relations with the police, who gradually became more present on some agencies’ networks to enforce necessary social distancing, wearing of masks, etc • Offering rent relief, discounts, postponed payments etc to third parties 	<ul style="list-style-type: none"> • Dialogue with government and key stakeholders to inform them of specific implications for the transport sector • Making the case for government funding and new policies to support sustainable transport operations within and beyond the pandemic • Preparing wider cases demonstrating the value of public transport to cities/countries/economies, especially in terms of supporting and stimulating economic recovery
Contingency management	<ul style="list-style-type: none"> • Testing and readying back-up facilities • Preparing alternative rooms for operational management • Developing satellite control centres • Identifying critical staff roles and single points of failure • Preparing a basic timetable option 	<ul style="list-style-type: none"> • Ongoing testing of operational and organisational processes • Planning for manual operation of the system • Monitoring impact on the supply chain and third parties 	<ul style="list-style-type: none"> • Implementing lessons learned within business continuity documents (including Pandemic Plans) • Preparing contingency plans to deal with possible further outbreaks

	Actions during <u>Decline</u>	Actions during <u>Stabilisation</u>	Actions during <u>Recovery</u>
			<ul style="list-style-type: none"> Refining procurement processes to enable quick delivery of equipment if outbreaks happen again in future
Performance management	<ul style="list-style-type: none"> Monitoring progress against KPIs and targets 	<ul style="list-style-type: none"> Specific monitoring of key targets, e.g. absenteeism, passenger safety, etc Developing new data sources/analyses based on partial information Developing new reporting/visualisation tools for data to inform decision-making 	<ul style="list-style-type: none"> Identifying targets/KPIs that will be affected by historical performance during the pandemic and adjusting for medium-long term performance

	Actions during <u>Decline</u>	Actions during <u>Stabilisation</u>	Actions during <u>Recovery</u>
Staffing			
Staff safety	<ul style="list-style-type: none"> • Providing support for mental health • Issuing Personal Protective Equipment (PPE), notably masks and hand sanitiser • Preventing vulnerable staff from working • Making medical professionals available to staff • Issuing timely travel advice to staff • Cancelling all meetings • Requiring rear-door boarding of buses 	<ul style="list-style-type: none"> • COVID-19 testing of employees (including antibody testing in some cases) • Requiring temperature checks for all staff and visitors entering facilities • Implementing masks for staff on an increasingly widespread basis • Only allowing meetings to take place with maximum limits on attendance • Implementing barriers between bus drivers and passengers 	<ul style="list-style-type: none"> • Continuing with practices that minimise team size (e.g. “bubbles”) and overlap • Move back to previous working conditions (incl. offices) under a phased approach • PPE for frontline staff • Longer-term remote working arrangements for non-essential staff • Planning for minimum staff contingents • Using protective barriers between staff and customers (e.g. bus driver barriers)
OCC staff safety	<ul style="list-style-type: none"> • Preventing non-critical staff from entering the OCC • Enhancing cleaning procedures that OCC staff are responsible for • Staff health checks when reporting for duty 	<ul style="list-style-type: none"> • Operating the OCC with the minimum staff required to avoid overlap • Implementing physical barriers between workstations 	<ul style="list-style-type: none"> • Continuing with practices that minimise team size (e.g. “bubbles”) and staff overlap • Continue to maintain alternative OCC facilities to split staff if necessary
Information to staff	<ul style="list-style-type: none"> • Providing advice on staff health and safety • Implementing defined staff Communication Plans • Setting up dedicated phone lines for staff 	<ul style="list-style-type: none"> • Operating day-to-day communications channels for staff • Running senior management/leadership sessions for staff to hear latest developments, updates and plans • Ensuring senior managers/leaders are visible to staff 	<ul style="list-style-type: none"> • Providing information about future service levels and the factors that this depends on • Continuing to demonstrate visibility of leadership
Staff absenteeism	<ul style="list-style-type: none"> • Splitting teams into “bubbles” to avoid staff overlap • Providing increased spare staff (particularly train drivers) • Adjusting shift management – extending shift lengths, staggering start/end times, preventing shift changes, etc 	<ul style="list-style-type: none"> • Implementing remote processes (e.g. sign on/off) • Ensuring employees can sign off at multiple locations • Reducing team rotations • Limiting cross-facility contact (e.g. depots) • Asking staff to take leave • Redeploying staff into more critical roles 	<ul style="list-style-type: none"> • Robust understanding of service delivery that is possible under various staff absence scenarios • Consider additional staff intake to provide extra contingency for absenteeism

	Actions during <u>Decline</u>	Actions during <u>Stabilisation</u>	Actions during <u>Recovery</u>
Staff training	<ul style="list-style-type: none"> • Cancelling training • Training and licencing additional staff to operate trains 	<ul style="list-style-type: none"> • Identifying essential vs. non-essential training • Deploying PPE to frontline trainees so training can resume • Altering classrooms to maintain social distancing • Identifying opportunities for training while staff are not required in service (e.g. customer service) 	<ul style="list-style-type: none"> • Resuming training activities in-person with significant mitigation measures • Retiming/re-planning training to account for lower capacity of training
Staff with Coronavirus COVID-19	<ul style="list-style-type: none"> • Requiring that the employee self-isolates • Taking assets out of service • Vacating buildings if an employee tests positive 	<ul style="list-style-type: none"> • Staggering return-to-work procedures • Implementing special/enhanced cleaning procedures for equipment/workspaces • Providing welfare/wellbeing support to staff that are unwell • Reporting positive employee cases publicly 	<ul style="list-style-type: none"> • Continue with effective management measures (requiring self-isolation, health checks, etc) recognising that the level of infected staff may decline in the medium-long term (depending on second wave of infections or seasonal variations in infections)

	Actions during <u>Decline</u>	Actions during <u>Stabilisation</u>	Actions during <u>Recovery</u>
Passengers			
Fare-related measures	<ul style="list-style-type: none"> Offering refunds on tickets and passes Offering free travel in some cities (particularly for key workers) 	<ul style="list-style-type: none"> Continuing to provide refunds on tickets and passes and fare discounts Offering fare discounts in some cases 	<ul style="list-style-type: none"> Considering fares and marketing promotions to encourage customers to return once it is safe to do so
Ticketing	<ul style="list-style-type: none"> Not accepting cash when buying a ticket/fare Limiting staffed ticket booth hours 	<ul style="list-style-type: none"> Not accepting cash transactions unless at ticket machines Strongly advising digital payments for fares 	<ul style="list-style-type: none"> Implementing a cashless system
Passenger safety and advice	<ul style="list-style-type: none"> Communications on hygiene and social distancing Advising passengers not to travel (some cities/countries) 	<ul style="list-style-type: none"> Implementing new signage (e.g. floor and seat signs) Advising on where to board trains/buses and to distribute when waiting Advising passengers to minimise interactions with staff Installing temperature monitoring points (particularly metros) Requiring customers to scan a code to register personal information and track movements Preparing emergency isolation kits in stations 	<ul style="list-style-type: none"> Ongoing health monitoring of passengers (e.g. temperature screening) Implementing measures to spread peak demand and reduce crowding Enacting crowd management plans
Passenger PPE	<ul style="list-style-type: none"> Requiring that customers wear masks and use hand sanitiser 	<ul style="list-style-type: none"> Updating passenger charters to stipulate that PPE is required Enforcing PPE for passengers through own staff, refusal to enter the system or engagement with police Providing hand sanitiser throughout networks 	<ul style="list-style-type: none"> Ongoing requirements for PPE while using the system (e.g. masks)
Communications	<ul style="list-style-type: none"> Implementing new messaging through audio announcements, screens, signs, stickers, remotely, etc Enhancing visibility and accessibility of information 	<ul style="list-style-type: none"> Carrying out customer surveys to understand how they have used the service and what their expectations are 	<ul style="list-style-type: none"> Refreshing campaigns providing safety advice to customers Working with customer teams, panels and advocates to develop responsive

	Actions during <u>Decline</u>	Actions during <u>Stabilisation</u>	Actions during <u>Recovery</u>
			<p>communications to passenger expectations</p> <ul style="list-style-type: none"> • Considering marketing and advertising campaigns to encourage customers to return once it is safe to do so • Ensure accurate information on service levels is available to customers (e.g. supplementing paper timetables)
Travel demand management	<ul style="list-style-type: none"> • Advising passengers not to travel (some cities/countries) 	<ul style="list-style-type: none"> • Presenting data via apps, e.g. crowding data, available space, services with high demand, etc • Restricting boarding at certain stations to limit crowding • Crowd control to limit entries 	<ul style="list-style-type: none"> • Ongoing monitoring of travel demand and patterns • Engagement with stakeholders and third parties to inform business strategies (working from home etc) that influence demand

	Actions during <u>Decline</u>	Actions during <u>Stabilisation</u>	Actions during <u>Recovery</u>
Operations			
Service levels	<ul style="list-style-type: none"> Implementing a range of service reductions, particularly frequency reductions, early closures and cancelling services (particularly buses) Closing stations/stops Developing phased service reduction plans or priority plans for reducing services in the event of staff shortage 	<ul style="list-style-type: none"> Implementing some additional services and repurposing vehicles (particularly buses) Monitoring demand for dynamic service adjustments Extending peak-hour service provision in response to peak demand spreading 	<ul style="list-style-type: none"> Ongoing dynamic service adjustments in response to demand/crowding Co-ordinating with stakeholders to manage demand through advice to use other modes (e.g. sustainable modes) Monitor wider determinants of demand (unemployment, fuel pricing, commuting patterns, etc) Consider promotions to drive up demand if safe to do so
Additional services	<ul style="list-style-type: none"> Route adjustments to serve essential journeys/workers (buses) 	<ul style="list-style-type: none"> Repurposing assets for wider community purposes (buses) e.g. grocery delivery, transport between healthcare facilities, operating mobile screening clinics 	<ul style="list-style-type: none"> Supporting regular services with on-demand options (buses)
Enforcement	<ul style="list-style-type: none"> Use of staff to check whether journeys are essential; some early use of penalties where restrictions were stringent 	<ul style="list-style-type: none"> Use of staff and police to enforce wearing of masks (with some financial penalties) and to refuse access to the system if necessary 	<ul style="list-style-type: none"> Monitor ongoing requirements for passenger PPE, Monitor rate of refusal onto public transport

	Actions during <u>Decline</u>	Actions during <u>Stabilisation</u>	Actions during <u>Recovery</u>
Technical Actions			
Managing IT	<ul style="list-style-type: none"> Implementing mandatory working from home policy for non-frontline staff 	<ul style="list-style-type: none"> Managing cybersecurity processes with remote working Optimising internet bandwidths Providing hardware to staff Training staff how to use new systems Rolling out e-learning/online training 	<ul style="list-style-type: none"> Consider enhancing capability to support continued widespread working from home
Managing maintenance and asset management	<ul style="list-style-type: none"> Halting ongoing works safely Monitoring staff, materials and contractor availability 	<ul style="list-style-type: none"> Increasing maintenance in some cases (where lower service levels/passenger demand presents an opportunity), e.g. “shovel-ready” projects Adjusting maintenance regimes based on use of assets (time/distance) Continuing work while monitoring staff, materials and contractor availability Work postponements and cancellations (major works, capital projects) 	<ul style="list-style-type: none"> Monitor long-term impact on investments (e.g. capital projects) that contribute to demand and revenue growth (or wider economic benefits) Identify and accelerate projects that stimulate economic recovery (in collaboration with governments) Identify design changes needed for assets in the long-term to inform future procurement specifications
Ventilation	<ul style="list-style-type: none"> Extending hours of ventilation Using maximum ventilation volumes 	<ul style="list-style-type: none"> Implementing additional cleaning of ventilation infrastructure Keeping windows open on trains/buses for fresh air 	<ul style="list-style-type: none"> Continuing to monitor effectiveness, including any wider information about spread of Coronavirus COVID-19 through airborne means
Cleaning			
Processes	<ul style="list-style-type: none"> Increasing cleaning scope and frequency across assets Increasing cleaning particularly of public-facing assets or assets that are regularly touched Strategically targeting cleaning at airport stations or lines 	<ul style="list-style-type: none"> Optimising vehicle cleaning in/before depots – i.e. implementing a “pre-clean” after the terminal station before the train enters the depot Testing new equipment (e.g. UV light, new cleaning products) Requiring staff to be responsible for some aspects of cleaning (e.g. operational workstations) as well as dedicated cleaning staff 	<ul style="list-style-type: none"> Continuing with enhanced cleaning throughout networks Testing for traces of COVID-19 on surfaces of vehicles, stations, etc.

Appendix A

The [Transport Strategy Centre \(TSC\)](#) was established in 1992 as a centre of excellence serving the railway industry on strategic, economic and technology issues. The TSC has since broadened its international group of research partners and strengthened its position as strategic advisors to public transport organisations around the globe. The TSC at Imperial College London is well known within the transport industry for its research in the field of public transport operations and management, transport economics and policy, and its expertise in relation to the initiation, facilitation and management of multi-year international benchmarking projects.

The TSC facilitates and manages ten programmes of international transport benchmarking in the rail, metro and light rail, bus and air transport sectors. These groups provide a forum for organisations to share their experiences and exchange information. Figure 1 below illustrates the global nature of the organisations that comprise these groups.

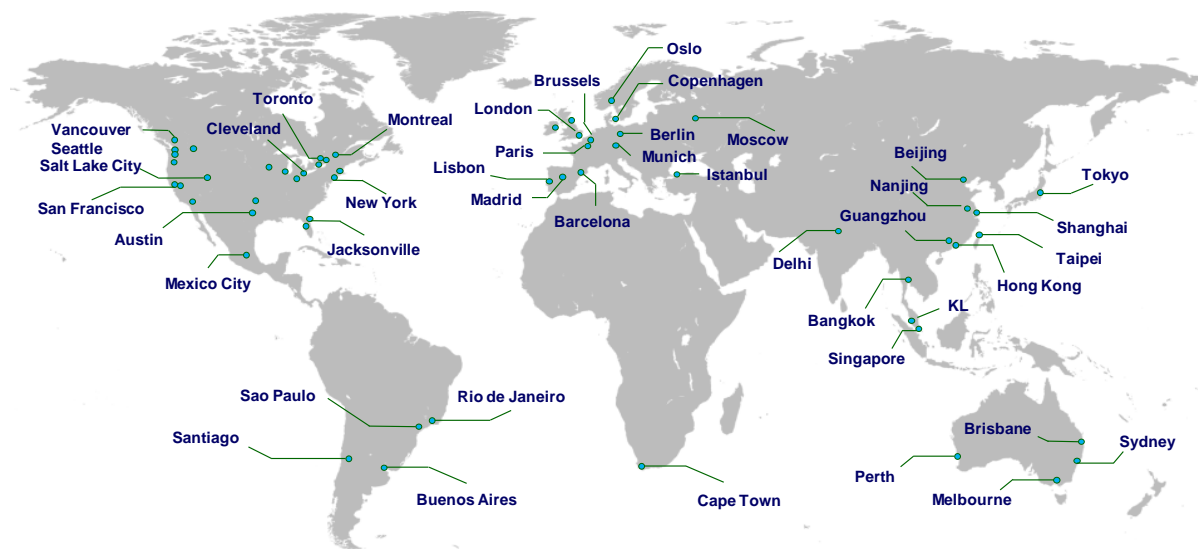


Figure 2 – Map of TSC benchmarking group members

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